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The Oxford Handbook *of* CREATIVITY, INNOVATION, *and* ENTREPRENEURSHIP

The Oxford Handbook of Creativity, Innovation, and Entrepreneurship

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SHORT CONTENTS

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CONTENTS

Introduction: Integrating Creativity, Innovation, and Entrepreneurship to Enhance the Organization's Capability to Navigate in the New Competitive Landscape

Christina E. Shalley, Michael A. Hitt, *and* Jing Zhou

Abstract

The purpose of this *Handbook* is to serve as a catalyst for the integration of the research on creativity, innovation, and entrepreneurship. A significant amount of research has been devoted to each of these areas, and they exist fairly independently of each other. However, by their nature, these three research areas are interrelated. In order to successfully survive and thrive in our dynamic and competitive global marketplace, it is a necessity to more fully understand how creativity is related to innovation and the roles that both creativity and innovation play in entrepreneurship. By doing so, we can reap the benefits of the accumulated knowledge from each research stream to inform the others and move the field as a whole forward. This *Handbook* contains 30 chapters written by leading scholars that speak to the major topics within these research areas and examine multilevel linkages between creativity, innovation, and entrepreneurship.

Key Words: creativity, innovation, entrepreneurship, multilevel linkages, integration of areas

The top 50 firms in *Fortune's* 2014 ranking of "The World's Most Admired Companies" are described as "innovators, disrupters and companies that overcame adversity" (Fairchild, 2014, p. 123). These companies represent technology-based industries (e.g., Apple, Google, Intel, Cisco), consumer products (e.g., Procter & Gamble, Johnson & Johnson, Nestle), traditional manufacturing (e.g., Caterpillar, Deere, 3M, Volkswagen), services (e.g., FedEx, Singapore Airlines, Wells Fargo, Accenture, Netflix), and retailing (e.g., Starbucks, Costco, McDonald's, Nordstrom). Many of these firms are leaders in innovation within their particular industry or industry segment. A further testament to the importance of innovation is shown in the recent firing of the CEO of Symantec. Symantec is the current leader among the Internet security companies, but the board was concerned that it was losing its hold as the market leader because it was not innovating fast enough. Therefore, the CEO, Steve Bennett, was removed by Symantec's board of directors because the firm was not taking adequate initiatives to innovate, introduce new products, and exploit growth opportunities (Perlroth, 2014).

The early years of the 21st century have been marked by significant turbulence fueled by economic and political problems but also by ineffective strategic leadership (e.g., characterized by extreme hubris and greed) (Haynes, Campbell, & Hitt, 2014; Hitt, Haynes, & Serpa, 2008). This period has also been a time of technological advancement and disruptions. In this dynamic environment characterized by significant uncertainty, businesses that remain relatively static in terms of their products and services and the processes used to produce and provide them are likely in a "state of dying." In

2005, the US Council on Competitiveness issued a report developed by leaders from industry, government, and academia that concluded that US firms could maintain (or gain) market leadership only through innovation. In 2010, IBM reported the results of a global study in which 60% of chief executives named creativity as a top priority for their organization. To be innovative, firms must exercise creativity. And, creativity and innovation are necessary for them to be entrepreneurial.

There is a significant amount of research devoted to creativity, innovation, and entrepreneurship. However, much of this research has been bounded and focused, with work in each area conducted independently of the others. Because of their interdependence, there is a need to integrate research and ideas on creativity, innovation, and entrepreneurship. That is the purpose of this *Handbook*.

Parallels Between Creativity, Innovation, and Entrepreneurship Research

As these three research areas have developed, four key parallel themes have emerged. First, central to each of the three areas is the importance of a new idea. Second, the process of coming up with ideas is pivotal to each area. Third, what kind of person is involved in being creative/innovative/entrepreneurial is much discussed. Finally, the overall context is also important for each area. Each of these themes is discussed in more detail here because the three fields could benefit from a discussion of shared research interests and findings that can inform each other.

With regard to developing or identifying a new idea, creativity involves the generation of ideas that are both novel and useful (Amabile, 1996; Shalley, Zhou, & Oldham, 2004). As such, creativity is a precursor of both innovation and entrepreneurship. Specifically, innovation involves the implementation of creative ideas (Zhou & Shalley, 2011). Although we commonly refer to creativity as idea generation and to innovation as the implementation of ideas, in reality creativity and innovation are not as clearly independent from each other as our disciplinary traditions seem to suggest. Also, if we think of entrepreneurship as a more specific form of innovation, one that relates to the development of new ventures, there are parallels here as well. Entrepreneurship refers to the application of creative ideas to new business ventures, which can include the creation of new markets, new products and services, and new firms (Eckhardt & Shane, 2003). Within the entrepreneurship literature, instead of focusing on the generation of creative ideas, scholars examine the identification of opportunities. Also, within the innovation literature, scholars discuss how important it is to get support for new ideas in order to be able to implement them, whereas in the entrepreneurship literature this is termed opportunity exploitation for new venture creation.

Some researchers (Gilson & Madjar, 2011; Madjar, Greenberg, & Chen, 2011) have proposed that creative ideas can be either incremental (i.e., modifications to existing processes) or radical (i.e., significant breakthroughs), with radical ideas occurring much less frequently. Parallel to the incremental/radical distinction in the creativity literature are the concepts of exploitation and exploration in the innovation literature. Specifically, exploration refers to firm behavior that is characterized by search, discovery, experimentation, risk taking, and innovation, whereas exploitation involves behaviors such as refinement, implementation, efficiency, production, and selection (He & Wong, 2004; March 1991). Finally, many true entrepreneurial activities and therefore many new business ventures by their nature may be more likely to involve a more radical type of creative idea or more explorative innovative behavior. However, this idea is contrary to Aldrich and Martinez's argument in this *Handbook* that, given institutional barriers and bureaucracy, entrepreneurs often develop only incremental rather than radical products, services, or new markets. The innovation literature and the creativity literature discuss the inherent tension between exploration and exploitation for units and firms or the potential benefits and costs of trying to develop more radical ideas (Gupta, Smith, & Shalley, 2006). Here the underlying issue is risk. Explorative innovations potentially have a higher failure rate than exploitative innovations. Similarly, incrementally creative ideas are more likely to be effectively implemented than their more radical counterparts. Finally, as pointed out by Rigolizzo and Amabile in this *Handbook*, successful entrepreneurs trying to deal with this dual tension should adopt a "fast failure" approach, which is a model based on rapid prototyping. This approach involves investing in trial and error for many ideas, but on a smaller rather than a larger scale, and not committing significant resources until after quick, objective feedback has been gained (McGrath, 2001).

Increasingly, research is examining creativity as a process (e.g., Gilson, Mathieu, Shalley, & Ruddy,

2005; Gilson & Shalley, 2004; Zhang & Bartol, 2010). The process of developing creative ideas involves a number of cognitions and behaviors that are more likely to result in creative outcomes. These can include challenging assumptions, broadly scanning the environment, recombining ideas from different areas, tolerating ambiguity, and making novel connections. For example, Unsworth and Luksyte argue in this *Handbook* that at times creativity requires being proactive (see also Unsworth, 2001), and Tierney argues that proactive creativity requires extending effort to widely scan the environment for potentially damaging problems that need solutions. This type of creativity is similar to what entrepreneurs do in trying to identify entrepreneurial opportunities. Also, entrepreneurs have to engage in these types of creativity-relevant processes to discover opportunities and exploit them. The creation, funding, development, and growth of new ventures all require a great deal of creativity. For example, entrepreneurs have to be creative in order to develop a new idea, seek venture capital funding, and pitch their idea to potential investors. Entrepreneurs have to engage in these types of processes to discover opportunities and then exploit them. As such, creativity is infused throughout the entrepreneurial process. Also, there is a rich literature on the capacity of individuals to combine ideas into new forms, which is fundamental to creativity and innovation.

Innovation may start from using new knowledge or reusing and combining existing knowledge (Anderson, Potočnik, & Zhou, 2014). The search for new knowledge may be induced by market discontinuities that can lead to new production. Similarly, entrepreneurial opportunity recognition is important because it enables entrepreneurs to meet a market need through a creative combination of resources to deliver value. Prior experience often helps entrepreneurs see patterns that others have missed, and pattern recognition is related to creativity. Creativity plays a role in recognizing novel associations or patterns across disparate data points. Creativity is often understood as a process of variation and selection (Campbell, 1960) in which it is important to generate a variety of ideas and then selectively retain those that are most promising. Similarly, entrepreneurs often come up with a number of ideas and may select one based on funding and the allocation of resources. And innovation involves selectively choosing from generated ideas for further development, refinement, and implementation.

The person also plays an important role in these three research areas. Creativity research has a long history of examining personal factors—such as being open to new experiences, being broad-minded, and being nontraditional—that are more likely to be associated with the propensity or ability of an individual to be creative (Barron & Harrington, 1981; Costa & McCrae, 1992; Feist, 1998). A number of personality characteristics (e.g., Creative Personality Scale, Gough, 1979) have been identified as being associated with individuals who are more creative than others. Also, individuals who are considered more creative tend to approach problem solving in ways that differ from those used by people who are less creative (Jabri, 1991; Kirton, 1976). Specifically, those who are more creative and innovative tend to be willing to take risks and to violate known paradigms and procedures in order to develop new ideas and solutions. Entrepreneurship research has long considered the role of personality in determining success as an entrepreneur and in differentiating entrepreneurs from non-entrepreneurs (Shaver & Scott, 1991). Also, although they receive less research focus, personal factors of innovators have been examined (e.g., Miron, Erez, & Naveh, 2004).

Paramount in Amabile's (1996) componential model of creativity is the role of intrinsic motivation. In this *Handbook*, Rigolizzo and Amabile discuss the role of synergistic extrinsic motivation for creativity, and Tierney discusses the important role of identity for creativity. The construct of creative role identity has been found to be associated with a greater degree of creativity among employees (Farmer, Tierney, & Kung-McIntyre, 2003). As discussed by Tierney, identity can also translate to innovation and entrepreneurship and should be further examined. For example, she mentions constructs such as entrepreneurial passion, founder role identity, and entrepreneurial identity aspiration as motivating behaviors. Also, Fisher and Kotha examine the critical role of individual identity for entrepreneurs. Chen, Liu, and He discuss the importance of passion for creativity, and Mainemelis and Dionysiou reference experiencing the state of flow. Entrepreneurs need passion and intrinsic motivation for new ventures in order to formulate a strategy and especially to implement it effectively (Hitt, Ireland, Sirmon, & Trahms, 2011). They deal with emerging problems, and this also plays an important role in innovation through idea elaboration and idea evaluation. Also in this *Handbook*, Zhang

and Bartol assert that empowerment of employees may influence their entrepreneurial behavior, such as taking risks, dealing with uncertainty, and enhancing innovation. Finally, Shin points out that entrepreneurs need to be effective leaders who can boost their teams' creativity and innovation. Leadership plays an important role for creativity and innovation as well.

Context also is significant for each of these three research areas. For example, within the creativity literature, contextual factors have been found to influence the occurrence of creative outcomes over and above personal factors (Shalley, Gilson, & Blum, 2009). According to a typology developed by Zhou and Hoever (2014), contexts may also interact with personal factors to influence creativity in a number of interesting ways. For example, a supportive context and a personal factor favoring creativity may reinforce each other and hence have synergistic effects for creativity. As another example, positive contexts may provide remedial resources that reduce or even reverse the potential negative effect of personal factors (e.g., Zhang & Zhou, 2014). A wide variety of contextual factors have been studied (Shalley et al., 2004), including rewards, relationships with coworkers, job complexity, and evaluation. There also has been work on the importance of the context for entrepreneurs and the munificence of the environment for innovation (Sirmon, Hitt & Ireland, 2007).

One area that is growing in interest is the role of the social context for creativity. As Perry-Smith and Mannucci point out in this *Handbook*, the lone creator or lone entrepreneur is no longer the norm; rather, we are embedded in a network of social relationships. Creators/Innovators/Entrepreneurs have to interact with a number of others as they generate, refine, and implement their ideas. The entrepreneurship literature has found that an entrepreneur's social networks matter for successfully launching new ventures and obtaining funding (e.g., Slotte-Kock & Coviello, 2010; Stuart & Sorenson, 2007). Research on social networks and creativity (e.g., Baer, 2010; Perry-Smith, 2006; Zhou, Shin, Brass, Choi, & Zhang, 2009) can shed light on how entrepreneurial network position may contribute to creativity, opportunity recognition, and new venture creation. For example, in order to have value creation, the results of creativity have to extend into the entrepreneur's social network. Also, the chapter by Aldrich and Martinez in this *Handbook* stresses the importance of entrepreneurs' belonging to multiple social networks, which generally enriches the diversity of viewpoints and information available to facilitate the creativity and innovativeness of their entrepreneurial ventures.

Increasingly in the creativity literature, more attention is being paid to team creativity (e.g., Gilson & Shalley, 2004; Hirst, van Knippenberg, & Zhou, 2009). Research has suggested that creative activity by employees can be prompted by intentionally establishing groups that are diverse in their makeup or by exposing individuals and groups to diverse experiences in an effort to increase knowledge transfer and enhance capabilities (Perry-Smith & Shalley, 2014; Shalley & Perry-Smith, 2008; Taggar, 2002). Teams are an important source of entrepreneurial competitive advantage. There is a substantial literature on individual entrepreneurs, but superior creative output could stem from having cognitive variety among entrepreneurial team members and from teams' ability to integrate and apply diverse thought processes. The entrepreneurship literature is starting to take a closer look at entrepreneurial teams, particularly during the period after invention and before startup. Less work has been focused on the composition and processes of top management teams that lead to innovation (Anderson et al., 2014). However, creativity is an integral part of top management teams' strategy formation and implementation. Porter (1991) noted that creative choices lie at the foundation of firm-level strategies driving skills and market position.

Chapters Included in Handbook

The chapters in this *Handbook* are organized in three sections corresponding to the three main research streams covered: creativity, innovation, and entrepreneurship. However, although each piece may foundationally emerge from one of these research streams, the chapters also discuss how the topics covered may be related to the other areas as well. Thus, these chapters, and this *Handbook* in its entirety, represent the contributions of leading scholars in these fields toward an integration of the areas of creativity, innovation, and entrepreneurship.

Organizational Creativity

We begin the section on creativity appropriately with a chapter that focuses on the most explored of the contextual factors thought to be important for creativity: leadership. The chapter by Shin focuses on the important question of how leaders provide the impetus for creativity in the workplace.

The chapter reviews the major works in the literature and argues that we need to understand the mechanisms through which leadership affects employees' creativity. Specifically, Shin proposes a mediator-based creativity model. Four mechanisms are proposed: motivation, affect, cognition, and context. In addition, he discusses several directions for future research. For example, future studies may want to consider leadership not only as a main effect but as a moderator. Also, he argues that we need to explore the cultural implications of leadership. Finally, implications of this chapter for future work on innovation and entrepreneurship are suggested.

The next chapter in this section is by Zhang and Bartol. They highlight the important role of empowerment for creativity and propose a cross-level model of empowerment and creativity and innovation. Specifically, at the individual and team level, they review the two major perspectives of empowerment: the psychological approach and the sociostructural approach. A multilevel conceptual model is developed for psychological empowerment and team empowerment for creativity and innovation at the individual and team levels, because there is evidence that empowerment shares similar meaning and relationships across levels. They propose some promising areas for future research. For example, they stress the need to identify team-level mediators that may have a direct cross-level impact on creativity and innovation at the individual level. Furthermore, they discuss ways to extend empowerment research to the study of entrepreneurship and argue that employee empowerment should positively contribute to the ability to be entrepreneurial.

The next chapter is authored by Byron and Khazanchi. They examine the role of rewards for creativity. This has been a controversial area within the creativity literature because, as they describe, prior studies have argued and found positive, negative, and no effect of rewards for creativity. They provide an overview of the theoretical rationales used for these effects, review the major research findings that support the major perspectives, and present results of a comprehensive meta-analysis on rewards and creativity. They also review the limited work that has focused on the relationship between rewards and innovation or entrepreneurship and suggest areas for future research. A major takeaway from this chapter is that we need to move away from examining the main effects of rewards for creativity and start to examine mediators and moderators. Byron and Khazanchi argue that it is important for models to include multiple cognitive, motivational, and affective mechanisms to explain the influence of rewards on creativity. Finally, they propose that the literature would benefit from a more comprehensive examination of the role of rewards for innovation and entrepreneurship.

The next chapter in this section was developed by Rigolizzo and Amabile and focuses on entrepreneurial creativity. Specifically, these authors propose that different stages of the creative process are supported by certain learning behaviors. The four stages they discuss are problem identification, preparation, idea generation, and idea evaluation and implementation. Also, they argue that both creative behaviors and learning behaviors are affected by different contextual conditions during each stage. Rigolizzo and Amabile discuss each stage of the creative process and its corresponding learning behaviors and use informative examples from entrepreneurial startups and other organizations. A key element is that they make the important distinction between intrinsic motivation and synergistic extrinsic motivation. They tease out the stages at which one or the other may be more critical for the creative process and how they can reinforce rather than undermine each other. Finally, they stress the importance of future research examining the boundaries of workplace learning for entrepreneurial creativity.

The following chapter, by Tierney, explores ways in which individuals' self-concept of their identity can influence their engagement in creative activities at work. This work reviews and integrates social identity theory and identity theory to discuss four main types of identity: personal, relational, collective, and role. Understanding which identities employees may hold, the relative strengths of these identities, and the identity target's orientation on creativity is an interesting contribution to the literature. This scholar goes on to consider how these four types of identity relate to different types of creativity, as well as motivational patterns for creativity. She also discusses the relevance of identities for innovation and entrepreneurship. A very convincing case is made for further considering the role of identity when discussing the important question of why individuals decide to be creative at work. Finally, Tierney discusses the impact of multilevel and cross-level effects of identity for creative engagement at work, and some promising avenues for future research are presented.

In a related chapter, Sanchez-Burks, Karlesky, and Lee introduce the concept of psychological

bricolage, which they define as the process through which an individual integrates previously unrelated knowledge to create novel solutions. As such, psychological bricolage essentially refers to the specific creative process in which previously unrelated knowledge or materials are integrated to result in novel outcomes. The authors argue that the integration of multiple or conflicting social identities facilitates psychological bricolage, thereby enhancing creativity. They discuss social identifies such as multiple cultural identities, gender identities, class and professional identities, and insider versus outsider identity in an organization. They review qualitative cases and quantitative studies that demonstrate the value of identity integration in facilitating psychological bricolage and creativity. Interestingly, the authors caution that emphasis on a strong and singular organizational identity may restrict identity integration, resulting in reduced psychological bricolage and creativity.

A third interesting and somewhat related chapter concerning identity and creativity is presented next. Elsbach and Caldwell-Wenman focus on the role of antagonism in the identities of professional artistic workers. Reviewing results from empirical case studies, they argue that professional artistic workers consistently signal their identities as artists and creators and suggest that they do not want to integrate their unique identity with a more "normal" identity such as being "professional" and "commercial." On the one hand, Sanchez-Burks and his coauthors suggest the value of integrating multiple identities, and Tierney discusses how the strength of multiple identities can vary and be integrated. On the other hand, Elsbach and Caldwell-Wenman observe that at least in the eyes of professional artistic workers, it is preferable to stick to the identity of being artistic rather than integrating it with the identity of being commercial. Together, these three chapters provide interesting implications for future research into the conditions under which identity integration is conducive to creativity, innovation, and entrepreneurship.

The chapter by Mainemelis and Dionysiou reviews and integrates the recent work on play, flow, and timelessness and their relation to research on creativity, innovation, and entrepreneurship. They define play as a broad construct that occurs in multiple ways, whereas flow and timelessness are more narrowly defined play states. Over the last few decades, these scholars argue, the way organizations and researchers conceptualize play has changed. Specifically, it has gone from being viewed as something either deviant or merely tolerated at work to something that plays an important role within the workplace for employee creativity and well-being. In particular, the authors discuss how some organizations have gone as far as trying to institutionalize play to reap its benefits. They point out areas where we know very little and also areas for future research. All in all, this is an emerging area within the field that could contribute some much-needed insights.

The chapter by Kaufmann aims to solve a prominent puzzle in creativity research: whether positive mood or negative mood facilitates creativity. Kaufmann provides a comprehensive review of the affect and creativity literature, starting chronologically with the initial body of work, focusing on the positive effects of positive mood on creativity, extending to later findings from laboratory and field research showing the positive role of negative moods in fostering creativity, and looking at a more recent and emergent stream of research suggesting that the dual routes of positive mood and negative mood can facilitate creativity. On the basis of this systematic and balanced review, and using problem solving as a general organizing framework, Kaufmann formulates a dual-process model in which positive mood and negative mood are said to promote the development of creative solutions in different aspects and different stages of problem solving. This model is important not only because it provides a plausible account of previous findings from both laboratory and field studies but also because it points to avenues for future research in creativity, innovation, and entrepreneurship.

The next chapter, by Chen, Liu, and He, focuses on the concept of passion. The authors first review the passion literature, covering issues ranging from the conceptual meaning of passion to the antecedents and consequences of passion. They then emphasize the role of passion in fueling individuals' creativity and the influence of entrepreneurial passion in promoting creativity and entrepreneurship. They point out major gaps in the research on passion for work and entrepreneurial passion; for example, the role of the occupational context has not been integrated theoretically with the construct of passion for work.

Moving to the team level of analysis, the next chapter is authored by Gilson, Lim, Litchfield, and Gilson. They first delineate the conceptual meaning of team creativity, defining it as both a process

and an outcome. Focusing on the most current work on team creativity, Gilson et al. use Rhodes' (1961) Four P's framework of creativity in reviewing aspects of team creativity: the creative person (e.g., team membership), process (e.g., cognitive processes), press (e.g., environment), and product (e.g., ratings of output). They then discuss the implications of their review for future research into team creativity, innovation, and entrepreneurship. For example, they argue that many of the team attributes that are desirable for creativity may not be the same as those needed for innovation.

The next chapter, by Perry-Smith and Mannucci, takes a social network approach to the study of creativity by stressing the importance of relationships, the pattern of connections, and the complexity of the social context. They categorize creativity and social network research into two perspectives: relational (e.g., strength of ties) and structural (e.g., global network structure). They discuss consistent and inconsistent empirical findings in this area and suggest some interesting avenues for future research. For example, they argue that it is critical to resolve the inconsistent results regarding weak and strong ties for creativity. This work also provides a convincing rationale for the importance of taking a social network perspective in researching entrepreneurship. Specifically, they highlight the combined importance of creative thought and social embeddedness for entrepreneurial success.

The chapter by van Knippenberg and Hirst proposes that creativity research should take a more cross-level perspective in studying the person-in-situation interaction. Specifically, they argue that cross-level interactions are more appropriate both conceptually and methodologically than an individual level of analysis. They use trait-activation theory to review results of previous work on the interaction of personality and other individual characteristics with situational influences. Both consistencies and inconsistencies in the results of prior research are indicated, and the authors call for further work to try to analyze why some of these contradictions exist. They discuss the importance of developing a person-in-situation perspective, because there is growing evidence that the influence of individual differences on behavior is better understood by focusing on moderating influences of certain contextual features. Finally, they call for consideration of a person-in-situation perspective to add value to research on innovation and entrepreneurship.

The chapter by Wang and Murnighan explores a relatively new area, that of the relationship between creativity and ethics. In organizations, both creativity and ethics have become increasingly important; therefore, it makes sense to consider how these two constructs are interrelated. Specifically, the authors define creativity as both an outcome and a process, and they discuss the role of ethics for each. They also discuss whether ethics comes more into play when one is considering the novelty or the usefulness of creativity (the two main dimensions of creativity). They make a convincing case for the role of ethics in evaluating the creativity of ideas and state that this issue may already be implicit when experts or knowledgeable others evaluate the social acceptability of new ideas. Overall, this chapter fits nicely in a newly emerging stream looking at the "dark side" of creativity. Finally, Wang and Murnighan discuss potential implications of ethics for entrepreneurship, an issue that has received little attention.

Turning to cross-cultural issues related to creativity, the chapter by Leung and Wang is particularly timely because businesses are global and organizations need to effectively manage for creativity and innovation in different cultural contexts. According to Leung and Wang, there may be important variations in how creativity is conceptualized across cultures. They provide a systematic review and analysis of cross-cultural issues related to creativity at the individual, organizational, and societal levels, with a focus on cultural values and antecedents of creativity. Further, they address the relationship between biculturalism and creativity and that between cultural diversity and team creativity. Their review and analysis suggest avenues for future research into the relations among culture, creativity, and innovation.

The final chapter in the first section of this *Handbook* is authored by Unsworth and Luksyte. They propose an expanded model of types of creativity by drawing on the original work from Unsworth (2001) and integrating it with work on creative outcome types. Specifically, they conceptualize four types of creativity that are theoretically distinct from the two levels of creative outcomes (i.e., radical versus incremental). By integrating the four types with the two levels of creative outcomes, they provide a more fine-grained description of the creative process. They follow the creative process from the point at which the individual problem solver becomes motivated to

potentially be creative, through the actual process of being creative, to the final outcomes, of which some will be creative. Finally, they suggest some interesting areas for future research and theorizing. For example, they propose that research should examine whether the types of creativity that they discuss also extend to "innovation types" or "entrepreneurial types."

Innovation

We begin the section on innovation with a unique paper by Mitchell, Smith, Stamp, and Carlson, who link creativity with the development of innovation. Their work provides a good transition between the sections on creativity and the contributions on innovation by focusing on the use of creativity in new-product development teams to create innovation. They extend research on organizing creativity to the organizational level by using a deliberate practice model of organizational creativity, and they explain its value and use through a unique case study. The case study describes the development and growth of *Eureka! Ranch*, an organizational creativity consulting firm. It describes the process used by the organization to achieve superior creative outcomes. The authors end their chapter by suggesting directions for improving creative outcomes in organizations and for further research to validate this process.

The next chapter in this section describes business innovation processes and is authored by Garud, Tuertscher, and Van de Ven. They describe the business innovation processes as an ongoing set of activities including those that involve invention, development, and implementation. Invention consists of the development of novel ideas that have potential value. To realize this potential, however, the ideas must be developed further, often in the form of prototypes, and followed by the infrastructure designed to generate the value. The implementation of innovation is focused on gaining widespread adoption. The authors suggest that this undertaking is much more complex than the simple linear, sequential process that is typically noted. They use the Minnesota Innovation Research Program (MIRP) and the many studies on innovation processes that have been derived from it to undergird their explication of the innovation process. As they note, research has shown that most innovation processes do not unfold in sequential stages and orderly steps. Rather, some things occur in unpredictable and sometimes uncontrollable ways based on resources and requirements. They end their chapter with a discussion of the implications of their work for practice.

The next chapter was developed by Altman, Nagle, and Tushman. They focus on unique approaches to creating innovation as opposed to the more traditional sequential innovation process within an organization. They argue that changes in technology, particularly the dramatic reduction in information constraints and the availability of many other external inputs, enable organizations to engage many other people in developing innovation. In fact, they suggest that organizations can now obtain information and ideas from communities of developers, professionals, and even users of the innovation through a platform-based business and ecosystem. The dramatic reduction in information processing costs have affected organizational boundaries, the business models used, the interdependence of different units and ideas and organizations, leadership practices, identity and search processes, and intellectual property. The authors argue that these changes require revisiting much of what we know about organization theory in terms of structures, processes, and organizational boundaries. They conclude that the evolutionary process models, such as the one described in the previous chapter, may be changing to completely new models of how innovation is developed. Thus, this interesting chapter may describe the future of innovation development and processes.

Following from and building on the previous material, the next chapter, by Altman and Tripsas, discusses moving from product-based to platform-based businesses. The authors explain how platform-based businesses can harness the innovative capabilities of external parties that complement the organization's knowledge. Although platform-based businesses have been studied in economics and strategy, the organizational implications of transforming from a product-based to a platform-based business model have not been explored. The authors suggest that the traditional approach of using creativity to develop innovation within the organization is quite different from the approach of platform-based businesses, in which external parties are engaged actively in the process of creating innovation. An important contribution of this chapter is the exploration of the way in which organizational identity influences whether and how organizations become platform based. Organizations that question their existing identity are more likely to change to a platform-based

business than those with strong organizational identities.

The next chapter, by Zott and Amit, focuses on a unique form of innovation and one that has become highly important in recent years: business model innovation. As they suggest, business models have become critical for businesses, and innovation in business models is a major issue of concern for managers, entrepreneurs, and management scholars because it has been identified as a source of firm value. Little research has been conducted on the process of business model innovation, and this chapter addresses that gap. The authors link creativity at the individual and firm levels with innovation at the business model level of analysis. Thus, they propose a multilevel model of business model innovation.

The chapter by Raffaelli and Glynn focuses on a different type of innovation: institutional innovation. They define institutional innovation as novel, useful, and legitimate change that disrupts, to varying degrees, the cognitive, normative, and regulative strengths of an organizational field. An institutional innovation is novel and useful, similar to many other types of innovation, but it differs from other types because it is also legitimate and appropriate. Institutions are important because they, in a sense, provide structure and value to behaviors, roles, and relationships in a community. Institutions provide order for the activities and interactions within the community. Therefore, institutions tend to remain relatively stable and resistant to change. Yet, institutions can and do change and, therefore, institutional innovation is an important concept to understand. Raffaelli and Glynn explain the characteristics of institutional innovation that determine its legitimacy and explain the processes involved in creating it and its composition. They end the chapter with a brief description of the implications for theory and future research.

The final chapter in the innovation section of this *Handbook* is by Helfat and Martin. They focus on the influence of dynamic managerial capabilities on creativity and innovation in organizations. In effect, dynamic capabilities are the primary means by which organizations create change with the purpose of developing or sustaining a competitive advantage. Recent research has explicated dynamic managerial capabilities, but much more is needed. Their work explains how dynamic capabilities are used to create change, such as in orchestrating assets and developing new organizational capabilities or business model innovations. Overall, they present a model of dynamic managerial capabilities composed of managerial human capital, managerial social capital, and managerial cognition to create innovations and technology and business models. Perhaps even institutional innovation could be considered an outcome based on the focus of the previous chapters. Overall, it is an excellent chapter to end the section on innovation, particularly because it explains the manager's role in the innovation creation process.

Entrepreneurship

The section on entrepreneurship in this *Handbook* has six interesting and unique chapters that describe various important aspects of entrepreneurship and explain how creativity and innovation play key roles in the entrepreneurship process. The first chapter, by Burgelman, explains how Prigogine's theory of the dynamics of far-from-equilibrium systems informs our understanding of organizational evolution. In particular, he focuses on how this Nobel Prize winner's work better explains the role of strategic entrepreneurship and innovation involved in organizational evolution. Therefore, this chapter provides an interesting and valuable transition from innovation to entrepreneurship. It provides a basic understanding of Prigogine's theoretical insights and how those insights, based on work in the physical sciences, actually inform our understanding of social systems. Burgelman explains how stochastically emerging innovations are incorporated into a system's deterministic relations, allowing it to continue to evolve. He then explains how this contributes to the development of a model in strategic management. The model he describes distinguishes between autonomous and induced strategic processes that relate to the development of internal innovation and entrepreneurial behavior. Burgelman also looks at how that activity helps an organization adapt to its external environment in order to evolve and enhance its longevity.

The next chapter is authored by Aldrich and Martinez. It provides a very interesting premise about entrepreneurship; namely, that entrepreneurs often do not develop highly creative and radically innovative products or new markets. Because of institutional barriers and bureaucratic mechanisms, they are often constrained to only incremental advances in the current products and services, a situation that stifles unique innovation. Alternatively, they note that there are opportunities for more creative and innovative actions derived

from the complexity of the institutions and the multiple audiences involved. They also argue that the social networks of entrepreneurs can facilitate creativity and innovation because they often provide quite different and unique viewpoints, information, and ideas. Of course, such outcomes depend on how the entrepreneur forms that network and the other networks in which he or she chooses to participate. On the whole, the authors offer an interesting view of entrepreneurial activity, quite different from the norm.

Morris and Webb present a different perspective of entrepreneurship, that of entrepreneurship as emergence. They suggest that the emergence perspective complements other perspectives of entrepreneurship, such as the seeking opportunities perspective. They describe emergence focused on the venture, the opportunity, and the entrepreneur. They suggest that creating ventures is a process in which an individual entrepreneur has to cope with many unpredictable and uncontrollable events. These may include such activities as obtaining a patent, gaining resources from investors, and hiring and trying to retain key employees, as well as identifying customers and selling products or services. They suggest that venture creation alone is a creative process, and, by definition, it can radically disrupt other routines, operations, and existing markets. Therefore, Morris and Webb explain how entrepreneurship emerges to create ventures. They present a theoretical foundation for the process of emergence and how this perspective can be integrated with other entrepreneurship perspectives to advance the scholarly understanding of entrepreneurship. Therefore, this chapter provides a base for future research and an evolution in our understanding of entrepreneurship.

In recent years, there has been a renewed emphasis on creating innovation in organizations, which is often called corporate entrepreneurship. Kuratko's chapter describes corporate entrepreneurship. He explains how creativity and innovation are necessary in organizations in order to engage in corporate entrepreneurship. He suggests that firms must consciously develop a strategy to engage in corporate entrepreneurship that is based on creativity and innovation to exploit opportunities for growth and gain a competitive advantage. In fact, Kuratko argues that corporate entrepreneurship is critical to gaining and sustaining competitive advantages, which are likely to take the form of a series of temporary advantages. This chapter provides an excellent overview and description of the corporate entrepreneurship process, its value, and outcomes. It also provides a good base for future research by suggesting new research questions on corporate entrepreneurship.

The next chapter, by Fisher and Kotha, describes an interesting process of resource acquisition in entrepreneurial ventures. As explained in the chapter, many have argued that resource acquisition is one of the most critical activities in which entrepreneurs engage. In fact, it plays a key role in the potential survival and success of a new venture. Fisher and Kotha argue that the individual identity of an entrepreneur and the organizational identity of the investors play a major role in determining the potential for a new venture. When these identities closely match, investors are more comfortable in providing resources to a new venture. Fisher and Kotha argue that the identities of the resource providers and the entrepreneur merge over time to create a venture identity. A venture identity is important to the organization's ability to gain legitimacy. This chapter explains the cognitive and affective mechanisms involved in venture identification. The authors also suggest that the uncertainty of a venture moderates the relationship between venture identification and resource acquisition. They present a model that explains how the integration or overlap of entrepreneurial identity and resource provider identity create a venture identity that in turn influences the probability of gaining resource support. Furthermore, the salience and centrality of the identities moderate the relationship between the match of entrepreneurial identity with resource provider identity and venture identity. Finally, the uncertainty involved in the venture affects the extent to which venture identity influences the probability of gaining resource support. In fact, under conditions of high uncertainty, the venture identity is even more critical in gaining resource provider support. Overall, Fisher and Kotha provide a different and, we think, highly valuable view of resource acquisition. It should provide a base for understanding of how entrepreneurs gain resource support for their ventures and spur future research on this important process.

The final chapter, by Cruz, Firfiray, Makri, and Gomez-Mejia, explains creativity, innovation, and entrepreneurship in a particular form of business, the family firm. Although it is distinctive, it is a critical form of business ownership and governance because it is the most common type of business throughout the world. Therefore, it is

highly appropriate for this chapter to end our discussion of how creativity, innovation, and entrepreneurship are integrated. The authors explain how socioemotional wealth provides an obstacle to and facilitates entrepreneurial activity in family firms. Although some research has shown that family firms tend to take less risk than other types of firms and therefore develop lower levels of innovation, Cruz et al. have a different view. Whereas some argue that the family's emphasis on socioemotional wealth is the primary reason that family firms take fewer risks to produce economic returns, these authors suggest that socioemotional wealth goals lead family owners to favor certain types of entrepreneurial outcomes that provide rewards for the family and enhance their socioemotional wealth. Yet, they also acknowledge that family ownership tends to have a negative effect on a firm's capacity to innovate. Much like Helfat and Martin, they take a dynamic capabilities perspective of family operations, suggesting that dynamic capabilities allow them to be more entrepreneurial. Certain dimensions of socioemotional wealth facilitate innovation, whereas other dimensions serve as an obstacle to the creation of innovation. These authors view the entrepreneurial process in terms of sensing (identifying opportunities), seizing (exploiting opportunities), and then transforming. They explain that family dynamics can facilitate or constrain the seizing and transforming capacity of the firm. They argue that these characteristics and a family's emphasis on socioemotional wealth make family businesses more likely to start new businesses and enter new markets alone, rather than forming alliances with other organizations or seeking external resources to help them do so. Of course, the unwillingness to seek the external resources constrains their ability to start new businesses and likely constrains the size of their entrepreneurial activities. Cruz et al, also argue, however, that families with a strong identity and intent to maintain an ongoing firm for future generations are more likely to engage in research and development and to formulate unique innovations that help the company sustain or create new competitive advantages. These arguments present a unique view of family firms and their engagement in entrepreneurial activities. The chapter provides a base for understanding of family entrepreneurial processes and the types of entrepreneurial activities that are facilitated or constrained by the structure and family dynamics in those businesses.

Areas for Future Research

As stated earlier, we hope that this *Handbook* serves as a catalyst for a much-needed movement to integrate these three research areas. Each of these areas is important alone, but research that gleans knowledge from each area and integrates it with the others promises to provide the understanding to enable organizations to create, innovate, and be entrepreneurial, thereby thriving and being competitive in the global marketplace. Each of the chapters in this *Handbook* identifies a number of important areas for future research. Rather than simply reiterating some of the more promising ones here, we highlight a few general areas that warrant future research. It is our hope that this *Handbook*, together with the scholarly research reviewed, and in particular with regard to the areas for future research presented, will set the stage for a more comprehensive integration of the research areas of creativity, innovation, and entrepreneurship in the future.

First, we argue that more research should be focused on how entrepreneurs, managers, and organizations in general can cultivate the interest of their employees in being more creative/innovative/entrepreneurial. Just because it is to the organization's best interest to continue to be creative/innovative/entrepreneurial does not mean that employees will see the value of behaving in ways that facilitate these outcomes or be motivated to engage in behaviors that lead to them. As Kuratko states in this *Handbook*, it is critical to develop an organizational environment that can cultivate employees' commitment to creativity/innovation/entrepreneurship. As such, more research is needed to determine what personal or contextual factors will cause employees to be more interested in creating and innovating, to be persistent in the face of obstacles and incidents of failure, and to continue to strive to be entrepreneurial on a regular basis. Creativity research has explored some of these issues (e.g., Anderson et al., 2014; Shalley et al., 2004; Zhou & Shalley, 2011), but there is much more that could be achieved in this area. For example, more work is needed taking a contingency perspective and identifying different mediators and moderators of personal and contextual factors (Zhou & Hoever, 2014). In addition, this *Handbook* contains three chapters that discuss different issues regarding the important role of individuals' identity for creativity/innovation/entrepreneurship. In the future, more emphasis on the role of identity, the interplay of multiple identities, and the importance of the strength of identity is needed. Also, it is critical to pinpoint the underlying cognitive,

motivational, and affective mechanisms driving certain relationships (Zhou & Shalley, 2011). Research in this area needs to be multilevel or cross-level to provide a more accurate model of the relationships at different levels of analysis (Zhou & Shalley, 2008). Identifying the particular management practices that are needed in order to encourage employees' commitment to being creative/innovative/entrepreneurial is important. Finally, at the organizational level, we need to look at how the importance of this issue can be effectively communicated down the different levels of the organization.

Second, within the creativity literature there is the well accepted interactional approach to creativity (Woodman, Sawyer, & Griffin, 1993), which looks at how the interaction of personal and contextual factors influences individual, team, and organizational creativity. A recently formulated typology of the nature of the interactions may further fuel this line of research (Zhou & Hoever, 2014). This approach could be readily expanded to the innovation and entrepreneurship literatures. Recently, research on the entrepreneurial process at the individual, group, and organization levels seems to have increased. However, is it possible that entrepreneurs with certain personal characteristics may be more likely to create or recognize opportunities under certain contextual conditions? Creativity can be helpful for entrepreneurship in developing ideas and selling them to others to gain legitimacy, funding, and support and to commercialize and grow a new venture. More work on the interaction of individual differences and the context for individual entrepreneurs and entrepreneurial teams as they discover, evaluate, and exploit opportunities could add value to our knowledge in this area. Also, there has been relatively less work in the innovation literature that examines the effect of context and how it might interact with personal factors, so it would be worthwhile for future research to address this area as well.

Third, there should be more emphasis on examining the various stages of the creative/innovative/entrepreneurial process and identifying what is most facilitative at each stage. For example, Perry-Smith and Coff (2011) found that the mood states of teams varied with each stage of the creative process (i.e., idea generation and idea selection). For example, an activated and pleasant mood had a positive influence on variance generation, whereas idea selection required a different mood. There is a rich literature on the capacity of individuals to combine ideas into new forms—the process of conceptual recombination that is fundamental to creativity and innovation. The creative process involves a variety of cognitions and behaviors (Smith, Ward, & Finke, 1995) that are aimed at discovering new patterns or combining familiar ideas, routines, and mental models; these could be the engine driving entrepreneurial discovery, because the search for patterns, when induced by market discontinuities, can form the basis for new ways of production. For example, creativity research (Reiter-Palmon & Illies, 2004) has found that the means of initially formulating problems can influence the creative process. So, further examination of how innovation and entrepreneurship are approached in their beginning stages may be highly useful.

The chapter in this *Handbook* by Mitchell et al. describes the creative and innovative process used at the *Eureka! Ranch* to achieve highly creative outcomes. This could be helpful for thinking more about what is necessary at different stages of the process. Also, Shalley and Perry-Smith (2008) discussed the emergence of team creative cognition, which is a shared repertoire of cognitive processes among team members that provides a framework for how the team approaches problems creatively. They proposed that the entrepreneurial team evolves over time, from working together, to coming up with an idea for a new technology, to commercialization. In addition, how ideas evolve and progress from one person's mind to another was conceptualized. These researchers argued that team creative cognition is particularly critical for entrepreneurial teams because creativity is not only a one-time event in discovering entrepreneurial opportunities; rather, it is important throughout the entire startup process. For example, they suggested that there is a window of opportunity during which creative cognition can be infused within the team. In particular, in the pre-startup phase of an entrepreneurial team, the members may be the most open to considering unique approaches to thinking. In the future, if more research is focused on examining the stages of the creative/innovative/entrepreneurial process, we may be able to develop a more comprehensive understanding of the desirable behaviors at certain points of the process.

The work of Altman and Tripsas and that of Altman, Nagle, and Tushman in this *Handbook* suggest that innovation is not constrained to organizational boundaries. In fact, the substantial technological progress of the last 2 decades now facilitates the involvement of communities of professionals in the creativity, innovation, and entrepreneurship processes of an organization. Actually,

all of these processes can take place outside the organization. Beyond the enhanced amount and potential diversity of knowledge that can be brought to bear using many external parties, we need to understand how the involvement of external parties can occur safely (e.g., guarding and controlling intellectual property) and efficiently.

One of the most prominent forms of business globally is the family business. Our understanding of how creativity is used to create innovations in these firms and how innovations are used to spur entrepreneurial actions in family businesses is important. Cruz, Firiray, Makri, and Gomez-Mejia explain that some attributes of these firms help them to be more entrepreneurial, whereas others constrain the creativity and innovation. There is clearly a need to understand the type of governance structures in these firms that promote the use of creativity, the creation of innovation, and the engagement of entrepreneurial behavior. The sheer economic impact of these types of firms worldwide suggests the importance of this research. Furthermore, the integration of creativity, innovation, and entrepreneurial behavior in family firms must be better understood and encouraged.

Finally, if creativity is expected as a part of every organizational member's job, there is no reason to exclude organizational decision makers and top management from creative endeavors. There has been some work on the microfoundations of strategy and dynamic capabilities (e.g., Teece, Pisano, & Shuen, 1997) that could be related to creativity, and each literatures could inform the other. Dynamic capabilities require that executive teams identify creative ways to adapt to a changing environment and develop creative solutions to problems that arise. Executive teams and their group dynamics play a central role in enabling such capabilities. For example, in this *Handbook*, Helfat and Martin present a model of dynamic managerial capabilities composed of managerial human and social capital, as well as managerial cognition to create innovation. Also, Raffaelli and Glynn discuss institutional innovation, which provides structure and value to behaviors, roles, and relationships. In addition, Zott and Amit explain the importance of business model innovation. Their work suggests to us that creative, innovative, and entrepreneurial actions are important in all areas of organizational functioning. Future research should continue to pursue these promising avenues.

In conclusion, we believe that the chapters included in this *Handbook* provide an effective review of cutting-edge research on creativity, innovation, and entrepreneurship. Furthermore, each of these chapters poses valuable ideas for future research. Our goal is that this *Handbook* will represent the first entry in a movement to more fully integrate these research streams and to provide valuable knowledge for individuals, teams, and organizations striving to be creative, innovative, and entrepreneurial.

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PART 1

Organizational Creativity

CHAPTER

1 Leadership and Creativity: The Mechanism Perspective

Shung Jae Shin

Abstract

During the last couple of decades, there has been a surge of interest in the literature on workplace creativity regarding the relationship between leadership and employee creativity. In particular, leadership and creativity scholars have conducted extensive research on the roles of supportive, transformational, and empowerment leadership, as well as leader–member exchange, in boosting employee creativity. Despite such efforts, however, our understanding of the relationship between leadership and employee creativity is far from complete. The purpose of this chapter is to provide a review of the mechanisms by which leadership has influence on creativity. The author asserts the importance of understanding such mechanisms for further theoretical and practical improvement in this area of research and guidance for future studies is provided.

Key Words: workplace creativity, innovation, leadership, creativity mechanisms, moderators for leadership

Introduction

In an effort to understand how to boost employee creativity, scholars have studied determinants of creativity in the workplace, focusing mainly on personal and contextual factors (e.g., Oldham & Cummings, 1996). Given that employee creativity is influenced by the perceived work environment (Amabile, Conti, Coon, Lazenby, & Herron, 1996; Woodman, Sawyer, & Griffin, 1993) and that leadership often shapes the work environment, leadership has been studied as one of the major contextual factors that significantly influence employee creativity (for review, see Shalley & Gilson, 2004; Tierney, 2008). In particular, researchers have suggested that leaders influence employee creativity not only by boosting their psychological states (e.g., Shin & Zhou, 2003; Tierney, 2008; Zhang & Bartol, 2010) but also by providing social contexts for creative processes such as problem identification, information gathering, and idea generation, evaluation, and modification (Amabile, 1996).

An increasing number of empirical studies have looked into the role of leadership in enhancing creativity by considering the impact of different types of leadership, such as supportive leadership (e.g., Scott & Bruce, 1994), empowerment leadership (e.g., Zhang & Bartol, 2010), and transformational leadership (e.g., Shin & Zhou, 2003). Nevertheless, it is still not well established how leadership affects employee creativity. As discussed in the following section, only a few studies have investigated possible mediators for the effects of leadership on creativity. Without understanding how leadership influences employee creativity (i.e., studying mechanisms), it would be hard to draw a complete picture of the leadership role in boosting creativity and innovation. This line of research requires additional accumulation of empirical findings, theories, and, most of all, an overarching framework for studying the role of leadership in boosting employee creativity (Tierney, 2008).

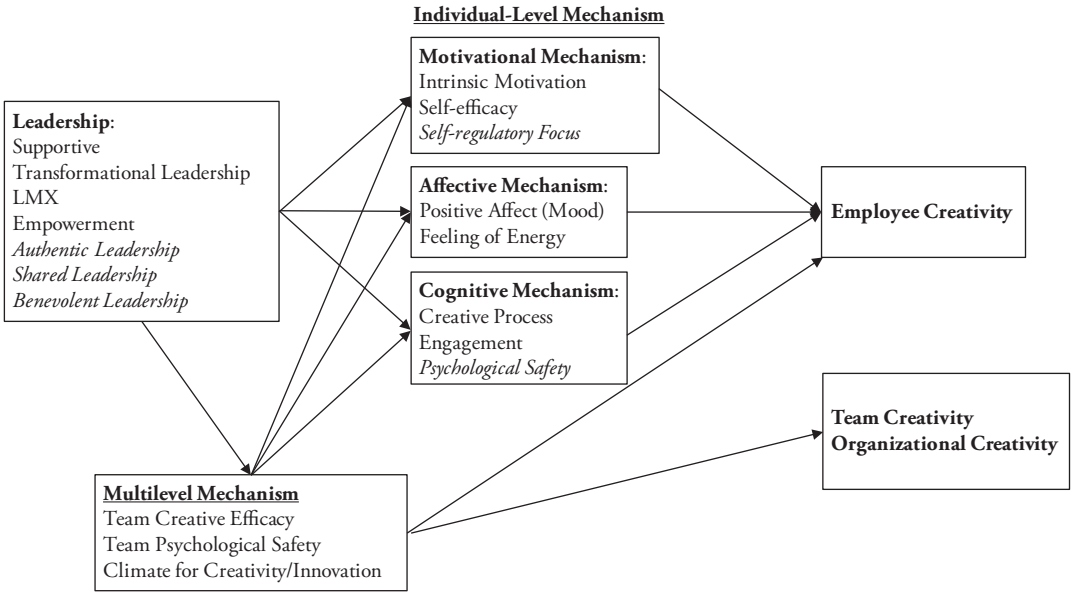

Fig. 1.1 Leadership Mechanism Model.
Note. Italics indicate suggestions for future studies.

The primary focus of this chapter is the following research question: How do leaders provide the impetus for creativity in the workplace? To date, there has been a paucity of studies empirically investigating mechanisms by which a leader influences employee creativity. In addition, leadership is a social influence and therefore is expected to impact employee creativity on multiple levels (e.g., Drazin, Glynn, & Kazanjian, 1999). At the individual level, a leader can directly affect employees' motivational, affective, and cognitive processes (e.g., Madjar, Oldham, & Pratt, 2002; Shin & Zhou, 2003; Zhang & Bartol, 2010). At the team or organizational level, a leader can create social contexts that support or inhibit individual creativity (Mumford, Scott, Gaddis, & Strange, 2002) and may affect creativity also by motivational, affective, and cognitive mechanisms. As depicted in Figure 1.1, the proposed model suggests that identification of these mechanisms is vital to the study of the relationship between leadership and creativity. In fact, when introducing the three-mechanism framework for creativity, Zhou and Shalley (2010) asserted that all motivational, affective, and cognitive mechanisms for employee creativity should be investigated in order to more deeply understand how to boost employee creativity. Such investigation is important not only in theory, to identify specific mediators and the appropriate leadership style or behavior, but also in practice, to train managers to engage in specific behaviors that boost employee creativity.

In this chapter, I propose a mediator-based leadership–creativity model and present a review of the last 20 years of research on leadership and creativity (and innovation to some extent). I begin by reviewing the literature on the impact of motivational, affective, cognitive, and multilevel mechanisms on creativity. Then, I suggest future studies to better understand how leadership affects employee creativity and innovation. Despite the fact that this chapter primarily deals with leadership and creativity, I also review limited research on leadership and innovation. The recommendations are not limited to leadership and creativity but extend to entrepreneurship and innovation as well.

How a Leader Affects Creativity

A leader can influence employee performance by demonstrating certain types of behavior, combinations of which we call leadership styles. One of the most frequently studied leadership styles in relation to employee creativity is the supportive leadership style. It has often been asked how supportive leadership can boost employee creativity. Whereas Oldham and Cummings (1996) responded to this question by investigating the role of intrinsic motivation and Tierney and Farmer (2002) explored the role of creative self-efficacy, Madjar et al. (2002) examined an affective mechanism (i.e., mood

states). As suggested by these differing research approaches to the same fundamental question, the same leadership style may influence employee creativity via different mechanisms. Therefore, in this section, I review the literature on leadership and creativity by focusing on the mechanisms rather than on specific leadership styles or behaviors.

In addition, although there have been fewer studies on team creativity than on individual creativity, I review the literature on leadership and team creativity as well. At the team level, leadership may influence team processes and emergent states (Marks, Mathieu, & Zaccaro, 2001), all of which may relate to motivational, affective, and cognitive mechanisms at the team level.

Motivational Mechanism

Intrinsic motivation. Several studies have examined the motivational mechanisms by which leadership affects employee creativity. This can be attributed to the perceived importance of intrinsic motivation in the workplace. According to the componential model of creativity (Amabile, 1996), intrinsic task motivation is one of the most important factors deciding creative performance. Specifically, supportive leadership, empowering leadership, and transformational leadership have been proposed to have an impact on follower creativity via increasing levels of intrinsic motivation. Previous studies have suggested that supportive leaders may increase the intrinsic motivation of followers by providing them with more choices and informative positive performance feedback (Oldham & Cummings, 1996). Furthermore, Zhou's work (2003), based on cognitive evaluation theory (Deci & Ryan, 1985), indicated that controlling supervisor behavior (e.g., close monitoring) had a negative influence on employee creativity, whereas informational supervisor behavior (e.g., developmental feedback) had a positive influence on creativity. Even though these studies did not empirically test the mechanism, they both suggested the mediating role of intrinsic motivation in the relationship between supervisory style (such as supportive and noncontrolling leadership style) and creativity (Amabile, 1988; Shalley, 1991).

Moreover, Zhang, and Bartol (2010) found, using survey data from professional-level employees and their supervisors in an information technology company, that empowering leadership had a positive influence on creativity via increasing intrinsic motivation. Here, empowering leadership includes leader behaviors such as emphasizing the significance and meaningfulness of the employee's job, providing more autonomy, and encouraging employees to have self-efficacy (Ahearne, Mathieu, & Rapp, 2005).

The transformational leadership style has also been studied for its effect on creativity (e.g., Jung & Avolio, 1999; Shin & Zhou, 2003, 2007). The four dimensions of transformational leadership (i.e., inspirational motivation, idealized influence, intellectual stimulation, and individualized consideration) are likely to boost the intrinsic motivation of followers by energizing them to perform beyond expectations, developing their capabilities, giving them discretion, and encouraging them to be playful with ideas (Shin & Zhou, 2003). Using a sample of employees and supervisors engaged in research and development (R&D) from 40 new venture companies and 6 established companies, Shin and Zhou (2003) found that intrinsic motivation partially mediated the contribution of transformational leadership to creativity. So far, however, only a few studies have empirically examined this mediation effect when studying the influence of leadership on creativity. Given the importance of intrinsic motivation for employee creativity, it is surprising that very few studies have actually investigated this mechanism.

Self-efficacy. Efficacy belief is another key element in motivational mechanisms for creativity. Scott and Bruce (1994) found that supervisors' high expectations for subordinates' innovativeness and high-quality leader–member exchange (LMX) actually led to subordinates' higher innovative behavior by increasing their perception of a climate for innovation. Even though the role of efficacy beliefs was not explicitly examined in their study, the perception of climate for innovation seemed to increase the employees' self-efficacy in innovation (Tierney & Farmer, 2002).

Ford (1996) suggested that self-efficacy beliefs are a key motivational mechanism for individual creativity. Tierney and Farmer (2002) proposed the idea of creative self-efficacy, which is "the belief one has the ability to produce creative outcomes" (p. 1138). They suggested that creative self-efficacy is an efficacy belief specific to creative performance, and they found that supervisor support (role modeling and verbal persuasion) was positively related to creative self-efficacy. Even though they did not formally test whether creative self-efficacy mediated the relationship, it was implied theoretically. Since then, a few studies have sought to formally investigate the mediating role of self-efficacy in the relationship

between leadership and creativity. One such study by Farmer and Tierney (2004), using a sample of R&D employees, showed that creative self-efficacy mediated the effects of supervisor creativity-supportive behavior (e.g., creative work facilitation, interpersonal support, creative goal emphasis) on employee creativity. Similarly, Choi (2004), using longitudinal data from 386 business school students, found that supportive leadership had a positive effect on creativity via creative self-efficacy.

Furthermore, with a sample of employees from an insurance company in Taiwan, Gong, Huang, and Farh (2009) showed that transformational leadership had positive effects on employee creativity through creative self-efficacy. They argued, based on the work of Bandura (1986), that transformational leaders tend to affect the efficacy beliefs of their followers by serving as a role model for proactive thinking and by verbally persuading followers to be more confident in their ability to produce creative outcomes, which in turn leads to higher levels of creative self-efficacy.

In a more general study, Liao, Liu, and Loi (2010) used longitudinal data from 828 employees on 116 teams to investigate the connection between LMX and self-efficacy. They found that the quality of LMX had an indirect, but significant, effect on employee creativity via general self-efficacy. They argued that high-quality LMX is likely to provide employees with positive expectations and to encourage the undertaking of challenging tasks (Bandura, 1986). They noted, however, that general self-efficacy is different from creative self-efficacy in terms of specificity. In particular, it is a more general belief in one's abilities and boost motivation by increasing self-confidence. Since the introduction of creative self-efficacy (Tierney & Farmer, 2002), self-efficacy beliefs have been viewed as one of the main mechanisms for the relationship between leadership and creativity.

Affective Mechanism

As suggested by Conger (1991), arousing followers' emotion is an important outcome of inspirational leadership. Similarly, other studies have asserted that managing followers' emotions is an important component of effective leadership (Goleman, 1998; Zhou & George, 2003) and that leaders can minimize the impact of negative events on employees' emotions through their behaviors (Pirola-Merlo, Hartel, Mann, & Hirst, 2002). Combined, these studies suggest that leaders are one of the main sources for employees' affective experiences in the workplace. Several studies have illustrated that positive affect may lead to better creative performance including fluency, flexibility, and originality (for a review, see Isen, 1999). A more recent meta-analysis indicated that there is a positive relationship between positive moods (e.g., happiness) and creativity and a negative relationship between negative moods (e.g., fear, anxiety) and creativity (Baas, De Dreu, & Nijstad, 2008). Further, Amabile, Schatzel, Moneta, and Kramer (2004) implied that followers might have an affective reaction to their leaders in addition to a perceptual or motivational reaction. In particular, leaders may have significant influence on employees' affective states such as emotion and moods in the workplace because they have a huge impact on the social lives of their employees at work. Following this logic, we can easily see the affective mechanisms by which leadership impacts employee creativity.

First, leaders can influence employee creativity by helping their affective states to be oriented toward creative behavior. For instance, the work of George and Zhou (2002) and Zhou and George (2001) showed that employees' negative moods resulting from job dissatisfaction could lead to greater creativity if their affective states were well managed by their leader. This phenomenon results when a leader with a high level of emotional intelligence who is aware of the emotions of his or her followers enables them to channel those emotions toward the desired creative processes. In addition, George and Zhou (2007) found that when a leader provided supportive contexts such as maintaining a level of developmental feedback, interactional justice, or trustworthiness, then both positive and negative moods were jointly and positively related to creativity. Even though this study did not test the mediation by an affective state per se, it implied that leadership can help employees utilize their affective states for positive creative performance.

Second, positive emotional or mood states created by a leader could lead employees to be more creative in their work. Madjar et al. (2002), using survey data from three Bulgarian knitwear companies, found that support for creativity from a supervisor and coworkers led to employees' experiencing positive moods and, in turn, to higher creativity. This finding suggests a plausible mediating role of emotion in the relationship between leadership and creativity. Additionally, Atwater and Carmeli (2009), in a longitudinal study, found that high-quality LMX led to feelings of energy (i.e., affective states encouraging individuals to pursue

creative paths), which in turn increased creativity. Although there have been very few empirical studies investigating this affective mechanism, partly because of the difficulty of measuring emotion (i.e., state) in a longitudinal research design, the affective mechanism must be considered when we look into the relationship between leadership and creativity.

Finally, the emotional intelligence of leaders can help employees have better emotional experiences, allowing for better engagement in cognitive and creative processes (Zhou & George, 2003). Because creative activities are affect-laden, if emotional states are well managed, employees are likely to engage in more creative behavior. In this regard, leaders with high emotional intelligence are able to help shape their followers' emotional experience such that engagement in the creative process is enhanced. Here, creative processes include identifying problems, questioning existing relationships, formulating ideas, and having a discussion with others (Torrance, 1988).

Cognitive Mechanism

Creativity requires extensive and effortful cognitive processing (Amabile, 1996). Leaders can affect followers' creativity, not only through the motivational and affective mechanisms, but also by facilitating cognitive processes involved in creativity (Reiter-Palmon & Illies, 2004). The important roles that a leader can play in facilitating employees' creative processes are providing access to diverse information, encouraging team members to share information and ideas, creating an environment for their indulgence in creative processes, and proactively encouraging them to engage in creative processes (Reiter-Palmon & Illies, 2004). A handful of prior studies have suggested positive links between specific team leader behaviors and creative process engagement by subordinates. In one such example, Shalley (1991) suggested that setting creativity goals may lead employees to engage in more creative processes.

The connection between leader behavior and creative process engagement was also highlighted in a study by Zhang and Bartol (2010), in which they investigated not only intrinsic motivation but also creative process engagement as the mechanisms by which leadership influences employee creativity. Their study found that empowering leadership had a positive influence on creativity through increasing both intrinsic motivation and creative process engagement. They also found that enhanced psychological empowerment led to higher levels of intrinsic motivation and creative process engagement when leaders encouraged creativity. Such findings are of great importance because they imply that leadership may affect creativity via not only motivational but also cognitive mechanisms. Although a greater accumulation of findings is required to draw a clearer picture of the cognitive mechanism, existing research indicates that a leader can boost followers' creativity through influencing their cognitive components for creativity.

Multilevel Nature of the Mechanisms

Leadership influence is not an isolated event; rather, it can manifest at multiple levels (Kozlowski & Klein, 2000), not only at the dyadic level but also at the team level and at the organization level. For instance, Scott and Bruce (1994) suggested that a leader can influence employees' perception of organizational climate, which in turn influences their motivation to engage in creative behavior. In addition, leaders can create social contexts in which employees better engage in creative processes (Reiter-Palmon & Illies, 2004). That is, a leader can also affect employee creativity indirectly by forming a work environment in which creativity is supported. Furthermore, a leader may have simultaneous influences on teams' emergent motivational states (e.g., team creative efficacy), team cognitive processes (e.g., information and idea sharing), and team emotional states (e.g., team moods). These multilevel mechanisms may have influence not only on organizational or team creativity but also on individual creativity.

Given the important role of leaders in affecting work environment characteristics such as organizational climate and culture (e.g., Mumford et al., 2002), it is reasonable to believe that leaders can create or maintain a creativity-stimulating climate while removing inhibiting aspects through their leadership influence. A study by Jung, Chow, and Wu (2003) supports this assertion because it showed, by measuring the transformational leadership behavior of 32 Taiwanese CEOs, that transformational leadership had a positive correlation with an innovation-supporting organizational climate. Gumusluoglu and Ilsev (2009) found similar results within data collected from 163 R&D personnel and managers at 43 small Turkish software companies. Their data showed that transformational leadership was highly related to the perception of support for innovation. Research by Sarros,

Cooper, and Santora (2008) also supports the role of transformational leadership in creative climates. Their survey of 1,158 managers in the Australian private sector showed that transformational leadership had a positive correlation with a climate for innovation. Even though none of these studies tested the influence of the climate for innovation on creativity or innovation, they showed that leaders can play a critical role in creating a climate for creativity or innovation at the organization level that inherently affects employee motivation, cognition, and emotional states.

At the team level, a few mechanisms through which leaders influence team or employee creativity have been proposed. One group of scholars proposed that transformational leadership has a positive influence on team creative performance through affecting teamwork processes (e.g., Bass, 1998; Dionne, Yammarino, Atwater, & Spangler, 2004). Examples of teamwork processes affected by transformational leadership are group cohesion, team communication, and conflict management. Each process is important for creativity because group cohesion is a critical motivational factor for team processes (Weaver, Bowers, Salas, & Canon-Bowers, 1997); team communication (e.g., information and idea sharing) allows team members to share their ideas and have a constructive dialogue (Nemiro, 2002); and conflict management helps awaken members to alternative viewpoints and emotional processes (Bassett-Jones, 2005). Hülsheger, Anderson, & Salgado (2009) also discussed team process variables. These included team cohesion (Woodman et al., 1993) and communication (Keller, 2001); vision, participative safety, support for innovation, and task orientation/task reflexivity (i.e., concern for the quality of task performance in relation to the shared vision or "process in which the team reflects upon the team's objectives, strategies, and procedures, and evaluates each other's work to improve team effectiveness and outcomes" [p. 1131]); and task and relationship conflict. Their meta-analysis on team-level behaviors showed that communication, vision, support for innovation, task orientation, and cohesion had the strongest relationships with creativity and innovation. Their analysis further suggested that the relationships were stronger for team rather than individual creativity and innovation. These studies suggest that motivational (e.g., cohesion, vision, support for innovation, task orientation), affective (e.g., relationship conflict), and cognitive (e.g., communication, participative safety, task reflexivity) mechanisms significantly relate to creativity and innovation at the team level.

Another group of studies has also examined team-level motivational mechanisms. For example, Shin and Zhou (2007), using 75 R&D teams in 44 Korean companies, found that transformational leadership was significantly and strongly related to team creative efficacy (i.e., "we believe we can be creative as a team"), which led to higher team creativity. As the study suggested, in a highly collectivistic team specifically, high team creative efficacy could be an important motivational team context for team member creativity. In a similar vein, with a sample of 163 work groups involving 973 employees in twelve Chinese companies, Zhang, Tsui, and Wang (2011) found that transformational leadership had indirect positive effects on group creativity via collective efficacy among members within the group. Eisenbeiss, van Knippenberg and Boerner (2008), using a sample of 33 R&D teams from five organizations, showed that transformational leadership had an indirect effect on team innovation through building of a team climate in support of innovation. Finally, Hon and Chan (2013) found that empowering leadership had indirect effects, via team self-concordance (i.e., value-based intrinsic motivation) and team creative efficacy, on the team creativity of 52 teams in hotel companies in China. Together, these findings imply that transformational and empowering leadership can create team contexts or processes from which team member creativity increases as a result of motivational mechanisms.

A significantly smaller number of empirical studies exist on either affective or cognitive mechanisms for leaders' influence on team creativity and innovation. Pirola-Merlo et al. (2002) examined affective climate as a mechanism for the interaction of obstacles and both transformational leadership and facilitative leadership on team performance based on affective events theory. They suggested that these leadership styles might help teams better deal with affective events for their performance. In a study of 136 primary care teams, Somech (2006) found that participative leadership had a positive influence on innovation in functionally diverse teams via team reflection (i.e., questioning, debating, planning, learning, analyzing, divertive exploration, making use of knowledge explicitly, and viewing team overtime with new awareness). Further, West, Borrilla, Dawson, Brodbeck, Shapiro, and Haward (2003) examined the role of leadership clarity (i.e., team

members' consensual perceptions of clarity of leadership of their teams) on team innovation in health care teams. They found that high levels of participation mediated the positive influence of leadership clarity on team innovation. However, before a conclusion can be drawn about leadership influence on team-level affective and cognitive mechanisms, more empirical investigations will have to be conducted on these topics.

Another topic rarely studied is how leaders affect individual creativity via team- or organization-level mechanisms. Whereas organization-level mechanisms such as climate have largely been studied as conditions (i.e., moderators) for certain managerial practices (including leadership) to have an influence on employee creativity (e.g., Wang & Rode, 2010), the literature has lacked empirical testing of these mechanisms as a mediating variable. With respect to team-level mechanisms, also largely untested, it would be interesting to investigate how individual employees react to the team-level processes and emergent states. For example, depending on individual characteristics such as creative self-efficacy, team members may react differently to the same team context (Shin, Kim, Lee, & Bian, 2012).

Interdependence Among the Mechanisms

The three mechanisms for boosting employee creativity may interrelate. For example, George and Zhou (2007) did an interesting study on the interaction between supervisor behavior (developmental feedback, interactional justice, and being trustworthy) and employee mood states on employee creativity. The results implied that the interaction may have a positive influence on creativity by facilitating positive creative processes such as focusing on useful ideas for improvement, sharing knowledge and information, accepting the risk of failure, and recognizing problems for creative solutions. This study showed not only that creative activities are affect-laden (e.g., tension, conflict, debates and disagreement resulting from introducing new ideas and/or changing the status quo) but also that emotional states influence individuals' cognitive processes. These findings are further supported by prior work of Zhou and George (2003) proposing that the leader's emotional intelligence might be helpful in awakening employee creativity through effects on their cognitive processes including identification, information gathering, and ideation.

In addition to emotional states' having a potential impact on cognitive processes (Schwarz & Clore, 1983), motivational mechanisms may influence cognitive processes by energizing employees to work harder in engaging in creative processes. Further, emotional states may increase or decrease the level of creative self-efficacy or vice versa (Bandura, 1997). Thus, there would be no doubt that these mechanisms are interrelated. However, the research question here is not what the relationships are among the mechanisms but how leaders can affect employee creativity: Which mechanism will be triggered by certain leadership behaviors? Given the interrelatedness among the mechanisms, we should investigate precisely which mechanisms are directly influenced by a given leadership style or behavior.

Discussion and Suggestions for Future Inquiry

In the previous sections, I have reviewed the existing literature on the types of mechanisms (motivational, affective, and cognitive) by which leadership affects employee creativity. Based on the literature review, we can draw the following conclusion: There is a paucity of studies examining the mechanisms by which leadership affects employee creativity. Only a few studies have examined motivational mechanisms, fewer still have examined the affective mechanism, one study examined the cognitive mechanism, and no empirical studies have examined team- or organization-level mechanisms for individual employee creativity. Without an understanding of how leadership influences employee creativity, we cannot further develop theory in this area of research. Furthermore, understanding of the mechanisms would allow us to better identify how and when to intervene in the relationship between leadership and creativity.

In this section, I discuss a number of issues in the literature and propose directions for future studies based on the proposed leadership–creativity mechanism model. In particular, the issues addressed are (1) fit between leadership style and mechanisms, (2) moderators (fit between mediation and moderation), (3) cultural congruence of leadership, (4) main or moderating effect, (5) multilevel sequential mediation, and (6) other leadership styles and mechanisms. Finally, I discuss some future directions for leadership, entrepreneurship, and innovation based on the proposed model.

Fit Between Leadership and Mechanisms

When we study the influence of leadership on creativity, there should first be a match between a leadership style and the mechanism by which the leadership style affects employee creativity. Without establishing such a fit, any theoretical development would be in vain, because it would be hard to find significant indirect effects of leadership on creativity empirically. To determine the appropriate mechanism by which a leader can influence employee creativity, we should first theoretically identify mediators that link specific leadership styles and creative performance. Based on the existing creativity literature, we should identify the most appropriate mechanism (i.e., motivational, affective, or cognitive) given the nature of the leadership style of interest. For instance, empowerment leadership is likely to increase employees' intrinsic motivation, which in turn tends to have a significant influence on creativity. Alternatively, intellectual stimulation, one of the components of transformational leadership, is likely to encourage followers' engagement in creative processes and, ultimately, their creative performance.

Second, to better establish the fit, we should investigate a more fine-grained leadership style. Studies by Shin and Zhou (2003) and others have shown the relationship between overall transformational leadership and employee creativity, partly because the four subdimensions of transformational leadership have been highly correlated with each other in empirical studies based on the available measuring instruments (e.g., the Multifactor Leadership Questionnaire). However, each of the four subdimensions of transformational leadership might have different effects on the different mechanisms. For instance, whereas inspirational motivation may have a strong direct influence on intrinsic motivation, intellectual stimulation may have a more significant relationship with the cognitive mechanism (e.g., creative process engagement) by encouraging employees to consider different perspectives and diverse information (Bass, 1998).

Third, when developing a leadership style that is effective in boosting or intervening in employee creativity, we should choose specific mechanisms first (i.e., which mechanism would be the most effective and efficient to impact employee creativity given the situation) and identify or create a leadership style that exerts significant influence on the specified mechanisms. For instance, as an entrepreneur, if you want to boost your employees' creativity, you should figure out which mechanism (e.g., motivational, affective, or cognitive) would be more important for them to generate novel and useful ideas for launching a new business. If their intrinsic motivation and self-efficacy seem to be already high enough, then perhaps you should find the most appropriate leadership behavior for activating or boosting the cognitive mechanism. In doing so, you could not only enable employees' cognitive resources such as social ties with experts in various areas but also encourage them to engage in more creative processes.

Conditions for Better Fit

The relationship between leadership and creativity is not always clear cut. For instance, the measured effects of transformational leadership on creativity have yielded mixed results (for review, see Herrmann & Felfe, 2013). Although it is important to identify the conditions under which a specific leadership style has a relatively larger positive effect on employee creativity, very few studies have investigated these conditions. For example, employee rating on the Creative Personality Scale (Gough, 1979) interacted with supportive leadership (Oldham & Cummings, 1996); employee cognitive style interacted with quality of the LMX (Tierney, Farmer, & Graen, 1999); conservation interacted with transformational leadership (Shin & Zhou, 2003); empowerment role identity interacted with empowerment leadership (Zhang & Bartol, 2010); creative role identity and job autonomy interacted with benevolent leadership (Wang & Cheng, 2010); and identification with the leader and organizational climate interacted with transformational leadership (Wang & Rode, 2010).

The first three studies looked into individual characteristics as moderators, whereas the others concerned contextual influences. This first group of studies implies that the effectiveness of certain leadership styles depends on the traits of the focal employee. That is, the effectiveness of a leader relies on how employees respond to the influence based on their own personality, cognitive style, and values. The latter group of studies implies that organizations or managers create and maintain the context that helps employees to perceive or have goals, role identity, autonomy, and encouragement so that they can get more benefits out of the leadership influence. These findings suggest two things. First, as a leader, if you want to significantly boost your employees' creativity, you have to select only those who have the traits aligned with your leadership style. Second, selection is not the end of the story;

you can also enhance the effectiveness of your leadership by creating a context that helps employees to better respond to your leadership influence.

A commonality in all of these studies, excluding Shin and Zhou (2003) and Zhang and Bartol (2010), is that no mediator was included (i.e., the mechanism that the condition moderates was not identified). The drawback in not considering mediation is that it may lead to a lack of understanding of how the moderators work. We may be able to identify more accurate and powerful moderators if we begin with how the leadership style influences employee creativity (i.e., what the mediators should be).

To further develop this area of research, we need to study not only first-stage moderators (i.e., interaction between leadership and a moderator on a mediator) but also second-stage moderators (i.e., interaction between the mediator and a moderator on creativity) (Edwards & Lambert, 2007) in relation to the leadership–creativity mechanism of interest. For example, Shin and Zhou (2003) examined follower conservation as a condition (i.e., a first-stage moderator) for the effect of transformational leadership on creativity, arguing that only those following their leader's influence are likely to have the benefits of transformational leadership. Here, follower conservation is a condition for the effectiveness of transformational leadership on intrinsic motivation, but not on creativity, making it a first-stage moderator. Zhang and Bartol (2010) investigated the moderating role of leader encouragement of creativity (i.e., a second-stage moderator) to show that psychological empowerment would have a more positive influence on creativity when combined with leader encouragement of creativity. As illustrated by the given examples, with more specific knowledge of the conditions (first-stage, second-stage, or both), we may be able to achieve a better fit between the mediators and the moderators.

Cultural Congruence of Leadership

To enhance the effectiveness of leadership, managers must also consider the cultural context of both the company location and the individual employees. Given the general business trend toward globalization, many organizations have multicultural teams operating across multiple countries. Because the effectiveness of certain motivational tools depends on the societal or cultural context (Adler & Gundersen, 2007), we have to consider the issue of cultural congruence in leadership. For instance, employees from different cultural backgrounds may have different expectations about leadership (Gerstner & Day, 1994) and may perceive the same leadership behavior differently. In support of this concept, a study by Jung and Avolio (1999) found that students from a collectivistic culture generated more ideas with a transformational leader, whereas those from an individualistic culture generated more ideas with a transactional leader. They further observed that collectivists tended to have higher levels of loyalty and commitment to their leader, whereas individualists tended to put priority on personal rewards. By highlighting the response to certain leadership styles within a specific culture, they showed the importance of cultural congruence for leadership effectiveness on creativity. In the literature, however, there have been very few studies that empirically test this cultural moderation in the relationship between leadership and creativity.

It is important to consider the mechanisms of leadership in creating a more fine-grained cultural leadership model. For example, if creative self-efficacy (i.e., one of the motivational mechanisms) is regarded as the most relevant mechanism in a certain context, then, depending on the cultural values (e.g., collectivistic versus individualistic), the leadership style (e.g., transformational leadership) should be aligned accordingly. Whereas the leadership style should perhaps promote collective creative efficacy in a collectivistic culture, it may be better to emphasize creative self-efficacy in an individualistic culture (e.g., Shin & Zhou, 2007). Furthermore, additional considerations such as psychological safety may be important when considering a fine-grained cultural leadership model. An example is the importance of factoring in the ability to "save face" in Asian countries. Psychological safety and respect are paramount if leaders want to encourage creativity in Asian employees.

Leadership: A Moderator or a Main Effect?

Because, mathematically, the components of an interaction term can be either a main effect or a moderator, it depends on the theoretical rationale whether leadership, as a component of an interaction, is a moderator or a main effect for employee creativity. Some studies (e.g., Oldham & Cummings, 1996; Shin & Zhou, 2003; Zhang & Bartol, 2010) have investigated leadership as a main effect on creativity. Given the proposed mediator, they argued that supportive, transformational, and empowerment leadership would have positive effects on creativity. Other studies, such as Shin

et al. (2012) and Van Dyne, Jehn, and Cummings (2002), investigated transformational leadership and LMX quality as a moderator. Shin et al. (2012) showed that team cognitive diversity had a positive relationship with individual team member creativity only when team leaders exhibited higher levels of transformational leadership and argued that transformational leadership helped team members to better utilize the benefits of team cognitive diversity. Van Dyne et al. (2002) found that LMX moderated the effects of strain on creativity such that the negative relationship between the level of strain and creative performance weakened when the quality of LMX was high. They argued that high relationship quality could protect employees from distractions from work caused by the work environment itself or by family strain.

Investigation of leadership as either a moderator or a main effect can be determined by the mechanism of interest. When there is a close relationship between a leadership style and a mechanism (motivational, affective, or cognitive), we could, theoretically, propose leadership as the main effect. On the other hand, when a construct of interest seems to have an effect on the mechanism and a leadership style helps the manifestation of its effect on the mediator, we can investigate the leadership style as a moderator. Therefore, I propose that if we seriously consider the mechanism (i.e., how leadership influences creativity), we can build a sound theoretical model for leadership and creativity. Without considering the mechanism, we may end up arguing that the main effect of leadership is its moderating role in boosting creativity, or vice versa. Thus, when we theorize about the role of leadership in creativity, we should be clear about whether it is being evaluated as a main effect or as a moderator in the consideration of the mechanism.

Multilevel and Sequential Mediation

A leader may have influence on employee creativity not only via parallel mediation but also via sequential mediation. For instance, Zhang and Bartol (2010) showed that empowerment leadership indirectly affects employee creativity via motivational and cognitive mechanisms at the same time (i.e., parallel mediation). In addition, different types of mediators may be sequentially interrelated to each other. For instance, Amabile, Barsade, Mueller, and Staw (2005) outlined an overarching theory of affect and creativity in organizations, proposing that positive affect facilitates cognitive variation and cognitive associations. Likewise, emotional components such as positive affect tend to increase motivation level and help individuals play with ideas and think more divergently. Therefore, to accurately determine how a leadership style affects employee creativity, we should design future studies to ascertain which mediator is directly influenced by the leadership style.

Further, it is plausible that leadership influences employee creativity via multilevel mechanisms sequentially. For example, transformational leadership may positively affect intragroup processes (i.e., team-level context) such as sharing ideas and information, discussing and testing ideas, and providing constructive feedback (e.g., Zhang et al., 2011). In turn, the improved intragroup processes may be helpful for the cognitive mechanism, which then leads to higher employee creativity. In addition, when viewed as a contextual influence, leadership can create and maintain a positive working environment, which may influence employee creativity through the proposed individual-level mechanisms. By considering the contextual mechanism and its influence on individual-level mechanisms, we can draw a fuller picture of how leadership influences employee creativity. Therefore, a study that examines multilevel and sequential mediations would be helpful for determining how the mechanisms work. That is, considering both levels at the same time would lead to a better understanding of how leadership affects employee creativity.

More Leadership Styles and Mechanisms

In the existing literature, as reviewed earlier, most of the studies have focused on supportive leadership (e.g., Oldham & Cummings, 1996), transformational leadership (e.g., Shin & Zhou, 2003), LMX (e.g., Scott & Bruce, 1994; Tierney et al., 1999), and empowerment leadership (e.g., Zhang & Bartol, 2010). However, there could be other leadership styles that provide the impetus for creativity by boosting the motivational, affective, and/or cognitive mechanisms.

For instance, authentic leadership may increase the motivation level of followers by supporting their self-determination and intrinsic motivation (Ilies, Morgeson, & Nahrgang, 2005) or by increasing positive effect (Rego, Sousa, Marques, & Cunha, 2014). As one study found, authentic leadership encourages positive self-development through leader behavior emphasizing self-awareness, moral perspective, balanced information processing, and relational transparency (Walumbwa, Avolio, Gardner, Wernsing, & Peterson, 2008). The same

authors argued that authentic leadership promotes trust and identification, which in turn increases perceived psychological safety (i.e., the degree to which individuals believe the context is safe for interpersonal risk-taking; Edmondson, 1999) and creativity. Given the theoretical rationales for the mechanisms (i.e., intrinsic motivation, psychological safety, and positive affect), it seems that authentic leadership is a promising leadership style for fostering employee creativity. Future studies should look into the individual components of authentic leadership, for each of the proposed mechanisms, to get a more accurate picture of the relationship between authentic leadership and creativity.

Other leadership theories that have been briefly studied for their impact on employee creativity are shared leadership and benevolent leadership. Shared leadership (Pearce, 2004) may have a positive influence on employee creativity based on the proposition that mutual influence among team members improves participation and information exchange. This enhanced team discussion provides cognitive resources for individual team member creativity, suggesting that shared leadership may have an indirect effect on creativity via the cognitive mechanism. Another interesting leadership style for employee creativity, benevolent leadership, is rooted in traditional Chinese societies, is prevalent in Chinese organizations, and can be represented as individualized care in a work or non-work domain (Farh, Liang, Chou, & Cheng, 2008). For example, Wang and Cheng (2010), using a sample of 167 supervisor–subordinate dyads, found that when creative role identity or job autonomy was high, the positive relationship between benevolent leadership and creativity was stronger. Although benevolent leadership originated from the Chinese culture, it could manifest itself in any country. For this reason, benevolent leadership would be another good candidate for future studies on leadership and creativity.

Finally, there seem to be other, lesser studied mechanisms by which a leadership style could affect employee creativity. One such mechanism is psychological safety. Although psychological safety has been proposed as a plausible antecedent of creativity (Edmondson, 1999), very few, if any, empirical studies have looked into it as a mediator. The difficulty of finding a significant correlation between psychological safety and creativity may account for the lack of research. Psychological safety may lead to more active participation in team discussion, but other conditions may be needed for it to be effective in increasing creativity, such as high levels of team cognitive diversity (Shin et al., 2012). Transformational leadership (in particular, individualized consideration), authentic leadership, and benevolent leadership may increase employees' perception of psychological safety. Therefore, when theorizing and testing these leadership styles on creativity, we should consider not only psychological safety as a mechanism but also the conditions under which this mechanism can be effective.

Another under-studied motivational mechanism is self-regulatory focus. Kark and Van Dijk (2007), by integrating the literatures on motivation and leadership, implied that leaders can influence the self-regulatory focus of their followers. Self-regulatory focus (i.e., either promotion or prevention focus) has been proposed to have significant influences on creativity via a nurturance or ensuring gains approach (promotion focus) versus a vigilance or ensuring no losses approach (prevention focus) (Higgins, 1997). Individuals with a promotion focus are likely to engage in a processing style that increases creativity through taking risks, seeking novelty, and favoring exploration (Friedman & Förster, 2001). Further, it has been suggested that one's regulatory focus (e.g., a promotion focus) can be brought about by situational cues (Higgins, 1997). Thus, leadership, as a contextual influence, can have an impact on the self-regulatory foci of employees (Kark & Van Dijk, 2007). Micromanaging, for example, can prime employees to be prevention focused, whereas individualized consideration and empowerment may lead followers to have a promotion focus. Theories about leadership and other psychological states are continually developing, as demonstrated by the emerging discussion on the aforementioned styles and mechanisms. To advance our understanding of how leadership affects employee creativity, we must integrate those new developments into the creativity literature.

Leadership, Entrepreneurship, and Innovation

An entrepreneur is not just a business person introducing a new product or service to the market; an entrepreneur is also an effective leader who can boost his or her team's creativity and innovation. Like the leadership literature, the entrepreneurship literature originally focused on the characteristics that a successful entrepreneur should have. However, recent arguments suggest that the focus of the field should move from the characteristics of agents to entrepreneurial discovery (Eckhardt &

Shane, 2003). Rather than just postulating whether the creativity of entrepreneurs is important for their success, scholars are beginning to examine how entrepreneurs find entrepreneurial opportunities—defined as "situations in which new goods, services, raw materials, markets and organizing methods can be introduced though the formation of new means, ends, or means-ends relationships" (Eckhardt & Shane, 2003, p. 336). As we can see from the definition of entrepreneurial opportunities, creativity and innovation are critical components of entrepreneurial success. Therefore, learning how to boost creativity and innovation is critical for a successful entrepreneur.

Given that startups are typically composed of teams rather than individuals, entrepreneurs need to lead their followers to find and implement entrepreneurial opportunities. Because of the significant influence of leadership on creativity and innovation that we have found, boosting creativity and innovation should be one of the most important roles an entrepreneur plays. To date, there have been very few studies on how entrepreneurs influence their teams' performance, but a recent study found that the lead founder personality traits (e.g., openness, neuroticism) had significant influences on new venture performance via task and relationship conflicts among top management teams. Whereas task conflict in the teams (positively correlated with the lead founder's openness) might have boosted creativity for developing new ideas, products, and strategies, relationship conflict (positively correlated with the lead founder's neuroticism) might have disrupted the team's cognitive processes (de Jong, Song, & Song, 2013). Although this study did not directly test any relationship between entrepreneurship and innovation, it implied that the behavior of entrepreneurs (partly determined by their personality traits) has significant effects on their followers' creativity and innovation, and in turn on the performance of their new ventures. I suggest that entrepreneurs are more likely to be successful if they have a clear understanding of how their behavior impacts their teams' creativity and innovation.

Conclusion

Leaders have a strong influence on employees' motivations, affective states, cognitive processes, and the contexts to which they are exposed. Although leadership and creativity scholars have started to pay attention to the mechanisms by which a leadership style can influence employee creativity, the attention to date has been less than adequate. Without consideration of how leadership affects employee creativity, it is not only difficult to develop a robust theoretical model for leadership and creativity but also less clear how managers can intervene to boost employee creativity. Based on an extensive review of the literature focusing on these mechanisms, I suggest that when research is undertaken on leadership and creativity, the fit between leadership style and mechanism should be considered, as well as the conditions for better fit, such as cultural congruence. Also, the role of leadership (main effect versus moderation) should be clarified in the theory, and the possible parallel, sequential, and multilevel mediations should be considered. Finally, knowledge about leadership theories and the related psychological states that employees may experience from leadership influence should be constantly updated. Given that leadership is one of the most prevalent contextual factors in a work environment, research in this area is vital to answering the question of how to boost employee creativity.

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CHAPTER

2 Empowerment and Employee Creativity: A Cross-Level Integrative Model

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Abstract

The ever-changing environment and heightened global competition have pushed the critical role of creativity and innovation to the forefront for the sustainable long-run growth and survival of organizations. Considerable research points to empowerment as one of the key determinants of employee creativity and innovation. This chapter reviews the literature on the relationship between empowerment and creativity/innovation. It focuses on building a multilevel conceptual model that connects both psychological empowerment and team empowerment to creativity and innovation at the individual and team levels of analysis. Future research directions, including the need for greater focus on entrepreneurship, are discussed.

Key Words: employee creativity, innovation, psychological empowerment, team empowerment

Introduction

The hypercompetitive global environment and the rapid pace of technological advancement continue to provoke interest in the central roles of creativity, organizational innovation, and effectiveness for the long-term survival of organizations. Considerable evidence indicates that employee creativity—the production of novel and useful ideas by an individual or by a group of individuals working together—is essential and can fundamentally contribute to organizational innovation and effectiveness (Amabile, 1988, 1996; Shalley, Zhou, & Oldham, 2004).

Accordingly, the field of organizational behavior has witnessed an increased interest in understanding factors that promote employee creativity, and among those factors, several researchers have pointed to empowerment as one of the most important and powerful influences (e.g., Amabile, 1996; Seibert, Wang, & Courtright, 2011; Shalley et al., 2004; Tierney, Farmer, & Graen, 1999). Growing interest in empowerment comes at a time when adapting to dynamic change requires employee initiative, creativity, and innovation (Drucker, 1988). In response, many companies have undergone dramatic structural changes, transforming from traditional hierarchical management systems to empowered work team structures aimed at improving the overall efficiency and adaptability of organizations (Arnold, Arad, Rhoades, & Drasgow, 2000).

The Concept of Empowerment

Two major perspectives on the empowerment phenomenon have emerged in the literature: the social-structural approach (Kanter, 1977) and the psychological empowerment approach (Spreitzer, 1995b). The social-structural perspective defines empowerment as a set of structures, policies, and practices designed to delegate authority and power throughout the entire organization (Kanter, 1977, 1983). This approach includes high-performance managerial practices such as open information sharing, decentralization, participative decision making, extensive training, and contingent compensation (Combs, Liu, Hall, & Ketchen, 2006; Liao, Toya, Lepak, & Hong, 2009; Pfeffer, 1998; Zacharatos, Barling, & Iverson, 2005); social-political support (Gomez & Rosen, 2001; Liden, Wayne, & Sparrowe, 2000; Sparrowe,

1994); leadership (Liden, Sparrowe, & Wayne, 1997; Yukl, 2010); and work design characteristics (Hackman & Oldham, 1980).

The second perspective, psychological empowerment, is conceptualized as an experienced psychological state or set of cognitions. Conger and Kanungo (1988) defined psychological empowerment as a process of heightening feelings of employee self-efficacy "through the identification of conditions that foster powerlessness and through their removal by both formal organizational practices and informal techniques of providing efficacy information" (p. 474). Thomas and Velthouse (1990) extended Conger and Kanungo's (1988) approach by arguing that empowerment is a multifaceted concept and specifying a more complete set of task-related assessments (i.e., meaningfulness, competence, choice, and impact) that determine intrinsic task motivation in workers.

To further capture the essence of empowerment, Spreitzer (1995b) refined the four dimensions of empowerment and developed and validated a multidimensional measure of psychological empowerment in the workplace. More specifically, Spreitzer (1995b) defined psychological empowerment "as a motivational construct manifested in four cognitions: meaning, competence, self-determination, and impact" (p. 1444). *Meaning* concerns a sense of feeling that one's work is personally important. *Competence* refers to self-efficacy or the belief in one's ability to successfully perform tasks. *Self-determination* indicates perceptions of freedom to choose how to initiate and carry out tasks. *Impact* represents the degree to which one views one's behaviors as making a difference in work outcomes. Spreitzer (1995b) presented evidence, later supported through meta-analysis by Seibert et al. (2011), that the four dimensions, while distinct, are reflective of an overall psychological empowerment construct. Thus, psychological empowerment is seen as an enabling process that enhances an employee's task initiation and persistence (Conger & Kanungo, 1988).

Scholars have also considered a version of psychological empowerment at the team level. Team empowerment refers to shared perceptions among team members regarding the team's collective empowerment (Chen, Kirkman, Kanfer, Allen, & Rosen, 2007). Evidence indicates that empowerment shares similar meanings and relationships across individual and team levels (Chen et al., 2007; Kirkman & Rosen, 1997; Seibert et al., 2011).

Spreitzer (2008) suggested that the integration of the social-structural and psychological perspectives on empowerment makes important contributions in terms of developing a more comprehensive theory of empowerment at work. In addressing this issue in their meta-analytic review of empowerment, Seibert et al. (2011, p. 2) argued that "Current scholars now view these factors [referring to structures, policies, and practices that constitute social-structural empowerment] as contextual antecedents of psychological empowerment, rather than as empowerment itself." We follow a similar approach in the present chapter, which focuses on building a multilevel conceptual model connecting both psychological empowerment and team empowerment to creativity and innovation at the individual and team levels of analysis. We also propose that this theoretical framework of empowerment may serve as the starting point to extend future empowerment research to entrepreneurship because, conceptually, employee empowerment plays an important role in influencing employees' entrepreneurial behaviors (Bratnicki, Kulikowska-Mrozek, Marzec, & Zbierowski, 2007). Although we acknowledge elements reflecting a social-structural perspective as contextual antecedents of psychological and team empowerment, detailed coverage of the relationships among social-structural antecedents and psychological and team empowerment is beyond the focus of this chapter. Instead, we concentrate attention on exploring the mediating and moderating mechanisms between psychological and team empowerment and the outcomes of creativity and innovation. For a meta-analytic review that includes some social-structural antecedents of psychological empowerment, please see Seibert et al. (2011).

Creativity has long been argued as the precondition for organizational innovation (Shalley et al., 2004). In fact, with its focus on generating novel and potentially useful ideas, it is often considered to be the first step in the innovation process. A second step, actual implementation of an idea, is then needed to produce innovation (Sawyer, 2012; Somech & Drach-Zahavy, 2013). With this two-step delineation, the presumption is that the presence of innovation presupposes that creative performance has occurred—that is, new and useful ideas have been created. Hence, in this review we consider innovation to include creativity, and we consider them equivalently unless a study has focused primarily on the implementation phase,

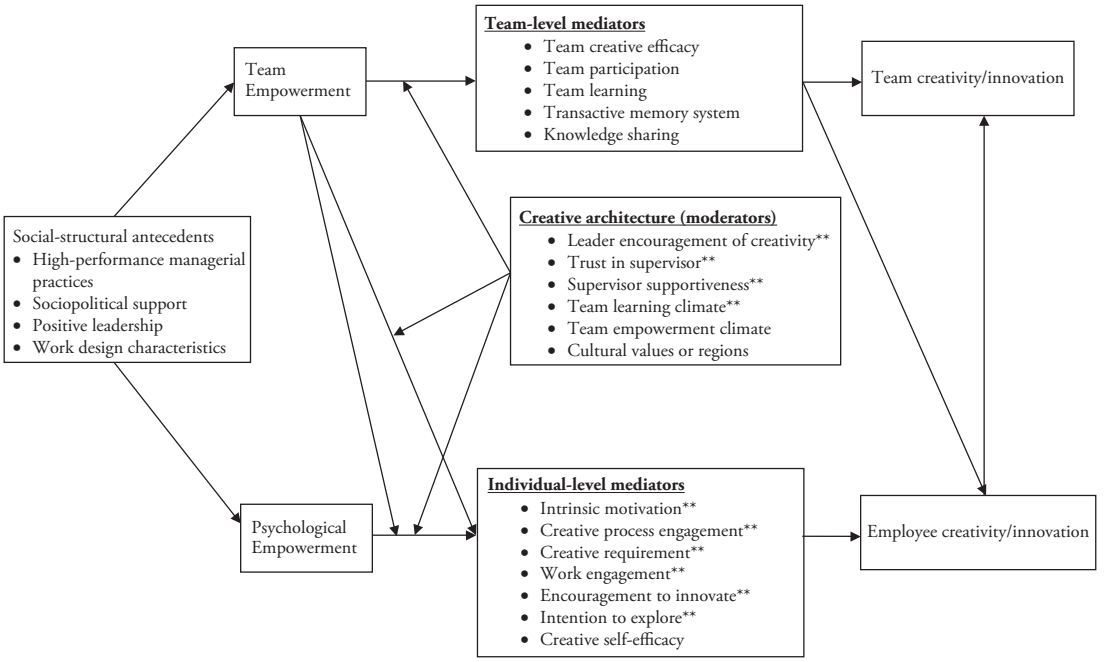

Fig. 2.1 Conceptual Model.

which occurs after a creative idea has been identified. As is the case with creativity (Shalley et al., 2004), Yuan and Woodman (2010) indicated that research evidence regarding the psychological processes underlying innovation also remains underdeveloped.

In the following sections, we first address the relationship between psychological empowerment and both employee creativity and innovation, along with related mediating and contextual mechanisms at the individual level. This coverage is followed by a discussion of the relationship between team empowerment and team creativity/innovation and related mediating and contextual mechanisms at the team level. Finally, we propose suggestions for future research, including consideration of cross-level connections between empowerment and creativity/innovation. Figure 2.1 depicts the overall framework and conceptual model for our review.

Literature Review

Psychological Empowerment and Employee Creativity/Innovation

A key function of psychological empowerment is to release the potential within individuals (Seibert et al., 2011). Employees who are psychologically empowered are motivated to experiment with new ways of doing things and to try creative methods for solving task problems (Alge, Ballinger, Tangirala, & Oakley, 2006; Jung, Chow, & Wu, 2003; Sun, Zhang, Qi, & Chen, 2012; Zhou, 1998). Thomas and Velthouse (1990) argued that empowered employees are powerful, highly confident, and passionately committed to their goals; hence, they demonstrate initiative and creativity in fulfilling these goals. Specifically, when employees perceive that their jobs are personally important and their behaviors can make a difference in work outcomes, they are willing to immerse themselves in the jobs by searching for more information and generating a great number of creative alternatives (Gilson & Shalley, 2004). In addition, when employees believe that they have the ability to perform challenging tasks successfully, they are more likely to fully explore the activities and remain motivated throughout the process until satisfying ideas are realized (Bandura, 1997; Tierney & Farmer, 2002).

Furthermore, self-determination or autonomy is an important determinant of creativity because the increased control over tasks boosts individuals' intrinsic motivation, thus significantly inspiring creativity (Amabile, Conti, Coon, Lazenby, & Herron, 1996). Autonomy provides employees with flexibility. Individuals generate the most creative ideas when they work in a high task autonomy work environment (Zhou, 1998); on the

other hand, centralization (lack of autonomy and empowerment) is negatively related to organizational innovation (Damanpour, 1991). In sum, consistent findings exist for a positive relationship between psychological empowerment and creativity (Amabile et al., 1996; Spreitzer, 1996; Zhang & Bartol, 2010a). Despite this fact, in considering the role of psychological empowerment in facilitating creativity, only limited studies have directly explored the mediating and moderating mechanisms governing the relationship between psychological empowerment and creativity.

Similarly, considering innovation, Spreitzer (1995a) suggested that, conceptually, innovation may result from psychological empowerment, and she subsequently provided empirical support for this notion (Spreitzer, 1995b). Lari, Shekari, and Safizadeh (2012) also found a significant connection between psychological empowerment and employees' innovative behaviors. In addition, Çakar and Ertürk (2010) and Ertürk (2012) demonstrated that psychological empowerment is positively related to innovation capability, which involves a company's ability to mobilize the knowledge embodied in its employees and to combine it to produce learning that leads to creating new product or process innovation.

In the next two sections, we discuss the mediators and moderators that have been directly tested and point to additional factors that may serve as potential mediators and moderators between psychological empowerment at the individual level and employee creativity and innovation.

MEDIATORS

Factors that have been directly explored as mediating mechanisms through which psychological empowerment influences creativity include intrinsic motivation, creative process engagement, and creative requirement. Tested mediators for the relationship between psychological empowerment and innovative behaviors or innovation include work engagement and encouragement to innovate.

Intrinsic motivation. Intrinsic motivation refers to the extent to which an individual is inner-directed, is interested in or fascinated with the task, and engages in the task for the sake of the task itself (Utman, 1997). Thomas and Velthouse (1990) posited that psychological empowerment is "presumed to be a proximal cause of intrinsic task motivation and satisfaction" (p. 668). Considerable evidence indicates that intrinsic task motivation is critical to creativity in organizations, and research has reported positive associations between intrinsic motivation and employee creativity on a task (e.g., Amabile, 1987, 1996; Taggar, 2002). Zhang and Bartol (2010a) found that psychological empowerment positively influenced intrinsic motivation, which, in turn, was positively related to employee creativity.

Creative process engagement. According to Amabile's (1983) componential conceptualization of creativity, intrinsic motivation is a necessary but not a sufficient condition for creative outcomes. Engaging in creative activities has an equal, if not more important, role in promoting employee creativity (Amabile, 1988, 1996; Amabile et al., 1996). Creative process engagement is defined as employee involvement or engagement in creativity-relevant cognitive processes, including (1) problem identification, (2) information searching and encoding, and (3) idea and alternative generation (Zhang & Bartol, 2010a). Psychological empowerment has important influences on an employee's willingness to engage in creative processes because empowered employees will expend more effort understanding a problem, searching for a wide variety of information, and generating a significant number of alternatives by connecting diverse sources of information. Consequently, psychologically empowered employees are more likely to take risks, explore new cognitive pathways, and generate creative ideas (Amabile et al., 1996). Research has indicated that psychological empowerment influences employee creativity, at least partially, through creative process engagement (Zhang & Bartol, 2010a).

Creative requirement. Creative requirement is defined as "the perception that one is expected, or needs, to generate work-related ideas" (Unsworth, Wall, & Carter, 2005, p. 542). Creative requirement is the experienced, psychological aspect of both explicit requirements (e.g., being directly told to develop creative ideas) and other cues (e.g., responding to what appears to be needed in the task situation). The argument is that empowered employees who have discretion and autonomy in resolving daily issues are more likely to encounter situations that require idea generation. Thus, Unsworth et al. (2005) found that the creative requirement of the job partially mediates the relationship between empowerment as manifested in autonomy and employee creativity.

Work engagement. Spreitzer (1995b) indicated that psychological empowerment may result in

effort, persistence, and behavioral engagement. Other previous research has suggested that psychological empowerment might be considered as an antecedent of work engagement (Macey & Schneider, 2008; Mathieu, Gilson, & Ruddy, 2006; Walumbwa, Wang, Wang, Schaubroeck, & Avolio, 2010). Work engagement is defined as "the extent to which an employee is cognitively, emotionally, physically and psychologically connected during the performance of his or her work roles" (Walumbwa et al., 2010, p. 90). Engaged individuals usually have high energy, are willing to invest effort on the job, and demonstrate high persistence in the face of difficulties. Recently, Bhatnagar (2012) identified and provided empirical evidence for work engagement as a strong mediator between psychological empowerment and innovation.

Encouragement to innovate. Fernadez and Moldogaziev (2012) found that empowerment practices aimed at offering employees discretion to influence work procedures and outcomes and providing employees with opportunities to acquire job-related knowledge and skills promote innovativeness through employees' encouragement to innovate. Encouragement to innovate is defined as "an affective state of experience of feeling" associated with an inclination to innovate (Fernadez & Moldogaziev, 2012, p. 162). The authors pointed out that this concept should not be confused with motivation to innovate or actual innovative behavior because encouragement to innovate represents only one component of the motivational process; that is, the emotion or affect component. Caution should be used here because the authors used a one-item measure to capture the construct: "I feel encouraged to come up with new and better ways of doing things."

MODERATORS

A factor that has been directly explored as a moderating mechanism influencing the extent to which psychological empowerment at the individual level effects creativity is leader encouragement of creativity. Factors that have been shown to moderate the relationship between psychological empowerment and innovation include trust in the supervisor and supervisor supportiveness.

Leader encouragement of creativity. Several studies suggest that when individuals know the importance of creativity in their jobs they are more likely to actually be creative (e.g., Carson & Carson, 1993; Speller & Schumacher, 1975). For example, Shalley (1991, 1995) found that assigned creativity goals effectively enhanced employee creative performance (i.e., the production of creative ideas), whereas assigned performance goals (e.g., production quantity) actually detracted from creative performance. Along similar lines, evidence suggests that leaders can play an active role in encouraging creativity by articulating the need for creative job outcomes. Leader encouragement of creativity is defined as the extent of a leader's emphasis on being creative and on actively engaging in processes that may lead to creative outcomes (Zhang & Bartol, 2010a). Such emphasis is likely to direct employee attention and facilitate effort toward trying to be creative (Scott & Bruce, 1994; Wyer & Srull, 1980). Zhang and Bartol (2010a) found that leader encouragement of creativity strengthened the relationship between psychological empowerment and creative process engagement, as well as subsequent employee creativity.

Trust in supervisor. Thomas and Velthouse (1990) indicated that the effectiveness of empowerment depends not only on employees' evaluations of their tasks but also on contextual factors such as trust in their superiors, peers, and subordinates. Trust in supervisor refers to the belief that the supervisor will act for the benefit of employees (Moorman, Blakely, & Niehoff, 1998). Ertürk (2012) found that trust in supervisor moderated the relationships between the psychological empowerment dimensions and innovation capability such that high levels of trust in the supervisor strengthened employees' willingness to accept greater responsibilities and improved the level of capability to be creative and innovative.

Supervisor supportiveness. In organizational settings, employees rely heavily on their supervisors for information, resources, and sociopolitical support (Kanter, 1988). When supervisors respond to their innovative ideas in a supportive manner, employees are motivated to use their perceived influence (measured with items from the impact dimension of psychological empowerment) for the development and realization of their new ideas (Janssen, 2005). On the other hand, when supervisors are perceived as not being supportive of employees' innovative behaviors, employees high in perceived influence are less likely to exhibit innovative behaviors. Thus, Janssen (2005) found that supervisor supportiveness moderated the relationship between employees' perceived influence in the workplace and their levels of innovative behaviors. Interestingly, although the innovative behavior measure used

in the study included both creativity and implementation aspects, the items loaded on a single factor.

Team Empowerment and Team Creativity/Innovation

Empowerment has been conceptualized at both individual and team levels of analysis (Kirkman & Rosen, 1997, 1999). Whereas individual psychological empowerment refers to how empowered the individual feels personally, team empowerment is defined as shared perceptions among team members regarding the team's collective level of empowerment (Chen et al., 2007; Seibert et al., 2011). Scholars have proposed that psychological empowerment functions equivalently across the individual and team levels of analysis (Chen et al., 2007; Kirkman & Rosen, 1997, 1999). Seibert et al.'s (2011) meta-analysis supported the proposed homology across levels because empowerment demonstrated relationships that did not differ in direction or magnitude at the individual and team levels.

At the individual level of analysis, the inclusion of innovation as an outcome (in the meta-analysis, innovation includes creativity, creative performance. and innovative behaviors) suggested that psychological empowerment is relevant to a broader range of behavior than is often investigated (Seibert et al., 2011). To our knowledge, no study in the field has examined the relationship between team empowerment and creativity or innovation at the team level. Seibert et al. (2011) suggested that future research should expand the criterion space of team empowerment to include other team outcomes, such as team creativity and team innovation.

In a closely related study involving technology, intention to explore was defined as individuals' willingness to explore a new technology and identify potential uses (Nambisan, Agarwal, & Tanniru, 1999). Intention to explore was conceptualized as an internal psychological commitment that indicates an individual is in effect trying to innovate. Maruping and Magni (2012) investigated how managers can promote greater innovation with technology in the workplace by creating a team empowerment climate and a team learning climate. Contrary to their expectations, they found that team empowerment climate—the extent to which team members have a shared perception of practices and behaviors that enhance information sharing and promote autonomy and responsibility (Seibert, Silver, & Randolph, 2004)—reduced employees' intention to explore the technology. Team empowerment climate was more strongly related to intention to explore when team learning climate—the extent to which team members have shared perceptions that the team emphasizes practices that promote innovation and risk taking—was also high. The limited measure of team empowerment climate used in the study may have influenced the results. The researchers suggested that managers should exercise constraint in allocating too many new responsibilities to team members when the team members are also expected to explore and exploit new technology, lest team members become overloaded.

Suggestions for the Future

As reviewed in the previous sections, most research has been devoted to an understanding of potential mediators and moderators of the relationship between psychological empowerment at the individual level and employee creativity and innovation. Because psychological empowerment is functionally equivalent across the two levels of analysis, we expect that certain mediators at the individual level will also mediate the relationship between team empowerment and team creativity/innovation as long as the individual-level concept is theoretically meaningful at the team level (e.g., creative self-efficacy vs. team creative efficacy). Beyond that, a particularly valuable channel for future research is to explore team level mediators (e.g., team participation, team learning) that are likely to transmit the influence of team empowerment—not only creativity and innovation at the team level, but also as a direct cross-level impact on creativity and innovation at the individual level. In addition, future research may further examine team level moderators (e.g., team empowerment climate, cultural values) that may influence the relationship between psychological empowerment and creativity/innovation at different levels. We will discuss several possibilities in the following two sections.

Potential Mediators of Empowerment and Creativity/Innovation

Creative self-efficacy. A stream of research has suggested that employees tend to be more creative when they have high levels of creative self-efficacy, which is defined as the belief that one has the knowledge and skills to produce creative outcomes (Tierney & Farmer, 2002, 2004). Efficacy beliefs enhance intrinsic motivation by promoting

perceptions of self-competence (Bandura, 1986); therefore, creative self-efficacy may reflect intrinsic motivation to engage in creative activities (Gong, Huang, & Farh, 2009). Previous studies found that supervisor behavior, transformational leadership, and job complexity are positively related to creative self-efficacy, which in turn positively influences employee creativity (Tierney & Farmer, 2002; Gong et al., 2009). Because leadership and work design characteristics are important determinants of psychological empowerment (Spreitzer, 1995a), we would expect that creative self-efficacy may function as another mediator between psychological empowerment and creativity/innovation at the individual level.

Team creative efficacy. Applying the concept of creative self-efficacy to the team level, Shin and Zhou (2007) defined team creative efficacy as team members' shared belief in their teams' capabilities of generating creative ideas. They found that team creative efficacy mediates the relationship between the transformational leadership and educational specialization heterogeneity and creativity in research and development teams. Research has indicated that transformational leadership or encouraging leader behaviors are positively related to team empowerment (Jung & Sosik, 2002; Kirkman & Rosen, 1999). In addition, Jung and Sosik (2002) found that team empowerment is positively related to collective efficacy (which refers to team members' shared perceptions on how capable their team is regarding a specific task; Bandura, 1997); collective efficacy, in turn, is positively related to team effectiveness. Thus, we would expect that team creative efficacy may mediate the relationship between team empowerment and team creativity/innovation. At the same time, team creative efficacy may inspire employee creativity of team members at the individual level, constituting a direct cross-level effect.

Team participation. Team participation refers to team members' involvement, cooperation, and collaboration through influencing, interacting, sharing information, and generating ideas for new ways of working (Anderson & West, 1998). Team participation plays an important role in the team processes necessary for effective team outcomes (Mathieu, Maynard, Rapp, & Gilson, 2008). Zhang and Begley (2011) found that empowerment (the self-determination dimension in particular) is positively related to team participation. Conceptually, beyond the dimension of self-determination, other dimensions of empowerment could also have an influence on team participation. More specifically, when members of a team have a general expectation that the team can be effective, the attitude of confidence will facilitate interaction and collaboration among team members to accomplish their tasks. When team members believe that their tasks have great impact on others and that they make significant contributions to the organization, they are more likely to be proactive in exploring and discussing work-related issues. Because high team participation facilitates team members' interaction and knowledge exchange (Hansen, Mors, & Løvas, 2005) and helps team members to develop new ideas (Amabile et al., 1996; Anderson & West, 1998), we would expect that team participation will mediate the relationship between team empowerment and team creativity and innovation. Because of high team member involvement in the team interactions, such participation may also have a cross-level effect in influencing the creativity of individual team members.

Team learning, transactive memory system, and knowledge sharing. As with team participation, three other variables—team learning, transactive memory system, and knowledge sharing—may be mediating mechanisms through which empowerment influences employee creativity and innovation. Team learning, the process by which team members integrate and convert individual knowledge into team knowledge, is essentially a collective cognitive process among team members (Argote, 1999). Team empowerment enhances team members' task motivation, which is derived from their collective and positive assessments of their tasks (Kirkman & Rosen, 1999). High levels of autonomy and potency can encourage team members to openly express ideas and suggestions, which can ultimately influence decisions that affect the team and provide opportunities for team members to collaboratively evaluate one another's suggestions (Locke, Alavi, & Wagner, 1997; Somech, 2006). As a result, team members may be able to learn from one another, and the interaction facilitates the process of knowledge integration. Teams that emphasize proactive learning continually refine knowledge and share information among members to develop new approaches to problem solving (Bunderson & Sutcliffe, 2003). The active use of different perspectives and diffused knowledge for solving problems may encourage team members to consider more alternatives, expand cognitive pathways for generating new ideas, and facilitate knowledge generation. Drach-Zahavy and Somech

(2001) found that the interaction process of team learning was related to team innovation.

Similarly, team empowerment may have an impact on a team's transactive memory system, which can be defined as shared cognition about the encoding, storing, and retrieving processes of information (Wegner, 1987, 1995). A transactive memory system helps employees in a team to be more aware of who possesses what specialized knowledge, to trust the reliability of the knowledge, and to coordinate the specialized knowledge effectively (Lewis, 2003). In an empowered environment, employees are more involved in key decision making and are more accountable for the outcomes in their team (Arnold et al., 2000; Kirkman & Rosen, 1999). The emphasis on self-determination and self-reliance encourages team members to rely on one another's knowledge and skills (Manz & Sims, 1987). This promotes the delegation of tasks based on members' expertise and motivates team members to become more specialized in their domains (Wegner, 1987). The collective belief that the team can be effective increases the expectation of responsibility and accountability, which motivates team members to deepen their domain-relevant expertise so that they can be trusted and accountable for the team outcomes. In addition, team empowerment promotes collaboration, which further encourages team members to freely communicate, interact, and exchange information about the team task (Dovey, 2002). Transactive memory systems have been shown to be associated with creative products (Wegner, 1987). Cohen and Levinthal (1990) suggested that the more team members develop an awareness of the capabilities and knowledge of others, the stronger the unit's absorptive capacity, which they argued is necessary for recognizing the value of creative ideas. In addition, the mutual accountability and assistance among members of teams using transactive memory systems enables the development and implementation of novel ideas (Eisenbeiss, Knippenberg, & Boerner, 2008). The effective coordination of a wide range of knowledge also facilitates team innovation because it provides the knowledge base for a quantity of high-quality new ideas, which are important for team innovation (Pirola-Merlo & Mann, 2004; West, 2002).

Related to transactive memory is knowledge sharing, which assists in the creation of shared mental models and the development of transactive memory, thereby enabling better coordination among team members (Srivastava, Bartol, & Locke, 2006). Knowledge sharing is a team process defined as team members' sharing task-relevant ideas, information, and suggestions with each other (Bartol & Strivastava, 2002). Srivastava et al. (2006) found that knowledge sharing mediated the relationship between empowering leadership and unit performance. The associated increase in knowledge among team members is likely to foster greater creativity and innovation.

Potential Moderators of Empowerment and Creativity/Innovation

Team empowerment. Team empowerment itself may potentially also have a cross-level impact on the relationship between individual-level psychological empowerment, various mediators, and employee creativity/innovation. For instance, Chen et al. (2007) found that in interdependent teams, team empowerment moderated the relationship between individual empowerment and performance in such a way that the influence of individual empowerment became less positive as team empowerment became more positive. To be more specific, when tasks were highly interdependent and the team was empowered, team empowerment seemed to be a greater influence on performance than individual empowerment. Thus, it appears that team empowerment may interact with individual-level psychological empowerment to influence employees' emergent states or creative processes and, consequently, to influence their creative/innovative performance. Achieving a greater understanding of the mutual impact of team empowerment and individual-level psychological empowerment and the circumstances influencing these relationships is an important area for future research.

Team empowerment climate. Seibert et al. (2004) defined empowerment climate as a shared perception regarding the degree to which an organization incorporates structures, policies, and practices aimed at enabling empowerment. Conceptually, empowerment climate and psychological empowerment are distinct in at least two ways (Seibert et al., 2004). First, empowerment climate refers to the work environment, whereas psychological empowerment is defined as an individual's experience of intrinsic motivation or, at the team level, as shared perceptions among team members about their collective empowerment. Second, respondents for empowerment climate are asked to assess organizational structures, policies, and practices, whereas respondents for psychological

empowerment are asked to evaluate their own psychological states. Empirically, Seibert et al. (2004) have verified that empowerment climate and psychological empowerment are distinct constructs.

Team empowerment climate has been shown to be an antecedent of team empowerment (Chen et al., 2007), but it may play a cross-level moderating role as well. Ekvall (1996) argued that team empowerment climate, which includes 10 elements—challenge, freedom, support of ideas, trust and openness, vitality and liveliness, funny and humorous, argument, conflict, risk preference, and time looseness—promotes more creative behaviors and effective innovations. Sufficient empowerment climate within a team can potentially bring a higher level of trust among team members, more information sharing, and enhanced autonomy and team accountability (Randolph, 1995). As a result, team members may have a greater feeling of respect and a higher level of self-determination; this may lead to a higher level of intrinsic motivation and more creative performance at the individual level and, ultimately, the team level. Team empowerment climate may also moderate the impact of psychological empowerment by boosting its effects. On the contrary side, insufficient empowerment climate may leave individual team members lacking in intrinsic motivation and in the desire to take on greater responsibilities and risks (Randolph, 1995). Si and Wei (2012) found that team empowerment climate moderated the relationship between transformational and transactional leadership and employee creativity. Because transformational leadership has been found to be a contextual factor influencing psychological empowerment at both the individual and the team level (Avolio, Zhu, Koh, & Bhatia, 2004; Gumusluoglu & Ilsev, 2009; Jung & Sosik, 2002; Kark, Shamir, & Chen, 2003), we would expect team empowerment climate to function as a moderator for the relationship between empowerment and creativity at both individual and team levels.

Cultural values. Zhang and Begley (2011) found that power distance moderated the relationship between empowerment and team participation, both of which are critical to innovative performance. Power distance refers to the degree of acceptance of an uneven distribution of power in an organization (Hofstede, 1980). Top-down decision making and hierarchical structure are typical characteristics of an organization with high power distance (Sagie & Aycan, 2003). In an organization operating with low power distance, employees feel comfortable interacting with others regardless of seniority and status (Cheung & Chow, 1999); therefore, they are more likely to form opinions and make decisions. On the other hand, in an organization with high power distance, empowered employees do not work effectively, because individuals higher in the organizational hierarchy make decisions and employees usually do not believe it is their function to initiate actions (Sagie & Aycan, 2003). Furthermore, previous literature suggested that employees with high levels of empowerment (e.g., determination and impact) may be perceived as threatening to supervisors in high power distance cultures and therefore may not be viewed as high performers (Eylon & Au, 1999; Spreitzer, 2008). Zhang and Begley (2011) found that low power distance strengthened the positive relationship between empowerment (the self-determination dimension in particular) and team participation. As discussed previously, we expect that team participation may serve as a mediator between team empowerment and creativity and innovation at both individual and team levels. Thus, we argue that power distance may function as a potential moderator in relationships between empowerment and creativity and innovation across levels.

Along these same lines, other relevant culture values, such as uncertainty avoidance, may also moderate relationships between empowerment and creativity/innovation. Uncertainty avoidance is defined as the extent to which employees feel uncomfortable in uncertain and ambiguous situations and try to avoid such situations by seeking guidelines and rules in the workplace (e.g., Dorfman & Howell, 1988). When uncertainty avoidance is high, psychological empowerment might not enhance employees' intrinsic motivation or creative self-efficacy as much as when uncertainty avoidance is low. Consequently, the effect of psychological empowerment on creativity and innovative behaviors might be weakened.

Relatedly, the meta-analysis conducted by Seibert et al. (2011) found that the culturally distinct geographic region moderated the relationship between psychological empowerment and task performance. More specifically, psychological empowerment was related to task performance more positively in Asia than in North America. They suggested that psychological empowerment might be more effective in collectivistic cultures. Therefore, cultural regions might be a factor to consider when conducting

cross-cultural analysis of psychological empowerment and employee creativity and innovation in the future.

Overall, previous empowerment research has focused mainly on investigating the antecedents and consequences of psychological empowerment and/or team empowerment. Despite the fact that some recent studies have begun to explore mediating and moderating mechanisms for the relationship between empowerment and creativity/innovation at either the individual or the team level, little research has addressed relationships at and across these two levels. Because psychological empowerment appears to be functionally equivalent across the individual and team levels of analysis, we would expect that team-level mediators proposed in the integrative model may mediate the relationship between team empowerment and both individual and team creativity/innovation. Moreover, it is possible that some mediators that have been investigated at the individual level, such as work engagement and creative process engagement, may also operate at the team level of analysis. We have already discussed this possibility with respect to creative self-efficacy and team creative efficacy. Finally, moderators proposed in the integrative model may interact with empowerment at both levels to influence the creativity and innovation of individuals and teams through the relevant mechanism at the proper level. Understanding these multilevel influences is an exciting area of great potential for future research on creativity and innovation.

Extending Empowerment Research to Entrepreneurship

Recently, there has been greater interest in and emphasis on management that encourages entrepreneurial behaviors (Bratnicki et al., 2007). Entrepreneurship is considered an important driver of achieving and sustaining competitive advantage in the face of environmental uncertainty (Zahra, 1999). Entrepreneurs are able to take risks and effectively deal with uncertainty, and they are capable of enhancing innovation (Bratnicki et al., 2007). Sustained corporate entrepreneurship should rely on ensuring critical internal organizational factors such as autonomy and discretion (Kuratko, Hornsby, & Goldsby, 2004). With respect to entrepreneurship, previous scholars have suggested that it is important to examine the influence of empowerment, because empowerment removes restrictions and boundaries, provides autonomy, and encourages employees to realize their creative potential and initiative (Kuratko, Ireland, & Hornsby, 2001). To face entrepreneurial challenges, employees should be aware of their potential and feel free to use their knowledge, skills, and creativity while working together. As a result, they might be intrinsically motivated and willing to take entrepreneurial actions (Kuratko et al., 2001). Thus, employee empowerment can play an important role contributing to employees' entrepreneurship (Bratnicki et al., 2007; Eylon & Bamberger, 2000; Klagge, 1998).

Despite the fact that many researchers have pointed to a relationship between empowerment and employees' entrepreneurial behaviors, there is a general lack of empirical research directly examining this relationship (Bratnicki et al., 2007). Empowerment research in the field of entrepreneurship has been studied mostly in literature focused on minority or disadvantaged groups (O'Connor & Ramos, 2006). For example, Kantor (2002) suggested that empowerment should be considered when evaluating the success of women in South Asian micro-enterprise. In addition, Osborne, Falcone, and Nagendra (2000) studied an entrepreneurship intervention for unemployed individuals in the United States, and Martin and Wright (2005) explored how to empower female entrepreneurs in the United Kingdom through information and communication technology.

Sundbo (1996) proposed that innovation empowerment is related to corporate entrepreneurship, which is carried out by many managers and employees in the organization and stimulated by higher management (Kanter, 1983). In other words, corporate entrepreneurship is derived from empowerment whereby managers and employees are activated to operate as entrepreneurs in the innovation process. Sundbo (1996) suggested that although empowerment is critical to firms, it should not get out of control. Thus, it is important for higher-level management to develop an organized corporate entrepreneurship approach (in contrast to uncontrolled corporate entrepreneurship) to balance the encouragement and potential risks of empowerment.

Future research is needed to link psychological empowerment via creativity to entrepreneurship. The framework established for the relationship between empowerment and employee creativity and innovation in this chapter might be used as a

starting point to explore the mediating and moderating mechanisms for this relationship.

Other Areas of Future Research Interest

Although most previous research has found positive outcomes of empowerment in the workplace, Speitzer's (2008) review piece on empowerment suggested that some trade-offs exist regarding empowerment. For instance, employees who reported high levels of the meaning dimension also reported a higher level of strain (Speitzer, Kizilos, & Nason, 1997). As a result, strain or emotional challenge may negatively influence employees' intrinsic motivation or work engagement, thus threatening to dampen creative outcomes. In addition, Zhang and Bartol (2010b) found that, although creative process engagement is positively related to creativity, there is a curvilinear relationship between creative process engagement and overall performance. That is, if employees spend too much time in the creative process, general performance might not be guaranteed or might even decrease. When employees are granted very high levels of empowerment, they may have greater discretion in terms of engaging in the creative process, which may put their general performance in jeopardy. Spreitzer and Quinn (1996) argued that employees who are overly empowered may become disempowered over time because their supervisors may become threatened by their empowerment. It is also possible that empowered employees may proceed in directions that are at variance with supervisor expectations and/or work needs. It would be of interest for future studies to explore changes (increases and/or decreases) in psychological empowerment, perhaps triggered by structural empowerment alterations, and the subsequent influences on employee creativity and innovation.

Future research may further explore the causality between empowerment and creativity and innovation. For example, exploring the reverse causality from creativity or innovation to empowerment might be interesting. More specifically, when employees are highly creative or innovative and generate numerous creative ideas, they may be granted a greater level of autonomy by their supervisors to take more innovative actions (Spreitzer, 2008). As a result, highly creative employees may perceive even higher levels of psychological empowerment, which then might further contribute to creative or innovative performance.

In the interest of parsimony, it would be useful for future research to assess the relative value of various mediators in terms of the variance accounted for when they are simultaneously considered. For example, although trust in supervisor and supervisor supportiveness are conceptually distinct, there may be some overlapping influence with respect to creativity and innovation.

As noted earlier, it is common to consider innovation to involve a creativity step and an implementation step (e.g., Somech & Drach-Zahavy, 2013). The research we have reviewed indicates that psychological empowerment, while clearly a factor in creative performance, also is related to innovation as a phenomenon. This latter connection suggests that it would be useful for future research to delineate the paths by which psychological empowerment may influence both the creativity stage and the implementation stage of innovation. Potential mediators and moderators of such relationships will also be important to explore. Such inquiries may be helpful in increasing the extent to which creative ideas are actually implemented in organizations.

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CHAPTER

3 Rewards' Relationship to Creativity, Innovation, and Entrepreneurship

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Abstract

Until recently, conflicting evidence about rewards' effects on creativity limited the ability to make firm conclusions about this relationship. This chapter provides an overview of the research (including meta-analytic evidence) on rewards and creativity and details its implications. Whereas the literature on rewards and creativity is extensive, research on the rewards–innovation and rewards–entrepreneurship relationships has been sparse. Although creativity is a precursor for organizational innovation and entrepreneurship, little is known about how rewards may increase employees' motivation to implement creative ideas including new venture development. This chapter reviews the limited research on rewards' effects on innovation and entrepreneurship and offers directions for future research to help fill these gaps.

Key Words: creativity, innovation, entrepreneurship, rewards, motivation

Rewards and Creativity

Organizations are interested in increasing creativity because creativity serves as a precursor to organizational innovation and entrepreneurship (Amabile, Conti, Coon, Lazenby, & Herron, 1996; Schuler, 1986). Because organizations have a vested interest in encouraging employees to be creative, they often use rewards with the intent of increasing employee creativity (Baer, Oldham, & Cummings, 2003; Van Dijk & Van den Ende, 2002). Yet, there are reasons to question the effectiveness of using rewards to foster creativity.

Empirical studies have yielded mixed results, with evidence to support both positive and negative effects of rewards on creativity (e.g., Eisenberger, Armeli, & Pretz, 1998; Amabile, Hennessey, & Grossman, 1986). Indeed, much of the debate surrounding the rewards–creativity relationship has been primarily about the direction of the effect of rewards on creativity (i.e., whether it is positive or negative) and less about the conditions that alter the rewards–creativity relationship and the mechanisms through which rewards influence creativity (e.g., Amabile, 1996; Eisenberger & Aselage, 2009; Eisenberger & Selbst, 1994). However, recent research studies have sought to provide, and have succeeded in providing, some clarity about the direction of rewards' effect on creativity; they have also explicated certain conditions that alter the rewards–creativity relationship (e.g., Byron & Khazanchi, 2012; Baer, Oldham, & Cummings, 2003). Therefore, it is important to clarify the direction of the rewards–creativity relationship, understand the conditions under which rewards may increase or decrease employee creativity, explicate the mechanisms that underlie the rewards–creativity relationship, and identify directions for future research.

Although the rewards–creativity relationship has received extensive research attention, the effect of rewards on innovation (i.e., the implementation of creative ideas) and on entrepreneurship (i.e., the application of creative ideas in the creation of new business ventures) has received

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rather limited research attention (e.g., Manso, 2011; Morris & Jones, 1993). Studies of the effect of rewards on creativity, innovation, and entrepreneurship have progressed largely independently of one another. Unless creative ideas are implemented or applied in the creation of new business ventures, they will be of little value to organizations and society. Moreover, given that this volume is focused on integrating the three interrelated areas of creativity, innovation, and entrepreneurship, it is also important to understand how rewards affect the implementation of ideas (i.e., innovation), as well as their application to the creation of new business ventures (i.e., entrepreneurship). Therefore, although much of the chapter is devoted to the rewards–creativity relationship, we also review research and propose directions for future research on how rewards impact innovation and entrepreneurship. We begin with a discussion of how rewards affect creativity and then discuss the effect of rewards on innovation and entrepreneurship.

Relationship Between Rewards and Creativity

Research examining the rewards–creativity relationship has relied predominantly on learned industriousness theory (LIT) and self-determination theory (SDT) to arrive at diametrically opposed predictions about the effects of rewards on creativity. Specifically, these theoretical perspectives often rely on contradictory properties or aspects of rewards and assumptions about cognitive and motivational processes to make opposing predictions about the effects of rewards on creativity (e.g., Byron & Khazanchi, 2012). Although LIT and SDT have more differences than similarities, researchers from these two competing camps have relied on common mediating mechanisms—self-determination and intrinsic motivation—to explain the influence of rewards on creative performance (e.g., Amabile, Hennessey, & Grossman, 1986; Eisenberger & Aselage, 2009). However, recent research has shown that contextual conditions may help us in understanding when and how rewards influence creative performance (e.g., Baer et al., 2003; Friedman, 2009). Along the same line, in a 2012 meta-analytic investigation, we directly addressed the controversy about the direction of rewards' effect on creativity. In doing so, we integrated diverse theoretical perspectives to theorize about multiple mediating mechanisms and empirically examine the moderating effect of contextual conditions on the rewards–creativity relationship.

We begin this chapter with a review of the controversy over whether rewards positively or negatively affect creativity; this is followed by sections on resolving and moving beyond the controversy. We then describe findings of our meta-analytic investigation. Finally, based on our review of existing research and our own findings, we discuss directions for future research into the rewards–creativity relationship.

Positive Effect of Rewards on Creativity

Research that has found a positive effect of rewards on creativity is grounded mainly in the LIT perspective (e.g., Eisenberger & Selbst, 1994; Eisenberger & Rhoades, 2001; Eisenberger & Aselage, 2009). LIT assumes that cognitive effort is inherently aversive and that informational aspects of rewards can reduce the aversiveness of cognitive effort and promote goal-directed behavior. Rewards that are contingent on creative performance inform individuals that creativity is the performance criterion and is desirable. This effect reduces the aversiveness associated with cognitive effort and enhances intrinsic motivation (i.e., the inherent enjoyment and satisfaction received from the task itself) and perceptions of self-determination (i.e., feelings of autonomy or freedom to be flexible and take risks), thereby contributing positively to creative performance (Eisenberger, 1992; Eisenberger & Aselage, 2009).

Eisenberger and Rhoades (2001) showed that students who were promised rewards for being creative produced more creative movie titles than did students who were not promised rewards. In a follow-up study, Eisenberger and Aselage (2009) replicated the positive effect of reward on creativity and provided further evidence to support their claim that contingent rewards can enhance perceptions of self-determination and intrinsic motivation. Specifically, their results showed that rewards for higher performance (i.e., being offered 10 dollars if their story titles were judged to be better than those of 80% of the past participants) created performance pressure—a negative or aversive affective state associated with dissatisfaction with their current progress towards desired goals—and perceptions of self-determination, which in turn enhanced intrinsic motivation and creative performance. Specifically, these authors argued that performance-contingent rewards induce commitment to the objective of achieving

higher standards of performance, which produces discomforting pressure for the necessity of higher performance. Individuals are more thoughtful, willing to depart from routine, and employ diverse skills in order to alleviate the negative experience of performance pressure (Eisenberger & Aselage, 2009). The results showed that students in rewarded conditions experienced greater self-determination and intrinsic motivation and, as a result, exhibited greater creativity in story titles compared with students in the non-rewarded condition.

Overall, LIT-based research has shown that the positive effect of rewards is likely anchored in informational aspects of rewards and context. Specifically, these studies indicate that the manner in which rewards are administered can amplify the positive effect of rewards on creativity. Additionally, by exploring mediating mechanisms underlying the rewards–creativity relationship, they help to explain why rewards can positively influence creative performance.

Negative Effect of Rewards on Creativity

Research that has found a negative effect of rewards on creativity is grounded mainly in the SDT perspective (e.g., Deci & Ryan, 1985; Amabile, 1996). Specifically, SDT researchers focus primarily on the controlling aspects and attention-eliciting properties of rewards to argue that rewards decrease intrinsic motivation and self-determination, which are considered to be necessary for creativity (e.g., Amabile, 1996; Amabile et al., 1986).

Several studies have supported the notion that intrinsic motivation and perceptions of autonomy are important predictors of creativity (e.g., Amabile, 1996; Dewett, 2007; Oldham & Cumming, 1996). For instance, using survey data collected from 165 research and development (R&D) personnel and their supervisors, Dewett (2007) provided evidence to support the idea that intrinsic motivation spurred risk-taking and creativity. Specifically, he found that risk-taking mediated the relationship between individuals' intrinsic motivation and their creativity.

As mentioned previously, according to SDT, rewards hamper creative performance by reducing intrinsic motivation and self-determination. Researchers have offered three theoretical reasons why rewards could hurt intrinsic motivation and self-determination (Eisenberger & Aselage, 2009). First, rewards create a means–ends relationship between the task and reward that takes away the enjoyment received from the task itself and diminishes self-determination (Amabile, et al., 1986). That is, individuals will engage in tasks only to acquire rewards, which will hinder the enjoyment received from the task itself. Relatedly, rewards also cause individuals to feel controlled (Amabile & Hennessey, 2010; Gagné & Deci, 2005). Rewards can cause individuals to feel that they are no longer free to choose their own work; rather, someone else is directing their behavior and choosing their work (Gagné & Deci, 2005). In the presence of rewards, individuals may feel coerced to engage in behaviors and tasks, especially when rewards are desirable even if the task is not. Finally, individuals who engage in creative tasks in the presence of rewards will show less subsequent intrinsic interest compared with those individuals who engage in creative tasks without any rewards. In other words, individuals who are offered a reward for completing a task focus their attention on the reward rather than the enjoyment of the task itself; this is referred to as the overjustification effect (e.g., Lepper, Greene, & Nisbett, 1973). In sum, according to these arguments, rewards reduce self-determination and intrinsic motivation because they focus attention on the reward, divert attention away from the task itself, and cause people to feel controlled.

Studies have shown that rewards that are contingent on task completion or are offered with nonspecific performance criteria decrease intrinsic motivation, perceptions of self-determination, and, hence, creativity (e.g., Amabile et al., 1986; Amabile, 1982). For example, Amabile et al. (1986) found that children in the non-rewarded group produced more creative stories than did children in the rewarded group. Specifically, children in the rewarded condition, who were explicitly contracted to produce collages and stories in return for a reward of being able to use a digital camera to take pictures, produced collages and stories that were lower in creativity compared with those produced by children in the non-rewarded condition (who were allowed to use the camera but not as a reward).

Overall, SDT-based research shows that detrimental effects of rewards on creativity are anchored in attention-eliciting and controlling aspects of rewards and context. Specifically, studies highlight the idea that conditions such as completion and not specific performance contingency

may contribute to the negative effect of rewards on creativity.

Rehashing and Resolving Theoretical Controversies

Based on the discussion already presented, it may be said that the controversy about the direction of the effect of rewards on creativity is likely due to the fact that researchers from opposite theoretical perspectives have focused on the set of conditions and mediating mechanisms that emphasize either the informational aspects or the controlling aspects of rewards and context. In doing so, researchers have ignored the possibility that the context in which rewards are administered may enable informational and controlling elements to coexist. For example, verbal rewards are typically viewed as informational. However, when verbal rewards are offered under close surveillance, the potentially positive aspects of informational elements are negated by the controlling aspects of surveillance (Pajak & Glickman, 1989). Thus, informational and controlling aspects of rewards and the contextual conditions or the manner in which rewards are administered likely interact to predict the rewards–creativity relationship.

This is evident from the criticisms SDT and LIT researchers offer of each other's approach. Specifically, SDT-based research is criticized on the grounds that researchers fail to clearly and explicitly establish a creativity contingency (Eisenberger & Aselage, 2009). That is, rewards that are offered for the completion of a task will likely lead individuals to believe that routine—as opposed to creative—performance is desirable and is the rewarded aspect of performance (e.g., Amabile et al., 1986). In this approach, controlling—as opposed to informational—aspects of rewards are likely rendered salient. Rewards that are controlling lead individuals to focus on completing the task and satisfying the routine aspects of the task, thus limiting exploration and risk-taking and decreasing creativity. In comparison, the primary criticism of LIT-based research is that informational properties of rewards (e.g., reward contingency) are confounded with informational aspects of the context (e.g., the instruction to be creative is a contextual condition) (Joussemet & Koestner, 1999). In other words, according to critics, it is not clear whether it is the reward or the context that is informational and has a positive influence on intrinsic motivation and creativity.

Furthermore, much of the existing research that has found either a positive or a negative effect of rewards on creativity has focused primarily on intrinsic motivation and perceptions of self-determination as mediating mechanisms to explain the influence of rewards on creativity. However, researchers have now developed much more complex and expansive views of motivational processes—as opposed to the more simplistic dichotomy of extrinsic and intrinsic motivation—that can help us make sense of the conflicting findings and advance research (Gagné & Deci, 2005). Similarly, given recent evidence for affective states as a contextual influence on creativity (Amabile, Barsade, Mueller, & Staw, 2005; George & Zhou, 2007), it seems likely that affective states triggered by rewards may be useful in explaining the effect of rewards on creativity.

Thus, the focus on a narrow set of contextual conditions and the lack of emphasis on alternative mediating mechanisms may have caused researchers to inadvertently focus too narrowly on rewards as being either informational or controlling. Therefore, in order to move beyond the controversy to a common ground, it is important that researchers identify contextual conditions and model multiple cognitive, motivational, and affective mechanisms to explain the influence of rewards on creativity.

Moving Beyond the Controversy

Although the controversy about the effect of rewards on creativity began in the early 1980s and has continued until recently, researchers from the opposing theoretical perspectives have acknowledged the complexity of the rewards–creativity relationship. For example, Eisenberger and Selbst (1994) concluded that the effect of rewards on creativity depends on how rewards are administered, how much creativity is required, and how large and salient the rewards are. Similarly, Amabile (1993) argued that extrinsic factors such as rewards that support individuals' need for autonomy, relatedness, and competence can enhance intrinsic motivation and creativity by internalizing and integrating extrinsic motivation. She referred to such external factors as "extrinsic in service of intrinsic" (p. 194).

Increasingly, creativity scholars have explicitly acknowledged that rewards may not necessarily undermine intrinsic motivation and may even boost intrinsic motivation and creativity, especially when the rewards confirm competence

and provide useful information (e.g., Amabile & Hennessey, 2010). This is not to suggest that rewards are uniformly helpful. Rather, there are conditions under which rewards can undermine intrinsic motivation and perceptions of self-determination. For example, when rewards lead employees to feel controlled, employees tend to have lower intrinsic motivation (e.g., Baer et al., 2003; Friedman, 2009). As such, research on the rewards–creativity relationship has started to move in the direction of identifying conditions and mechanisms that can help us understand when—and not just whether—rewards increase or decrease creativity (e.g., Baer et al., 2003; Friedman, 2009).

In a field study, Baer et al. (2003) showed that the effect of extrinsic rewards varies as a function of job complexity, such that rewards lower creativity when individuals are engaged in complex jobs but increase creativity when individuals are engaged in simple jobs. Furthermore, they showed that individuals' cognitive style interacts with job complexity to predict the effect of rewards on creativity. Specifically, rewards did not affect the creativity of innovators (i.e., those who do things differently or in new ways) in complex jobs but diminished the creativity of adaptors (i.e., those who find ways to do things better) in complex jobs. These results suggest that certain jobs or tasks have intrinsic features and that rewards can hurt creativity on such tasks for some individuals but not for others. Similarly, for jobs or tasks that are not intrinsically motivating, rewards can enhance perceptions of self-determination and intrinsic motivation associated with greater creative performance. In another study, Friedman (2009) showed that the effect of rewards on creativity depends on how rewards are framed or presented. Specifically, the study found that individuals who were promised rewards that were framed as gains (i.e., if your creative responses are in the top half, you will receive a bonus of one experimental credit) had significantly higher creativity than did those promised rewards that were framed as non-gains (i.e., if your creative responses are among the bottom half in terms of creativity, you will not receive the bonus of one experimental credit).

A Meta-analytic Investigation

In 2012, Byron and Khazanchi conducted a meta-analytic investigation both to reconcile inconsistent findings and to examine the conditions that moderate the rewards–creativity relationship. Specifically, we meta-analyzed 60 experimental and non-experimental studies that had examined the rewards–creativity relationship. We proposed that the conflicting results in the existing literature might be caused by differences in the contextual conditions under which rewards are administered. To that end, we examined the potential moderating effects of contextual conditions, such as the reward contingency, the amount of performance feedback (i.e., aspects of the reward or context that provide performance feedback), the amount of choice offered or control imposed by the reward or context, the amount of engagement information offered (i.e., information likely to increase or decrease task engagement, such as labeling a task as "play" or as a "game"), and task complexity, on the rewards–creativity relationship.

We found that creativity-contingent—but not performance- or completion-contingent—rewards increased performance on creative tasks. Specifically, the effect of creativity-contingent rewards was further enhanced by positive and specific performance feedback and by choice provided by the reward and context. These findings provide support for LIT's basic assertion that rewards can be informational; when rewards are made explicitly contingent on creativity, they provided information that directed individuals' attention and cognitive effort to enhance their performance on creative tasks. Individuals use cues from rewards and their context to inform and enhance desirable dimensions of performance. When rewards provide useful information (e.g., by making them contingent) and confirm competence (e.g., though positive, specific feedback), they likely boost intrinsic motivation and create performance pressure to be creative. The results also provide support for one of SDT's contentions, namely, that choice is important because it enhances perceptions of self-determination and intrinsic motivation and, hence, creativity. Conversely, when the rewards or context impose control, individuals may experience lower intrinsic motivation and self-determination, as well as control over their cognitive effort, that can limit flexible thinking and the free exploration of ideas necessary for creativity.

Furthermore, in this meta-analysis, by integrating multiple theoretical perspectives, we attempted to explore multiple mediating mechanisms to understand the effect of rewards on creativity. Although we could not empirically test mediators, our results provide indirect support for at least four

mediating mechanisms: (1) criteria clarity; (2) positive affect; (3) perceived competence; and (4) negative affect. Specifically, we theoretically modeled these four mediating mechanisms to explain the influence of rewards on creativity and to account for mixed results. Thus, in addition to resolving the ongoing debate about the effect of rewards on creativity, the findings of our meta-analytical investigation extend the existing research by clarifying when and how rewards can increase or decrease creativity.

Future Research Directions

Based on our in-depth review of existing research and the findings of our meta-analysis, it is clear that future research must consider contextual conditions that modify the effect of rewards on creativity. In the following section, we discuss directions for future research on the rewards–creativity relationship in terms of type of reward, type of creativity, and creativity in teams.

Types of rewards. As mentioned earlier, informational and controlling aspects of rewards can coexist and are rendered salient by specific contextual conditions. Shalley and Perry-Smith (2001) found that when extrinsic factors such as expected evaluation were framed as informational (i.e., providing information to improve performance) rather than as controlling (i.e., setting standards of performance), they improved creativity. Therefore, the type of reward may determine its effect on creative performance because different types of rewards may be viewed as more informational or more controlling (Deci & Ryan, 1985; Shalley & Perry-Smith, 2001). Researchers examining the effect of rewards on performance have considered a number of different rewards, including money, other tangible rewards (e.g., prizes), and verbal rewards (e.g., praise or recognition), but have not systematically examined the differential effect of various types of rewards on creativity. This is an important omission because organizations employ a variety of rewards such as monetary bonuses and employee recognition to foster creativity, and we suspect that different types of rewards vary in terms of the extent to which they are likely to be perceived as informational and/or controlling.

For example, verbal rewards may be viewed as more informational than other types of rewards because verbal rewards can offer useful information about what is desirable. Furthermore, verbal rewards may be seen as less controlling because recognition and positive feedback may help individuals meet personal goals with which they identify, such as feeling worthy (Gagné & Deci, 2005). Because verbal rewards may be perceived as less controlling and more informational than other types of rewards, they may be more likely to increase creativity. Similarly, monetary rewards may have a more positive effect when they are accompanied by more information. For example, when a monetary reward accompanies specific forms of recognition (e.g., employee of the month, innovator of the year), the reward may affirm recipients' competence and self-identity. Conversely, other forms of tangible rewards (e.g., onetime bonus for winning patents) or intangible rewards (e.g., gaining a privilege) may be perceived as controlling because they do not provide any useful information and they focus recipients' attention on the acquisition of rewards (Deci & Ryan, 1985). Therefore, they may reduce the positive effect of rewards on creativity.

Although the results of our meta-analysis suggest that different types of rewards have differential effects on creativity, empirical research in work settings is relatively sparse. Most of the primary studies included in this meta-analysis were in non-work settings. Future research can benefit from examining the effects of specific types of rewards common to work settings (e.g., bonuses, verbal recognition, annual merit increases) on employee creativity. Moreover, our results suggest that consideration of the informational and controlling aspects of these different rewards is likely to be fruitful in explaining how they affect creativity.

Type of creativity. Radical creativity refers to creative greatness (e.g., scientific discovery worthy of a Nobel Prize), whereas incremental creativity refers to creativity in everyday life—problem solving in which individuals participate every day (e.g., rearranging a photo album or determining a new approach to solving a scheduling problem). Although both types of creativity are important (Kaufman & Beghetto, 2009), there are important differences between them. For instance, radical creativity is associated with big breakthroughs and, compared with incremental creativity, is more likely to result in entrepreneurial activity and new business ventures. Similarly, radical creativity involves complex tasks and innovating, whereas incremental creativity involves working on a simpler task and adapting (e.g., Kirton, 1994).

However, much of the research on the rewards–creativity relationship has focused on incremental creativity (e.g., Byron & Khazanchi, 2012), and research examining the effect of rewards

on radical or eminent creativity is largely lacking (e.g., Kaufman & Beghetto, 2009). Perhaps this is so because it is rather difficult to measure radical creativity. For instance, how will we measure creativity associated with big scientific breakthroughs such as developing the iPod or Post-It notes. Moreover, researchers have argued that studying creativity as a unitary concept is overly simplistic and that it is important to distinguish between the effects of rewards on these two types of creativity because they are associated with different motivational factors (Gilson, Kim, D'Innocenzo, & Moye, 2012). Therefore, it is important to examine whether rewards have a differential effect on radical and incremental creativity.

Existing theory and research offer inconsistent views on the effect of rewards on incremental versus radical creativity. Some researchers argue that both extrinsic and intrinsic motivation are needed for radical creativity and that rewards can dampen intrinsic motivation that is necessary for persistence on tasks that require incremental creativity (Kaufman & Beghetto, 2009). Although our meta-analytic results are not consistent with this conjecture, Kaufman and Beghetto (2009) provide an example of a child whose intrinsic interest and curiosity in insects might be dampened by extrinsic rewards of ice cream to learn about insects. Other researchers argue that rewards can increase creativity on tasks such as product modification or adaptation that require incremental creativity because such tasks are not intrinsically motivating (Gilson et al., 2012). That is, intrinsic motivation is critical for radical creativity because generating breakthroughs requires absorption in tasks that is characterized by individual exploration, spontaneity, and interest (Gilson et al., 2012). Therefore, rewards may have a positive effect on incremental creativity because it is likely that informational aspects may benefit incremental creativity more than radical creativity. However, rewards may have a neutral or negative effect on radical creativity because informational aspects may not benefit radical creativity, and controlling aspects of rewards may be particularly detrimental to tasks that require radical creativity (Gilson et al., 2012; Byron & Khazanchi, 2012).

Research on the moderating effect of task and job complexity provides some insights to support the view that rewards may benefit incremental but not radical creativity. For instance, Baer et al. (2003) found that job complexity significantly moderated the effect of contingent rewards on creativity; in the presence of rewards, individuals engaged in more complex jobs exhibited lower creativity than individuals engaged in simple jobs. Given that radical creativity typically involves complex tasks, these findings imply that rewards may not increase radical creativity but could benefit incremental creativity.

Although existing theory and research provide some initial insights into potential effects of rewards on radical versus incremental creativity, we lack systematic research examining how rewards may differentially affect everyday creativity in organizations (incremental creativity) versus radical creativity associated with entrepreneurial ventures. Therefore, future research should examine the effect of rewards on radical versus incremental creativity.

Creativity in teams. Organizations often rely on teams to generate creative ideas for new products, processes, and problem solutions—ideas that serve as a precursor to innovation and entrepreneurial activity. Therefore, organizations need to be concerned about increasing not only individual creativity but also creativity of teams. Unfortunately, rewards research has focused almost entirely on individual creativity; the effect of rewards on creativity of teams has been largely ignored.

Research has examined how other factors besides rewards affect team creativity. This research has primarily examined team creativity as a function of group processes, characteristics, and contextual moderators (De Dreu, Nijstad, Bechtoldt, & Bass, 2011). Specifically, there has been extensive research showing that team creativity is affected by group characteristics such as team composition and cohesiveness, as well as group dynamics and interactions (De Dreu et al., 2011; Shalley, Zhou, & Oldham, 2004; Taggar, 2002). For example, Taggar (2002) found that team creativity-relevant processes such as effective communication and conflict management improved group creativity, whereas "involving others" enhanced individual creative performance of group members. Future research should examine the effect of rewards on creativity-relevant group processes such as collaboration and team identification. For instance, rewards might affect the extent to which individuals collaborate to generate ideas and solve problems or the extent to which individuals experience commitment toward group versus individual creativity. Therefore, future research will benefit by examining how rewards influence creativity-relevant group processes and, hence, team creativity.

Moreover, future research on team creativity will benefit by examining the effect of rewards on other types of motivation besides extrinsic and intrinsic motivation to explain their effect on creativity (Cooper & Jayatilaka, 2006), such as prosocial and pro-self motivations (e.g., Bechtoldt, De Dreu, Nijstad, & Choi, 2010; Cooper & Jayatilaka, 2006; De Dreu et al., 2011). For example, Bechtoldt et al. (2010) found that group creativity may be enhanced when groups have higher epistemic motivation—the tendency to engage in thorough and accurate information processing—and adopt prosocial or other focused motivation (e.g., group reward) as opposed to pro-self motivation (e.g., individual reward).

Finally, future research will also benefit from examining the context or the manner in which rewards are administered. One such contextual condition that may be especially relevant in a team setting is the fairness of rewards. Specifically, research has shown that procedural fairness (or perceived fairness of organizational procedures) and interpersonal fairness (or the extent to which individuals perceive being treated with respect and dignity) may be instrumental in facilitating creativity-relevant individual- and group-level processes such as affective state, exchange relationships, and collaborative problem solving (e.g., George & Zhou, 2007; Khazanchi & Masterson, 2011; Li, Bingham, & Umphress, 2007). For example, in a study of 109 technology firms and 91 student-based project groups, Li et al. (2007) found that perceived procedural justice enhanced collaborative problem solving among project members, which in turn improved product performance. Similarly, Khazanchi and Masterson (2011) found that employees whose supervisor treated them with more honesty, respect, and integrity had higher-quality relationships with their supervisor and were more likely to be creative at work. Therefore, future research is likely to benefit from examining fairness as a contextual condition in understanding the effect of rewards on team creativity.

Relationship Between Rewards and Innovation

Whereas creativity involves the production of novel and useful ideas, innovation involves the implementation and execution of creative ideas (e.g., Amabile et al., 1996; Klein & Sorra, 1996; Van de Ven & Angle, 1989). By and large, most research that has examined the effects of rewards on the creative process has focused on the former and ignored the latter. That is, studies have considered how rewards influence the *production* of novel and useful ideas—and have failed to consider how rewards influence their *implementation* and *execution*.

This is a significant oversight, because implementing creative ideas is at least as important as producing them. Although creative ideas are necessary for innovation, they are not sufficient: creative ideas do not add value unless they are implemented. "Increasingly, organizational analysts identify implementation failure, not innovation failure, as the cause of many organizations' inability to achieve the intended benefits of the innovations they adopt" (Klein & Sorra, 1996, p. 1055). As such, organizations must determine how to motivate employees to both produce and implement creative ideas.

The results of only a few studies provide insight into the relationship between rewards and innovation. For example, in a study of R&D engineers, scientists, and technicians from a large industrial company, Scott and Bruce (1994) found that employees who perceived that innovation was rewarded (as part of a more general survey of the supportiveness of the climate for innovation) were more likely to be rated by their managers as engaging in innovative behavior at work.

Although a handful of additional studies claim to have examined the effects of rewards on organizational innovation, much is left unknown about the rewards–innovation relationship. There are several reasons for this knowledge gap. A primary reason is that studies that examine the rewards–innovation relationship often use the terms "creativity" and "innovation" interchangeably and therefore fail to measure and examine the effect of rewards on the implementation of ideas; this usage reflects broader definitional and measurement issues (e.g., Eisenberg, 2002; Eisenberger, Fasolo, & Davis-LaMastro, 1990; Zhou, Zhang, & Montoro-Sánchez, 2011). For example, in their study relating performance–reward expectancies to individual-level innovation, Eisenberger et al. (19990, Study 2) measured the usefulness of employees' suggestions to improve the company rather than measuring how well the company implemented those suggestions. As another example, in their study relating rewards to firm-level innovation, Goodale, Kuratko, Hornsby, and Covin (2011) measured top managers' perceptions of the importance of innovation to their

business unit rather than measuring how well they innovated.

Although empirical research is short on answers to the question of rewards' effect on innovation, theory provides some potential answers (e.g., Damanpour & Aravind, 2011; Klein & Sorra, 1996; Manso, 2011). Manso (2011) argued that organizational rewards intended to motivate innovation must acknowledge the tension between exploration and exploitation; that is, the fact that many novel, and thus untested, ideas may fail. As such, organizational rewards must motivate the discovery of creative ideas, tolerate failure, and reward long-term success. Klein and Sorra (1996) similarly argued that organizations must provide incentives for implementing innovation and also disincentives for avoiding innovation implementation to create a climate that is supportive of innovation.

It appears that this area of research is ripe for discovery. Researchers should look to theory relating reward to innovation and to research relating reward to creativity as a starting point. Future research should examine whether the reward conditions that tend to increase the production of creative ideas have similar effects on their implementation. For example, we found that rewards that are contingent on creative production tend to be associated with increased creative performance. It seems likely that rewards that are contingent on creative idea implementation would also be associated with increased idea implementation; rewards that are contingent solely on creative production may prompt idea generation at the expense of idea implementation. Similarly, research should examine how organizations can design a reward system that provides a suitable emphasis on each of these outcomes (i.e., idea generation and idea implementation) while acknowledging that the processes related to creativity and innovation may entail "failures."

Lastly, we should acknowledge that research examining the rewards–innovation relationship should be investigated at many levels. At the individual level, research should examine whether and how rewards may influence the extent to which employees work toward the implementation and execution of creative ideas. Individual-level research is important because it seems likely that individuals vary in the extent to which they are motivated by different rewards and have the skills necessary to implement creative ideas, among other individual-level differences. At the team level, research should examine whether and how rewards may influence the extent to which teams work together to implement their creative ideas. Group-level research seems important because teams such as teams of R&D scientists, quality circles, or product teams are often responsible for innovation in organizations. Lastly, at the firm level, research should examine how different organizational reward systems are associated with firm innovation. Firm-level research that considers a broad array of firms' human resource practices seems important because reward systems are likely to be more influential in the presence of other human resource practices that are supportive of innovation (e.g., Goodale et al., 2011; Hunter, Cushenbery, & Friedrich, 2012).

Relationship of Rewards to Entrepreneurship

Although the relevant literature lacks a common definition of entrepreneurship, scholars of entrepreneurship often define it as the creation of new businesses (e.g., Hitt, Ireland, Sirmon, & Trahms, 2011; Rumelt, 1987; Venkataraman, 1997). This definition is meant to cover a broad range of business activities that include the creation of a new firm, the creation of new markets, and the creation of new products or services (e.g., Eckhardt & Shane, 2003; Venkataraman, 1997).

Earlier we compared and contrasted innovation and creativity; here, we should also compare and contrast entrepreneurship and creativity (and innovation). As defined earlier, entrepreneurship overlaps with creativity in that both consider novelty an important defining characteristic. Entrepreneurship also overlaps with innovation in that both are concerned with the implementation of creative ideas. Creative and innovative behavior is believed to underlie entrepreneurship (e.g., Schuler, 1986). As articulated by Hitt et al., "Entrepreneurs create value by leveraging innovation to exploit new opportunities and to create new product-market domains" (Hitt et al., 2011, p. 59). However, entrepreneurship differs from both innovation and creativity in that entrepreneurship represents a more narrow application of creativity and innovation—that is, creativity and innovation applied to the creation of new ventures (e.g., Kuratko, Montagno, & Hornsby, 1990).

Whereas rewards' effect on creativity has been ensnared in controversy and has been a subject rife with debate, our review of the literature suggests that scholars in entrepreneurship are not ensnared in such a debate. Rather, entrepreneurship scholars have uniformly hypothesized that

rewards are likely to have unequivocally positive effects on corporate entrepreneurship. That is, the dominant view in the literature is that effective reward systems promote entrepreneurship. Incentives are believed to promote entrepreneurship by defining entrepreneurial outcomes as a desired goal, by providing feedback, and by motivating entrepreneurial activities (e.g., Hornsby, Kuratko, & Zahra, 2002; Kuratko, et al., 1990). (However, we should note that these views have, at best, weak support, as discussed later.)

More specifically, scholars have offered several recommendations regarding how to design reward systems to increase corporate entrepreneurship (e.g., Morris & Jones, 1993; Schmelter, Mauer, Börsch, & Brettel, 2010; Schuler, 1986). First, rewards should be made contingent on creative idea generation, cooperative behavior, and willingness to take risks (e.g., Morris & Jones, 1993; Schmelter et al., 2010; Schuler, 1986). Because entrepreneurial behaviors often entail risk, rewards should tolerate failure, emphasize persistence, and be focused on a long-term horizon (e.g., Block & Ornati, 1987; Kuratko et al., 1990; Schuler, 1986). Additionally, some scholars have emphasized the need for a mix of both financial and non-financial rewards because intrinsic motivation is considered to be important to corporate entrepreneurship (e.g., Hornsby, Kuratko, Shepherd, & Bott, 2009; Morris & Jones, 1993; Schmelter et al., 2010).

Although some studies have considered how rewards may be linked to entrepreneurship, we are able to draw few conclusions from these studies. First, there is a shortage of empirical work on this relationship. In discussing the relationships between human resource practices in general (and reward systems in particular) and entrepreneurship, Morris and Jones (1993) stated, "Unfortunately, little in the way of empirical evidence has been produced to confirm or falsify the proposed relationships" (p. 882). We found only a handful of studies that had examined these relationships (e.g., de Villiers-Scheepers, 2012; Morris & Jones, 1993; Schmelter et al., 2010).

Second, of the empirical studies that have considered rewards and entrepreneurship, most have relied on measures of entrepreneurship that seem likely to fail to measure actual entrepreneurial outcomes. For example, several studies have related reward systems to self-reported entrepreneurial orientation (e.g., de Villiers-Scheepers, 2012; Morris & Jones, 1993; Schmelter et al., 2010; Sykes, 1986), which seems likely to precede entrepreneurial outcomes and may not be reliably measured through self-reports. Even Block and Ornati (1987), who overcome the drawbacks of self-reported outcomes by categorizing corporate ventures as successes or failures, acknowledged the inadequacy of their data because it failed to consider the overall economic performance of the combined ventures.

Lastly, of the empirical studies that have considered rewards and entrepreneurship, most have relied on measures of reward systems that focus on the mere perceived availability of rewards rather than on whether the rewards are designed in a way that may promote entrepreneurship (e.g., de Villiers-Scheepers, 2012; Hornsby et al., 2009). For example, using a sample of 458 managers, Hornsby et al. (2009) found that managers' perceived reward availability was not significantly related to the number of ideas they implemented. However, the measure of reward availability does not specify entrepreneurial activities as a contingency (the rewards/reinforcement subscale of the Corporate Entrepreneurship Assessment Instrument). Sample items of this subscale include "The rewards I receive are dependent upon my work on the job" and "My manager would tell his *[sic]* boss if my work was outstanding" (Hornsby, Kuratko, & Zahra, 2002).

Although the dominant view in the literature is that effective reward systems promote entrepreneurship, the empirical results do not always mesh with this generally held view. Perhaps because of the issues cited previously, research has found mixed results. Some studies concluded that rewards are not related to entrepreneurship. For example, Block and Ornati (1987) concluded that performance incentives are nonessential, given that the availability of incentives for venture managers was not significantly related to the success (or failure) of their ventures. Similarly, Hornsby et al. (2009) found that reward availability is not significantly related to entrepreneurial activities. In contrast, other studies concluded that rewards are positively related to entrepreneurship. For example, in a study of 146 established firms in South Africa, de Villiers-Scheepers (2012) found that reward availability is positively related to firms' entrepreneurship intensity.

Based on this review of the research, we can make several recommendations to guide future research. First, because we were able to find few empirical studies that have investigated the rewards–entrepreneurship relationship, we recommend that future research be aimed at learning more about this relationship. Specifically, future

researchers should examine whether and how rewards may affect entrepreneurship (including corporate entrepreneurship). For example, it would be useful to determine whether and how anticipated rewards affect entrepreneurs' new venture creation.

Second, because we found that the few empirical studies that examined this relationship used outcome measures that may be inappropriate to this research question, we recommend that researchers employ outcome measures that allow more conclusive results. Some possible outcomes measures are measures of the entrepreneurial activities of entrepreneurs and employees within organizations or measures of outcomes related to these activities such as the performance of these ventures.

Lastly, because we found that the few empirical studies that examined the rewards–entrepreneurship relationship used reward measures that focused on their mere availability, we recommend that researchers employ measures of rewards that capture the complexity of reward systems that are theorized as crucial. More specifically, researchers should employ measures of reward systems that examine the extent to which rewards are contingent on entrepreneurial activities or outcomes, have a long-term horizon, and are accepting of risk-taking and failure.

Conclusion

In this chapter, we sought to review and consolidate existing research on the influence of rewards on creativity, innovation, and entrepreneurship—three interrelated fields that have progressed largely in parallel. Of these three relationships, we found that the rewards–creativity relationship has been most extensively researched and enjoys the greatest theoretical interest. In contrast, there is little research or theory regarding how rewards may influence innovation or entrepreneurship.

In terms of the rewards–creativity relationship, although there has been considerable debate over whether rewards increase or decrease creativity, we emphasize the importance of moving beyond the controversy to establish a common ground. Specifically, we explicated the conflicting assumptions about cognitive and motivational processes underlying the rewards–creativity relationship and focused on the informational or controlling and attention-eliciting aspects of rewards and context to make sense of conflicting predictions and findings. Recent research, including our meta-analytic investigation, points toward the need to identify contextual conditions and integrate multiple mediating mechanisms to develop a deeper understanding of when, how, and why rewards facilitate or hurt creativity. We end the discussion of the rewards–creativity relationship with recommendations for future research. We recommend that research on rewards–creativity can be beneficial by examining the moderating effects of type of reward and type of creativity.

In comparison to the literature on rewards and creativity, we found few studies that explored the effects of rewards on innovation and entrepreneurship. Moreover, the limited research on the effect of rewards on innovation and entrepreneurship is characterized by measurement and definitional problems that allow us to draw few conclusions. Specifically, in these studies, innovation is often not measured as the implementation of ideas, and entrepreneurship is not measured in terms of actual entrepreneurial outcomes such as performance of ventures and actual entrepreneurial activity. Future research can benefit greatly from examining the effect of rewards on innovation and entrepreneurship. More specifically, future research should aim to examine the effect of rewards that are made explicitly contingent on creative idea implementation and actual entrepreneurial outcomes.

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CHAPTER

4

Entrepreneurial Creativity: The Role of Learning Processes and Work Environment Supports

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Abstract

This chapter argues that the creative process is supported, at each stage, by certain learning behaviors and that both creative behaviors and learning behaviors depend on particular social-environmental conditions at each stage. Focusing on entrepreneurial creativity within startups and established organizations, the chapter describes four stages: problem identification; preparation; idea generation; idea evaluation and implementation. It explains how creativity-relevant and domain-relevant skills are distinct and how each skill set becomes more or less important depending on the uncertainty inherent in a given stage. The chapter also discusses the role of intrinsic motivation and the impact of various forces on the motivation for entrepreneurial creativity. With examples drawn from cases of entrepreneurial individuals and companies, links are made between creativity, learning, and the ways in which social-environmental factors influence the motivation for these behaviors differentially at different points in the creative process.

Key Words: creativity, creative process, entrepreneurship, innovation, startups, learning, learning behaviors, social-environmental conditions, motivation, intrinsic motivation

Introduction

Individuals are constantly seeking creative outlets. Hobbies—the activities we choose to engage in for fun—are often very creative activities. Even at work, organizations advertise innovation as a way to attract top talent. Why, then, is it important or even necessary to motivate creativity? Creativity—the generation of new, useful ideas—may be inherently rewarding, but it is also easily stifled and highly sensitive to social-environmental conditions (Amabile, Conti, Coon, Lazenby, & Herron, 1996). In this chapter, we argue that creativity is a staged process supported by learning behaviors. Both creative behaviors and learning behaviors differ somewhat across the stages of the creative process, and the optimal social environments for motivating them are stage dependent (Amabile, 1997; Nembhard & Edmondson, 2006).

As humans learn new skills, we assess our environment, process new information, develop solutions, and evaluate their use. Creative performance involves a similar process that is directed toward the production and evaluation of novel and useful ideas rather than skills. Entrepreneurial undertakings require rapid learning in service of nimble creativity in order to succeed in dynamic and complex business environments. In essence, entrepreneurial creativity is the development of novel and useful products, services, or business models in the establishment of a new venture (Amabile, 1997). The entrepreneurial creative process and its associated learning behaviors do not differ from those involved in other forms of creativity (for example, in science or the arts). However, in entrepreneurial ventures, implementation of the end product serves as a touchstone for each stage of the creative

process, providing guidance and correction as ideas are developed, tested, rejected, and finally come to fruition. Learning is heavily involved throughout. Therefore, by understanding the process of creativity through the lens of learning, entrepreneurs (and entrepreneurial managers in more established organizations) can make purposeful decisions about how to motivate employees and, most importantly, how to avoid extinguishing the creative spark.

Creativity depends on three internal components within the individual, and one external component, the social environment (Amabile, 1983, 1993, 1996). The internal components are domain-relevant skills, creativity-relevant processes, and task motivation. Although each component depends, to some extent, on innate or deeply ingrained talents and orientations, they can all be influenced by experience and by the immediate social environment. Each component is necessary, and none is sufficient for creative behavior; the higher the level of each component, the more creative the outcome.

Domain-relevant skills include talent in, knowledge about, and technical expertise for doing work in the domain or domains that are relevant to the problem or task at hand. Essentially, this component is the individual's set of cognitive pathways for solving a given problem or doing a given task. The larger the set, the more alternatives the individual has for producing a new combination. The ability to merge ideas or products into new designs is especially important for entrepreneurs. Many of the most successful new entrepreneurial ventures involve the combination of already existing products or technologies. For example, the explosion of popular apps for smartphones demonstrates the opportunity of combining an existing product (e.g., game, calendar, paperback book) with a new technology.

Creativity-relevant processes include personality processes (e.g., tolerance for ambiguity) and cognitive styles (e.g., a propensity for idea proliferation) that predispose the individual toward unusual approaches to problems, as well as work styles marked by high energy and perseverance on difficult problems. Because so many new ideas fail for reasons both within and outside the entrepreneur's control, both an abundance of ideas and the determination to persevere are critical skills to entrepreneurial creativity.

Task motivation can be either intrinsic or extrinsic (or, more, likely, some combination of the two). Intrinsic motivation is the drive to engage in a task because it is interesting, enjoyable, personally challenging, or satisfying in some way; this form of motivation is most conducive to creativity. Extrinsic motivation is the drive to engage in a task for some reason outside the task itself—for example, to gain a reward, win a competition, or earn a positive evaluation. Extrinsic motivation can undermine intrinsic motivation (e.g., Deci, Koestner, & Ryan, 1999), and thus creativity, if it is perceived by the individual as controlling or constraining. However, "synergistic extrinsic motivation," which is the use of externally derived incentives to enhance existing intrinsic motivation, can be a powerful tool (Amabile, 1993). For example, informational feedback that provides direction on how to make progress or improve performance can support intrinsic engagement in the task.

The fourth component, the external social environment (e.g., the work environment in an organization) influences each of the three internal components (Amabile, 1983, 1993, 1996). Domain-relevant skills can be influenced by supports for learning, including formal training and on-the-job opportunities for gaining new skills. Creativity-relevant processes can be influenced by training in idea-generation techniques and the development of thinking skills through observation of and collaboration with creative colleagues (Scott, Leritz, & Mumford, 2004). Studies of learning curves (Epple, Argote, & Devadas, 1991) show that the more we use skills, the more skilled we become. An environment that supports the process of creativity, rather than the outcome, allows people to practice and learn both from and for the creative process.

Recent research suggests that creativity-relevant processes can also be influenced by events in the work environment that cause positive or negative affect (Amabile, Barsade, Mueller, & Staw, 2005; Amabile & Mueller, 2008). Of all three components, however, task motivation is the most strongly and immediately influenced by the work environment. When the environment supports autonomy and exploration of challenging, meaningful work, intrinsic motivation increases. When the environment is constraining and the work is perceived as meaningless, intrinsic motivation decreases (Ryan & Deci, 2000).

The four creativity components all contribute to the outcome of any creative process an individual undertakes—whether that process is as minor as tweaking a company's logo or as major as starting a new venture. The creative process encompasses

stages which, although distinct, do not necessarily follow a straightforward sequence (Amabile, 1996). However, for simplicity's sake, the stylized sequence can be described as follows: (1) problem or opportunity identification; (2) preparation; (3) idea generation; and (4) idea evaluation and implementation (Amabile, 1983).

The initial stage of the creative process, problem identification, is accomplished by the difficult task of challenging assumptions (Amabile, 1996; Piaget, 1966). It is facilitated by cultivating the intrinsic motivation to take risks and explore the world—two behaviors that are particularly important for entrepreneurship. In Stage Two, preparation, knowledge, and resources are gathered from multiple sources; the purpose of this stage is to acquire relevant information before generating solutions to the problem (Amabile, 1996). Reinventing the wheel is not a useful exercise for entrepreneurs. In Stage Three, idea generation, the newly gathered information is combined with existing knowledge to generate new connections and create new solutions. However, not all of these new ideas will be valuable or acceptable. The fourth stage of the creative process is idea evaluation and implementation—the evaluation of ideas in terms of the optimal level of novelty and appropriateness to meet the initial goal (Amabile, 1996). In the arts, the appropriateness criterion is met when the work of art is expressive of intended meaning. In business, however, appropriateness equates to usefulness for customers. For entrepreneurs, it is especially important that the ideas be truly useful.

The three components of creativity—domain-relevant skills, creativity-relevant processes, and task motivation—have differential importance at the different stages of the creative process, depending on the level of new learning or novel cognitive processing required in the activity at that stage.

Domain-relevant skills play a prominent role at the second and fourth stages, where knowledge is acquired (Stage Two) or applied (Stage Four) in a relatively straightforward way. For example, for individuals in entrepreneurial ventures, knowledge about the domain and technical skills provide a way to assess the current business environment and evaluate the feasibility of newly generated ideas. Creativity-relevant processes are more prominent in the third stage. Developing novel ideas requires complex cognitive processing and breaking mental sets to view existing problems in new ways.

Of course, both domain skills and creativity skills are needed at all stages of the creative process, but they become more or less important depending on the level of uncertainty inherent in the stage. For example, knowledge of the domain space could reduce the time and effort exerted in the Stage One (problem identification). An entrepreneur who is familiar with the needs of customers and potential customers should be able to more easily identify unmet needs or avoid trying something that has already been shown not to work.

Finally, intrinsic motivation is most important in the first and third stages, when a drive to engage in unfettered exploration is most valuable. The componential theory of creativity emphasizes the importance of stage-appropriate motivation (Amabile, 1997): intrinsic motivation is more crucial at Stages One and Three, when the most novel thinking is required, but synergistic extrinsic motivation can be useful at the more algorithmic stages (Stages Two and Four).

In the remainder of this chapter, we integrate research on creativity, learning, and entrepreneurship to delve more deeply into each stage of the creative process. Using examples from successful and struggling entrepreneurial ventures, we explore the creative behaviors that are most needed at each stage, the learning behaviors that support creativity at each stage, and the environmental factors that are most conducive to the necessary motivational states. Throughout, we discuss implications for leading entrepreneurial ventures.

Stage One: Problem Identification

The first stage of the creative process is problem identification, which is directed toward making sense of the problem or opportunity at hand (Amabile, 1997). The goal of this stage is to construct the problem in a way that increases the chances of generating novel, workable solutions. In entrepreneurial settings, opportunities may seem obvious after the fact—although no one had seized them previously. For example, Nike founder Phil Knight, an avid middle-distance runner in school, had a coach who was obsessed with finding great shoes for his team (Wasserman & Anderson, 2010). Knight knew that he wanted to provide runners like himself with shoes that were comparable in quality to Adidas but much less expensive. Knight's domain-relevant knowledge made the opportunity in the market clear to him. His innovation lay in figuring out how to make that idea a reality.

Alternatively, an entrepreneur may spend intensive time and effort figuring out the problem that needs solving. Creativity-relevant processes, such as challenging assumptions and making novel connections, can help entrepreneurs discover new problems. Southwest Airlines challenged the assumption that consumers make air travel decisions based on service and amenities. Solving the problem—by lowering cost at the expense of amenities—was then a matter of execution.

Problems can also be "discovered" by reframing an existing situation. Reframing has the power to transform difficult problems into exciting opportunities (Dutton, 1992). Jeff Housenburg, CEO of Shutterfly, attributes his success to reframing Shutterfly's service model. The company transformed from a photo finishing service to a vehicle for publishing personal photo albums. The reframing lay in viewing the company as one that sells memories, not products. This new way of envisioning the use of an existing product enabled Shutterfly to develop creative solutions for a much wider, nonprofessional market base. In Stage One of the creative process, reframing presents an old or familiar problem as a newly discovered one.

Desired Behaviors for Problem/ Opportunity Identification

Whether the entrepreneur is discovering a new problem or reframing an existing one, certain behaviors help him or her to be effective during this stage of the creative process. These behaviors include thinking broadly; considering the passions, pain points, and nagging problems of oneself and others; scanning the environment widely (Perkins, 2001); staying alert to things that don't fit and needs that aren't met; amplifying weak information signals that others may miss (Ansoff, 1975); and abandoning safe, taken-for-granted assumptions (Argyris, 1976).

As an example, consider the entrepreneurial venture Sittercity, an online babysitter–parent matching service (Wasserman & Gordon, 2009). Sittercity was founded in Boston in 2001 by Genevieve Thiers, then a college student. By 2009, Sittercity had moved to Chicago, and its large, successful program in cities throughout the United States led to equity financing of $7.5 million. Throughout the growth of this company, Thiers engaged in many iterations through the creative process—each time, identifying a problem or opportunity, preparing to solve it, generating ideas, validating her chosen ideas by actually implementing them, and assessing results.

Thiers had a long history of babysitting—first for her six younger siblings, then for neighborhood children, and eventually for families who hired her during her college years. Moreover, she loved it; she had a passion for meeting new people, getting out of her own home, and eating food from someone else's kitchen. Her initial problem identification grew from paying attention to her own unmet needs and nagging problems. About to graduate from college, she said, "I didn't know what I was going to do with my life, but I wanted to do something big—not be a nine-to-five employee" (Wasserman & Gordon, 2009, p. 2). Thus, the initial problem was to create an unusual (entrepreneurial) career path for herself. This realization heightened Thiers' alertness to unconventional opportunities, led her to think broadly about her future, and amounted to abandoning the safe, taken-for-granted assumption that she would stay in a "regular" job—even as she accepted a full-time job at IBM after college.

Three days before college graduation in 2000, Thiers identified the specific opportunity that would lead to the founding of Sittercity. She did so by picking up on a weak signal that most other people would have completely missed. She was posting flyers for an upcoming musical event, and she found herself helping a very pregnant woman post flyers advertising for a mother's helper. In that moment, she saw the unmet need that countless parents have of finding a suitable babysitter, and she wondered if it would be possible to list all of the babysitters in the country in one place. To her, this could be the "big" undertaking she had been looking for. She worked on her business idea for many months, while also working full-time at IBM, and launched the Sittercity website in September 2001.

By March 2002, the number of parents and sitters registered on the site had begun to grow, and Thiers—still alert to weak signals and things that didn't fit—noticed that a few parents were not from Boston; they were from New York or Cleveland. Puzzled, she inquired, and discovered that they were commuters to Boston from those cities who had heard about Sittercity from their work colleagues and were hoping to find sitters in their hometowns. This identified another opportunity: expand Sittercity to new locations.

Learning Behaviors that Support Stage One

The goal of the first stage of creativity is to spot new problems and opportunities. This requires a difficult shift in the deeply rooted underlying

assumptions that drive the routine behaviors that make up most of our day. Learning these routines is often effortless; changing them is not. The difficulty arises, in part, because routines are extremely valuable. In their classic work on organizations, March and Simon (1958) provided a description of the power of routines for accomplishing the well-defined tasks that build organizational capacity. Routines increase efficiency by reducing uncertainty, variability, and the time it takes to make decisions. Once established, routinized behaviors, which March and Simon termed "programs," are launched by a particular stimulus that can occur in many different situations. It is the routine, not the situation, that guides behavior (Levitt & March, 1988). The nuances of the situation are suppressed in favor of the expectations of the routine (Nelson & Winter, 1982). Routines, whether examined at the organizational or the individual level, are sticky—so sticky that adult learning theorists have long argued that breaking routine thinking requires a triggering event (Dewey, 1938; Marsick & Watkins, 2001; Piaget, 1966).

This is particularly problematic for creative entrepreneurs because they must not only break their own routines but also convince investors and customers to try something new. Certain learning behaviors can help to activate routine-breaking triggers. Adopting an open systems view (Senge, 1990), seeking feedback (Edmondson, 1999a), and maintaining a learning mindset (Dweck, 2006) can all serve the creative behaviors of Stage One. An open systems view considers how all elements of a system interact, as well as the interactions among related systems. Seeking feedback means, among other things, looking for disconfirming information at the risk of proving favored ideas false. Similarly, a learning mindset is open to new possibilities and able to challenge existing assumptions. For our purposes, the key element is that individuals with a learning mindset are better able to extract learning from situations; they have "learned how to learn" in just about any setting (Feuerstein & Rand, 1974).

Developing an open systems view of a given domain supports the creative behavior of thinking broadly. In his seminal work on organizational learning, Senge (1990) reveals how prone even top executives are to viewing only their piece in a system of interacting dependencies. By seeking to understand how a given product or service relies on, and is relied upon, by consumers, suppliers, competitors, and industries, entrepreneurs may be able to identify the gaps that trigger great ideas and the problems that are not being addressed by the current business environment.

Confirming or disconfirming hunches can be facilitated by expanding the scope of feedback beyond one's own internal states and seeking help from others both within and outside the relevant domain. The active seeking of feedback is a necessary part of the learning process (Edmondson, 1999a) and can save valuable time by allowing the problem-solver to abandon infeasible ideas early (McGrath, 2001) or by triggering new connections that identify unmet needs. Internal feedback can alert us to the weak signals missed by others and give us a sense of what doesn't fit, while openness to external feedback helps us expand our thinking and develop a learning mindset.

A learning mindset is needed to engage in the creative behavior of scanning the environment widely. It raises one's perspective above the routines themselves to adjust embedded associations and reframe the situation (Kegan, 1982). This embracing of uncertainty, at the expense of the comfort of certainty, is a hallmark of human learning (Piaget, 1966). As demonstrated in the example of Southwest Airlines, entrepreneurial opportunities often arise because current products and services rest on specific assumptions about the customers that belie their actual needs and desires. Getting into the practice of surfacing, and challenging, underlying beliefs is a learning tool that enables entrepreneurs to define the ultimate goal of their creative process.

Work Environment Influences at Stage One

All work behavior is motivated either intrinsically or extrinsically, and usually both ways (Amabile, 1997). As we have noted, work motivation is strongly affected by the social environment. The social-environmental conditions that entrepreneurs seek for themselves and establish for their first employees can determine whether, and how, people in the entrepreneurial organization will be motivated to engage in the learning behaviors necessary at each stage of the creative process.

Intrinsic and extrinsic motivation are often considered opposite constructs, with extrinsic motivation undermining intrinsic. Indeed, decades of research in psychology, organizational behavior, and economics suggest that intrinsic motivation and complex performance (like creativity) diminish

when people are focused primarily on extrinsic goals, such as tangible rewards and deadlines, or extrinsic constraints, such as restrictions on how a task may be done (Deci & Ryan, 1980; Frey & Palacios-Huerta, 1997; Lepper & Greene, 1978; see Deci et al., 1999, for a review).

However, an accumulating body of research supports a much more nuanced view (Amabile, 1993, 1996; Amabile & Kramer, 2011). It is true that extrinsic forces that lead individuals to feel controlled generate nonsynergistic extrinsic motivation, which does undermine the intrinsic desire to tackle a problem for its own sake. But extrinsic forces that support individuals' ability to engage in problem solving or opportunity identification, such as rewards that provide resources or recognition that confirms competence, can create the synergistic extrinsic motivation that actually adds to intrinsic motivation. Whether this type of extrinsic motivation will support creativity depends on the stage of the creative process; this is the concept of stage-appropriate motivation mentioned earlier.

According to the componential theory of creativity (Amabile, 1983, 1996; Amabile & Mueller, 2008), a more purely intrinsically motivated state is conducive to Stage One, when problems to be solved and entrepreneurial opportunities to be pursued are being identified. Intrinsic motivation fosters the expansive thinking, wide exploration, breaking out of routines, and questioning of assumptions that this stage requires.

Ideally, the work environment at this stage will present individuals with puzzles, dilemmas, problems, and tasks that match their interests and passions, thus maximizing the probability that intrinsic motivation will remain high throughout the process (Csikszentmihalyi, 1990). For example, from a young age, Phil Knight was passionate about running and gear that optimized the running experience; he sought out environments in which he could explore this domain. Whatever the domain, the environment should allow a high degree of autonomy (Gagne & Deci, 2005), whereby the person feels free to follow new pathways and need not fear breaking out of established routines—whether formalized or implicit. There should also be an optimal level of challenge, in which work demands are neither well below nor well above the person's current skills (Csikszentmihalyi, 1997); it is at optimal levels of challenge that learning is most likely to occur (Bandura, 1993). Ideally, the task or problem will have sufficient structure so that the person can engage with it productively but not so much structure that there is little room for anything surprising.

Within an existing organization, leaders at the highest level can engender the proper environment for Stage One by voicing support for entrepreneurial, creative, innovative behavior and then showing that support through actions that reward and recognize good new ideas—even when those ideas ultimately fail (McGrath, 2001). In fact, one of the most effective means for triggering the learning described in the previous section is to laud the value of good-effort failures that naturally arise whenever people try radically new ideas. Leaders at all levels in an organization, down to immediate supervisors, should talk about the importance of creativity—and then walk the talk.

Lower-level leaders can play a particularly important role at Stage One by matching people to projects on the basis of not only their skills and experience but also their interests (Amabile et al., 1996). Moreover, supervisors can greatly increase the probability that people will engage effectively with new problems to solve (and find hidden opportunities) if they put two structural supports in place. First, providing clear strategic direction toward meaningful goals lends purpose to the work (Latham & Yukl, 1975); coupling that strategic direction with operational autonomy allows flexible exploration (Ryan & Deci, 2000). Second, in forming teams to collaborate on a creative task, leaders should ensure a substantial degree of diversity in perspectives and disciplinary backgrounds among the members and then provide the teams with support for communicating effectively across their differences (Mannix & Neale, 2005). With these structural conditions in place, people are more likely to question their taken-for-granted assumptions in deciding how to tackle the task before them.

Conversely, managers undermine intrinsic motivation and creativity if they establish a work environment that is marked by an emphasis on the status quo and on extrinsic motivators such as unrealistic deadlines (Amabile, DeJong, & Lepper, 1976) and rewards that are dangled like carrots to induce employees to perform. And, although competition with other organizations can fuel intrinsic motivation by lending additional meaning to the work, win-lose competition within the organization can sap intrinsic motivation (Deci, Betley, Kahle, Abrams, & Porac, 1981). Finally, rigid status structures in the organization can lead employees to consciously or unconsciously believe that certain

assumptions may not be questioned and certain problem domains are off-limits to them (Detert & Edmondson, 2011).

Startup entrepreneurs have the advantage and challenge of establishing their own work environment. As such, they should be conscious that they are developing long-term practices for the fellow members of their founding team and their earliest employees. Generally, the first employees are intrinsically motivated because there is little pecuniary reward at the outset. Even in the earliest days of a firm, founders can model and encourage the sort of freewheeling exploration and questioning of assumptions that characterize Stage One. They can look for partners and initial employees who are also passionate about the undertaking, and they can focus everyone's competitive instincts on external entities rather than internal colleagues.

Stage Two: Preparation

Preparation in this context is the acquisition of knowledge within a relevant domain. It is accomplished by gathering information and resources to understand what has and has not been done to address the defined problem. Gaining a deep understanding of the problem space allows entrepreneurs to seize opportunities as well as sharpen the creative goal. Nike founder Phil Knight's travels through Japan, including many visits to sporting goods stores, allowed him to identify a Japanese company and brand that could help bring his idea to fruition. Although he still had not actually established his own company before he traveled, his growing understanding of the culture enabled him to make a favorable deal with his targeted Japanese manufacturer based on a cold call.

For individuals who have a deep familiarity with the problem space, this stage can be a trivial one. An important exception to consider is that such individuals may face a different sort of challenge in the preparation stage: unlearning some of their familiar cognitive pathways and re-examining their assumptions. Experts who engage in creative endeavors can be stifled by the deeply ingrained mental representations they hold (Runco, 1994), which may lead them to think they already know the answer.

Desired Behaviors for Preparation

The behaviors that can be most conducive to the preparation stage are, in some ways, distinct from the desired behaviors for problem/opportunity identification. They include perseverance (Dweck, 1986), searching for and incorporating a wide range of information, and discarding preconceived notions as warranted by new information (Piaget, 1966).

In her many iterations through the creative process to build Sittercity, Genevieve Thiers engaged in a range of preparation behaviors. Although she could not have known it at the time, her years of babysitting, including the junior year abroad at Oxford University, when she elected to be both a student and a nanny, served as excellent preparation. The wide range of information she gained about parents and their constraints, needs, and concerns served her well as she founded her company. This knowledge formed the broad foundation of domain-relevant skills that Thiers could immediately call to mind and upon which she built as she worked intensely on her startup.

Excited about her initial opportunity identification just before college graduation, Thiers did an Internet search to see if anyone was already offering such a service. Although she found websites for Babysitters.com and Sitters.com, neither was an operating business. In the summer of 2000, after Thiers had graduated from college and started her job at IBM, she spent her free time writing a business plan for Sittercity. She searched for relevant information during this phase, drawing on resources at the Boston office of the US Small Business Administration (SBA), and incorporated that information into her approach to preparing the business plan. By the fall of 2000, after Thiers had participated in three meetings with potential investors arranged by the SBA, she discarded her preconceived notion that external funding was the route to starting this business. She persevered, searching for other ways to fund Sittercity.

As new problems and opportunities arose, Thiers repeatedly dove into information gathering. As described earlier, when she noticed the puzzling fact that a few parents from outside of Boston were signing up for her service, which was then available only in Boston, she spent time talking with them to discover their underlying motivations. Later, when Sittercity's major competitor, Babysitters.com, launched its site, she diligently monitored that site, as well as others that later appeared, to keep herself prepared to deal with competition.

An important resource on which Thiers drew in preparing to grow her business was her boyfriend, Dan Ratner, whom she met a few months after launching Sittercity. Ratner, although only a few

years older than Thiers, had already been involved in more than one startup. His entrepreneurship experience, as well as his technical expertise, served as broad and deep sources of information and assistance for Thiers in the ensuing years. Eventually, in 2005, Ratner joined Sittercity as vice president. Thiers was CEO.

Learning Behaviors That Support Stage Two

The second stage of creativity can be viewed as adopting or calling up the routines of the domain; as such, it is subject to all the advantages and drawbacks of human minds as incredible learning machines. For experts, the second stage of creativity can be a trap when the routines of the domain become mental ruts (Levitt & March, 1988). On the other hand, knowing a subject matter can free up cognitive resources to engage with it in multiple ways. This freedom is not typically available to novices during the learning process (Bransford, Vye, Stevens, Kuhl, Schwartz, Bell, & Meltzoff, 2005). One of the great paradoxes of creativity is that expertise can be both a great source of and a substantial barrier to creative thinking. What makes the difference is whether the expert retains a learning mindset and continues to learn from the situations she encounters (Feuerstein & Rand, 1974).

Novices face different challenges at Stage Two. The learning process is generally a social one, situated in a specific context (Vygotsky & Cole, 1978). Studies on how novices become full participants in a community of practice have demonstrated that learning best occurs when individuals engage in the co-construction of knowledge in that community (Lave & Wenger, 1991). As demonstrated in the partnership of Thiers and Ratner to build Sittercity, working with practiced professionals can help novices process vast amounts of new information in meaningful ways.

In the first stage of creativity, there is possible discomfort from surfacing deeply held beliefs and challenging the assumptions embedded within routines. In Stage Two, there can also be discomfort in the effort it takes to learn something new. For adults, context is particularly important in enhancing the intrinsic motivation needed to stay actively engaged in the often arduous learning process. For example, informal learning through problem solving (Marsick & Yates, 2012) acquired in the "midst of action" is specific to the task at hand (Raelin, 1997). This action learning is potent because it addresses challenges of transfer, which are common when employees attend external trainings and then struggle to apply what they've learned back in their job context. Action learning means paying particular attention to learning while actually doing one's work.

In her seminal work on achievement-oriented behavior, Dweck (1986) observed that children who focused on learning something new had better outcomes and were more resilient to failure than those who focused on demonstrating what they already knew. Learning-oriented children had an implicit theory that they had the ability to increase their intelligence through effort. In contrast, performance-oriented children felt that intelligence was fixed, so they focused their efforts on demonstrating what they already knew. A learning orientation enables children to be resilient to the failure inherent in the learning process. It also means they are more likely to take on challenges and seek feedback because these activities are less threatening to them. Learning orientation is related to the learning mindset discussed earlier in that both connote an openness to exploring new possibilities. However, they are distinct constructs. A learning mindset is developed over time and describes the ability of individuals to find the lesson in any situation—learning is a natural process of how they interact with the world. A learning-oriented individual associates effort with intelligence and will therefore approach difficulties and challenges with the belief that they can be overcome. They will learn if the situation requires it, but they will not necessarily reframe situations as learning opportunities on a consistent basis.

Dweck's (1986) work has been extended to organizations, with dozens of studies consistently demonstrating that a learning orientation is positively associated with better learning and performance outcomes (Payne, Youngcourt, & Beaubien, 2007). Organizational culture can help individuals develop a learning-oriented or growth mindset by embracing risk-taking in learning new skills, emphasizing challenge and development over success, and giving preference to deep learning over fast learning (Murphy & Dweck, 2010).

Work Environment Influences at Stage Two

Synergistic extrinsic motivation, which uses externally derived incentives to enhance existing intrinsic motivation, can be particularly useful at Stage Two, because thorough preparation for idea generation can be a tedious affair. Particularly for people who are novices in a domain, the learning

required is often vast and the time commitment is often high—meaning that intrinsic motivation alone may be insufficient to fuel behavior (Amabile, 1997).

The motivation for learning is more likely to be maintained if people perceive a sense of progress (Amabile & Kramer, 2011). And progress in gathering and assimilating information is more likely if the work environment has a sufficient level of two kinds of resources: relevant information and people who are both willing and able to share their tacit knowledge about the problem domain (Frey & Osterloh, 2000). In established organizations, managers can ensure the availability of these resources by supporting the establishment of accessible, useful information management systems; by finding new ways for employees to access new sources of information; and by structuring the organization to facilitate smooth coordination and cooperation among individuals and groups. Moreover, tacit knowledge available to problem-solvers within an organization grows dramatically when employees with diverse sets of skills, backgrounds, and experiences are brought on board (Woolley, Gerbasi, Chabris, Kosslyn, & Hackman, 2008).

Startup entrepreneurs can support their own progress in gaining knowledge by building and accessing wide social networks of individuals with potentially relevant, yet diverse, perspectives. Analysis of social networks shows the power of cultivating and maintaining connections in peripheral, but related, domains (Granovetter, 1973). These "weak ties" provide ways of linking previously disconnected groups and filling in structural holes at the nexus of potential for the innovative recombination of ideas (Burt, 1995). Often, the information-rich individuals are venture capitalists or other investors. Sometimes, they are other entrepreneurs—as in the innovation hotbed known as Silicon Valley (where venture capitalists and angel investors also abound). Not only can new opportunities be identified (Stage One) through even casual conversations in such settings, but much useful—and unique—information can be learned.

Managers can foster the synergistic extrinsic motivation needed in Stage Two with occasional rewards and recognition that confirm individuals' competence as they struggle to learn (Bandura, 1993). A sense of progress once again comes into play. Self-efficacy increases as individuals experience progress towards goals, even when the goals are externally set, as is often the case in learning situations. The progress is a signal of improvement, which furthers motivation (Elliott & Dweck, 1988).

Ideally, managers will also support intrinsic motivation by enabling people to pursue new areas that have piqued their curiosity (Lepper & Henderlong, 2000). For example, some organizations—most famously, 3M and Google—give some of their employees the gift of time by allowing them to spend approximately one day per week working on any project they wish. These self-motivated pursuits can involve extensive exploration into new domains of knowledge that can, ultimately, serve as superb preparation for generating new and valuable ideas. Google Scholar is one of many products that resulted from initial "free time" work.

Work environment elements to avoid include an atmosphere of threatening critical evaluation connoting incompetence (Dutton, 1992) and constrained communication in the work group or across the organization (Detert & Edmondson, 2011). To be sure, these elements can be damaging at any stage of the creative process. But they can be particularly harmful when people are venturing into arenas where they have much to learn and must adopt a vulnerable dependence on others with greater expertise.

Stage Three: Idea Generation

Idea generation, the third stage of the creative process, is the one that most commonly comes to mind when people think of creativity. The goal of Stage Three is to produce high-quantity and high-quality ideas. Generating a large number of new ways to combine existing concepts increases the probability of finding one that works (Simonton, 1999). Creativity-relevant processes are the most used, and the most useful, creativity component at this stage (Amabile, 1988). They depend on the interaction of flexible cognitive processes (including deliberate techniques for creative thinking), energetic work styles, and nonconforming personality traits.

Brainstorming (Osborn, 1953) and breakthrough thinking (Perkins, 2001) are two of the many techniques that have been devised to facilitate the flexible cognitive processes required by this stage. The goal of brainstorming is to unleash as many ideas as possible. It requires that all ideas receive at least initial exploration, with brainstorming groups ideally designed to reduce concerns about criticism by the self or by others. Research has shown that the quality of ideas produced

during brainstorming can be increased if individuals develop the ideas alone, then openly discuss all of them in a group session (Diehl & Stroebe, 1987). Breakthrough thinking involves seeking and embracing different ways of looking at the problem and turning the difficult aspects of the problem to one's advantage. For example, a company with slow elevators installed mirrors in the lobby so that the previously painful wait time became an advantage to riders, who want to "spruce up" on their way to their appointments (Byrnes, 2005).

Desired Behaviors for Idea Generation

The most prominent behaviors involved in successful idea generation can be described as various forms of mental gymnastics—taking unusual leaps in perceiving the world and combining cognitions in new ways (Cropley, 1967; Getzels & Csikszentmihalyi, 1967). These behaviors include seeing multiple perspectives, exploring new cognitive connections, embracing complexity, tolerating ambiguity, and proliferating ideas.

After her initial opportunity identification and preparation, Genevieve Thiers entered the idea-generation phase by first coming up with a name for her business. Considering the essentials of what she wanted to do (i.e., helping parents in her city find a sitter), she considered various verbal connections and hit upon the new linguistic combination, "Sittercity." As Thiers developed her business concept, she considered a number of different ideas for how to set up the Sittercity service. She knew that there were existing agencies to help parents find just the right babysitter, but those were expensive and time-consuming. She began focusing on how to provide such a service more cheaply and efficiently, but still with high quality. It was clear from her personal experience in this domain that parents were much more likely to hire a sitter who was a college student; therefore, she knew that she would require all sitters registered on her site to be currently enrolled college students. It was also clear to her that, even when an agency was involved, parents would want to interview potential sitters. When expanding her Sittercity business into new geographical areas, Thiers generated ideas for many different ways to entice parents to join. She offered movie tickets for referrals, interacted with local mothers' groups, went on talk shows, and offered "SpeedSitting" events to remove the barrier of unfamiliarity with a new sitter.

Throughout the development of her business, Thiers generated a broad range of ideas by considering her complex multiple goals and, perhaps most importantly, by keeping the perspective of parents and the perspective of her business needs in mind simultaneously.

Learning Behaviors That Support Stage Three

Because the creative goal has been defined, Stage Three is a more targeted version of the activities that occurred at Stage One; like that earlier stage, it requires challenging assumptions and breaking out of cognitive routines. Theories of transformational learning (Mezirow, 1990) lend insight into learning behaviors that reinforce the creative behaviors of seeing multiple perspectives, exploring new connections, and embracing complexity. Transformational learning is distinct from technical learning—the acquisition of knowledge and skills described in Stage Two. Technical learning, although potentially challenging and fruitful, occurs in known spaces in answer to technical problems. In contrast, transformational learning, the highest level of learning (Bateson, 2002), occurs in response to adaptive challenges—the difficult, frustrating problems that arise from unpredictable breaks in routine. Globalization provides many examples of these dilemmas as leaders struggle to understand, manage, and inspire people from different cultures, with different values, needs, and priorities (Molinsky, 2013). Transformational learning in creative endeavors means seeking information that is not only new to the problem-solver but novel in the given setting. Adapting ideas from a different domain is a key source of creative concepts, particularly for entrepreneurial ventures. Certainly, neither the Internet nor babysitting were new when Thiers developed Sittercity. The creative act lay in using the power of one to serve an unmet need in the other.

Although Thiers worked alone at that point, this sort of recombination can be served by engaging multiple actors from different disciplines to work together toward a common goal. For example, in a study of medical teams in Helenski, Engestrom (1999) described how personnel from different sites, with different levels of experience and authority, were able to cross boundaries to redesign the children's healthcare model. Individuals had to transform how they interacted across both horizontal and vertical boundaries to gain multiple perspectives, make new connections, and embrace the complexity of understanding the experience of care for children within their system.

Work Environment Influences at Stage Three

Stage Three, idea generation, involves divergent thinking to produce a large number and wide variety of candidate ideas. Intrinsic motivation is particularly important at this stage, and extrinsic motivation can be particularly detrimental, because the individual problem-solver must become deeply engaged in the problem itself, exploring the possibilities that arise from new combinations of the knowledge elements garnered in Stage Two.

That sort of deep engagement, sometimes experienced as "flow" (Csikszentmihalyi, 1990), is more likely when people have work that is optimally challenging—neither so difficult that it is completely beyond their capabilities nor so easy that they are bored. The implication is that managers must allow for sufficient preparation in Stage Two (or assign creative problem-solving projects to individuals with the optimal level of existing skills) so that the individual is able to generate truly novel ideas that are at least potentially useful.

One of the most supportive things that managers can do at this stage is, essentially, to leave people alone. Autonomy, a sense of control over one's own work and one's own ideas, is central to the divergent-thinking mindset. Research on the exploratory phases of innovation processes has shown that autonomy in both goals and supervision can lead to better team outcomes (McGrath, 2001). In some cases, this can require physically separate spaces for work. For example, Steve Jobs famously secluded his group at Apple as it was creating the first Macintosh; he even flew a pirate flag over the building, as a symbol of the group's difference from the rest of the organization.

This type of autonomy allows for creative people to feel like originators of their work (De Charms, 1968), a belief that may be particularly important for individuals who are drawn to entrepreneurship. Unlike more traditional organizations, entrepreneurial ventures involve high levels of risk, but they often afford more freedom to explore and experiment. Ideally, these opportunities will be explicitly valued by entrepreneurial leaders. They can accomplish this by clearly signaling that calculated risks are encouraged, even though failure will often result. Entrepreneurial leaders can also seek out the "small wins" (Amabile & Kramer, 2011) that are inherent in creative ideas by actively recognizing elements of ideas that could be applied to the end product, even if the idea as a whole must be abandoned; this orientation toward learning from failure is crucial.

While allowing autonomy, leaders at all levels should be sufficiently involved to encourage the generation of a range of new ideas, from the incremental to the radical. Moreover, in contemporary business, most problems and opportunities are sufficiently complex that few of them can be solved or pursued by lone individuals—whether entrepreneurs or inventors within established firms. Ideally, the collective intelligence (Woolley, Chabris, Pentland, Hashmi, & Malone, 2010) of committed individuals with deep, diverse expertise will have been leveraged to come up with ideas to the identified problem. Working autonomously does not necessarily mean working alone.

To keep the engine of new ideas cranking long enough for really good ones to emerge, there must be an atmosphere of openness inside the organization, whether it is a three-person startup or a 50,000-person conglomerate. The need for openness in innovation has even redefined the boundaries of what it means to be a firm. Many organizations now draw on external expertise and knowledge to supplement existing research and development efforts (Chesbrough, 2006; Lakhani & Panetta, 2007). There should be mechanisms for considering new ideas by which leaders and colleagues welcome new solutions and hear out new ideas. The work environment should be such that, although not every idea can be accepted, every idea will be respected enough to receive a fair hearing (Edmondson, 1999a).

To best facilitate Stage Three work, managers should keep the emphasis on intrinsic motivation and, to the extent possible, avoid extrinsic motivators. As damaging as an environment of harshly critical evaluation can be at Stage Two when people are trying to learn new knowledge and skills, it can be even more harmful at Stage Three when people are trying to "be creative" in the purest sense of the word. Similarly, competition with coworkers who could have valuable information or useful perspectives can undermine intrinsic motivation (Deci et al., 1981); moreover, it can cut off access to important stimuli for idea generation. Time pressure can operate in this fashion, too. When people are placed under deadlines for solving complex problems, they will feel controlled, and their intrinsic motivation will be undermined (Gardner, 2012)—especially if they don't understand and accept the urgency of the problem. At a practical level, unrealistic deadlines don't allow people the time to come up with many ideas (Amabile et al., 1976).

Finally, Stage Three thinking is particularly vulnerable to bureaucratic red tape and rigid routines—which can crop up quickly even in relatively young companies. Ideally, the work environment will afford people easy access to materials, colleagues, and information that could be helpful in stimulating divergent thought processes (Amabile, 1996). For example, at the renowned design firm IDEO, people expect that they may be called on to participate in brainstorming sessions for projects that are well outside their usual areas of expertise, in the hope that they may stimulate the process through their "outsider" perspectives (Hargadon & Sutton, 1997). Indeed, anyone in the firm feels free to ask anyone else to participate, and it is considered an honor to be asked.

Stage Four: Idea Evaluation and Implementation

The fourth stage of entrepreneurial creativity includes two related but distinct elements—idea evaluation and initial idea implementation. (Full implementation of an idea is, strictly speaking, innovation, not creativity [Amabile, 1988].) Consideration of idea implementation drives the efforts of idea evaluation. The goal is to determine which of the newly-generated ideas is optimally novel and useful for implementation in the current business environment. Often, evaluation of ideas leads to the realization that the most novel idea is not the best fit for the current market situation, competitive situation, or level of resources available. Successful entrepreneurs have often adopted a "fast failure" approach, which gives quick and objective feedback to allow the entrepreneur to quickly evaluate many ideas. It is based on a rapid prototyping model that involves investment in trial and error. Many ideas are tested on a small scale before fully committing resources (McGrath, 2001).

Stage Four is the stage at which ideas become reality, or not. Perhaps more prominently than any other, the fourth stage of entrepreneurial creativity is often marked by a return to earlier stages and trying again, with new understanding and sharpened criteria. The problem-solver could reconsider ideas from Stage Three that were not pursued, generate new ideas, back up to gather additional information, or even return to the beginning and re-conceptualize the problem or opportunity.

Interestingly, the evaluation of an idea's novelty is usually quite straightforward. As long as the problem-solver prepared adequately enough, it is fairly easy to determine how different the idea is from what has been done before. It is the usefulness aspect of creative ideas that can present a greater analytical and practical challenge. No matter how new and potentially useful it might be, if a creative idea cannot be implemented within the current environment, it is simply not useful. This is evident in ideas that are "ahead of their time," such as Leonardo DaVinci's helicopter[1] or Charles Babbage's 1837 analytical machine[2]. Both were amazingly well thought-out, novel ideas, but the technology, materials, and manufacturing processes were simply not available to bring the ideas to fruition—that is, to render them useful.

Even when the infrastructure exists to support a novel idea, it may not become reality because the organization, the industry, or the world may not be prepared to change to the degree required to adopt the new idea. The delay in the standardized use of seatbelts (first invented in 1885, implemented widely in the 1960s), and the lack of adoption of the metric system in the United States are examples of useful ideas that stalled because people were unwilling to change their habits. As these examples show, it is often difficult to determine a priori whether an idea will be within a given environment.

Desired Behaviors for Evaluation and Implementation

The demands of the fourth stage of entrepreneurial creativity require, again, a somewhat different set of behaviors from those required at earlier stages: realistically analyzing the potential of the various ideas, unbiased by passion for them; communicating the chosen idea clearly; non-defensively gathering feedback on the idea's potential; and implementing the idea with a balance of speed and attention to crucial details (Amabile, 1996; Dyer, Gregersen, & Christensen, 2011).

Encouraged by her SBA advisors in the summer of 2000, Genevieve Thiers fearlessly presented her business idea to potential investors. Unfortunately, in her own words, she got "laughed out of the room" (Wasserman & Gordon, 2009, p. 3). These investors saw the idea as little more than a babysitter's club, not a serious business endeavor. However, rather than abandon the original idea, Thiers analyzed their reactions and realized that, as older men with grown children, they actually had less expertise in this particular marketplace than she did.

The feedback from these investors did, however, lead Thiers to non-defensively realize that she had to figure out how to get the service up and running

without relying on investors. This led her to re-enter the creative process at the idea-generation stage. Choosing from the ideas thus generated, she recruited sitters by putting up posters in local colleges and holding recruiting events—including one at an all-female college that attracted 150 students. She held focus groups with parents to figure out their willingness to pay and, with Ratner, developed a streamlined payment transfer process.

Thiers worked tirelessly to implement her ideas quickly and assess their success as soon as possible. Ratner remarked that "she has limitless energy and a total lack of fear" (Wasserman & Gordon, 2009, p. 7). Nonetheless, Thiers also paid careful attention to details. She monitored competitors' websites and adjusted her strategy as the competitive signals became clearer. For example, she realized how crucial it was to have information on her website about safety, parents' primary concern when hiring sitters.

Because she had developed a system for carefully tracking Sittercity's membership rates daily, Thiers got immediate feedback on the success of the ideas she implemented, enabling her to discard failed ones and quickly try something new. Moreover, when she got unexpectedly positive feedback—such as learning that media reporters, many of whom were mothers, loved her company—she moved quickly to build on the new opportunity. This led Thiers to send press releases to a wide range of media and to enthusiastically respond to requests for interviews.

Thiers's fast failure approach of repeated iterations through problem/opportunity identification, preparation, idea generation, and evaluation/implementation allowed her to steadily and successfully grow Sittercity. In 2004, *Time* magazine named Sittercity one of the year's "50 Coolest Websites." In 2005, Sittercity received a $500,000 investment on favorable terms. By 2006, the company had grown to include over 100,000 sitters and 11,000 registered parents. By 2013, the company had a presence in more than 25 major cities in the United States and had expanded to include pet care, senior care, housekeepers, and tutoring services.

Learning Behaviors That Support Stage Four

The fourth stage of creativity is a culmination of the learning and creative efforts of the earlier stages. The more creatively the problem space was framed, the more expertise that was developed, and the more ideas that were generated, the better the chances of success at the evaluation/implementation stage. The learning behaviors at this final stage are more directed versions of those described in earlier stages. In particular, idea evaluation relies heavily on seeking, listening to, and applying feedback.

Not all feedback is equally useful. In a meta-analysis of external feedback in learning situations, Kluger and DeNisi (1998) found that feedback is more effective when it builds on previous iterations and provides correct information about the current trial (Hattie & Timperley, 2007). Feedback on iterations can make a highly complex and challenging task more manageable because it scaffolds the learning process as that process moves along (Eisenhardt & Tabrizi, 1995). It directs the process toward specific, challenging goals (Latham & Yukl, 1975) without overwhelming individuals who are in the midst of learning how to better judge the value of each iteration. Even when these criteria are met, seeking feedback from others can often be difficult because individuals do not want to appear ignorant or admit to making mistakes (Argyris, 1976; Edmondson, 1999a). However, feedback from experimentation—that is, concrete feedback from the work itself—provides an objective source of learning for the problem-solver that can be easier to accept and discuss.

At times, even concrete feedback is ignored. Because of the effort and success experienced to even get to Stage Four, individuals are prone to cling to ideas that simply don't work. The effects of this escalation of commitment are well documented (Brockner, 1992; Sleesman, Conlon, McNamara, & Miles, 2012; Staw & Ross, 1989) in that, once time and resources ("sunk costs") have been dedicated to a given course of action, individuals are vulnerable to "throwing good money after bad" (Staw, 1981). The result can be an irrational commitment of even more resources, rather than "cutting one's losses" (Arkes & Blumer, 1985). The temptation to maintain a course of action is strong, even in the face of clear evidence that it is a bad idea.

For these reasons, it is crucial for problem-solvers, including entrepreneurs, to respond non-defensively to feedback from informed others. Critical reflection on "the basic premises that underlie thinking" (Mezirow, 1990) has been shown to facilitate learning from feedback (Argyris, 1976; Senge, 1990). Learning is described as a cycle of action and reflection (Argyris, 1976; Edmondson, 1999b), and entrepreneurial ventures, in particular, are action-oriented. The time and space for reflection can seem like time away from 'real work,' but it is

important to take that time. O'Neil and Marsick (1994) described how, by embedding pauses for reflection within action, managers can gain insights into the problems and situations at hand, as well as their own learning patterns. This type of insight is needed at all stages of creativity, but with the high stakes involved in this final stage, it is especially important and useful here.

Work Environment Influences at Stage Four

As facilitative as passionate intrinsic motivation for the ideas can be at Stage Three, it can become something of a handicap at Stage Four. Here, individuals who came up with ideas need to dispassionately evaluate them with a critical eye, choose the most promising from among them, and champion that idea by communicating clearly and effectively with others in the organization (Battilana & Casciaro, 2013). This requires a combination of intrinsic and synergistic extrinsic motivation.

Certain structural elements in the work environment support the effective evaluation and implementation of ideas. Clearly defined task structures and mechanisms, such as review procedures (Zollo & Winter, 2002), can be detrimental at Stage Three but now become much more appropriate. They support competent performance, and a sense of self-efficacy that boosts synergistic extrinsic motivation, as discussed earlier. Providing access to information through structured knowledge processes can ensure coordination of activity and availability of critical information at the time of need (Lee & Choi, 2003).

In all but the smallest startup organizations, more people are involved at Stage Four than at any of the earlier stages, to ensure that the selected ideas are fully vetted across multiple stakeholders throughout the organization. This means that wide cooperation and collaboration, helpful at each stage of the creative process, are essential at this stage. Often, that collaboration must be cultivated by keeping key individuals informed and involved throughout the process. In established organizations, these individuals may be colleagues in marketing and manufacturing; in entrepreneurial startups, they may be venture capitalists or other investors and partners. Buy-in of key stakeholders can make all the difference in whether promising ideas get implemented or wither away. And cultural norms within the organization make all the difference in determining how those individuals interact with the idea generators (Russell & Russell, 1992). The most helpful organizational norms are those that combine an openness to new ideas with an expectation that every idea will be constructively challenged. This means that idea evaluators should objectively and dispassionately focus on the merits of the work itself (the pros and the cons) while avoiding harshly critical evaluation that implies incompetence on the part of the idea generators.

In the same vein, reactions to failure can make an important difference. Managers should expect that, as ideas are tested, a good number of them will be found to be infeasible (Sitkin, 1992). If the culture is one that views such occasions as learning opportunities, rather than opportunities for blame, idea generators will maintain their motivation to cycle back through earlier stages of the creative process—or move on to other creative problem-solving projects, if the decision is made to end the current project (McGrath, 2001). And such decisions do need to be made at times. Although it is harmful for decision makers to be wedded to the status quo, it is equally harmful for them to implement new ideas with insufficient regard to the organization's capabilities and the realities of the marketplace.

Sufficient resources for testing and refining ideas are essential at this stage, and organizations need processes for securing and quickly deploying these resources. Other work environment factors can have a direct positive effect on intrinsic and synergistic extrinsic motivation. If there is a truly urgent need for a solution or workable idea, that realistic time pressure can actually augment intrinsic motivation—as long as the problem-solvers understand the urgency and are protected from extraneous demands so they can focus on the project (Ohly & Fritz, 2009). Genuine urgency can lend great meaning to the work (Amabile & Kramer, 2011). Sometimes that urgency arises because a competitor firm is attempting to create a product to capture the same market. Although internal competition among coworkers can undermine intrinsic motivation and creativity, competition with outside organizations can add to the cohesion and intrinsic motivation of problem-solving teams.

Most broadly, the organizational work environment should be one where people at all levels care about birthing and developing new ideas. Even contentious debate over the novelty, feasibility, and ultimate value of new ideas is preferable to bland apathy.

Future Directions

Both managers and researchers still have much to learn about entrepreneurial creativity. Our

exploration of the process of entrepreneurial creativity suggests several avenues for future investigations into how learning can serve creativity and innovation. We believe that, just as open innovation has redefined organizational boundaries, the boundaries of workplace learning should be expanded. The entrepreneurial stories we presented demonstrate that new ideas and creative insights are not bound by time or location. Because learning involves making new connections to break from old ways of thinking, it can and does occur both within and outside of work. In fact, the learning that occurs outside of work may be more useful than the formal training and job development that occurs within the constraints of the workplace.

Organizations benefit, and should therefore support, learning outside of work, even when it is not related to the employee's primary work role. Because learning outside of work is primarily voluntary, autonomous, and intrinsically motivated, only barriers of time and resources remain. These are barriers that organizations are designed to overcome. Research on non-workplace learning that enhances performance at work can help direct resources toward activities that naturally leverage intrinsic motivation in service of workplace innovation.

Future research on the joy of achievement also has the potential to leverage intrinsic motivation to serve entrepreneurial efforts in startups and established firms. Stages Two and Four of the creative process can be arduous, often involving repeated failure. Recent work on the power of progress, including incremental progress (small wins) (Amabile & Kramer, 2011), has shown that progress in meaningful work is a powerful motivator and boosts positive affect. This means that arduous tasks can become self-motivating and satisfying if progress remains salient. Viewing creativity, learning, and performance through the lens of the progress principle could enlighten researchers and managers about how to enhance both employee work life and performance.

Other research could address environmental conditions that target cognitive rather than motivational processes. Triggering the creative process requires some change in thinking or behavior that allows entrepreneurs to notice things others miss and to realize the potential of new ideas. Future research could examine the types of triggers that tend to spark the entrepreneurial creative process, as well as behaviors in which entrepreneurs could engage to be more aware of triggers. For example, facilitated reflection has been shown to guide people toward challenging underlying assumptions (Argyris, 1983; O'Neil & Marsick, 1994). This raises research questions about the possibility for self-directed reflection that might enhance the learning of individuals and teams and thus enable them to more readily break out of cognitive routines.

Individual differences may also play an important role in the processes we have explored. Given the strong psychological forces of cognitive routines and sunk costs, tremendous effort is required to begin and to continue the experimental mindset required for creative entrepreneurship. Although confidence enhances the likelihood of tackling transformational challenges, it may quickly lead to overconfidence in one's ability to evaluate the solutions to those challenges (Judge, Erez, & Bono, 1998). Research has shown that self-efficacy may, in fact, exacerbate the tendency to hold on to bad ideas (Bragger, Hantula, Bragger, Kirnan, & Kutcher, 2003; Garland, 1990). Because learning enhances self-efficacy and tends to embed people in routines (at least initially), it may be impossible to objectively evaluate one's own work, raising the stakes on making creativity a collaborative process. Ideally, future research will address the under-explored issue of self-evaluation in the creative process.

Conclusion

Creativity is hard. But it is hard at different points in the process for different reasons. Breaking out of routine thinking to identify truly interesting problems or opportunities requires intrinsic motivation and creativity-relevant skills that are supported by an open, learning-oriented mindset. Understanding a given domain deeply and widely requires learning domain-relevant skills that can be supported by access to expert knowledge and any other environmental factors that facilitate steady, meaningful progress. Intrinsic motivation and creativity-relevant skills are most important when taking the risk to generate new and useful ideas. Successfully validating a new idea and communicating its value depends on yet another set of skills, including dispassionately understanding the perspectives of stakeholders. Motivating the appropriate behaviors at each stage of creativity involves a nuanced understanding of the power of both intrinsic and synergistic extrinsic motivation, and especially how they may be used together to reinforce rather than undermine each other. This

understanding must then actually be applied to the work environment, with leaders modeling the behaviors they hope to inspire.

As difficult as it may be, creativity is also highly rewarding. In this chapter, we deconstructed the stages of creativity to reveal the underlying learning behaviors that support creative problem solving and the work environments that can motivate—or demotivate—it. By establishing these facilitating environments, entrepreneurs and entrepreneurial leaders in established firms can help people push through the frustration to engage in genuine breakthrough thinking.

Notes

1. "Leonardo da Vinci's helicopter is a world renowned example of his ability to think centuries ahead of his time. It is the first known drawing of any helicopter-like machine… The design was drawn in 1493, 450 years earlier than an actual helicopter would take to the air."—*Leonardo Da Vinci's Inventions.* http://www.leonardodavincisinventions.com/inventions-for-flight/leonardo-da-vinci-helicopter/
2. Charles Babbage developed the principle of the Analytical Engine, which was the world's first computer and could be programmed to solve a wide variety of logical and computational problems.—Charles Babbage *and* Henry P. Babbage. *(1889/2010).* Babbage's Calculating Engines. *England*: *Cambridge University Press*.

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CHAPTER

5 An Identity Perspective on Creative Action in Organizations

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Abstract

The chapter explores a number of ways in which the self-concept of identity holds relevance for our understanding of creative engagement in work settings. Relying on research streams from both social identity theory and identity theory, the chapter addresses possible implications that four presiding identity types—personal, relational, collective, and role—may have for pertinent issues such as creativity motivational patterns and creativity forms. In addition, the chapter considers identity-related tenets such as multilevel effects, cross-level effects, and inclusivity as possible ways of understanding the nuances and complexities that surround creative engagement in work settings. The relevance of identities and identity-relevant elements for the broader constructs of innovation and entrepreneurship are also briefly addressed.

Key Words: creativity, identity, self-concept, personal identity, relational identity, collective identity, role identity, motivation

Introduction

It has become increasingly apparent that innovation is a performance realm that can afford organizations greater effectiveness and competitiveness through the generation of novel and useful products and processes (Baer & Oldham, 2006). Serving as a first and necessary step in the innovation process (Amabile, 1988), the topic of creativity has generated a strong and growing field of dedicated research (Shalley, Zhou, & Oldham, 2004). The story of whether and how creative behavior emerges and is maintained in organizational contexts is inherently complex, and there is a need to identify constructs that lend themselves to greater understanding of the dynamics around creativity in work settings.

Albert, Ashforth, and Dutton (2000) addressed identity as a core self-concept, describing it as a "root" and "versatile" construct that can serve as a valuable tool for "theoretical development and revelation" in relation to a number of organizational and employee-level phenomena. Further, Drazin, Glynn, and Kazanjian, (1999) suggested that the concept of identity may prove useful for understanding the intricate patterns and levels of the means by which employees are drawn to creative engagement. As a construct, identity exists at multiple levels and orientations (Brewer & Gardner, 1996; Brickson, 2000). As individuals, we simultaneously hold multiple identities and are informed by frames of reference evoked by these identities (Brewer & Gardner, 1996). Drazin et al. (1999) stated that such multiplicity and sensemaking are critical to an adequate understanding of creative engagement in work contexts.

The purpose of this chapter is to explore the question: *How might the self-concept of identity help us understand the intricacies of creative engagement in work settings?* Given the complexity and pervasiveness of identity, the construct may provide a natural and integrated means for understanding employee's propensity to engage in creative

action. In particular, the chapter considers the impact of the multilevel nature of identity in terms of creativity-related motivation, as well as the types of creativity that different modes of identity might initiate. The rich nature of identity as a concept also permits some exploration of central dynamics such as identity inclusiveness, multilevel effects, and cross-level effects that may shed some light on employees' willingness to partake in creative endeavors. The relevance of identities and identity-relevant elements for the broader constructs of innovation and entrepreneurship are also briefly addressed.

Identity and Creative Action

Notions of identity formulation stem from two distinct streams of literature and theory, social identity theory (cf. Tajfel & Turner, 1979; Hogg, 1996) and identity theory (cf. Burke, 1980; Stryker, 1968, 1980). Although these approaches are similar in that they focus on active self-definition and the social nature of such definition, they rely on different foundations for identity formulation and maintenance (Hogg, Terry, & White, 1995). Social identity theory stems from the field of social psychology and builds on the notion of social classification or membership and an individual's associated value and significance stemming from memberships (Tajfel, 1978). Such memberships are self-defining in the sense that the attributes of relevant categories are subsumed by the individual and become part of who they are as a person. Much of the focus on social identity theory has been on intragroup and intergroup behavior and the impact of identity on such behavior. Three levels and forms of identity—personal, relational, and collective—are commonly considered under the framework of social identities that vary in terms of their importance to the individual (Hogg et al., 1995).

Identity theory has a sociology-based foundation stemming from symbolic interactionism, a perspective positing that social interactions give rise to symbolic meanings which in turn influence action (McCall & Simmons, 1978). Identity theory focuses on a form of identity defined in terms of specific roles, as well as the social interpretations and meanings attached to these roles (Burke, 1991; Stryker, 1980; 1987). Whereas the basic intent of social identity theory is to understand group-related behavior, the intent of identity theory is to understand behavior as it relates to roles and the social construction of those roles. Like social identity theory, identity theory views the self as multifaceted, but approaches the subject in terms of the multiple roles in which people find themselves in the course of their life, not in terms of the multiple social categories in which they are embedded. Like social identity theory, identity theory recognizes a hierarchical structure to the organization of identities in terms of their meaning to the individual. Role identities are considered in terms of their "salience" or importance to the individual, with more salient identities likely to elicit the enactment of role-appropriate behaviors that, in turn, provide a sense of self-worth and well-being (Callero, 1985).

Both broad identity approaches recognize the motivational nature of identity as a self-concept and its influence on cognitive and behavioral manifestations. Despite their differences in nature, both identity frames, as well as their respective identity self-concepts, hold relevance for creativity in work contexts. When identities become cognitively or psychologically salient, a form of structuration is evoked in which identity-relevant values become evident, goals and motivations are elicited, behavioral strategies are designed, and all are organized or aligned toward behavior that is consistent with the relevant identity (Drazin et al., 1999). Such processes support creative engagement, and as a result, creative performance outcomes should emerge (Drazin et al., 1999).

Personal Identity and Creativity

The personal identity orientation perspective focuses on how individuals see themselves in terms of characteristics, abilities, interests, and traits that distinguish them from other individuals (Brewer & Gardner, 1996; Tajfel & Turner, 1985). The basis of self-definition for a personal identity is intrapersonal assessment of one's own traits (e.g., skills, attributes) and comparison of these traits to those of others. Such an orientation is considered to be the independent self. The goal in establishing a personal identity is discerning how one is unique, or better, relative to others in the relevant social context (Brewer, 1991; Flynn, 2005).

Jaussi, Randel, and Dionne (2007) suggested that individuals can possess a *creative personal identity*, representing a sense of self tied to being a creative person in general. Their study found that employees bringing greater cross-application of non-work experiences to their work activities tended to be rated higher for creative performance when they also possessed a stronger creative personal identity. Consistent with an individualized

identity orientation, someone with a creative personal identity would view themselves as possessing a constellation of creativity-relevant skills, attributes, and interests that define them in a unique way as a creative individual. In addition, they would be more likely to value creative action and to have goals that center on creative activities.

Relational Identity and Creativity

Relational-based identity stems from "assimilating with significant others" (Brewer & Gardner, 1996) and reflects those aspects of the self that are held in common with relationship partners (Sedikides & Brewer, 2001). In contrast to personal identity, for which the goal is to differentiate oneself, relational identity is about determining ways in which one is similar to relevant individuals. The sense of self stemming from a relational identity is referred to as the interpersonal self (Brewer & Gardner, 1996) or the interdependent self (Markus & Kitayama, 1991) because one's self-definition is explicitly linked with the relational partner. In a general sense, the values, norms, and expectations defining the relationship determine whether creativity will be a behavioral pattern in which the dyad partners engage.

In organizational contexts, sense of relational identity often revolves around identity with one's supervisor (Sluss & Ashforth, 2008). A relational construct that lends itself to both identity and creativity concerns is leader–member exchange (LMX), a role-based relationship between supervisor and employee that is characterized by negotiated role expectations for the dyad incumbents (Graen & Scandura, 1987). One study (Tierney, 2005), exploring LMX and employee identity, found that high-LMX employees possessed both a strong relational identity with their supervisor and a strong identity for being creative in their work role. In addition, prior work (Dunegan, Tierney, & Duchon, 1992) found that high-LMX employees tend to view creativity and innovation as valued behaviors in their work context. Combined, these two studies suggest that because high-LMX employees consider creative behavior as a role-appropriate behavior for their high-quality relationship, as their identity with the relationship develops, so does their sense that being creative is a core part of who they are as an employee. Therefore, it is not surprising that a number of studies (e.g., Scott & Bruce, 1994; Tierney, Farmer, & Graen, 1999; Van Dyne, Jehn, & Cummings, 2002) have linked involvement in high-quality LMX dyads with a higher incidence of employee creative performance.

Collective Identity and Creativity

Similar to relational identity, collective identity is a form of social classification by which an individual defines himself or herself in terms of a group such as a team, department, or organization. The basis for self-definition of a collective identity is assimilation and the degree to which the individual is similar to the target collective (Hogg & Abrams, 1993). Individuals are drawn to certain groups, or identify with these groups, because they provide them a means of self-enhancement and uncertainty reduction (Abrams & Hogg, 1988; Hogg & Abrams, 1993). Self-enhancement is achieved through the bolstering of self-esteem derived from membership in a group that is positively distinct from other groups (Haslam, Powell, & Turner, 2000; Hogg & Terry, 2000). Uncertainty reduction is achieved by establishing and validating one's subjective sense of self within the context of a broader group (Hogg & Terry, 2000). When individuals identify with a collective, they internalize the goals and norms that define the collective (Ashforth & Mael, 1989). From a creativity perspective, a collective identity would, in general, prompt creativity when the collective's goals and behavioral expectations align with and require creative action.

A small number of studies have focused on the relevance of collective identity for creativity. For example, one study (Paulsen, Maldonaldo, Callan, & Ayoko, 2009) detected that charismatic leaders enabled research and development (R&D) team innovation by fostering team identity among the work group members. A series of studies conducted by Adarves-Yorno and colleagues adopted a social identity perspective to understand how collective identity influences individuals' judgments of creativity. Their first two studies (Adarves-Yorno, Postmes, & Haslam, 2006, 2007) determined that when individuals held a salient social identity with their group, their perception of what constituted creativity in a product or idea tended to be more conservative if their group was characterized by a prominent conservatism norm. Moreover, within groups in which social identity was strong, individual creators were received more favorably if they reflected the group's norm regarding creativity (e.g., more or less conservative). A third study (Adarves-Yorno, Haslam, & Postmes, 2008) detected a pattern consistent with the in-group versus out-group dynamic typical of the self-categorization aspect of social identity theory whereby products generated by the

focal group were rated as significantly more creative than the creative products of other groups if social identity was strong.

Another study (Cohen-Meitar, Carmeli, & Waldman, 2009) found that an employee's sense of identity with their organization led to higher levels of organizational identification, which triggered a greater sense of vitality, positive regard, and organization-based self esteem, all of which linked positively to employee creativity. A comparable study (Hirst, van Dick, & van Knippenberg, 2009) examining creativity and identity at the collective level of teams determined that R&D employees who reported a strong identification with their team tended to put forth more creative effort and to have higher creative performance. The authors noted that because norms and values for creative activity are quite high in R&D teams, employees who have an internalized sense of identity with the team will be more inclined to put forth the effort as a means of contributing to the group and meeting their normative expectations. The stronger the collective identity, the more the individual will view himself or herself as representative of the collective and willingly assimilate in terms of normative behavior (which in this case was creative behavior).

Role Identity and Creativity

The premise for the concept of role identity is that individuals relate in varying degrees to a myriad of roles and may use their connection with these roles as a means of self-definition (McCall & Simmons, 1978). As with identity types based on social identity theory, the literature on role identity recognizes the social nature of identity. The main difference is that, unlike social identity theory identities, in which the focal individual is directly comparing or relating to other social entities according to their attributes and qualities as a method of identity formulation, the individual sense of identity in role identity theory is influenced by the socially derived roles as well as external expectations and feedback related to those roles (Riley & Burke, 1995).

Petkus (1996) introduced the concept of role identity in relation to creativity. He noted that individuals experience a strong positive affect with creative role identity in the sense that they like to think of themselves, and like others to think of them, in terms of fulfilling a creativity-related role. Farmer, Tierney, and Kung-McIntyre (2003) applied the concept of creative role identity to the workplace, describing the self-concept as the extent to which the role of being a creative employee is part of an individual's self-identity. They found, in general, that employees with stronger creative role identities tended to be rated higher in terms of creative performance. Additional work (Tierney & Farmer, 2011) found that creative role identity influences creative self-efficacy over time such that employees become more confident that they can be creative in their work when they have a salient creative role identity. Another study (Wang & Cheng, 2009) found that benevolent leadership had a positive association with creative performance for employees with stronger creative role identities. Janssen (2003) offered an interesting insight into the implications of creativity-related role identity, noting that employees holding such a strong role identity may encounter conflict with coworkers because they have opted to identify more with the creative role than with their collective work group.

Identity and Motivational Patterns for Creativity

Because sense of identity is a motivational force, it should prove useful in understanding how various identity types may, or may not, elicit employees' engagement toward creative behavior. The traditional view of considering motivation has focused on the two general forms, intrinsic and extrinsic motivation. Intrinsic motivation is present when people engage in a task or behavior of their own volition because they inherently enjoy the activity and find it interesting for its own sake. In contrast, extrinsic motivation is at play when someone engages in a task or behavior for external reasons.

Although intrinsic motivation, by nature, is an autonomous state, self-determination theory (Deci & Ryan, 1985) suggests that extrinsic motivation can be differentiated into four types, which exist along a continuum reflecting greater or lesser degrees of external control and corresponding types of regulation (Gagne & Deci, 2005). These forms of extrinsic motivation vary in nature according to the extent to which the values, attitudes, and regulatory structures corresponding to the focal behavior are "internalized" by the employee. In identity terms, internalization depicts the extent to which the person assumes the identity as part of who they are. Highly internalized identities are strong and psychologically salient in terms of influence. The internalization aspect, Gagne & Deci (2005) suggest, is similar in that a high level of internalization involves assumption of the attributes associated with a certain type of task behavior (e.g., values, attitudes) as part of who the person is.

Gagne and Deci (2005) reported that *external regulation* motivation is driven purely by external contingencies and depicts no internalization. *Introjected regulation* is considered to be a moderately controlled mode of motivation in that the individual feels pressured to engage simply because of self-worth or ego needs but not because of any internalization. *Identified regulation* is considered a moderately autonomous motivation state in which the person connects with the value attached to a behavior because the value corresponds in some manner to his or her personal goals and identities. The most autonomous form of extrinsic motivation is *integrated regulation*, in which individuals feel that the behavior is so integrally linked to other aspects of their self (e.g., values, interests, identities) that they view the behavior, itself, as a core part of who they are as a person. In addition, the identity literature suggests a number of identification motives (Cooper & Thatcher, 2010), as well as motivation patterns aligned with social identity processes (Ellemers, De Gilder, Haslam, 2004), that may underlie whether or not an employee is driven to be creative in his or her work.

According to Cooper and Thatcher (2010), people with a salient personal identity or individual orientation consider themselves "unique and different" and, as a result, tend to engage in activities that reflect independence and are "diverse and not particularly mainstream" (p. 520). The case might be made that individuals with a strong personal identity are more motivated, in general, to seek out creative opportunities as a means of differentiating themselves. When an individual possesses a core personal identity around creativity, a strong motivational orientation is elicited for affirming and validating the sense of identity as a creative person (Jaussi et al., 2007), and an associated pattern of activity should emerge that will facilitate and ensure that successful engagement in creativity takes place.

Using the self-determination theory motivational framework, an argument could be made for a creative personal identity motivational pattern for creativity that depicts both the *intrinsic* motivation and the *integrated regulation* form of extrinsic motivation. As noted earlier, individuals with a strong creative personal identity should possess skills, values, and interests that align with creativity (Jaussi et al., 2007). Holding a personal identity elicits a strong motivation for fulfilling self-interest (Brewer & Gardner, 1996), so it is likely that individuals with a creative personal identity will derive a sense of inherent enjoyment and fulfillment from conducting creativity tasks because such tasks provide a vehicle for self-expression, consistent with intrinsic motivation. In addition, when a personal identity is tied to creativity, the act of creativity would closely correspond to the other aspects of the self, such as creativity-related values and interests, such that the behavioral manifestation of creativity would become internalized as another corresponding facet of the self. Further, because individuals with a personal identity orientation seek both self-enhancement, the drive to see oneself as superior to others (Hogg, Terry, & White 1995), and self-consistency, the drive to see oneself as consistent across situations (Swann, Pelham & Krull, 1989), (Cooper & Thatcher, 2010), it is more likely that they will be motivated to maintain creative engagement across time, contexts, and circumstances.

The motivation pattern for creativity among those with a strong relational identity will be dictated by the needs of the dyad and the expectations of the relational partner (Brewer & Gardner, 1996). Because engagement in targeted activities may serve as a means of developing relationships (Cooper & Thatcher, 2010), individuals with a propensity to establish a relational identity may engage in creative behavior as a means of making themselves more attractive to potential dyad partners who value creativity. In terms of established relationships, if creative action is expected by the dyad partner, or if engagement in creativity is required for the welfare of the relationship, an individual with a strong relational identity will be more inclined to seek creative opportunities. Because individuals with a relational orientation are driven by motives of uncertainty reduction and personalized belongingness (Cooper & Thatcher, 2010), creative engagement might be used as a means by which they add value to the dyad and ensure their place in the relationship. In order to understand the creativity potential of someone with a strong relational identity, we would need to consider the parameters of the dyadic relationship and whether creative action might play a role there.

From a self-determination theory perspective, the creativity motivational pattern of someone with a relational orientation would not be one of intrinsic motivation, because creative engagement is elicited by the needs and expectations of the relational partner and not necessarily by the individual's inherent interest or enjoyment in creative tasks. One could make an argument for

three of the extrinsic motivation types depending on how salient the relational identity is for the individual and the reasons underlying the interpersonal connection. In a situation in which the relational identity is not particularly strong but the relationship does serve some instrumental purpose for the individual, engagement in creative behavior would be dictated by the individual's offering of outcomes the partner values, reflecting the *external regulation* form of extrinsic motivation. If the individual does not necessarily value creative behavior for its own sake but creative engagement would bring about a sense of worth or ego fulfillment in contributing to the relationship, the extrinsic motivation form is *introjected regulation*. In the case in which the sense of relational identity is more salient and the individual places a stronger value on the dyad's maintenance, if he or she believes that creativity is key to that maintenance, the motivation for creative engagement is of the *identified regulation* form. Although creativity is not valued for its own sake, it is of value to the individual in that it facilitates achievement of the critical goal of maintaining the quality of the relationship.

Because one of the presiding goals stemming from a relational identity orientation is to contribute to the welfare of the dyad member, it also represents prosocial motivation (Grant, 2007). Grant (2008) acknowledged the extrinsic nature of prosocial motivation, stating that it is driven either by *introjected regulation*, whereby the individual seeks to help others in order to "avoid guilt and protect self-esteem," or by *identified regulation* driven by the desire to fulfill "core values and identities" (p. 49).

The creativity motivational pattern for an identity with collectives, such as one's team or organization, should parallel in some respects that of the relational identity pattern in the sense that both are driven by the norms and expectations of the other (i.e., collective). On one hand, it could be argued that a collective identity may involve the two most extrinsically controlled modes of motivation for creativity suggested by self-determination theory. Given that individuals holding a salient identity for a specific collective will follow the collective's norms and directives as a means of maintaining membership, creativity motivation may be externally regulated when it is mandated by the collective as a requirement for membership. Likewise, an argument might also be made for the *introjected regulation* form of motivation for creativity, in which the individual internalizes the need for creative engagement but only as a means of feeling worthy to be part of the collective. Although the latter motivation would be considered a form of prosocial motivation, as suggested by Grant (2008), its intent is driven by a sense of external pressure or obligation from the collective. In these two scenarios, creative action is initiated and maintained only when the collective dictates it, not because the individual inherently values or enjoys creative activities, nor because such activity is congruent with a personal goal for creative achievement.

On the other hand, it may be the case that the creativity motivation for someone with a collective identity falls more along the lines of *identified regulation*. Although this form of motivation involves identifying with the value of a behavior as a means of achieving self-goals (Gagne & Deci, 2005), if the individual highly identifies with the collective and the collective highly values creativity, engagement in creativity might be congruent with permitting the individual to achieve the valued personal goal of being a contributing member of the collective.

Ellemers et al. (2004) also made a case for the possibility that a collective identity may lead to the *integrated regulation* mode of motivation for creativity. They suggested that as the sense of identity with a collective becomes stronger over time, the highly identifying individuals will begin to internalize the collective's goals and assume them as their own. In a case in which the collective is creativity oriented, the individual may likely feel more volitional in terms of creative action, sensing an autonomous and natural pursuit of creativity goals.

In addition, creative successes may enhance a collective's status in the broader context. Because a goal of a collective identity is to enhance the status of the collective as a means of enhancing one's own sense of esteem, identifying individuals may be more motivated to face creative challenges (Hirst, van Dick, et al., 2009). The degree to which the individual has the opportunity to be associated with a collective that is distinguished from other collectives on relevant dimensions (e.g., creative performance) may also enhance the extent to which creative activity is motivated behavior. These two patterns of creativity motivation are also consistent with the identification motives of uncertainty reduction and depersonalized belongingness that underlie a collectivist orientation (Cooper & Thatcher, 2010).

Adherence to the collective's norms and expectations, for or against creative involvement, is a

way of establishing the stability of membership in the collective and avoiding uncertainty regarding self-identity in the broader context. Unlike a personal identity, which orients one to establish individual uniqueness, and relational identity, which moves one to personalized belongingness, collective identity is associated with a drive for depersonalized belongingness in which one seeks to establish how one is similar to the collective (Cooper & Thatcher, 2010). In seeking to embody the "prototype" of the collective, individuals will disengage from the aspects of their self that define them as unique and embrace those personal aspects that permit them to be seen as one with the collective (Hogg & Terry, 2000). Such a depersonalization motive is relevant for creative engagement in the sense that an individual who is naturally oriented toward creative endeavors may disassociate from these tendencies if the collective is not prone to creative engagement. In contrast, someone who is not necessarily creatively inclined may develop values and extend efforts in this regard if they identify with a collective that has a reputation and pattern of creativity.

Because role identity reflects an internalized set of role expectations, the more psychologically central the role, the greater will be the motivation to engage in role-specific behaviors (Markus & Wurf, 1987). Therefore, the basic drive underlying role identity stems from the parameters of the targeted role and the role-specific activities that are dictated by the role. Because role identities are informed by both introspection and contextual feedback (Riley & Burke, 1995), the motivational pattern for creative engagement would be shaped by how relevant others, as well as the individual, interpret the role and the individual's capacity to fulfill the role. Petkus (1996) framed creative role identity as a motivating drive that elicits creative role performances. Farmer et al. (2003) further suggested that because individuals for whom a creative role identity is salient find creative activities particularly meaningful and a central means of self-verification, they will be more motivated to engage in creative activities in their work.

The contextual and self-reflective bases for role identity make for a potentially complex motivational mapping for creative work. In certain respects, the motivational pattern reflects a fair degree of external regulation because role expectations are being determined, in part, by members of the work context. Some of the motivation also stems from the need to receive role support from the individual's social context—to have relevant others verify and confirm for the individual that they are, in fact, a creative worker. Such a motive aligns with self-determination theory's notion of *introjected regulation,* whereby the motivation for creativity is associated with ego involvement and the employee's need to maintain a certain level of self-esteem and verification. On the other hand, role identity also entails a fair amount of introspection and self-input involving the individual's self-assessment of role-related skills, attributes, and former modes of behavior and success. In this regard, for individuals with a strong creative role identity, creative engagement may be quite consistent with their personal goals and values, indicative of an *identified regulation* motivation mode. To the degree that the individual has thoroughly internalized the role of being a creative employee, creative action at work may be seen as volitional and a core part of who the person is, which would reflect an *integrated regulation* form of motivation.

An interesting paradox around motivation might exist for employees with the latter motivation pattern, however. Research suggests that the more central a creative role identity is to an employee, the greater the employee's interest in protecting that identity. Farmer et al. (2003) reported that employees with the strongest creative role identities—the ones who were most likely to have internalized the role of being creative as part of their core self-concept—were the least likely to exhibit creativity in their jobs if they felt that such action was not valued by the work context. They explain this counterintuitive finding by suggesting that rather than permitting their creative efforts, and by association their sense of self, to be dismissed by the organization, strong creative role identity employees would refrain from creative engagement as a means to protect their self-valued sense of identity.

Identity and Creativity Types

Consideration of identity might also be useful in understanding the types of creativity to which different identity forms might be drawn. Unsworth (2001) proposed that we consider the nature of creativity along two dimensions: (1) whether the problem of concern has been personally discovered (open) or has been recognized by others and presented to the individual for solving (closed), and (2) whether creativity engagement is self-determined (internally driven) or externally imposed (externally driven). Accordingly, combinations of

these two elements point to four types of creativity: *expected* (open problem/externally driven), *proactive* (open problem/internally driven), *responsive* (closed problem/externally driven), and *contributory* (closed problem, internally driven).

Because individuals with a salient creative personal identity view themselves as possessing a repertoire of creativity-related skills, values, and personal traits (Jaussi et al., 2007), they should seek out opportunities to innovate as a means of self-validation. If the drive of personal identity is to differentiate and establish oneself (Brewer & Gardner, 1996), then those possessing a creative personal identity might seek creativity opportunities that permit them to clearly stand out from others and establish themselves as a creative exemplar. As noted earlier, relative to the other identity types, it is likely that their drive for creative engagement is more internal because of their underlying motive of defining themselves in terms of creativity and also the fact that they are more likely to seek out creative opportunities because they enjoy them. Furthermore, since a personal identity elicits motives to distinguish oneself from others, efforts in these areas where the potential to stand out as a creative contributor may be the greatest.

If we consider Unsworth's four creativity types, we might say that the *proactive* form carries the greatest responsibility, as well as the greatest potential for acknowledgement and validation for the creator. Not only does this creativity type require extending efforts to scan the environment for potentially damaging problems that others have yet to realize, but there is also the added responsibility of generating novel solutions to those problems. Such parameters present the potential for the greatest risk but also the greatest payoff in terms of distinguishing oneself from others on the basis of creativity. Therefore, it seems likely that *proactive* creativity may hold great appeal for those with a creative personal identity. Secondary to *proactive* creativity, *contributory* creativity would be a likely pattern as well. Although *contributory* creativity entails addressing identified problems that someone else has discovered, the fact that one needs to step forward and volunteer to solve the problem when others might not be able or willing to, would still hold appeal to those possessing a strong creative identity, because the opportunity for distinguishing oneself as creative is still present.

In terms of Unsworth's typology, the driver for creativity associated with a relational orientation would initially seem to be external in that it is shaped by the expectations and needs of the dyad partner. The individual with a strong relational identity does not necessarily have an inherent drive to seek out creative opportunities for their own sake or personal creative fulfillment. In this sense, *expected* or *responsive* creativity would be likely patterns to see in these relational conditions. When the dyad partner brings general issues or specific problems to the attention of the relational identifier to be addressed, the individual would respond as a means of serving the partner or the relationship. However, it is also possible that under conditions in which the dyad is compromised or in jeopardy, the identifier may take more initiative and voluntarily address specific problems or be on the lookout for potential threats to resolve. In these cases, the dyad member may assume more engagement aligned with *proactive* or *contributory* creativity. Furthermore, because relational identity elicits compliance with dyad-specific roles (Sluss & Ashforth, 2008), if one dyad member is designated the role of innovator or creative problem-solver, we might expect to see either *proactive* or *contributory* creativity fall within the realm of that person's ongoing responsibilities regardless of the needs of the dyad.

The type of creativity for collective identity is likely to be quite similar to that of a relational identity, and for some of the same reasons. Because individuals with a strong collective identity orientation assimilate the goals and norms of the collective, the type of creativity produced will also be a reflection of the creativity-related expectations and behavioral patterns of the collective. If the pattern in the collective is to willingly seek out new opportunities for creativity and the image of the collective is that of the innovator, individual members holding a strong identity with that collective will follow the path for *proactive* creativity. At the same time, highly identifying members have a stake in the survival and welfare of the collective (Brewer & Gardner, 1996). As a result of this ongoing concern, they may be inclined toward *responsive* and *contributory* forms of creativity as well, depending on the situation within the collective and its needs at the time.

A role identity aligned with creativity could pose a strong argument for engagement in all four of Unsworth's creativity types. If one considers oneself to play the role of the innovative problem-solver, and such a role therefore is a presiding occupation, than one would accept all opportunities to

demonstrate that one is an appropriate fit for the creative role. Additionally, because creative role identity is both self-determined and other determined (Farmer et al., 2003), creative engagement would be both internally and externally driven. Because someone with a strong creative role identity would perceive providing service as an innovator to be a core part of who they are, they would be as inclined to actively seek out potential problems to be addressed creatively as to respond to problems brought to them by others. In this regard, we might expect to see a creative role identity individual produce *expected, proactive, responsive,* and *contributory* types of creativity.

Identity Multilevel and Cross-Level Effects and Creative Action

Identity may be useful in considering creativity at multiple levels because identities have the capacity for cross-level effects (Albert et al., 2000). For example, if a multitude of individuals with creativity-related personal identities coalesce around creativity commonalities in terms of behavioral patterns and outcomes, they may begin to identify with one another as a creative team. If a confluence of personal and team-level creative identities are present and creative engagement is enacted as a result, the organization may eventually assume an identity as a creative firm. Individuals possessing creativity-based identities at personal and relational levels, may then develop and identity with the organization that they see as prototypical of themselves.

Sluss and Ashforth (2008) argued that relational identification connects person-focused and role-focused identification. Because a salient sense of identity tends to correlate with a strong identification with the identity target (Cohen-Mietar et al., 2009) we could likewise surmise that someone with a creative personal identity orientation who develops a relational identity with another individual may likely assume a creative role identity in the context of their relationship, whereby they serve the relationship by taking on creativity challenges and responsibilities. According to Sluss and Ashforth, "the cognitive associations between the nested levels of self likely make it easier to seamlessly shift between the identities associated with the levels" (p. 13). In this regard, we would expect creativity-related cognitive orientations that preside in creative personal identity and creative role identity to facilitate the individual's adoption of a creative orientation in the relationship.

Because individuals with a dominant collective identity tend to see themselves as prototypical of the collective, if their collectivity target is highly innovative, they may come to view themselves as creative as well. Likewise, because collective identity elicits normative behavior and goals on the part of its members, identity with a creative collective would naturally lead to individual creative action over time. Such a pattern of involvement would likely lead to skill development and creative productivity that might inform both the development of a subsequent creative personal identity and a creative role identity.

From a level perspective, role identity is an interesting construct in the sense that it overlaps in certain ways with personal, relational, and collective levels of identity. Similar to personal identity, the strength of one's role identity is determined, in part, by self-assessment of past performance and self-perceptions of whether one has attributes and capacities that align with a specific role (McCall & Simmons, 1978; Markus & Wurf, 1987). However, similar to dyadic and collective identities, role identity is also "socially contextualized" (Oyserman & Packer, 1996) and can be based on perceived role-related expectations, requirements, and feedback from social others (Riley & Burke, 1995). Those with strong creative role identities engage in creative acts to gain creativity "role support" from those in their social milieu as a means of validating that the role identity holder is in fact successfully fulfilling the creativity-related role (Petkus, 1996). Therefore, creative role identity can be understood from a multilevel perspective as well. For example, employees might play the role of creative problem-solver in terms of their own individual work and interpersonal interactions for the benefit of their work team or larger collectives. So the multilevel issue with creative role identity is, at what level does the creative role exist and become manifest, and from what level or levels do the roles and expectations derive or originate?

Identity Inclusiveness and Creative Action

Drazin et al. (1999) stated that, as a field, creativity research in general has failed to adequately acknowledge the issue of "partial inclusion" and the relevance that it holds for creative engagement. They noted that because individuals are members of various groups and find themselves playing various roles, it is reasonable to assume that each of these realms may have some degree of influence over employees' decisions to engage in creative

action. Multiplicity is central to the concept of identity (Burke, 2003): individuals simultaneously occupy multiple identities in multiple realms, all of which have the potential to influence their cognition, motivation, and action (Ashforth, 2000; Ashforth & Mael, 1989). As such, partial inclusion is an inherent aspect of identity theory.

Identity is also a dynamic phenomenon in that different identities can fluctuate over time and events in terms of their salience for the identity holder (Ashforth & Mael, 1989). Drazin et al. (1999) acknowledged that creative engagement in organizations is characterized by an irregular pattern of ebb and flow. The multiplicity, or partial inclusiveness, and dynamic elements of identity can be useful in explaining why creativity is not a consistent response among individual employees. Not all identities are consistent, and in the course of daily operation individuals are placed in circumstances in which they may need to reconcile their multiple identities and the demands they place on individuals (Hogg & Terry, 2000). As certain creativity-relevant identities become salient or more psychologically central to an individual, we would expect these to have more behavioral influence than other forms of identity (Ashforth & Johnson, 2001) to the extent that creativity-related identity enactment is inconsistent with more weakly held or less dominant identities.

One study (Tierney et al., 1999) found that employees who self-identified with personal characteristics of an "adaptor" (e.g., resists change, prefers routine and structure) tended to engage in high levels of creative action when they were members of a high LMX dyad. An identity interpretation of this finding would suggest that as a party to a relationship to which members strongly identify and for which creativity is an expected role, the employee's relational identity prompted behavioral engagement in areas to which their personal identity would not naturally have brought them.

Ideas for Further Consideration

Although few studies have entertained the potential role of identity in relation to creative performance, its use as an organizing framework could guide the ongoing study of creative engagement in a number of regards. As discussed in this chapter, understanding of which identities employees hold, the relative strengths of these identities, and the identity target's orientation on creativity could shed light on an employee's form of motivation for creativity as well as the type of creative outcomes he or she endeavors to produce. One of the basic tenets of identity theorizing is that an individual comprises a multitude of different identities that reside at different levels and with varying magnitudes and fluctuating levels of influence for behavioral engagement (Ashforth & Mael, 1989). Inherent in this notion is the distinct possibility that an individual may simultaneously possess identities that conflict with one another (Swann, 1987) in terms of directing the employee toward, or away from, creative engagement.

Drazin et al. (1999) pointed out that one of the assumptions made in the ongoing field of creativity research is that employees operate under conditions of total inclusion, in the sense that their creative engagement is influenced by forces at a single level (e.g., their immediate work group). Research has now begun to account for the multilevel nature of creativity (e.g., Hirst, van Knippenberg, & Zhou, 2009). Future studies allowing for identity-related notions such as multiplicity, embeddedness, and nesting would provide the opportunity to more realistically capture the complex positions in which individual employees find themselves when making decisions regarding whether or not to be creative in their work. The degree to which held identities align with one another and are either in favor or against creativity could dramatically increase or decrease the chances that creative action will take place. Exploration into how and when creativity-related identities align for creative action would also be warranted, as would studies of how employees negotiate their repertoire of identities (cf. Swann, 1987) when they present conflicting expectations for creativity.

Another interesting notion to consider is the degree to which creativity may actually serve as a basis for identity formulation. A personal identity is informed, in part, by self-reflection and interpretation of skills, behavioral patterns, and performance (Brewer & Gardner, 1996). If an employee observes that she seems to have command of creativity-relevant skills and has been successful in applying these skills towards creative outcomes, she may develop a creative personal identity over time and experience. An individual holding a strong creative personal identity would normally be expected to strive to be unique and to stand alone as an innovator. However, if that individual perceives that another individual is similarly deposed toward creativity and possesses the same creativity-relevant skills, values, and attributes, she may be inclined to gravitate toward the other person and develop a

relational identity based on creativity-related commonalities and goals. Adoption of a relational identity under these circumstances might be appealing if the individual anticipates that creativity will be an ongoing activity in the dyad and feels that dyad participation would augment the ability to stand apart from others in terms of creative achievement.

Individuals are drawn to collectives that can be instrumental in helping them achieve the sense of self they want (Haslam et al., 2000; Hogg & Terry, 2000). For someone with more of a creative personal identity orientation, identity with an innovative collective might hold appeal in the sense that the individual sees herself or himself as prototypical of the collective. Identity with such a collective might not only facilitate creative efforts but also reinforce the notion that one is a creative individual. In contrast, it has been suggested that strong personal orientation toward creativity may also inhibit the development of a collective identity. Janssen, van de Vlient, and West (2004) reported that when an individual's innovative ideas are met with resistance, the intragroup conflict that arises may highlight the dissimilarities between the innovator and the rest of the collective. Because similarity is a foundation for identity with a collective, a perceived lack of commonality makes it unlikely that the innovator would develop a sense of identity with the collective. Future research could explore the extent to which a collective might draw or repel the identification of individuals with strong creative personal identities, who normally would opt to keep a separate identity from that of the collective, depending on how the collective responds to creative activity.

People also tend to gravitate toward collectives that will make them distinct and enhance their image or sense of self (Haslam et al., 2000). Likewise, they often choose to identify more with a collective that is distinct from other collectives (Ellemers et al., 2004). If we consider this from a creativity perspective, it can be argued that a team or organization that is known for deviating from the status quo and being cutting-edge innovative might hold appeal for employees seeking to distinguish themselves from other employees in the sense that the team provides them with a means to stand out and be esteemed. Therefore, research could consider whether the creativity reputation of a collective might attract members who wish to be part of that image.

In addition, if identity is a key impetus for or against creative activity, we need to have a better sense of how creativity-related identities are shaped and maintained in the work context. An important aspect of a manager's job in promoting creativity is to set creative role expectations for employees (Shalley, 2008). Prior research (e.g., Farmer et al., 2003) suggests that relevant members of the work context have the capacity to influence individual employees' sense of creative role identity through the creativity expectations they communicate. Therefore, another beneficial line of inquiry would be identifying the constellation of means by which managers can facilitate the creation and maintenance of identities conducive to creative action for their employees.

Finally, although the specific focus of this chapter has been on creativity, the notion of identity is also relevant to two other constructs to which creativity is inexplicably linked—innovation (Amabile, 1988) and entrepreneurship (Zhou, 2008). Creativity is a narrower concept, being the initial idea-generation step in the broader process of innovation that also includes behaviors such as idea development, adoption, and implementation (Anderson, De Dreu, & Nijstad, 2004). It seems logical that the dynamics around both personal identity and role identity for innovation would parallel those for creativity in the sense that individuals would determine whether they held either a distinct constellation of characteristics, abilities, interests, and traits or affiliation with certain roles conducive to developing or championing others' ideas or moving them toward practical application. Thus, we might expect to see a host of personal and role identities play out along the myriad of innovation stages.

Advancing this notion further, we could surmise that in order for innovation to take place, there must be a prevalence of employees assuming personal and role identities consistent with these different innovation stages. Although cross-functional teams are commonly used for innovation in organization settings, a possible identity-related challenge for innovation is the fact that members are likely to hold different functional identities. It has been posited (Cheng, Sanchez-Burks, & Lee, 2008) that when members of such teams are characterized by identity integration, an individual attribute that permits a person to see compatibility among multiple and disparate social identities, they can capitalize on the unique perspectives and knowledge present in the team, and innovation levels should be enhanced. Because innovation represents more of a collective phenomenon, it is not surprising that

research has found a connection between collective identities and innovation activity. An interesting example is that of emergent "innovation communities," defined as collectives that are engaged in open innovation practices and formed around a particular innovation concept or project (Fichter, 2009). One of the defining characteristics of these communities is that their members possess a strong identity with the collective and its values and goals around open innovation.

It has been suggested that entrepreneurs' self-identities are an impetus for the ventures in which they engage (Ireland & Webb, 2007). Shepherd and Haynie (2009) noted that adoption of an "entrepreneur identity" permits an individual to position himself or herself as unique and distinct from others, in line with Brewer's (1991) notion of personal identity. Fauchart and Gruber (2011) reported that researchers interested in exploring identity in relation to entrepreneurship have tended to approach the topic from predominantly a role identity perspective. For example, consistent with the role identity tenet that individuals may hold multiple identities corresponding to multiple roles (Thoits, 1983), Cardon, Wincent, Singh, and Drnovsek (2009) suggested identities related to three specific roles central to entrepreneurial endeavors—inventor, founder, and developer. They used a role identity foundation to explain "entrepreneurial passion" and to convey that these role identities each elicit role-specific passion motivating behaviors central to that role. Founder role identity has also been examined (Hoang & Gimeno, 2010) in terms of its centrality (i.e., degree of importance to the individual) and complexity (i.e., perceived diversity of the role) and the extent to which these aspects influence the ease with which a founder can transition into critical founding activities.

Another application of role identity to entrepreneurship (Farmer, Yao, & Kung-McIntyre, 2011) focuses on entrepreneur identity aspiration, defined as "a possible but unrealized future entrepreneur self" (p. 246) and finds that the strength of such identity aspiration predicts discovery and exploitation behaviors among nascent entrepreneurs. Shepherd and Haynie (2009) explored the concept of entrepreneurs' "superordinate identity," which comprises the multiple role identities entrepreneurs maintain. They proposed that holding this more "holistic" self-identity permits entrepreneurs to develop strategies for managing their multiple role identities and that, as a result, they experience greater psychological well-being. In a move away from the role identity approach, Fauchart and Gruber (2011) adopted the social identity perspective to identify three types of founder identities—darwinian, communitarian, and missionary. They discovered that each identity type corresponded with a different social motivation, basis of self-evaluation, and frame of reference. They also ascertained that the founder identity type influenced the entrepreneurial decisions made related to markets served, customer needs addressed, and resources deployed.

Conclusion

One of the challenges of contemporary organizations is how to foster performance behaviors that are necessary for sustenance and survival under conditions of increasing resource scarcity, economic uncertainty, and global complexity. It is suggested here that creative engagement is a necessary behavioral realm for corporate effectiveness and that it can be understood and promoted through the framework and basic tenets of identity. The application of identity to creativity may provide a vehicle for better understanding the nuances and dynamics that impede or encourage employees toward greater or less creative involvement in the work setting. In particular, application of an identity framework may provide insight to such complex phenomena as emergent motivational patterns for creativity, the types of creativity in which employees opt to engage, and how employees create in the face of multilevel identities and the degrees of inclusiveness of these identities.

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CHAPTER

6 Psychological Bricolage: Integrating Social Identities to Produce Creative Solutions

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Abstract

Novel solutions are often created by combining existing but previously unrelated knowledge. Unrelated or disparate knowledge can come from different individuals, but it can also reside within one mind. This chapter introduces the concept of *psychological bricolage,* defined as the process through which an individual integrates previously unrelated knowledge to create novel solutions. It reviews research showing that psychological bricolage is facilitated when individuals can integrate social identities that are often considered separate or in conflict, such as family and work identities, or gender and professional identities. Implications for future research on ideation, innovation, and entrepreneurship are discussed.

Key Words: psychological bricolage, identity integration, identity, creativity, social identity, entrepreneurship

Integrating Social Identities to Produce Creative Solutions

The bricoleur creates with what ever is at hand . . . uniting internal and external knowledge.

—Levi-Strauss, 1962

Creative people [are] able to connect experiences they've had and synthesize new things.

—Steve Jobs, 1995

Before the advent of computers, secretaries such as Bette Nesmith Graham faced an annoying problem: correcting mistakes on an electric typewriter that involved a tedious, multistep process with questionable results. Bette came up with a novel solution. The breakthrough came when she recombined knowledge tied to her experiences as a professional typist with knowledge tied to her experiences as a painter. The creative solution involved developing a fast-drying paint formula that could be applied to paper and typed over. The result was a new product, known today as Liquid Paper (Gross, 2013). This example illustrates how novel solutions are created by making use of existing but previously unrelated ideas (Amabile, 1996; James, 1890; Royce, 1898; Schumpeter, 1934). As noted by the 1st-century Roman poet, Lucretius: *Nil posse creari de nilo* ("It is not possible to create something from nothing").

Unrelated ideas can come from different minds, providing the rationale for seeding brainstorming groups with diverse members (Osborn, 1963; Rietzschel, Nijstad, & Stroebe, 2006; Sutton & Hargadon, 1996). However, Graham's story illustrates how disparate ideas can also reside within the same mind (e.g., Cheng, Sanchez-Burks, & Lee, 2008; Leung, Kim, Goncalo, Ong, Qiu, Polman, & Sanchez-Burks, 2012). The process by which individuals create novel solutions by making use of previously unrelated ideas they already possess is what we conceptualize here as *psychological bricolage*.

Our term psychological bricolage draws on and connects two parallel streams of research from different disciplines, starting with the seminal work

on "social bricolage" introduced by the cultural anthropologist Lévi-Strauss (1962) to explain how societies create novel solutions by making use of resources that already exist within the collective social consciousness. The second stream is research on "creative cognition," an intrapsychic approach focusing on how people cognitively engage in the process of retrieving and recombining knowledge sets in new ways (Finke, Ward, & Smith, 1992; Leung, Maddux, Galinsky, & Chiu, 2008). Our term, psychological bricolage, reflects a common underlying concern about the nature of knowledge recombination found across current and classic social psychological and anthropological research.

Psychological Bricolage: Sources and Challenges

A growing stream of research on the socially constructed and dynamic nature of people's identities provides important insights into processes underlying psychological bricolage. This work reveals that one deep reservoir of unrelated ideas is people's collections of social identities, or social groups by which they define themselves. Bette Graham's social identities, for example, included professional typist, amateur artist, and probably others. Each social identity is tied to experiences in distinct social, professional, or cultural contexts, as well as to specific knowledge (Shih, Pittinsky, & Ambady, 1999). For example, Graham's identity as a typist was activated in the context of an office, and the activation of this identity brought to the fore her knowledge about typing. In contrast, her identity as a painter was activated in the context of her art studio, and in that situation her knowledge about painting and design was more cognitively accessible. This suggests that, to facilitate the recombination of existing ideas in new ways, one must understand the factors that influence how unrelated knowledge structures are simultaneously brought to mind and made cognitively accessible.

Inherently, psychological bricolage appears to be a challenge because it entails bridging identities that are often considered separate or in conflict. This may include, for example, handling segmented professional and personal identities (Sanchez-Burks, 2002, 2005) or managing the conflicting expectations of being a woman and being in a male-dominated profession (Cheng et al., 2008; Sacharin, Lee, & Gonzalez, 2009). When people perceive conflict between different identities, opportunities for psychological bricolage are diminished because the multiple identities are less likely to be simultaneously activated, and the knowledge sets associated with these identities are less likely to be made simultaneously accessible. This later challenge is illustrated by an old Mexican-American folktale describing a woman who was trying to buy a bilingual parrot. According to the tale, the parrot spoke Spanish if one pulled its right leg and spoke English if one pulled its left leg. "What happens if you pull both legs?" the woman asked, "Will he speak Tex-Mex?" "No," the parrot answered, "I'll fall on my ass" (West, 1988, cited in Benet-Martínez, Leu, Lee, & Morris, 2002). As this folktale suggests, attempts at experiencing or being both identities at the same time is often seen as foolhardy, leading to a less-than-ideal situation of being a member of neither one group nor the other. These negative effects of belonging to conflicting groups have been well documented in the literature about immigrants (who belong to different cultural/ethnic groups with incompatible values) (e.g., Berry, 1990), women in the work force (who belong to gender and professional groups with competing demands) (e.g., Eagly, Makhijani, & Klonsky, 1992; Martin & Knopoff, 1997), and people who work in matrix organizations and cross-functional teams (who belong to different functional departments with contrasting priorities) (e.g., Glynn, 2000; Hogg & Terry, 2000).

Consistent with the creative cognition approach, which argues that the activation of conflicting identities can be beneficial for creativity, management scholars have suggested that embracing conflicting organizational identities can also accrue benefits. Daft (1982), for example, proposed a "dual-core" model for organizations, whereby they move between two contrasting activities of innovating and implementing (Duncan, 1976). Similarly, Brown and Eisenhardt (1997) suggested that organizations in complex environments need to develop structures and processes that move between the polar states of pure chaos" and "pure structure. In a fast-changing world, the argument goes, organizations need to be ambidextrous; that is, they must be able to live with paradoxes in the form of internal contradictions in the organization's culture and structure (Tushman & O'Reilly, 1997).

This logic applies to individual organizational members as well. McCaskey (1988) argued that, similar to dual-core organizations, individuals in organizations need to be "two-faced," much like the ancient Roman god, Janus, who had two faces on his head, each facing opposite directions. Likewise, Weick (1979) proposed that organizational members should

engage in contradictory activities such as simultaneously using and discrediting precedents. This notion of "requisite variety" suggests that a highly varied environment requires organizations and their members to be similarly varied (Ashby, 1952).

From these various lines of research, it is clear that the ability of organizational members to manage paradoxical identities may be critical when innovation is important to an organization's survival and growth. Yet, as we describe later, it is not easy for individuals to successfully achieve this competency. In this chapter, we examine how the management of multiple, conflicting identities affects an individual's ability to engage in psychological bricolage and the implications of psychological bricolage for creative and entrepreneurial endeavors. We review research on the psychological mechanisms that facilitate or hinder the integration of conflicting identities, describe how such mechanisms relate to creative and entrepreneurial performance, and draw implications for organizational interventions.

Social Identities as a Resource for Psychological Bricolage

The social identities of individuals provide a cognitive resource for psychological bricolage in organizations. Social identities refer to the ways in which people define who they are based on their memberships in different groups (Tajfel, 1981). Racial, gender, religious, professional, community, and organizational groups are just a few of the many types of membership-based social identities that have been studied in the psychological and management literatures. Social identities have been shown to affect how we think, what we know, and how we perform.

Research on social identities has yielded two critical insights with significant implications for understanding creative and entrepreneurial performance in organizations. First, our social identities define the boundaries between insiders and outsiders. Insiders, also called in-group members, are individuals who share membership in the groups to which we belong. For example, an engineer might consider other engineers to be fellow insiders (i.e., in-group members). Outsiders, or out-group members, are individuals who do not belong to and may not be relevant to our immediate groups. An engineer might consider, in particular situations, stay-at-home mothers to be out-group members.

Second, social identities are tightly bundled with specific knowledge sets. At any given moment, individuals do not have access to all the knowledge they possess. However, activation of any one social identity can lead to better accessibility of knowledge associated with that identity and, in turn, to better performance on tasks related to that knowledge domain. For example, when Asian women's cultural identity (i.e., being Asian) is primed or made salient, they performed better on math tests, a domain in which Asians are stereotypically expected to excel. In contrast, when their gender identity (i.e., being a woman) is primed, they perform worse on math tests, conforming to stereotypes of women as being inferior in math (Shih, Pittinsky, & Ambady, 1999). In a similar study on how people make attributions or explanations about social events, Chinese-American biculturals who were exposed to Chinese cues made more situational attributions (i.e., explained events using factors in situations external to the actors), a prototypically Eastern attributional style. In contrast, those who were exposed to American cues made more dispositional attributions (i.e., explanations using factors internal to the actors), a prototypically Western attributional style (Hong, Morris, Chiu, & Benet-Martínez, 2000). These findings demonstrate that making salient one identity facilitates the accessibility of cognitive frameworks, knowledge, competencies, and skills related to that identity.

In the sections that follow, we build on these two key findings about social identities—that they define insiders and outsiders in a particular context and that different knowledge sets are made accessible when they are activated—to provide better insight into factors that facilitate and inhibit opportunities for psychological bricolage and entrepreneurial performance. Specifically, we argue that psychological bricolage may be more difficult for people who perceive conflict between their different identities. To the extent that multiple social identities are activated one at a time rather than simultaneously, it is less likely that the different knowledge sets tied to those identities will be made accessible simultaneously to enable psychological bricolage. Moreover, individual differences in the management of social identities affect how and when insider and outsider knowledge sets are activated.

Psychological Management of Multiple Identities: Identity Integration

Identity integration (II) represents one strategy that individuals use to manage multiple social identities. II refers to people's subjective perceptions of compatibility between multiple social identities.

Any one person belongs to many social groups at the same time—for example, one can be simultaneously a man, a Latino, a teacher, a volleyball player, and a Republican. Some of these identities do not pose any conflict with one another. It is not problematic to imagine someone who is both a teacher and a volleyball player. However, it is not infrequent for individuals to hold identities that, on their face, have conflicting values, norms, and expectations. For example, a person can identify with being both White and Black, both Republican and pro-choice, both a female and in a male-dominated profession, or both a New Yorker and a fan of the Boston Red Sox.

There is not a single way in which individuals negotiate among these conflicting identities. Roccas and Brewer (2002) proposed four general strategies individuals use to manage multiple social identities: *intersection* (for example, our New Yorker who is a Red Sox fan will identify only with other New Yorkers who are also Red Sox fans), *dominance* (the same person, if she has a dominant "sports" identity, will identify with other Red Sox fans), *compartmentalization* (she will identify with either New Yorkers or Red Sox fans, depending on external cues—e.g., the Red Sox fan identity will be activated at a baseball game), and *merger* (she will identify with New Yorkers and with Red Sox fans). Research on immigrants has established similar taxonomies to describe strategies individuals use to manage their home and host cultural identities: *assimilation* (identification with only the dominant or host culture), *integration* (identification with both cultures), *separation* (identification with only the ethnic or home culture), or *marginalization* (low identification with both cultures) (Berry, 1990).

Importantly, individuals who opt to identify with both of their conflicting identities—those who adopt the *merger* or *integration* strategies from the taxonomies describe—differ in their perceptions of compatibility between the social groups to which they belong (Benet-Martínez & Haritatos, 2005). II measures the degree to which individuals perceive two conflicting identities as compatible or as in opposition to each other (Benet-Martínez & Haritatos, 2005). Individuals with high IIperceive their two identities as largely compatible and complementary, but those with low II feel caught between their two identities and prefer to keep them separate. II is typically measured with the use of self-report scales. A sample item might be "I feel torn between 'Identity A' and 'Identity B' [referring to specific social groups with which individuals identify]."

Psychological research on II began with studies of biculturals, who are individuals who identify with two cultural groups that have conflicting values (e.g., Asian-Americans). Subsequently, II has been was extended to the examination of other types of social identities, such as gender, race, or professional identities (for a review, see Nguyen & Benet-Martínez, 2013). For example, women in male-dominated professions such as engineering who have high II feel that their gender and professional identities blend together seamlessly, whereas similar women with low II feel torn between these two identities and report feeling conflicted based on their dual membership.

Identity Integration and Creativity

Of particular importance to this chapter, II has been shown to predict levels of innovation and creative performance in multiple settings. A study of academics with multidisciplinary professional identities (e.g., someone who obtained a PhD in one discipline but has an academic appointment in another) found that those with high II (i.e., those who saw their disciplinary identities as compatible) had more publications than those with low II (i.e., those who perceived conflict between their disciplinary identities). To the extent that a successful publication record requires both novelty (original ideas) and integration of existing ideas (building on ideas, theories, or evidence that already exists), this study provides initial evidence that II may be related to creativity (Cheng, Sanchez-Burks, & Lee, 2013).

Other research has more closely examined how individuals with multiple cultural identities perform on creative tasks. One study found that, when performing a creative task that requires cross-cultural knowledge (e.g., coming up with a novel dish using both Asian and American ingredients), Asian-American biculturals with high II (i.e., those who perceived their Asian and American cultural identities as compatible) developed more dishes that were more creative—that is, more novel, useful, and marketable to customers—than those with low II. Importantly, biculturals with high II were more creative only when the task required knowledge from different cultures (cooking with ingredients from both cultures). When asked to come up with creative dishes using *only* Asian or *only* American ingredients, there were no differences in creative performance between those with high versus low II (Cheng et al., 2008).

In a follow-up study, Cheng et al. (2008) replicated this finding with ascribed and achieved

identities focusing on female engineers as examples of women in a male-dominated profession. Female engineers who had high II between their gender and their professional identity were more creative when designing a new cell phone targeted for women, but they did not outperform their counterparts with low II when designing a cell phone for a more general audience. These studies suggest that individuals with high II are not inherently more creative than those with low II. Rather, they are more creative *only* when knowledge relevant to the conflicting identities is required. For Asian-Americans, this may be cooking with Asian and American ingredients; for female engineers, it may be designing technological products for women. In summary, when individuals perceive their two identities as compatible, or have high II, they are more likely to integrate knowledge sets that are associated with these identities, facilitating their creative performance on tasks that draw on those disparate knowledge sets.

Revisiting Identity Integration through The Lens of Organizational Boundaries and Insider/Outsider Perspectives

Thus far, we have examined the potential to enhance creativity from the joint activation of two or more social identities. In this section, we contextualize this process. As noted earlier, psychological bricolage is related to individuals' ability to simultaneously activate conflicting or unrelated social identities and their associated knowledge structures. However, what is considered conflicting or unrelated identities may be different in different contexts. For example, in the context of a corporate strategy meeting, one's identity as a manager will be salient, but one's identity as Little League baseball coach will not. The first identity as a manager is an "insider" identity, insofar that it is highly relevant in this context. The second identity as a baseball coach is an "outsider" identity because it is generally viewed as irrelevant to this particular context.

Organizational boundaries often provide the main context to define insider and outsider identities. At a typical work setting, organizational or professional identities are considered insider identities, whereas other identities (e.g., gender, ethnicity, nationality) are often considered outsider identities. In work settings, knowledge and perspectives shared by other insiders or organizational members are activated and made more accessible, but unique knowledge that is presumably irrelevant to the organization is less likely to be made salient. Here, the opportunity to bring in a novel insight arises from drawing on one's existing knowledge that is *not* shared by other insiders within the organization. In the following section, we elaborate on this overarching framework to discuss how organizations can better promote the activation of outsider identities to foster creativity.

Strategies that Facilitate (and Inhibit) the Activation of Outsider Identities

One common way in which organizations attempt to integrate inside and outside perspectives is to bring in new individuals, such as consultants or new hires, to supplement existing members in the organization. Implicit in this practice is the belief that insiders and outsiders possess different knowledge sets and different experiences. However, the research on II suggests that outsider perspectives do not come exclusively from individuals outside the organization. Rather, insiders or current members of an organization have many outsider identities within them. In this sense, organizations already possess the outsider perspectives needed to facilitate creativity. Barriers to creative performance include organizational factors that inhibit the expression and integration of outsider identities and perspectives. Some of these forces are well documented in the research literature. For example, work on *Protestant relational ideology* and professionalism has shown that there exists a strong norm within work contexts to suppress employees' thoughts about and exhibition of non-work experiences and identities (Sanchez-Burks, 2005; Sanchez-Burks, Neuman, Ybarra, Kopelman, Park, & Goh, 2008). As such, non-work identities and their associated knowledge sets are less accessible for developing solutions to workplace problems (Higgins, 1990). The challenge for organizations, therefore, is to facilitate insiders' abilities to engage in psychological bricolage by leveraging their existing outsider identities and bringing the associated knowledge sets to the fore. This in turn requires dismantling some of the long-standing beliefs and norms that act as barriers to the activation of non-work–related identities in the workplace. In the next section, we outline several managerial practices that can achieve these goals.

Making Non-Work Identities Salient

Google's well-known management practice of requiring engineers to spend 20% of their time on "personal projects" is commonly considered a

catalyst for bringing employees' non-work identities, knowledge, skills, and competencies into the workplace (Mediratta, 2007). Indeed, just asking employees to discuss or think about identities outside their profession may be a way of making salient these outsider identities. These activities may be particularly useful during the ideation stage of the creative process.

Social psychological research shows that external cues such as perceptual stimuli (words, sounds, pictures) are often highly effective in activating different social identities. Simply working outside the traditional workplace—in a coffee shop, at home, in a park—exposes people to a myriad of non-work–related cues and may serve to make salient non-work identities during work. Cues such as attire can also activate outsider identities. For example, one study showed that asking people to wear causal clothing while performing a task can activate non-work–related psychological processes at work (Sanchez-Burks, 2005). In short, relatively simple interventions such as allowing employees more flexibility in where they work or allowing more causal work attire can attenuate the strong and pervasive boundary between our work and non-work identities.

Other organizational artifacts can also activate outsider identities to invigorate creativity. For example, when Bank of America acquired MNBA, Bank of America invested tremendous effort to retain MNBA's original organizational identity (Creswell & Dash, 2005). To the surprise of many MBNA employees, MBNA mottos reflecting their mission and culture remained on the office walls after the merger. The post-merger organization had two dress codes—a more formal one reflecting MBNA's strength in front-office operations, and a more casual one reflecting Bank of America's strength in back-office operations. This explicit policy to maintain an outsider organizational identity within Bank of America enabled the post-merger Bank of America to retain and integrate the outsider perspectives, skills, and knowledge brought in by MNBA employees. This practice of facilitating outsider perspectives in turn plays a critical role in enabling Bank of America to continuously experiment and innovate, a key competitive advantage for the organization (Lee, Edmondson, Thomke, & Worline, 2004).

When Insider Identity Strength can Inhibit Creativity

As described earlier, successful integration of insider and outsider identities lies in part in organizational members' openness to outsider perspectives and ideas. Successful integration may also be a function of employees' perceptions of their insider rather than outsider identities. A recent study exploring how multicultural experiences relate to creativity found that individuals who "glorified" their insider identity—that is, those who viewed their cultural in-group as superior to foreign cultures or cultural out-groups—had decreased levels of creativity after extensive multicultural experiences. In contrast, individuals who were just "attached" to their insider identity—those who identified with their cultural in-group but did not necessarily view it as superior to or better than cultural out-groups—experienced increased levels of creative performance after extended multicultural experiences (Clerkin, 2013).

This finding shows that the nature of a person's insider identity may be an important factor that influences his or her ability to integrate outsider identities and engage in psychological bricolage. Organizations need to walk a fine line between increasing attachment to the organization among their employees without inducing glorification. Indeed, glorification of one's organization—seeing one's in-group as superior to the out-group—can lead to positive illusions about insiders' perspectives and negatively biased perceptions of outsiders' perspectives as inferior. This creates barriers to psychological bricolage and highlights a possible downside of unquestioning pursuit of higher levels of organizational identity from employees. New employees go through intensive socialization to the organization's culture and norms; rituals and artifacts are introduced to reinforce and delineate a clear boundary between inside and outside identities and perspectives. Such tactics may be effective for building cohesion, loyalty, commitment, and citizenship behaviors, but research suggests that they may also reduce psychology bricolage and, in turn, creativity.

Mere Exposure to Outsider Perspectives Versus Integration of Identities

It is commonly assumed that exposing insiders, such as organizational employees, to outsider perspectives can increase creative performance. For example, organizations might encourage their employees to train outside the organization to learn "best practices" from other organizations. However, recent research suggests that mere exposure without identification can potentially undermine effective psychological bricolage. This is supported by studies examining the integration of multiple

cultural identities. For example, Asian-Americans who have lived for at least 5 years in an Asian country and 5 years in the United States, and therefore have substantial exposure to both cultures, nevertheless can have low levels of II between these cultural identities and in turn may exhibit lower levels of creativity on tasks requiring both Asian and American knowledge.

In addition, there are empirical data showing that multicultural experiences alone (e.g., such as living in many countries starting at a young age, participating in study-abroad programs) can lead to *lower* levels of flexibility and openness if exposure is not accompanied by identification with the different foreign cultural groups (Hanek, Lee, & Brannen, in press). Presumably, being exposed to another culture (without identification with that foreign culture) can highlight ways in which the foreign culture differs from one's home culture, and this *decrease* the likelihood that outsider identities or perspectives will be integrated.

Given this research, it appears that simply introducing outsider perspectives, knowledge, and expertise within an organization may do more harm than good when it comes to increasing creative performance. Such interventions might reinforce the differences between outsider and insider identities, making it more difficult for outsider perspectives to be brought to bear on innovative endeavors. In other words, just knowing about a different, contrastive perspective often makes salient the polarization between the different groups and social identities, reinforcing the belief that multiple identities and related knowledge sets are unbridgeable.

Generalized Identity Integration: Cross-Domain Individual Difference for Creativity?

Although we have focused thus far on how integration of insider and outsider identities supports psychological bricolage, there may be ambiguity about which of numerous outsider identities are most critical for the creative task at hand. In prior empirical research, the critical outsider identity is often made explicit by the research design. For example, when researchers examine how people create innovative fusion dishes in America, we know that an Asian culinary perspective is a useful outsider perspective for this specific task. Or, when we study how people design a new cell phone for women, it is understood that a female perspective is a useful outsider perspective to complement the insider/engineer perspective. However, there are many creative challenges in which it is unclear which outside perspectives and knowledge sets might facilitate creativity. For example, when designing a new cell phone for an unknown or shifting target market, it is not clear which outsider identity should be brought to bear during the creative process.

This issue is partially addressed by emerging research on "generalized identity integration" (GII), an individual difference measure of how people generally manage their multiple identities, regardless of what those identities are (Hanek, 2013). In essence, individuals high in GII have lowered barriers for activating any and all outsider identities in regard to an organizational task. For example, when designing new cell phones, an engineer with high GII would have heightened access to many, if not all, of her outsider perspectives—being a woman, a Latina, a Buddhist, a bird watcher, and so on. Such an engineer may show higher levels of creativity in multiple tasks, each drawing on different outsider-related knowledge sets. Individual differences in GII suggest the possibility that organizations need not define, a priori, the domain of the outsider identity that is needed to increase creative performance for any given task. This also suggests that GII may be an important trait for organizations to consider when recruiting for positions that require high levels of creativity.

Lessons for Mergers and Acquisitions

The example of the merger of Bank of America and MBNA underscores the point that bringing in outsider perspectives (e.g., through mergers) without retaining and integrating the associated outsider identities may do little to advance organizational creativity and innovation. Indeed, mergers and acquisitions are common strategies used by business firms to bring in outsider knowledge sets so as to generate innovation. The merger of Sprint and Nextel, for example, was based on a strategic decision to combine cell phone technology (Sprint's expertise) with walkie-talkie technology (Nextel's expertise), and the acquisition of YouTube by Google was similarly touted as a way to combine search engine technology (Google's expertise) with multimedia/video material (YouTube's expertise). However, prior research has provided equivocal evidence that mergers and acquisitions successfully increase organizational creativity and innovation. Indeed, studies have found that mergers and acquisitions are just as

often predictive of lower rather than higher levels of innovation (Cassiman, Colombo, Garrone, & Veugelers, 2005).

The II perspective suggests that one reason for this failure: after the merger, most firms are quick to create a new, unified "insider" organizational identity, often at the expense of the pre-merger "outsider" organizational identities. Employees brought into the parent organization are often expected to adopt the organizational identity of the parent organization and abandon the one associated with their former organization. Unfortunately, suppression of the outsider identity makes knowledge, expertise, routines, and networks associated with the former organizational unit inaccessible. Ironically, this undermines the underlying rationale for the merger, which is bringing together insider and outsider expertise and knowledge sets (*not* abandoning prior expertise and knowledge). In effect, policies that retain and integrate insider and outsider organizational identities may be a critical post-merger strategy that enables organizations to reap the elusive benefits of a merger.

This idea is consistent with a study in which multicultural employees with different cultural identities exhibited higher global skills *only* when the organization had a diverse rather than a unified identity (Fitzsimmons, 2011). In contrast, when organizations embraced a singular organizational identity, the various cultural skills that multicultural employees brought with them were dampened. Further, employees who did not identify strongly with the organization for which they worked were better able to counter the attenuating effects of a unified organizational identity, and their diverse skills were more likely to be employed. It seems reasonable, therefore, to suggest that organizations that want to leverage the diverse knowledge inherent in their employees' outsider identities need to allow for more variegated and even contrasting organizational identities.

Entrepreneurship and Identity Integration

Like other creative endeavors, entrepreneurship entails generating and developing ideas that are both new and useful (Ward, 2004). As such, psychological bricolage may be a helpful framework for understanding entrepreneurial behavior. Mitchell, Busenitz, Lant, McDougall, Morse, and Smith (2002) introduced the concept of *entrepreneurial cognition*, which focuses on "the knowledge structures that people use to make assessments, judgments, or decisions involving opportunity evaluation, venture creation, and growth" (p. 97). We suggest that psychological bricolage may an important mechanism that enables entrepreneurial cognition. Arguably, integrating knowledge structures related to multiple identities can enable the conceptualization of new means, ends, or means–ends relationships, which are defining characteristics of entrepreneurial ventures (Eckhardt & Shane, 2003).

Summary

In this chapter, we introduce the notion of psychological bricolage to provide an overarching framework for understanding the individual processes underlying creativity. Recent studies have shown that individuals who are able to integrate multiple and conflicting social identities are better able to bring together different sets of knowledge to improve creative performance. These studies have included, among other groups, people with multiple and conflicting cultural identities and people with multiple and conflicting gender, class, and professional identities. Psychological bricolage describes the common experience across these samples of managing multiple and conflicting social identities.

Our exploration of psychological bricolage leads us to several conclusions that extend and challenge common assumptions in theory and practice. First, we propose that the differentiation and integration of insider versus outsider identities provides a general framework to understand previous research. For example, within the United States, one's "insider" cultural identity means being American, but one's "outsider" cultural identity may refer to being Asian. For women at work, one's professional identity is the "insider" identity, but one's gender may be seen as an "outsider" identity. Because insiders and outsiders have access to different knowledge relevant for different types of tasks and situations, integration of insider and outsider identities is a critical factor that engenders creativity.

Second, existing organizational research suggests that organizations benefit from employees' identifying with the organization. Organizational identification has been shown to relate to a multitude of positive outcomes, ranging from organizational citizen behavior to commitment (Mael & Ashforth, 1992; Feather & Rauter, 2004; Van Dick, Grojean, Christ, & Wieseke, 2006). Our discussion of psychological bricolage, particularly as it relates to insider and outsider identities, suggests that a strong organizational identity can also have downsides. Specifically, reinforcing

the insider identity of employees can weaken outsider identities, making the knowledge associated with outsider identities less accessible in organizational settings. Indeed, this chapter questions the assumption that a singular, monolithic, and stable organizational identity is ideal and suggests strategies organizations can use to blur the constraints of insider identities and thereby facilitate their integration with outsider identities.

In conclusion, insiders seeking novel solutions to problems can benefit from outsider perspectives, even when they reside within one's own mind. The holy grail of increasing creative performance does not necessarily lie in the development or recruitment of individuals with extraordinary creative talent; rather, it entails leveraging employees' existing and broad repertoires of outsider identities beyond those associated with the organization. Organizations that can facilitate the activation of outsider identities, and weaken the norms that inhibit them, are better able to leverage psychological bricolage to enable creative performance, innovation, and entrepreneurship.

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CHAPTER

7 The Role of Antagonism in the Identities of Professional Artistic Workers

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Abstract

Through a review of empirical case studies, we examine the identities of professional artistic workers (i.e., a subset of professional creative workers who perceive themselves as creators of unique outputs that embody personal, artistic visions). To affirm their social identities at work, professional artistic workers appear to desire and signal exclusion from normative professional identity categories (e.g., corporate, or commercial) that they perceive as antagonistic to their social identities. Further, they appear to consistently signal such identity antagonism, over time, to maintain the authenticity of their social identities. These findings suggest that explicit and sustained identity antagonism may be essential to the maintenance of artistic workers' social identities in professional work settings. Based on these findings, we develop a framework describing the role of antagonism in the identities of professional artistic workers. We discuss the implications of this framework for understanding and managing artistic workers in professional contexts.

Key Words: creative workers, artistic workers, professional identity, antagonism

Introduction

Increasingly, organizations have turned to professional creative workers—that is, "people who add economic value through their creativity" (Florida, 2002, p. 68)—to gain a competitive advantage in their industries (Florida, 2002, 2005). Creative workers are thought to be the source of innovative ideas, which provide one of the few nonreplicable strategic advantages a firm can attain (Amabile, 1988; Oldham & Cummings, 1996; Styhre & Eriksson, 2008). Over time, the perceived benefits of creative workers have led some firms to hire highly artistic individuals (i.e., designers, writers, graphic artists) into traditional professional roles as a means of promoting innovative thinking (Elsbach & Flynn, 2013). These "professional artistic workers" are the subject of this chapter.

Professional Artistic Workers

> We spend a lot of time on a few great things. Until every idea we touch enhances each life it touches. We're engineers and artists. Craftsmen and inventors. We sign our work. You may rarely look at it. But you'll always feel it. This is our signature. And it means everything. *Designed by Apple in California*.
>
> *—Excerpt from newspaper advertisement, Apple Inc., 2013*

Organizational researchers have found that some professional creative workers perceive that they possess "artistic identities" at work (Feist, 1999; Fletcher, 1999). As suggested in the Apple advertisement, these workers perceive themselves as *creators of unique outputs that embody personal, artistic visions*. For example, in a recent study of toy designers, Elsbach and Flynn (2013) found that many of these designers defined themselves as "artists" who preferred to work independently on creative projects that they could own and control as a means of fulfilling their individual artistic visions at work (e.g., making the coolest new toy car with

great styling and ingenious performance features). These artistic designers contrasted with other toy designers who self-defined as "problem-solvers" and saw their primary creative contributions as refining the ideas of others, adding expertise to a collaborative group, or helping to mold a creative idea into a marketable product.

In this way, self-defined artistic designers seemed to approach their work in line with the methods of the stereotypical creative genius—designing with unconventionality, nonconformity, independence, rebelliousness, and idealism (Kasof, 1995)—whereas the problem-solving designers seemed to approach their work in line with stereotypes of corporate professionals—designing with conscientiousness, flexibility, and rationality (Chung-Herrera & Lankau, 2005). These findings fit with extant research that has defined the two primary approaches to creative work as an artistic approach, which involves independent work, unconventional thinking, and revolutionary insights, and a problem-solving approach, which involves integrating and organizing existing ideas and finding practical solutions to creative problems (Gluck, Ernst, & Unger, 2002; Ivcevic & Mayer, 2006).

An examination of professional artistic workers in extant literature (discussed in more detail later) reveals two interesting findings. First, in professional work contexts, such artistic workers appear to suffer identity threats (i.e., instances in which the integrity of their self-concepts is called into question by events or actions that are at odds with those self-concepts) more often than do creative workers who take a problem-solving approach to their work. Second, many of these identity threats seem to arise out of conflicts between the norms and expectations associated with artistic identities and those associated with more traditional corporate or professional identities. As noted by Jeremy Isaacs, General Director of the London Royal Opera House—who employs numerous creative workers to design and build sets and costumes for opera and ballet productions,—"The problem of employing creative people in an organisation which in any sense is an industrial one is that their creativity sometimes needs to be tempered to the constraints within which the organisation is able to work" (quoted in Fletcher, 1999, p. 68).

In the following sections, we examine these findings in more detail and construct a framework describing the identities of professional artistic workers that may be useful for managers. In general, our framework suggests that managing professional artistic workers requires an understanding of the central role of *antagonism* (i.e., a state in which opposing forces, such as opposing identity norms, are at work) in the identity processes of these workers. We begin our discussion with a definition of antagonism and its relevance to social identity.

Antagonism and the Identities of Professional Artistic Workers: Insights from Empirical Research

Social antagonism has been defined as situation in which "an identity 'A' is threatened by the antagonistic forces of another identity, 'anti-A' "(Trent & Gao, 2009, p. 255). In a similar vein, Wenger (1998) argued that "identity is defined, in part, through the practices we do not engage in; together, participation and non-participation shape identity" (quoted in Trent & Gao, 2009, p. 266). Finally, Delbridge (1998) stated that identity construction at work proceeds through a framework of structured antagonisms (e.g., being in control vs. complying with management) that confront workers on a daily basis.

Together, these arguments suggest that antagonism between "who we are" and "who we are not" is a central and ongoing process in the development and maintenance of social identities. As we illustrate below, empirical research appears to support this suggestion. Further, this research suggests that professional artistic workers are especially likely to rely on antagonism in the affirmation of their identities at work.

In the following sections, we use a review of empirical case studies to first examine *why* antagonism is central to the affirmation of social identities in general, and of professional artistic workers' identities in particular. Next, we use these empirical studies to examine just *how* antagonism is used in the affirmation of professional artistic workers' identities by delineating the specific roles antagonism plays in this process. We conclude by presenting a framework that illustrates the role of antagonism in the identities of professional artistic workers.

Why Antagonism Is Central to the Affirmation of Professional Artistic Workers' Identities

The notion of antagonism in social identity processes is not new. In particular, frameworks of social identity have suggested that antagonism may be central to the creation and maintenance of many group and organizational identities (Tajfel & Turner, 1986). Further, studies of identity

maintenance in social groups have shown that antagonism is often important to these processes (Brown, Kornberger, Clegg, & Carter, 2010; Clarke, Brown, & Hailey, 2009; Hackley & Kover, 2007; Livingtston & Haslam, 2008). This research suggests at least two reasons why antagonism may influence social identity affirmation in general and the affirmation of professional artistic workers' identities in particular.

Antagonism and identity affirmation in general. A first reason why antagonism may be central to identity affirmation processes in general is that group members may want *to signal exclusion from specific categories that are seen as antagonistic to their social identities*. In this vein, research on social *disidentification* (Elsbach, 1999; Elsbach & Bhattacharya, 2001) has shown that group members may define who they are, in part, by signaling who or what they are not. For example, Gioia, Price, Hamilton, and Thomas (2010) described the how such a *via negativa* approach—that of coming to define "who we are" by first defining "who we are not"—was an important step in the identity formation process for a new school of information science and technology that arose within a large state university. They revealed how faculty and staff of the new school spent a lot of time, early on in the construction of their collective identity, discussing "who we're not." As the Dean of the new school noted (Gioia et al., 2010, p. 14):

> The first two years were who or what we weren't—it was some version of identity by exclusion. We weren't computer science, we weren't library science, and we weren't MIS. Everyone was always speaking in the negative—in the sense of articulating to ourselves who we aren't, not who we are.

In this case, the members of the new school may have been responding to implicit comparisons between their school and other, more traditional schools. In such contexts, if there are perceptions of rivalry or competition between two groups (e.g., the new school is competing for students and funding with traditional schools), researchers have found that there is an unconscious tendency for members of one group to distance themselves from the other (Spears, Gordijn, Dijksterhuis, & Stapel, 2004). As Spears et al. (p. 605) put it, "People automatically distance themselves from outgroup attributes when intergroup antagonism is cued or chronic."

This type of distancing may have been especially likely in the study by Gioia et al. (2010) because, as a part of a traditional university with traditional schools of computer science and engineering, the founders of the new school may have feared that they would be mistakenly categorized as one of those traditional schools. As a consequence, they signaled that they were *not* a traditional school.

In a related manner, Clegg, Rhodes, and Kornberger (2007) described how members of the emerging industry of business coaching used distinctive and opposing self-categorizations (e.g., "not consultants") in defining their collective identity. This occurred because members of business coaching firms perceived that their firms were often mistaken for consulting firms. As Clegg et al. (p. 501) reported, "The coaches note some confusion among their clients about the differentiation between consulting and coaching, a distinction that is the very stuff of their identity."

A second reason why antagonism may be central to general identity affirmation processes is because group members may want *to signal the authenticity of their social identities.* According to psychologists, to be authentic, we must align our internal experiences (e.g., values, beliefs, feelings) with our external expressions (Avolio & Gardner, 2005; Wood, Linley, Maltby, Baliousis, & Joseph, 2008). Thus, given that some groups are defined as the opposite of others (e.g., not-for-profit), the authenticity of these groups may involve expressed antagonism toward their opposing groups.

In this manner, Fiol, Pratt, and O'Connor (2009) described how the identities of some groups within organizations (e.g., pilots vs. airline executives in an airline company) were maintained over time through intractable identity conflicts in which the identity of one group was defined as the negative of the identity of another group (e.g., pilots defined themselves as non-management). In these cases, the authenticity or legitimacy of one group's identity was dependent on its rejection of the opposing group's identity.

In the same vein, Trent and Gao (2009) described how second-career teachers (i.e., teachers who had had a previous career in business, engineering, or some other field) in Hong Kong defined their unique teaching identities ("At least I'm the type of teacher I want to be") through their opposition to traditional teaching identities. Again, the authenticity of these second-career teachers' identities rested on expressing antagonism between this identity and that of traditional teachers. As one second-career language teacher remarked (p. 261):

> I'm the opposite of the traditional Hong Kong teacher; [who is] very strict, rigid, do past (exam)

> papers all the time. I'm seen as different. I think I would describe my image at school as an "out-of-the-box" teacher. I try to be more creative. I try to be an inspirational teacher. I connect with my students and show them how language is used beyond the classroom and beyond the exam.

Together, these findings suggest at least two reasons why antagonism may be useful for affirming social identities in general. First, *desires for exclusion from antagonistic categories* may be a driving force in identity affirmation for members of a collective that is defined in opposition to those categories. Second, group members may engage in long-term and continuous social antagonism with an opposing group *to affirm the authenticity of their social identities*.

Antagonism and identity affirmation for professional artistic workers. Although these roles of antagonism in identity affirmation may occur in other groups, we suggest that they are especially likely to arise among groups of professional artistic workers. That is, we propose that professional artistic workers may be especially likely to feel the need to be (1) excluded from categories they perceive as antagonistic to their social identities and (2) engaged in long-term, consistent antagonism with opposing groups to maintain the authenticity of their identities. We suggest that antagonism plays a central role in identity affirmation for these workers for the following reasons.

Professional artistic workers desire exclusion from antagonistic categories. First, in their self-definitions, professional artistic workers appear especially likely to desire exclusion from categories that they perceive as antagonistic to their social identities. Research on the identities of artistic workers reveals that they, like members of other work groups, define themselves according distinctive social categorizations (see Bain, 2005; Feist, 1999; Petkus, 1996). Yet, the specific *types* of distinctive identity categorizations used by artistic workers appear to be unusual because so many of them are *exclusionary categories* (i.e., categories whose core meaning is based on exclusion from another group—such as "non-smokers"). Researchers have found that professional artists commonly define themselves as outsiders (Brooks & Daniluk, 1998; Empson, 2013), non-conformists (Kasof, 1995), non-tradtionalists (Eikhof & Haunschild, 2007), uncollaborative (Elsbach & Flynn, 2013), and non-managerial (Jemielniak, 2008). As one artist in Brooks and Daniluk's (1998) study noted "I definitely view myself as an outsider. As a woman and as an artist. I still feel that I'm not a mainstream operator, by choice and inclination" (p. 251).

These types of exclusionary categorizations appear to arise, at least in part, because professional artistic workers perceive professional characteristics and behaviors to be impediments to creativity. As a result, being aligned with the category of "professional" (including its stereotypical traits) would be a clear signal that one possesses characteristics that are antagonistic to creativity. As Hackley and Kover (2007, p. 70) mentioned in their study of artistic workers in an advertising agency:

> No interviewee mentioned *any* agency practice that facilitated or supported creativity. The implication was that creative excellence was achieved by creatives *despite* agencies and clients, not *because* of them. In short, "How can I be creative if I start to think like an MBA?"

A second and related reason why professional artistic workers may be especially likely to engage in acts that signal exclusion from professional categorizations is that they may perceive that they are morally superior to most other professional workers. In this vein, psychologists have found that perceptions of moral superiority are associated with the acceptance of norm-breaking behavior among group members (Iyer, Jetten, & Haslam, 2012) and especially among creatives (Bierly, Kolodinsky, & Charette, 2008). Thus, artistic workers who perceive their group is morally superior to other groups may be unafraid to engage in norm-breaking behaviors (which might exclude them from seemingly desirable professional categories) because they feel that their moral superiority protects them from any negative evaluation. In this manner, the maestro in Marotto, Roos, and Victor's (2007) study of a professional orchestra discussed how conforming to professional norms for politeness during rehearsals was not necessary because getting the music right was a more worthy cause. As he put it (p. 395):

> Music isn't just a pursuit; it's a "sacred endeavor." When we enter a rehearsal, we are not in a rehearsal hall but rather a church. . . . Our act of making music together is not simple matter during which I need to pay any attention to or care about niceties toward anyone, because the stakes are too high.

A third and final reason why professional artistic workers may be especially likely to signal exclusion from antagonistic categorizations is that they may be especially fearful of being mistakenly categorized

as corporate, commercial, or customer-focused. Such fears may arise because, simply by working in a professional environment where concerns about financial viability, consumer preferences, organizational status/reputation, and collegial work behavior are salient and considered most important in work decisions, artistic workers risk being aligned with these professional characteristics.

Extant research shows that professional artistic workers, in response to these fears, take great pains to maintain antagonism between their identities and corporate categorizations to make clear which categories they do and do not belong to. For example, in their study of a Scandinavian architectural firm, Brown et al. (2010) noted that many of the architects bristled at the thought of being perceived as service providers who merely carried out the orders of clients. Instead, these artistic professionals claimed to take on only projects that "are interesting to us." As one architect noted (Brown et al., 2010, p. 538):

> [Our firm] is definitely not a service provider. . . . I think you are, if you are an architect, you go in and you look at a brief and you see much more than what you're given. And you've then got to develop, you've got to develop that. And so someone might come up to you and say "right, I want this house built." And you say, well that's a completely missed opportunity. What you should be doing is this.

Similarly, in their study of artistic workers in an advertising agency, Hackley and Kover (2007, p. 68) noted that artistic workers "carved out self-respect by setting their values *at odds* with those of their employer." Hence, some of these workers distanced themselves even more from the commercial ethos, speaking repeatedly of advertising as "bullshit" and of their preference for the superior values of art and literature.

Professional artistic workers engage in consistent antagonism to appear authentic. In addition to expressing antagonism to signal exclusion from undesired identity categories, we suggest that professional artistic workers may be especially likely to engage in long-term antagonism with opposing groups to maintain the authenticity of their identities (Brooks & Daniluk, 1998; Svejenova, 2005). This is because, in areas that lack objective, evaluative standards—such as artistic pursuits—authenticity is seen as critically important in denoting the value of outputs (Peterson, 2005). Artistic workers may be strongly motivated to maintain antagonism toward professional identity dimensions as a means of affirming the authenticity of their artistic approach to work. To signal that their work is not contaminated by corporate motives for marketability or commercial outputs, artistic workers may engage in consistent claims that "we are artists—not managers" (Brooks & Daniluk, 1998).

The use of such consistent antagonistic claims may be especially likely when artistic workers face strong pressures to become more professional. As Brown et al. (2010, p. 543) observed about many of the artistic architects in their study: "Asserting creativity is a *constant* refrain [emphasis added]; even when the architects bemoan that they are not being creative they are positioning themselves not in terms of who they are [in that moment] but what they aspire to be." Similarly, in her study of a professional filmmaker's struggles to preserve his artistic identity in Hollywood, Svejenova (2005, p. 965) noted:

> The very success and fame, which are usually associated with. . . . professionalism, may distort the interaction of the creative professional with different audiences and make it more difficult for him or her to continue being truthful to [his or her] own self.

Such comments illustrate the necessity for a sustained commitment to antagonism by artistic workers (i.e., an "us vs. them" or "hero vs. villain" positioning between themselves and business professionals) in order to maintain a sense of authenticity or being true to oneself in their identities (Svejenova, 2005). As Brown et al. (2010, p. 543) put it:

> While the hero is a potent trope in Western mythology that implicates superhuman abilities, for the junior architects at [the firm studied] the hero role that subjects enacted preserved the fantasy of artistic freedom in the face of bureaucratic art.

Summary. These findings and arguments explain why antagonism may be especially important to the identity affirmation of professional artistic workers. Specifically, they suggest that *professional artistic workers' identity processes rely on salient and sustained antagonism between the defining characteristics of the identity category "artists" and those of the opposing category "professionals"* (i.e., corporate or commercial). In the following sections, we provide further evidence of the role of antagonism in identity affirmation by illustrating *how* antagonism is used by professional artistic workers, on a daily basis to maintain their identities.

How Antagonism Is Used in the Affirmation of Professional Artistic Workers' Identities

Based on our review of extant research, we suggest that professional artistic workers use antagonism in two primary ways to affirm their identities. First, they use antagonism *to signal, to others, exclusion from unwanted identity categorizations*. Second, they use antagonism *to signal, to themselves, authenticity in their identities*. To each of these ends, we found that professional artistic workers may signal three types of antagonism: (1) antagonism between professional and artistic goals, (2) antagonism between professional and artistic evaluations, and (3) antagonism between professional and artistic work practices. We discuss these uses and types of antagonism next. A sampling of empirical studies illustrating the roles of antagonism in artistic workers' identity affirmation is displayed in Table 7.1.

Table 7.1 Evidence of the Role of Antagonism in Artistic Worker Identity Affirmation

Role of Antagonism in Identity Affirmation—Signaling Category Exclusion to Others	Role of Antagonism in Identity Affirmation—Signaling Authenticity to Self
Elsbach & Flynn (2013)—Qualitative study of corporate toy designers	
Antagonism Between Professional and Artistic Goals "I have been called incredibly headstrong on more than one occasion. It's because I am really trying to champion something of my own and keep the idea pure and uncompromised." (p. 527)	*Antagonism Between Professional and Artistic Goals* "I look at other artists and get inspired by their style or their quality of work and I am like I want to try to move that bar, I want to meet that standard but yet still make it my own style . . . and really that is my ultimate happiness—just doing art for myself. I can draw a cool car now and I can render it and it looks photo real and it is all nice, and that's what makes me happy." (p. 528)
Antagonism Between Professional and Artistic Work Practices "I find it very hard to let someone else take control of a project that I have started working on. Once I have an idea going, I think 'this project is mine.' " (p. 527)	"[Marketing] have done things to the [X toy] line that I absolutely would not do, and they have made it a horrible toy. I think that toy line is going to die because they haven't followed the ideas I started with. Now some new group is going to pick it up and do their own things to it, and make it something that it's not meant to be. I believe I know why that toy was successful, but it's not my call anymore and somebody else is going to take it in a different direction and the key ideas are going to get diluted and lost. And it was a success in the first place because of that singular vision that I had." (p. 534)
"Like when it comes to styling or feature help, you know, I sometimes can be abrasive to taking help, you know, because that's my thing . . . because I feel I should own that whole arena of styling on my designs." (p. 535)	*Antagonism Between Professional and Artistic Work Practices* "I don't want to ask for help. It is just my nature to take ownership. At the end of the day, someone has to have the passion to make sure it is going to be done and be accountable that it is going to be done right, and if you don't take ownership that is not going to happen." (p. 528)
Beech, Gilmore, Cochrane, & Grieg (2012)—Qualitative study of professional opera house	
Antagonism Between Professional and Artistic Evaluation "It gets frustrating when you know the director has a different opinion. . . . It's a lot easier if everyone just said things rather than pretending to come to some kind of group conclusion. . . get things out in the air. . . . be blunt." (p. 44)	*Antagonism Between Professional and Artistic Goals* "[For one opera singer] a singing career was not simply something she wanted to 'achieve,' it was also something that she felt she needed to do in order to express herself or play out her 'destiny'. . . . She it expressed it as follows: 'I do it because I love it. . . . no other way to describe it.' " (p. 43)
"I felt like I was being crticised for being me and for my vision. . . . an aria I've sung for years. . . . I'd really thought about it. . . . what I wanted." (p. 44)	

Table 7.1 Continued

Role of Antagonism in Identity Affirmation—Signaling Category Exclusion to Others	Role of Antagonism in Identity Affirmation—Signaling Authenticity to Self
Brown, Kornberger, Clegg, & Carter (2010)—Qualitative study of architects in UK firm	
Antagonism Between Professional and Artistic Goals "Yeah you do [win pitches], but at the same time that pitch was what we wanted to do and it just happened to coincide with what the client wanted to do. I think that's very much what, in competitions and things like that, that Oban [director] goes for. It's very much the attitude is well we're going to present a project that—well, obviously we look at the brief, but our interpretation of the brief is very much our interpretation of the brief, it's not the client's. It's not another architect's, it's very much how we want to do the project." (Adam, associate director; p. 539) *Antagonism Between Professional and Artistic Work Practices* "Oban, a director, stressed that any formal office structure or defined routines would restrict creativity and interaction, and that structures and routines (such as job descriptions) should be kept to a minimum." (p. 533)	*Antagonism Between Professional and Artistic Goals* "I mean at the end of the day. . . we can't be making any money off that project. It's a beautiful design and the only reason I'm pushing for it is because it's a beautiful design, like we absolutely, you love the architecture so you push for it. But from a pure commercial sense it just doesn't make sense." (p. 531) "At EA staff talked about the importance of 'design conscience,' by which they meant working on unique and imaginative solutions to the technical problems they faced, their fixation on experimentation and exploration, and their lack of regard for issues of organizational efficiency." (p. 534) "As Kylie [graduate architect] said: 'I've never associated money with design time." (p. 537)
Styhre & Eriksson (2008) and Styhre & Gluch (2009)—Architects in Scandinavian firm	
Antagonism Between Professional and Artistic Goals "I do not know how to put it, but it is a strenuous fight to all the time defend the aesthetic and architectural values and the details, and so forth. And then you know that in the end, the contractor comes with a solution that is uglier and half as expensive and promotes the idea successfully for the client, and then the whole concept is gone and things become, we think, uglier." (p.229)	*Antagonism Between Professional and Artistic Goals* "I graduated in '86. Back then I studied art history in my leisure time and took courses in architecture history and architecture theory but since then things have changed. The work is taking over more and more. I have turned into one of those tired architects that I noticed when I was 25 years old myself. (Architect, SAO)" (p.230)
Jemielniak (2008)—Qualitative study of software developers in corporate context	
Antagonism Between Professional and Artistic Goals "Some software engineers may dabble outside the scope of the project if it interests them. 'Out-of-the-box' software engineers are sometimes the source of creeping requirements and technology churn." (p. 28) *Antagonism Between Professional and Artistic Work Practices* "Programmers are considered the worst dressed occupation of all industries. . . . However, casual dress—just like bohemian negligence—could also be an act of denouncing the form (in this case, the managerial uniform), resistance toward the standardization, and bracketing." (p. 31)	*Antagonism Between Professional and Artistic Goals* [Q:] Do you work at home? [A:] At home? No, definitely not. I mean, I do some hobbyist programming, but it is something totally else. . . . I move away from commercial and professional programming, and at home I can write, hmm, let's say a script that generates nice color pictures. And everybody know you can't do this at work, nobody really needs it, but such amateur projects give you a sense of satisfaction, that you are doing something interesting." (p. 26) "A person creates beautiful code when he wants to show 'I can do it, too!' So he writes a nice program, distributes it as an open source project on the Internet, and people say 'Hey, that's a smart guy to do something like that.'" (p. 27)

(*continued*)

Table 7.1 Continued

Role of Antagonism in Identity Affirmation—Signaling Category Exclusion to Others	Role of Antagonism in Identity Affirmation—Signaling Authenticity to Self
Hackley & Kover (2007)—Qualitative study of artistic workers in an advertising firm	
Antagonism Between Professional and Artistic Goals "One creative explained frankly that this is work [that] did not 'pander to consumers.' He wanted to produce work that resonated with 'people who feel the same as I do . . . I'm not trying to communicate with everyone out there.' " (p. 68) Other creatives distanced themselves even more from the commercial ethos, speaking repeatedly of advertising as 'bullshit', and of their preference for the superior values of art and literature." (p. 68) "Consumers and clients *respond* to creativity while creative professionals and artists *understand* it. Therefore the approval of the latter is seen as more intrinsically important." (p. 71) "If a creatives seems particularly close to non-creative workers, this might be interpreted negatively by other creatives." (p. 71) *Antagonism Between Professional and Artistic Evaluation* "When [approval] is obtained from non-creatives it is often received with suspicion as a 'sell-out', creating a potential tension in collegiality for creatives." (p. 72) "Creatives need the approval of clients and account executives, but this kind of approval is merely necessary to keep their jobs. The approval they *seek* is from peers in advertising who share their aesthetic sense. Industry awards are a powerful source of peer approval. . . . The plaque or trophy affirms creative *permanence*." (p. 70) *Antagonism Between Professional and Artistic Work Practices* "Interviewees expressed a need for psychological or physical 'space' to 'free your mind' to do their best work. They 'shut the door' to their office or 'walk around'. 'I prefer to work alone. . . I want silence. . . I always retreat for a while to my office. . . .' These creative professionals alluded to agency structures and strictures only as things to be resisted or evaded." (p. 69)	*Antagonism Between Professional and Artistic Goals* "The implication was that creative excellence was achieved by creatives *despite* agencies and clients, not *because* of them. In short, 'How can I be creative if I start to think like an MBA?" (p. 70) *Antagonism Between Professional and Artistic Evaluation* "This Interviewee, a published poet, seemed somewhat stung by comments he reported from a previous job that his work was a 'little bit too sophisticated.' He sought recourse in outside creative pursuits: poetry and prose writing. . . . There was a sense that creatives felt that advertising as a business could never understand their work in the way that other creatives could" (p. 68) "Creatives need approval, but they fear that some kinds of peer approval (such as that from clients or senior account directors) might be seen to threaten their professional integrity." (p. 71) *Antagonism Between Professional and Artistic Work Practices* "It is not merely out of perverseness that creatives resist many aspects of the organizational discipline to which most workers are subject. They feel that this resistance is fundamentally necessary to the integrity of their professional practice." (p. 69) "Creatives feel that their professional needs are not circumscribed by organizational bureaucracy: they transcend it. Interviewees . . . spoke of the importance of 'playing' with ideas and of 'getting out of the agency a lot . . . a lot of the ideas come to us at home.' " (p. 68)
Svejenova (2005)—Qualitative study of identity conflicts of filmmaker in Hollywood	
Antagonism Between Professional and Artistic Evaluation "The director explained that one of the reasons for that less favorable welcome in the USA was due to the impression his usual viewers, the 'modern' audience, had got of him becoming mainstream. According to the director, working with more financial resources had made his films less underground but not more mainstream." (p. 960)	*Antagonism Between Professional and Artistic Work Practices* "In Hollywood, the power is usually not with the film director but with the film studios, stars, and even the unions. Such a shift in power, Almodovar himself acknowledged, could hamper his 'way' of working through sequential filming, filming at all hours, having final say on the script and final cut of the film, deciding on posters, campaigns, and distributors. Hence Almodovar's reluctance to respond favorably to offers from Hollywood, where professional networks, chains of agents and organizational charts could limit his freedom." (p. 963)

(*continued*)

Table 7.1 Continued

Role of Antagonism in Identity Affirmation—Signaling Category Exclusion to Others	Role of Antagonism in Identity Affirmation—Signaling Authenticity to Self
Brooks & Daniluk (1998)—Qualitative study of professional women artists in varying jobs	
	Antagonism Between Professional and Artistic Goals "A basic issue confronted by all of the women [artists] as they forged their career paths was how to reconcile the necessity of earning money with the pursuit of personal and artistic freedom. Each woman made a unique decision about this matter, but all of them ultimately chose to give priority to freedom." (p. 253) *Antagonism Between Professional and Artistic Work Practices* "I definitely view myself as an outsider. As a woman and as an artist. I still feel that I'm not a mainstream operator, by choice and inclination. But I learn things that way as well. By being outside, you can see clearly I think." (p. 251)
Nemiro (1997)—Qualitative study of professional artists/actors/musicians	
	Antagonism Between Professional and Artistic Evaluation "I submerged myself so completely that I think I became fully present, and they [the audience] didn't matter in a way that was different. In other words, I wasn't playing to them and asking them, 'please, please like it.' [If you focus on] I have to get this job, there's a desperation there, and you lose your creativity."
Sinetar (1985)—Qualitative study of entrepreneurs in corporate environment	
	Antagonism Between Professional and Artistic Work Practices One [artistic] manager . . . arrives at work early each morning and makes coffee for everyone . . . . He then cleans up the coffee room before the custodians can get to it. He is oblivious to his company's unwritten social law that says senior executives must not engage in such activities. Thus, he unknowingly thwarts lower level employees' ego needs to do a job they feel is rightly theirs." (p. 58) "Another creative thinker . . . upsets subordinates and superiors alike by refusing all clerical help, including a secretary to answer his phone and type his letters. Instead, he scrawls all memos on yellow legal pads, unaware that his colleagues get irritated because of this and because they can't get in touch with him when he's away from his office." (p. 58) "Another entrepreneur, hired to help a corporation reconceptualize itself into new markets, spent the majority of his first year wandering about the halls, asking people vague, unanswerable questions. His incomprehensible approach alarmed fellow executives; more action-oriented business colleagues considered his constant probing a waste of time . . . . In time, the man successfully accomplished what he'd been hired to do. His style of handling the project, however, put him on thin ice even with those who'd hired him in the first place." (p. 59)

Using antagonism to signal, to others, exclusion from unwanted identity categorizations. Signaling exclusion from identity categorizations that run counter to professional artistic workers' identities appears to be done primarily for the benefit of others in the workplace (e.g., colleagues, clients, managers). These signals help to protect artistic workers from mistaken categorizations by others and provide a reminder to others about the superiority (moral and otherwise) of artistic workers compared to other professional workers. As noted earlier, we found three common types of antagonism signaled to others: antagonism between professional and artistic goals, evaluations, and processes.

Antagonism between professional and artistic goals. First, we found several examples of professional artistic workers using antagonism between their own artistic goals and the professional goals of their employers to signal exclusion from corporate or commercial categories. For instance, a number of the architects studied by Styhre and Gluch (2009) and by Brown et al. (2010) made it clear that their work goals were related to achieving artistic visions rather than consumer approval. For example, Brown et al. (p. 539) noted that one architect's own vision trumped that of the client:

> Well, obviously we look at the brief, but our interpretation of the brief is very much our interpretation of the brief, it's not the client's. It's not another architect's, it's very much how we want to do the project.

Similarly, Styhre and Gluch (p. 229) reported how one architect found the goals of contractors with whom the architects worked to be at odds with their own artistic goals:

> I do not know how to put it, but it is a strenuous fight to all the time defend the aesthetic and architectural values and the details, and so forth. And then you know that in the end, the contractor comes with a solution that is uglier and half as expensive and promotes the idea successfully for the client, and then the whole concept is gone and things become, we think, uglier.

These examples also indicate a disdain for professional goals and, as noted earlier, signal that artistic goals are in many ways superior to those of corporate managers. Such antagonism helps to affirm artistic identities as not only distinct but *positively* distinct from professional identities.

Antagonism between professional and artistic evaluation. Second, we found that artistic workers often signaled antagonism between the evaluative standards of corporate professionals and those of artists as a means of affirming their identities. Thus, approval and praise by "suits" and other members of the professional category was seen as evidence that an artistic worker has "sold out" (Hackley & Kover, 2007). By contrast, artistic workers made it clear that they considered evaluations from their peers to be the only legitimate appraisals they would recognize (Nemiro, 1997). As Hackley and Kover explained in their study of advertising artists (p. 70):

> Creatives need the approval of clients and account executives, but this kind of approval is merely necessary to keep their jobs. The approval they *seek* is from peers in advertising who share their aesthetic sense. Industry awards are a powerful source of peer approval. . . . The plaque or trophy affirms creative *permanence*.

One reason that evaluative standards are a target of antagonism for artistic workers may be that these workers routinely receive negative feedback about the commercial value of their work. In turn, they may align themselves even more strongly with artistic evaluative schemas as a way of protecting their identities from such negative feedback. This notion fits with psychological and organizational research on individual responses to threatened identities (Aronson, Blanton, & Cooper, 1995; Elsbach & Kramer, 1996), which shows that, if one dimension of a person's social identity is threatened, that person will prop up his or her identity by affirming an alternate identity dimension. Thus, artistic workers who are told that their work is not seen as commercial enough to satisfy clients (e.g., Styhre & Gluch, 2009) may respond to this feedback by claiming a strong affiliation with artistic evaluations (and exclusion from more commercial evaluations).

Antagonism between professional and artistic work practices. Finally, artistic workers appear to signal exclusion from undesired identity categories by using and making salient their unique work practices. In these cases, artistic workers attempt to make clear to others in the work environment that they are outsiders and should not be mistaken for managers or other corporate professionals.

In his study of artistic software developers, Jemielniak (2008, p. 31; see also Hearn, 2005; Kawasaki, 1990; Kidder, 1981) described some of the unique work practices of these artistic workers as follows:

> Programmers are considered the worst dressed occupation of all industries. . . . However, casual

> dress—just like bohemian negligence—could also be an act of denouncing the form (in this case, the managerial uniform), resistance toward the standardization, and bracketing.

Similarly, in their study of an advertising firm, Hackley and Kover (2007, p. 69) described the signals artistic workers sent about their identities through their work practices:

> Interviewees expressed a need for psychological or physical "space" to "free your mind" to do their best work. They "shut the door" to their office or "walk around." "I prefer to work alone . . . I want silence . . . I always retreat for a while to my office . . .". These creative professionals alluded to agency structures and strictures only as things to be resisted or evaded.

Using antagonism to signal, to oneself, authenticity in one's identity. While signaling antagonism to others appears an important means of identity affirmation for professional artistic workers, our analysis of extant case studies suggests that antagonism may be used, more often, as a *self*-affirmation tactic. In particular, it appears that artistic workers may act in ways that signal antagonism as a means of proving to themselves that they are authentic in their artistic identities. We provide examples of these self-affirming signals next.

Antagonism between professional and artistic goals. One of the greatest hurdles faced by artistic workers in professional or corporate environments was staying true to their artistic ideals and visions in work output. Numerous researchers have documented the pressures organizations place on artistic workers to make their work more practical, commercial, and inexpensive (see Fletcher, 1999). For example, Elsbach and Flynn (2013), described how toy designers—who often defined themselves in terms artistic categories such as "independent," "idealistic," and "rebellious" (see Bain, 2005; Feist, 1999; Jemielniak, 2008; Petkus, 1996)—were pressured to incorporate the ideas of others in their toy designs as a means of making those designs more commercially successful. For these artistic workers, being pressured to work toward more practical, commercial, and normative goals represented a direct threat to their identities.

We suggest that artistic workers, in order to cope with such threats, may sustain antagonism with corporate goals as a way of signaling to themselves that they are pursuing more idealistic (and artistic) goals. That is, artistic workers may deliberately work toward goals that are at odds with professional norms as a way of maintaining authenticity in their identities. In this vein, one toy designer in Elsbach and Flynn's (2013) study made clear that his ideals and goals for a specific toy design were at odds with the current direction that the marketing department was taking. As this designer put it (p. 534):

> [They] have done things to the [X toy] line that I absolutely would not do, and they have made it a horrible toy. I think that toy line is going to die because they haven't followed the ideas I started with. Now some new group is going to pick it up and do their own things to it, and make it something that it's not meant to be. I believe I know why that toy was successful, but it's not my call anymore and somebody else is going to take it in a different direction and the key ideas are going to get diluted and lost. And it was a success in the first place because of that singular vision that I had.

In some cases, the very "unprofessional" nature of their goals is what artistic workers most want to emphasize in their work. As DeFillippi (2009, p. 10) noted in his study of artistic media workers (i.e., people working in television, film, online media, and so on):

> People who make media tend to care more about their work than about salaries or job security. They see their employer or company more as a vehicle for their creative self-expression than anything else. They are also among the workers most likely to accept exploitive labor practices in order to get to do what they love to do. And yet they still sell their uncertain predicament to themselves and their friends as incredibly cool.

In other cases, artistic workers pushed toward less practical or less commercial goals despite their recognition that these goals are necessary. As one architect in the study by Brown et al. (2010, p. 531) noted:

> I mean at the end of the day . . . we can't be making any money off that project. It's a beautiful design and the only reason I'm pushing for it is because it's a beautiful design, like we absolutely, you love the architecture so you push for it. But from a pure commercial sense it just doesn't make sense.

Antagonism between professional and artistic evaluation. A second type of antagonism that artistic workers signal to maintain authenticity in their identities is antagonism between professional and artistic evaluation. In these cases, artistic workers may downplay or even refute the legitimacy of

professional evaluations of their work and remind themselves that it is the evaluation of other artists that counts. As one advertising artist in Hackley and Kover's (2007, p. 71) study remarked, "Consumers and clients *respond* to creativity while creative professionals and artists *understand* it. Therefore the approval of the latter is seen as more intrinsically important."

In addition, artistic workers may frequently remind themselves that they are not producing their work for the approval of consumers or other commercial audiences. Rather, they are seeking artistic fulfillment and approval that can come only if they ignore these audiences. In this manner, one musician in Nemiro's study of professional artists (1997, p. 234) claimed that her best work occurred when she didn't worry about audience evaluation: "[In this instance] I submerged myself so completely that I think I became fully present, and they [the audience] didn't matter in a way that was different. In other words, I wasn't playing to them and asking them, 'please, please like it.' "

Antagonism between professional and artistic work practices. Finally, artistic workers may engage in routine work practices that fit with and authenticate their identities as artists. In most cases, it appears that these work practices are not done to purposely signal antagonism to others, but to affirm to the artists themselves that they are working in an authentic manner. For example, in her 1985 description of creative workers, Sinetar discussed several examples of work practices by artistic types that were antagonistic to those of more professional workers (p. 58):

> [One] creative thinker. . . . upsets subordinates and superiors alike by refusing all clerical help, including a secretary to answer his phone and type his letters. Instead, he scrawls all memos on yellow legal pads, unaware that his colleagues get irritated because of this and because they can't get in touch with him when he's away from his office.

Similarly, in Elsbach and Flynn's 2013 study of corporate toy designers, one designer remarked on his steadfast refusal to engage in normative collaboration behaviors such as asking for help from teammates (p. 528):

> I don't want to ask for help. It is just my nature to take ownership. At the end of the day, someone has to have the passion to make sure it is going to be done and be accountable that it is going to be done right, and if you don't take ownership that is not going to happen.

As with the other antagonistic signals given by artistic workers to affirm the authenticity of their identities, these signals appear designed to convince workers that although they are working in a more professional context, their work behaviors remain true to their artistic roots. As Hackley and Kover (2007, p. 69) commented, "It is not merely out of perverseness that creatives resist many aspects of the organizational discipline to which most workers are subject. They feel that this resistance is fundamentally necessary to the integrity of their professional practice."

Summary. These findings suggest several ways that antagonism may be used in the affirmation of artistic workers' identities in professional work settings. Specifically, they suggest that *professional artistic workers may make claims or engage in acts that signal to themselves and others that they are not interested in corporate goals, evaluations, or work practices*. These tactics help professional artistic workers to avoid being misperceived by others and to maintain authenticity in their self-concepts.

A Framework of the Role of Antagonism in the Identities of Professional Artistic Workers

Together, the findings we have discussed provide a framework describing the role of antagonism in the identities of professional artistic workers. This framework is illustrated in Figure 7.1. In our final discussion, we examine the implications of this framework for theory and practice.

Discussion

Conflict and antagonism have been central components of social identity theory from its inception (Tafjel & Turner, 1986). Further, substantial empirical research has explored the roles of conflict and antagonism in identity maintenance (Clarke et al, 2009; Clegg et al., 2007). An interesting aspect of this research is that a considerable amount of it examines such conflicts in the context of artistic work (see Table 7.1). This does not appear to be an accident. Artistic workers seem to be disproportionately represented among those who feel that their identities are routinely threatened by pressures to act in normatively professional ways at work (e.g., pressures to be more pragmatic, commercial, and collaborative). Artistic workers, by their very nature, have identities defined by antagonism toward most professional workplace norms.

An implication of this notion is that antagonism should play an important role in frameworks

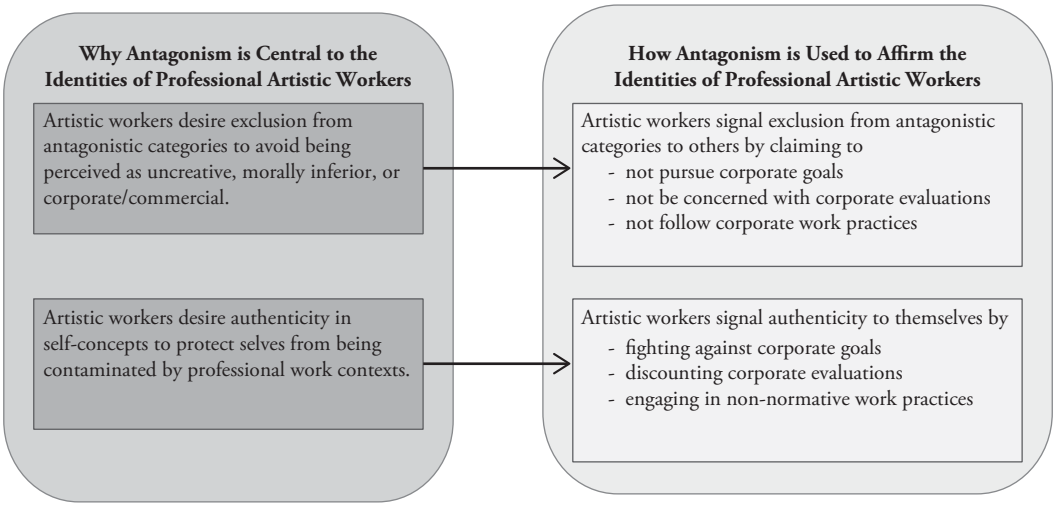

Fig. 7.1 The Role of Antagonism in the Identities of Professional Creative Workers.

of artistic workers' identities. Further, a greater focus on the role of antagonism may improve theoretical and practical frameworks for managing professional artistic workers in general, and it may relate to the broader literatures on innovation and entrepreneurship. We discuss these implications next.

Explicit Identity Antagonism and the Management of Professional Artistic Workers

> If it is the very insecurity and isolation of creative professionals in advertising that gives their work its resonance, then perhaps the industry has unwittingly produced its own optimum condition.
>
> —*Hackley & Kover, 2007, p. 75*

Theoretical implications and directions for future research. The primary theoretical insight to come out of our review of empirical research is that, in many cases, explicit and sustained identity antagonism might be essential to the maintenance of professional artistic workers' social identities. That is, as uncomfortable as antagonism may be, its presence may be necessary for professional artistic workers to be secure in their social identities and productive in their creative endeavors.

This notion adds a new wrinkle to frameworks of identity management in cases where individuals feel pressures to affirm multiple and competing identities at work. Extant frameworks have suggested three possible solutions to these pressures: (1) *identity integration* (Gotsi, Andriopoulos, Lewis, & Ingram, 2010), in which the individual finds a way to combine competing identities into a single meta-identity (e.g., "practical artist"); (2) *identity shifting* (Empson, 2013; Gotsi et al., 2010), in which the individual shifts between two opposing identities across time and location (e.g., being an artist during the initial idea-generation phase of a project and an engineer during the implementation phase); and (3) *identity separation* (DeFillippi, 2009), in which the individual maintains multiple identities in a hierarchical fashion but removes antagonism by privileging one over another (e.g., working for an organization but viewing oneself as an independent contractor, rather than an employee, to privilege an identity of independence over dependence).

Our framework adds a fourth solution, which might be labeled *explicit identity antagonism.* This involves maintaining a singular identity at work that is consistently at odds with an expected or normative work identity. This idea recognizes that for some artistic workers, the most effective means of maintaining their distinctive, exclusionary, and authentic identities is to be consistently in opposition to a normative, professional identity. Such a solution may not be possible for most employees (i.e., by definition, a majority of employees cannot be non-normative). Yet, as noted in the epigraph for this section, for highly artistic workers, it may represent an ideal means by which to be creative in a professional context.

The potential benefits of explicit identity antagonism are supported by research on identity affirmation and diversity in groups (Swann, Polzer, Seyle, &

Ko, 2004). In their study of graduate students engaged in a group task, Swann, Kwan, Polzer, and Milton (2003) found that group members displayed the most creativity when other group members recognized their unique and individual traits and thereby allowed them to verify their self-views. These findings suggest that calling attention to what is unique and different about individual group members may be important to enhancing both self-affirmation by those group members and their creative performance.

Our findings suggest that explicit identity antagonism may be one way of calling attention to what is unique and different about professional artistic workers in corporate work settings. Further, consistent with research on individual responses to identity threat (Aronson et al., 1995), our findings suggest that, if signaling antagonism in one area (e.g., evaluation) is useful in affirming the identities of professional artistic workers, these workers may feel less threatened when engaging in activities in a second area (e.g., pragmatic work practices) that might be inconsistent with their social identities. Aronson et al. found that, when subjects in an experimental study felt threats to their self-concepts with regard to the personality dimension of "compassion" (i.e., because they wrote an essay arguing against the expansion of services for disabled persons), they sought feedback about themselves that would affirm positive self-concepts with regard to a *different* dimension of personality (i.e., independence, objectivity, and sociability). These findings suggest that individuals may seek balance in affirming a positive self-concept and may be willing to engage in some self-discrepant behavior if they are given opportunities to balance that behavior with self-affirming acts.

Yet, these notions have not been tested directly. Future research is needed to assess the validity of these insights. In addition, research is needed to extend our framework of identity antagonism to more specific creative contexts. For example, we may need to explore the role of antagonism in affirming distinctiveness and uniqueness for creative workers who work on teams and groups (a common work practice in creative industries). Although it has been shown that intragroup conflict of any type is destructive (De Dreau & Weingart, 2003), recognition of identity differences may not, necessarily, lead to conflict. Future research might examine how one can leverage antagonism to affirm distinctiveness among artistic workers, yet avoid conflict between these workers and others when they work in teams or groups.

Future research may also need to examine how to maintain antagonism in creative industries that rely heavily on artistic workers. For example, in filmmaking, publishing, or high fashion, some firms or divisions within firms may find that artistic workers are the norm rather than the exception. Is it possible to signal and promote antagonism when an opposing group is not salient? Might artistic workers start to feel less distinctive (and thus less affirmed) if they are surrounded mostly by similar others?

According to social identity theory (Abrams & Hogg, 1990), group members will be motivated to maximize positive, intergroup distinctiveness as a means of maintaining positive self-concepts. This argument suggests that artistic workers will be motivated to maintain antagonism with other professional workers (who would be perceived as a comparative out-group) as a means of affirming positive self-concepts. Yet, the level of positive intergroup distinctiveness depends on the presence and salience of such comparative out-groups. Future research may need to examine how the ability to signal and perceive identity antagonism is related to the presence and salience of relevant out-groups.

Practical implications and limitations. In addition to the theoretical implications, a strategy of explicit identity antagonism may provide an effective tool for managers of artistic workers when the other three methods of identity management (i.e., identity integration, identity separation, and identity shifting) do not work. For instance, identity integration (Gotsi et al., 2010) may not be feasible for some highly artistic workers because these workers' identities were actually *formed* in opposition to professional identities. That is, the identities of some artistic workers were constructed to be the opposite of professional identities (i.e., non-commercial). Therefore, combining these two opposing identities makes no logical sense. Integration of professional and artistic identities might be as difficult as integrating the identities of smokers and non-smokers.

For different reasons, identity separation (DeFillippi, 2009) (i.e., keeping multiple identities but prioritizing one over another) may be an unsatisfactory solution for the management of artistic worker identities. In these cases, the goal is to remove antagonism by recognizing and supporting the superior identity (e.g., by providing creative

workers with alternative work arrangements that support artistic identities and remove pressures to behave professionally). Yet, based on our arguments, managers who remove antagonism from the work environment may also remove the most important means of affirming artistic identities.

Finally, identity shifting (Empson, 2013) may be difficult for some highly artistic workers because it is not easy for these workers to compartmentalize when they are being an artist and when they are being a professional business person. Numerous studies of creative and artistic workers have documented the nonlinear, all-consuming nature of artistic and creative thinking (Fletcher, 1999; Wallace & Gruber, 1989). It is often a process of repetition, revision, and rethinking, and as Wallace & Gruber (1989, p. 155) stated, it occurs not when it is convenient, but at any time: "Archimedes' famous insight occurred while he as having a bath, Poincare's when he was stepping onto a bus, Kekule's during a reverie, and Darwin's while reading 'for amusement.'" As a result, it may be difficult and undesirable for artistic workers to turn off their creative identities in order to turn on their professional ones.

By contrast, explicit identity antagonism may be a more effective means of affirming the identities of artistic workers because it does not ask artistic workers to compromise on their ideal self-concepts, nor does it remove an essential means of identity affirmation for these workers (i.e., sustained signals of antagonism between professional and artistic identities). In other words, situations that allow explicit identity antagonism provide artistic workers with greater identity affirmation: the experience of antagonism itself provides a signal that an artist's distinctive traits and characteristics are recognized (Swann et al., 2004, 2003).

Of course, there are obvious drawbacks to creating an environment that sustains constant identity antagonism. For example, disagreements about work practices and priorities are likely to arise in such environments. These disagreements must be managed and prevented from turning into disruptive relationship or task conflicts (De Dreau & Weingart, 2003).

Further, attention should be paid to how professional artistic workers are used in teams. Recent research has shown that teams with higher levels of team creative confidence—that is, a "shared understanding that the team is more creative than each team member individually" (Baer, Oldham, Jacobsohn, & Hollingshead, 2008, p. 257)—were more creative in their outputs than those with lower levels of team creative confidence. Because one of the defining dimensions of artistic identities is a preference for independent creative work (Bain, 2005; Petkus, 1996), it would appear that the presence of professional artistic workers on creative teams might decrease team creative confidence and creative output. Therefore, management of teams that contain artistic workers may require special attention to setting expectations and getting buy-in to the team process.

Finally, compensation and reward systems must be adapted to allow for both highly artistic and highly professional workers to be rewarded for their own contributions to the organization's success. Artistic workers may not need or want the same type of compensation as most professional workers (Hargadon & Bechky, 2006), and providing unique incentives to these workers might help to affirm their distinctive identities. Yet, differences in compensation between artistic and other professional workers must be clearly explained and accepted by all workers to avoid the perception that artistic workers are getting something "special" (Folger & Konovsky, 1989).

Linking Our Framework to Innovation and Entrepreneurship Literatures

In addition to its implications for creativity research, we believe our framework of the role of antagonism in the identities of professional artistic workers has implications for research and theory on innovation and entrepreneurship. In particular, because artistic workers are often part of teams constructed to create innovative and entrepreneurial outputs, we believe our framework has important implications for understanding these teams.

For example, our proposals about artistic workers' need for antagonism relate to recent research from the innovation literature on the *composition of innovative teams*. Innovation researchers have found that the most innovative teams (i.e., teams that are able to both generate and implement new ideas) are those that have a specific proportion of creative personality types versus more conformist personality types (Miron-Spektor, Erez, & Naveh, 2011). Innovation was found to be most likely when teams had a high proportion of creative members but also a moderate proportion of conformists (i.e., members who seek consensus and tend to comply with group rules and norms). In these innovative teams, conformists were necessary

to ensure group harmony and group potency (i.e., belief in the team's ability to accomplish its goals)—characteristics that can be lacking when a team is dominated by creative types.

Our framework suggests another reason why conformists may be important on creative teams: They help to demonstrate how artistic workers are distinct from more typical corporate professionals. That is, creative teams that combine artistic workers with conformists highlight the contrast between these types of professionals and help to affirm the antagonistic nature of artistic workers' identities. As a result, artists do not need to engage in more disruptive forms of antagonism (e.g., refusing to incorporate the ideas of others into creative projects) to affirm their identities. These insights may help innovation researchers to better explain the effects of diverse membership on innovative teams.

In addition, our framework about antagonism and artistic professionals' identities relates to the *structure and functioning of entrepreneurial teams*. In particular, research on new venture teams (i.e., teams made up of subgroups of new venture founders and investors) suggests that divisions or faultlines (Lau & Murnighan, 2005) may arise in these entrepreneurial teams due to differences in mental models (e.g., schemas of what the venture should look like) and structural characteristics (e.g., ownership share in the venture) across subgroups. Lim, Busenitz, and Chidambaram (2013) proposed that new venture teams with greater faultlines between subgroups will experience greater relationship conflict because members identify with their own subgroup and are biased against members of the other subgroup. Such conflict further affects the team by reducing knowledge sharing across subgroups and, ultimately, reducing the identification of business opportunities.

Our framework adds to these insights by suggesting an additional reason why faultlines may arise in new venture teams, especially if new venture founders perceive themselves as artistic. That is, the need for antagonism by artistic founders may lead them to sustain and even enlarge natural faultlines between themselves and investors as a means of affirming their distinctive identities. Such faultlines may have less to do with general mental models or structural characteristics of the new venture (as suggested by Lim et al., 2013) and more to do with the identities of the members of the new venture team. In this way, our framework may nudge entrepreneurship researchers to consider the self-concepts of team members as an important variable affecting the functioning of new venture teams.

Conclusion

In conclusion, we propose that, for professional artistic workers, explicit and sustained antagonism between their identities and the identities of normative business professionals may be critical to the affirmation of their self-concepts. This notion separates artistic workers from other types of creative workers, such as those focused on problem solving (Elsbach & Flynn, 2013). From this perspective, identity antagonism is something to be maintained rather than avoided when managing artistic workers. More importantly, this perspective suggests that identity antagonism may be a fruitful area of research for extending our general understanding of creative workers in professional work settings.

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CHAPTER

8 Play, Flow, and Timelessness

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Abstract

Over the last 3 decades, work culture has profoundly reconceptualized play as a creativity stimulant and as a core element of workplace social life. During the early wave of this transition in the 1980s, some organizations merely tolerated employees' spontaneous playful behaviors, but more recently, a growing number of organizations have deliberately institutionalized specific forms of play as integral to their culture to enhance work practices and creativity. Organizational research has closely followed these developments with an increasing number of studies focusing on workplace play and two closely related concepts, flow and timelessness. This chapter reviews the latest empirical and conceptual advancements in research about play, flow, and timelessness in organizational settings and how they relate to creativity, innovation, and entrepreneurship.

Key Words: play, playfulness, flow, timelessness, creativity, innovation, entrepreneurship, work culture

Introduction

1. I have an active fantasy life.
2. I have a very active imagination.
3. I try to keep all my thoughts directed along realistic lines and avoid flights of fancy. [reverse scored]
4. I don't like to waste my time daydreaming. [reverse scored]
5. I take too much time fantasizing or daydreaming instead of working.

The five scale items listed above tap a region of the concept of playfulness, albeit with different intentions. The first four items appeared in Costa and MacRae's (1992) fantasy scale (a facet of openness to experience), which has shown positive associations with employee creativity (e.g., George & Zhou, 2001; Taggar, 2002). The fifth item appeared in Bennett and Robinson's (2000) organizational deviance scale along with other items that refer to such negative behaviors as stealing, forging, loafing, littering, and using illegal drugs while at work. The sharp contrast between linking playfulness to creativity and to deviance highlights how divided and perplexed contemporary work culture is about play.

A century ago, when creativity was rarely seen as a desirable work behavior (Davis, 1963; Kilbourne & Woodman, 1999), organizations uniformly perceived play as a feeble and illegitimate behavior that had no place in the world of work (March, 1976; Sandelands, 1988). However, with the advent of the knowledge economy has come a significant re-evaluation of creativity, which is now seen as a desirable work behavior (DeFillippi, Grabher, & Jones, 2007; Shalley & Gilson, 2004). This, in turn, has allowed play to slowly but vividly infiltrate the values and practices of an increasing number of organizations (Mainemelis & Ronson, 2006). As is often the case in studying human behavior during cultural transitions, play researchers have found contrasting perceptions across work organizations, in which play is perceived as creative, deviant, or a mixture of both.

For several decades, research on play in organizations has been limited, fragmented, and dispersed across time and thematic areas. In recent years, many authors have stressed the need for a more methodical and systematic examination of play behaviors in the workplace (e.g., Mainemelis & Altman, 2010; Mainemelis & Ronson, 2006; Sandelands, 2010; Statler, Heracleous, & Jacobs, 2011; Statler, Roos, & Victor, 2009). Mainemelis and Ronson (2006) proposed a theory about play and creativity in organizations by integrating insights from more than 150 multidisciplinary studies published before 2006. In this chapter, we examine conceptual and empirical contributions to the organizational literature on play published between 2005 and 2013.

We first examine research on the global concept of play, and we then focus on two more narrowly defined playful experiences, being in flow and sensing timelessness. Play is a very broad construct that is manifested in multiple ways and at variable levels of analysis and intensity. The constructs of flow and timelessness, on the other hand, are two more narrowly defined play states. Flow and timelessness entail the formal elements of the global play construct, but they also entail additional elements known to be experienced in these two states. In addition, unlike other forms of play that are passive or contemplative, flow and timelessness are active, energetic, and skill-focused play states. Between the two constructs, flow is broader, entails more formal elements, and has more variable levels of intensity, whereas timelessness is more narrowly defined, has fewer formal elements, and is experienced at the more intense levels of the flow state.

Play

Although definitional debates about play persist, the interdisciplinary literature substantially agrees that play is not a set of activities but a way of organizing behavior in relation to an activity. Integrating previous conceptualizations, Mainemelis and Ronson (2006) defined play as a behavioral orientation consisting of five qualities that are superimposed on most human activities:

1. *A threshold experience.* Between-and-betwixt convention and illusion, the inner and the outer, the old and the new, or the true and the false, play is accompanied by a unique threshold awareness that sets it apart from life as usual and triggers the willful suspension of disbelief.

2. *Boundaries in time and space.* Play is circumscribed within physical, social, and psychological limits in time and space. These temporal and spatial boundaries separate play from normal life and legitimize undesirable, unexpected, or repressed social roles and behaviors.

3. *Uncertainty–freedom constraint.* Most forms of play involve some type of uncertainty or unresolved possibility. Play is also relatively free from external constraints, such that participants are allowed a considerable degree of freedom to manipulate processes and assume new identities and roles, while at the same time play imposes its own internal constraints, which are determined or voluntarily accepted by the players themselves.

4. *Loose and flexible association between means and ends*. Regardless of the presence or absence of goals and the degree of rationality that it may or may not have, play is not motivated by the search for efficient means to satisfy a fixed goal in a reliable way. A defining element of play is the flexible manner by which means and ends are handled.

5. *Positive affect*. Play involves positive affect that varies in its degree of intensity and complexity. Play involves positive and negative emotions, and cognitive and emotional elements, but it generally results in some form of positive affect, be it fun, relaxation, ecstatic joy, or emotional relief.

The more each of these elements is present, the more play-like the activity becomes. In its most intense forms, play involves a circular interaction among the five elements. Moreover, this set of five elements is manifested in various forms of play, such as solitary play and social play, free play and structured games, as well as specific activities aimed at inducing play (e.g., simulations, virtualization, gamification, free time, crowdsourcing, blue-sky projects). Mainemelis and Ronson (2006) suggested that play is manifested in organizational behavior in two general forms: as a form of *engagement* with work tasks (playing with one's core work) or as a form of *diversion* (playing with non-work elements in the work context). They argued that both manifestations of play foster creativity, albeit in different ways.

Play as engagement fosters creativity directly by facilitating creativity-related *cognitive processes* (e.g., problem framing, divergent thinking, mental transformations, practice with alternative solutions, evaluative ability); *affective processes* (e.g., affective pleasure in facing a challenge, openness to affective states, emotional modulation of both positive and

negative emotions, access to affect-laden thoughts); and *intrinsic task motivation*. Play as engagement also sharpens and develops *domain-related* and *creativity skills* that foster creativity (Amabile, 1996). Diversionary play, on the other hand, facilitates creativity indirectly by promoting *psychological adjustment* (e.g., restoratory and compensatory functions) and by shaping a *supportive social context* (e.g., psychological safety, social networks, culture). More recent studies (reviewed later in this chapter) have suggested that engagement play and diversionary play may also promote or otherwise be related to innovation and entrepreneurship. Last but not least, Mainemelis and Ronson (2006) proposed that *job complexity, lack of environmental threat,* and *available time and space for play* are key organizational conditions for nurturing play in the work context. Next, we examine recent research on play as engagement and play as diversion.

Play As Engagement

Oliver and Ashley (2012) analyzed 120 interviews with advertising agency directors published in *The Wall Street Journal's* "Creative Leaders" series between 1977 and 2007. They found that ad agency directors believe that a playful work environment is important for stimulating the creative process, preventing burnout, and maintaining an energy-charged social climate. In addition, Oliver and Ashley noted (p. 340):

> One difference over time is that the later interviews suggested more tools and environmental design factors for implementing the fun environment, whereas the earlier interviews alluded to fun and energy that came from people who were passionate about work. The change in the interviews may reflect a shift in culture or it may simply reflect a shift in the social acceptance of actively playing within the work environment.

Oliver and Ashley's (2012) statement corroborates our observation that recent studies in the field have focused less on describing the general tolerance that organizations increasingly show toward play and more on analyzing specific practices that organizations employ in an attempt to institutionalize play. Two recent conceptual contributions to the field stress that an important aspect of playful organizational practices (e.g., virtualization, blue-sky projects, crowdsourcing competitions, serious play interventions, simulations, storytelling) is that they delineate social forms of play, not solitary play activities.

Sandelands (2010) observed that play is not about individuals but about the whole of the human community. He suggested that five mystifying elements of play—attraction, synchrony, merger, selflessness, and unserious seriousness—conjure a transpersonal social whole and a dynamic of creating new social forms and new social arrangements. Statler et al. (2011) also argued that serious play practices and interventions should be seen as collective organizational practices that are induced when the paradox of intentionality arises: "where people engage in playful behaviors deliberately with the intention to achieve work-related objectives" (p. 237).

Andriopoulos and Gotsi (2005) examined the functions of blue-sky projects in a product design and engineering consultancy firm in Northern California. Because such firms operate under constant pressure to perpetually present their clients with novel, distinctive solutions, they must, on the one hand, imagine and define the future instead of merely anticipating it and on the other hand, keep the risks and failures associated with wildly imagining the future internal to the organization, so that they will have no impact on their client's business. The consultancy tackled this dual challenge through so-called moonshine projects: blue-sky projects regularly used to unleash employees' imagination and promote creative freedom—with no design boundaries, no client specifications, no predefined budgets, and no competitive products to consider. Andriopoulos and Gotsi found that this playful work practice enhanced creative thinking, generated new knowledge, broke down stereotypes, enhanced employee morale and satisfaction, and built a visionary reputation for the organization. According to the company's president (p. 320):

> In these Moonshine things we can take risks and do things that our clients might never accept. You do experimental things and you are open to failure. Like, "Oh, well, we thought it would be a cool thing but it's just a failure." We can't do that to a client, they come to us because they need to have a successful product.

Andriopoulos and Gotsi (2005) observed that blue-sky projects foster creativity but also entail a hidden danger, because as employees become passionately involved in them, they may start to regard other, less playful work tasks as mundane. Andriopoulos and Gotsi suggested that managers can prevent this problem by stressing the strategic fit and functional integration of blue-sky

projects in the larger work context. Zhang and Bartol (2010) found that although creative process engagement is positively related to creative performance, the relationship between creative process engagement and overall job performance has an inverted U-shaped pattern. Future research can examine whether the hidden danger found by Andriopoulos and Gotsi contributes to this effect. Given that play is more likely to occur in creative rather than mundane work tasks (Mainemelis & Ronson, 2006), its seductive elements may lead people to focus excessively on creative tasks and even ignore orders to stop working on them (Mainemelis, 2010). For example, Mainemelis and Epitropaki (2013) wrote that during the making of *The Godfather*, Francis Ford Coppola's passion for the most creative aspects of filmmaking resulted in exceptionally high levels of collective creative performance but also in missed deadlines, budget overruns, and social havoc on the film's set.

Free time, a legitimate proportion of employees' work time in which they can playfully pursue ideas of their own choice, has long been adopted by companies such as 3M and Gore (Mainemelis & Ronson, 2006). Iyer and Davenport (2008) noted that in a 6-month period, the 20% discretionary work time at Google resulted in half of all new products and features, including Gmail, AdSense, and Google News. However, they also observed that some Google engineers experienced an inherent pressure to invent something innovative in their discretionary time. This is a second hidden danger in practices that attempt to stimulate play as engagement: They may be insufficiently shielded from the normal managerial pressures for efficiency, accountability, and control, a situation that hinders play and may even trigger cynicism and resentment among employees (Walker, 2011).

A useful reminder here is that play does not reside in the practices organizations institutionalize in order to promote play, but rather in the intersubjective understandings of the individuals who ultimately play or do not play within the time and space delineated by these practices (Hjorth, 2005; Mainemelis & Ronson, 2006; Sandelands, 2010). A fruitful direction for future research is examination of the social and psychological factors that increase or decrease the likelihood that work practices aimed at promoting play as engagement actually fulfill their mission.

In an in-depth case study, Dodgson, Gann, and Phillips (2013) explored the introduction of play through virtualization technologies into a large and historical organization at the turn of the third millennium (pp. 1366–1367):

> IBM couched its use of virtual worlds in terms of encouraging play. This in itself was not uncontroversial. IBM's bureaucratic culture in the early 1990s impeded its ability to explore new fields and adapt . . . and such a culture would not easily embrace playfulness. . . . Virtual worlds were nonetheless recognized in IBM as a technology that facilitates play, including those activities where people experiment, explore, prototype, rehearse, and tinker with new ideas, often in combination with others with different skills. The company developed a virtual world strategy document in 2007 that acknowledged this; it referred to the importance of collaboration, learning, and play. Through its use, the company recognized that virtual worlds provided a space where experimentation is relatively quick and inexpensive and where activities are built upon the copresence of many people from diverse backgrounds. They also conveyed fun and enjoyment and allowed the cocreation and codevelopment of new ideas assisted by their visual representation.

Among other findings, Dodgson et al. captured three critical steps in the introduction of play at IBM, which might generalize to some extent to other large organizations attempting to foster play. The first was a set of influential reports on innovative developments in games which "helped elicit senior management's endorsement for their use" (p. 1367). The second was the growing awareness among IBM employees that virtual worlds enhance collaboration and innovation in novel ways. The third was the interplay among uncertainty, freedom, and constraint in the evolution of virtual worlds over time (pp. 1368–1369):

> [To] overcome some of the risks involved in exploring an unknown technology, several of IBM's researchers created promotional roles, including those of "intraverse evangelists," who were to promote and support the use of virtual worlds within IBM, and "metaverse evangelists," who would promote virtual worlds externally; one researcher adopted the persona of "ePredator," inhabiting Second Life with the goal of establishing good behavior. This concern for appropriate behavior led to the development of a code of conduct and etiquette guidelines for use by all IBM staff working in virtual worlds. As one of the initiators of the VUC said, "The rules of play,

these are the virtual world guidelines developed by those using the system, and the measures of value are increase in profits, decrease in overload, and improved employee experience."

Crowdsourcing is another practice that has recently been linked to play. Afuah and Tucci (2012) suggested that, under certain conditions, crowdsourcing offers a better alternative to distant search and creative problem solving than the alternatives of do-it-yourself or designated contracting. Gratton (2011) noted that crowdsourcing allows organizations to expand their circle of play, with sources of ideas that extend far beyond their boundaries, and that play builds social connections in highly diverse big ideas crowds. Witt, Scheiner, and Robra-Bissantz (2011) proposed that online idea competitions (a form of crowdsourcing) can be enhanced by incorporating play elements. In an exploratory study, they found that if the gamification of idea competitions is properly planned, it can contribute to participants' task involvement, enjoyment, and flow experiences. Their study participants reported being immersed in the idea competition, felt that time passed quickly, were not easily distracted, and felt content when developing new ideas. A promising direction for future research is the examination of whether, how, and when play elements and playful experiences such as flow and timelessness can improve the experiential and practical outcomes of crowdsourcing.

Heracleous and Jacobs (2008) examined the crafting of physical symbols during strategy team retreats of telecommunications organizations. They operationalized these symbol artifacts as embodied metaphors constructed through the engagement of the body. Unlike cognitive maps, these symbols are tangible entities that extend into three-dimensional space: "They are metaphors in the flesh that are recursively and simultaneously constructed and interpreted, embodying the blending of source and target domains, and engendering meaning both in their construction process and their subsequent interpretations" (p. 313). Analyzing video data, Heracleous and Jacobs found that these embodied metaphors (1) prompted strategy team members to identify general assumptions and critically reflect on them, (2) helped participants capture intangible elements of their collective identity, and (3) triggered creative insights and potential shifts in managerial mindsets. They also noted that, due to their exploratory and highly divergent nature, such forms of playful intervention are more valuable in the early stages of strategy formation or in the strategy review process, where creativity is more important.

Thorsted (2013) reported that the toy maker LEGO (from the Danish *leg godt,* meaning "play well") uses games that create an understanding of internal organizational logistics and also strengthen corporate culture but do not necessarily support creative processes. She argued that play becomes a significant social event only when it transforms communities of practice into communities of players characterized by autonomy, intense personal relatedness, acceptance of ambiguity, and suspension of normal hierarchical roles. Thorsted's study prompts researchers to pay close attention to whether play directly fosters creativity, supports it indirectly, or promotes other outcomes not related to creativity. Two equally important issues that merit more research in the future are the ways in which play influences different stages of creativity and innovation and the levels of analysis at which play achieves its effects.

Schlachtbauer (2013) suggested that play affects the initial development of innovation ideas, the elaboration of these ideas into an innovation concept, and the evaluation and acceptance of an innovation concept. In a study of a German car manufacturer, he observed that the innovation concepts that finally made it to the company's management conference were not those that were generated in brainstorming sessions; rather, they originated from a bootlegging project that was developed between one employee of the company and employees of a university, "at which the idea could evolved and mature" (p. 161). Schlachtbauer suggested that play creates the free space that ideas need in order to grow and become interesting innovation candidates. This implies that play can aid innovation not only in terms of idea generation but also in terms of idea elaboration and possibly idea evaluation and acceptance.

Similarly, in a study of radical design projects in fire engineering, Dodgson, Gann, and Salter (2007) found that simulation technologies fostered innovation by serving as boundary objects that facilitate novel relations in interorganizational projects, by enabling experimentation that would often be physically impossible or prohibitively expensive to undertake in reality, and also by encouraging buying in and ownership of designs in multiple parties.

Cohendet and Simon's (2007) qualitative study of a videogame firm in Montreal sheds light on how play may affect creativity and innovation at

different levels of analysis. They observed that the specialists involved in the development of videogames were gamers making games for gamers: For them, playing was a means for identifying with a community, sharing a common language, establishing a dialogue with the elusive casual gamer, and also enhancing their personal creativity. Product-level creativity was not an additive function of the personal creativity of specialists but relied instead on "a subtle alchemy among communities of scriptwriters, game-designers, graphic artists, sound designers, software programmers and even testers" (p. 591). Cohendet and Simon found that management achieved this integration by establishing a shared context (physical and communicative) that was experienced by employees as a supportive playground for interactions and debates about the game-in-the-making. The importance of play as a more general cultural element present in the firm's work environment was also evident in the tendency of management to encourage even administrative and management employees to regularly play while at work.

Joseph, Tan, and Ang (2011) reported that information technology (IT) professionals engage in updating (staying up-to-date with the latest technologies in the IT field) as either work or play. In a study of 181 IT professionals from 29 organizations in Singapore, they found that perceived threat of professional obsolescence was positively related to updating as work and negatively related to updating as play. Updating as work was positively related to turnover intentions, whereas updating as play was negatively related to turnaway intentions. Lower degrees of perceived threat enabled IT professionals to engage in updating as play, and to enjoy and sustain a means-oriented engagement in updating in the long run, while also making them less likely to consider a career change into a non-IT profession. This finding supports the view that lack of perceived threat in the work context is key to enabling play as engagement and that play as engagement fosters and is fostered by intrinsic motivation (Mainemelis & Ronson, 2006).

Fillis and Rentschler (2010) noted that, when interviewing entrepreneurs about their motivations concerning business development, intrinsic motives stand out as channels of their passions and creative endeavors. They suggested that play is an intrinsically motivated context that channels entrepreneurial passion toward new venture development, unbounded searching for solutions to emerging problems, and new strategy formulation. Mainemelis, Harvey, and Peters (2008) observed that companies such as Disney, Ferrari, and Harley-Davidson and industries such as aerospace engineering and Silicon Valley companies "did not start as sober and detailed business plans. These companies and industries were all born out of the passionate play of their founders" (p. 39). In a rich historical account of the links between play, creativity, innovation, and entrepreneurship in Silicon Valley, Cringley (1996) wrote (pp. 45–47):

> It takes new ideas a long time to catch on—time mainly devoted to evolving the idea into something useful. This fact alone dumps most of the responsibility for early technical innovation to the hands of amateurs, who can afford to take the time. . . . This explains why the personal computer was invented by hobbyists. . . . Since there wasn't a personal computer business as such, they had little expectation that their programming and design efforts would lead to making a lot of money. These folks were pursuing adventure, not business. . . . Breakdowns were frequent, even welcome, since they gave the enthusiast something to brag about to friends. The test of the pioneer was how well he did despite his technology. This explains the disdain with which "real programmers" still often view computers and software that are easy to use. They interpret "ease of use" as "lack of challenge". . . . With few exceptions, early microcomputer software came from the need of some user to have software that did not yet exist. He needed it, so he invented it. And son of a gun, bragging about the program at his local computing club often dragged from the membership others who needed the software, too, wanted to buy it, and an industry was born.

In a study of 112 entrepreneurs, Kauanui, Thomas, Sherman, Waters, and Gilea (2010) found that entrepreneurs who viewed their businesses within a holistic life context tended to create a work environment that promoted play as integral to work. These entrepreneurs' quest for meaning in their lives via their enterprises turned their work into a calling, a reward in and of itself, and it was also associated with expressed playfulness and a less egocentric emphasis in their method of managing goals and resources. Fillis and Rentschler (2010) also suggested that we should pay more attention in the future to how entrepreneurs' values and life orientations are translated into specific attitudes toward play in their workplaces.

The intentional incorporation of specific play practices in an initially small number of

organizations has gradually attracted the attention of a growing number of organizations. For instance, Kurt, Kurt, and Medaille (2010) noted that whereas in the past, creativity and innovation were not seen as important processes for libraries, today they are considered essential for improving the user experience. Kurt et al. stated that companies with playful cultures, such as Google, 37signals, IDEO, and Pixar, inspire libraries to innovate by incorporating play in the workplace. Considering that play is sensitive to the social context in which it is enacted, future studies should carefully identify factors that contribute to the success and failure of the process by which play is introduced into organizations.

In addition, considering that a growing number of organizations are institutionalizing play, future studies can examine how play is related to organizational routines. Although early accounts of organizational routines reflected relatively unchanging, habitual, and mindless behaviors, recent views stress that routines do not simply re-enact the past but entail both ostensive and performative aspects that allow them to adapt to contexts requiring idiosyncratic and ongoing changes (Feldman & Pentland, 2003). Dionysiou and Tsoukas (2013) suggested that the ostensive aspect of routines is created from participants' joint, intersubjective understandings and interactions and develops to incorporate understandings that are, to some extent, congruent or compatible among participants and a set of mutually coherent action dispositions. These understandings and dispositions enable participants to guide and coordinate their actions in future routine performance without completely determining them. We would expect, therefore, that the incorporation of play can promote variation in routines and ensure that each new routine performance will differ somewhat from previous performances. The extant literature suggests that in fact many play activities entail routines or rituals that foster novel behaviors (e.g., Kolb & Kolb, 2010; Mainemelis & Ronson, 2006; Smith & Stewart, 2011), and that many workplace routines support rather than hinder creativity (e.g., Gilson, Mathieu, Shalley, & Ruddy, 2005).

Play As Diversion

A focal point of recent research on diversionary play is whether and how the high-paced rhythms of contemporary social contexts constrain play. Russ and Dillon (2011) investigated changes in pretend play in children during a 23-year period. Analyzing 14 studies of children ages 6 to 10 years, from 1985 to 2008, they found that, over time, imagination and comfort with play increased, negative affect expression in play decreased, and there was no change in the organization of the story and the amount and range of affect expression in play. They noted that one possible explanation for the fact that affective and cognitive processes in play have remained the same or improved over time is that children are resilient and can find ways and time to play despite the decline in their unstructured time. Russ and Dillon's study suggests that children's *desire* to play has not changed over time. This is reminiscent of earlier studies that found that adults working in organizations that were inhospitable to play desired and found ways to play (e.g., Roy, 1959), as well as recent studies showing that today people spend more time at work, have less time available for play in leisure, but also play more at work (e.g., Hunter, Jemielniak, & Postula, 2010).

In an ethnographic study of play behaviors in five high-tech companies in Europe and the United States, Hunter et al. (2010) found that software engineers who worked long hours treated their work as play both in work and in leisure; 45% reported that they occasionally but regularly wrote pieces of software in leisure. In other words, during their leisure time, they replicated core work behaviors for pleasure and for no apparent commercial use. Some engineers mentioned that while trying to create an excellent software program in work time, they often spent time on coding functions not specified by the client because they found it fun and also because it would result in more beautiful code. Software engineers felt that long working hours had a leisurely feel, owing to the playful environment, the exchange of stories and jokes among colleagues, and the fact that they took 2 hours or more to surf the Net, play computer games, or otherwise engage in play. They even stayed at work after hours to play group network games. The companies provided play attractions, such as a table tennis room, snooker and football tables, and even dance classes, but rarely institutionalized play activities. Yet, employees were aware that turning work into play ultimately led them to spend more hours at work than required. This study offers several vivid cues for the further study of play as a core component of occupational cultures, as a space of creative freedom away from hierarchical control, but also as a form of subtle normative control.

Thorsted (2008) found that one form of play, storytelling, promoted fun work diversions; strengthened collective engagement; helped to

create a shared, positive attitude toward play; and functioned as a medium that enabled participants (i.e., business college employees) to connect with their personal creative sides. In a similar study in a Danish medical company, Thorsted (2008) found that play enabled the participants to experience flow and helped create new social networks and channels for sharing information. An important finding was that when the medical company tried to recreate the success of the playful intervention, it had little success. Thorsted cautioned companies that play is unpredictable and cannot easily be recreated by a specific formula. Mainemelis and Ronson (2006) also stressed that play can seriously backfire if organizations try to manipulate it. A recent study by Andersen (2011) of a state-run public health campaign in Denmark found that although play was deliberately chosen as a medium, the inclusion of various forms of scripted, one-way communication in the campaign's content ended up either corrupting play or triggering play that had little to do with the campaign's goals. Andersen concluded (p. 407) that "the concept of play as form is so forceful that it refuses to be a mere medium for a state-run campaign." Future research could focus more sharply on the conditions that influence the way that employees respond (individually and collectively) to design work climate factors aimed at promoting playfulness in the work context.

Some recent studies have focused on the role of humor in social play. Korczynski (2011) suggested that by studying humor in the context of diversionary social play, we can understand peoples' implicit lived sense of their current workplace and their implicit vision of more ideal alternative workplaces. Reflecting on Roy's (1959) classic study, Korczynski noted that the deeply engrained satire, teasing, and clowning in the machine shop studied by Roy served, in effect, as transgressive expressions of voice targeting hierarchical control relationships. In a window blinds factory in England, Korczynski found that humor involves a creative play with and against repetitive work structures and expresses a sense of resistance to the perceived forced labor process while simultaneously lubricating it. A promising direction for similar studies is the comparative analysis of social play within creative companies such as Google and social play in Taylorized industrial organizations.

In interviews with 87 employees in a health systems company, Lilius, Worline, Dutton, Kanov, and Maitlis (2011) identified a practice they called bounded playing. In bounded playing, employees engaged in enjoyable diversionary activities but with an explicit awareness of their need to focus on work. In other words, unit members had developed mutually understood play boundaries that enabled them to engage in routine diversionary play. An unique finding of this study was that the display of boundaries is playful in itself: "For example, during water gun breaks, those who are not available open up an umbrella as a signal" (p. 884). Lilius et al. noted that bounded playing and workplace celebrations establish members' information ties, foster authentic knowledge of another, and strengthen relationships. Social play may also enable employees to grasp the reality of the social context in which they attempt to make a creative contribution, to internalize the domain's basic criteria for evaluating creative work, and to build and sustain networks of information exchange, feedback, and support (cf. Adler & Chen, 2011; Perry-Smith, 2006).

Other researchers have focused on diversionary play in the context of engagement with the Internet. In an early study, Webster and Martocchio (1993) found that playfulness in computer interactions was positively associated with employee involvement, positive mood, satisfaction, and learning. More recently, Mauri, Cipresso, Balgera, Villamira, and Riva (2011) recorded somatic activity (skin conductance, blood volume pulse, respiratory activity, electroencephalography, electromyography, and pupil dilation) in 30 participants during a 3-minute exposure to a slide show of natural panoramas (a relaxation condition), a stroop and mathematical task (stress condition), and the subject's Facebook account. They found that the Facebook experience was different from both stress and relaxation on many linear and spectral indices of somatic activity. They suggest that Facebook use can evoke a positive valence/high arousal state, "leading to a core flow state that might represent a key factor able to explain why social networks are spreading so successfully" (p. 730).

Cocker (2011) noted that many companies fire or punish employees for engaging in workplace Internet leisure browsing, although it is unclear whether, how, and when Internet browsing influences work performance. He suggested that moderate surfing serves as a work break that can help restore employees' depleted cognitive and affective resources, offer them access to various sources of information, and strengthen their sense of autonomy. In a study of 268 employees, Cocker found that those who surfed the Internet during work

hours were significantly more productive than those who did not. Self-reported productivity was higher for those who surfed for shorter periods and more frequently. Cocker found the "point of inflection" to be 12% of the employees' work time; above this threshold, surfing the Internet began to negatively affect productivity. Future studies should try to replicate this finding and assess performance with non–self-report measures as well.

In addition, Trougakos, Beal, Green, and Weiss (2008) suggested that work breaks can take the form of chores (requiring increased behavior regulation) or respites (requiring less behavioral regulation). In an Experience Sampling Method (ESM) study with 64 cheerleading instructors, Trougakos et al. found that engaging in respite activities during work breaks was positively related to higher levels of positive emotions and lower levels of negative emotions during these breaks, whereas engaging in chore activities during breaks was positively related to negative emotional experiences. People who engaged in respite activities during the breaks also displayed higher levels of positive affective display after the breaks. Although respites are not necessarily synonymous with diversionary play, this study's findings corroborate previous findings that diversionary play, as a cognitive and emotional break from core work tasks, benefits workers' psychological adjustment at work (Elsbach & Hargadon, 2006; Mainemelis & Ronson, 2006).

Altman and Baruch (2010) stressed that, across cultures, meals are predominantly relational events that create, shape, transmit, and display culture. Analyzing survey data of lunch practices in 73 organizations in the United Kingdom, they proposed a group/grid model of four organizational lunch patterns (isolates, hierarchical, individuals, teams). Future studies can build on this model to examine social and solitary forms of diversionary play during lunch breaks across more and less playful organizational contexts.

Although some studies have shown that diversionary play blurs the boundaries between work and non-work (e.g., Hunter et al., 2010), some have shown that diversionary play has clear boundaries that separate it from work (e.g., Cocker, 2011; Lilius et al., 2011), and others have indicated that the effects of diversionary play on psychological adjustment are significantly influenced by whether such boundaries exist (e.g., Trougakos et al., 2008). A fruitful direction for future research is detailed examination of the personal and contextual characteristics that influence the boundaries of diversionary play, as well as the personal and contextual characteristics that likely moderate the effects of diversionary play on psychological adjustment processes, such emotional rejuvenation and cognitive rest.

Another set of recent studies has focused on how play outside work hours affects the identity and learning processes of professional workers. Kolb and Kolb (2010) studied the emergence of a ludic learning space in a pick-up softball league: "Regardless of the role you played in real life, a therapist, a forest ranger, a nurse, unemployed, or a college professor, this was time to play ball" (p. 38). The main themes in their case study were the voluntary and enjoyable character of social play, its autopoietic boundaries and evolving internal structure, the celebration of foolishness, the role of play signals, the cardinal importance of a play community as a core motive to play, and the inherent tension between wholehearted fun and the desire to win. Stressing the dialectical nature of both social play and experiential learning, Kolb and Kolb found that three elements of a ludic space—self-directed engagement, a dual focus on process and outcome, and novelty—are key social context principles that facilitate deep learning. They concluded that deep learning can be fostered within organizations insofar as the work context allows participants to express themselves in authentic ways, to self-organize, and to create boundaries for recursive, timeless play.

Future research can further illuminate how involvement in ludic leisure-time communities is associated with employees' well-being and identification with their work and organization. Another interesting variable to consider is whether one's ludic community involves coworkers and whether, when, and how the diversity of ludic communities helps create and maintain social networks that offer professionally relevant information and ideas. Furthermore, Kolb and Kolb's (2010) observations about the tension between wholehearted fun and winning during play prompts additional research about how this tension influences the evolution of ludic communities and the optimal or threshold levels to ensure that the tension will not negatively affect the unfolding of play communities over time.

Ibarra and Petriglieri (2010) observed that people work at being certain things but play at becoming others. They introduced the concept of identity play as the engagement in provisional but active trials of possible future selves. They noted that identity work and identity play differ in terms of purpose (behavioral goals and locus of

evaluation), place (activity boundaries and identity tense), and process (type of exploration and type of commitment). Identity play generates deliberate variation (rather than consistency) and is aimed at creating and rehearsing future possibilities (rather than maintaining or repairing existing identities and integrating them with external role demands). The authors noted that many settings outside work (e.g., educational programs, sabbaticals, leisure activities) offer safe havens that are particularly conducive to triggering the transitional psychological context for identity play. They also argued that role transitions are a particularly useful context for exploring identity play dynamics and moderators.

Driver (2003, p. 86) suggested that some forms of play allow us to "alienate ourselves from alienated experience to rediscover a more subjective and in many ways unspoiled way of experiencing" reality. Several diversionary play forms offer reflective spaces where individuals can momentarily step out of their normal role expectations and consciously reflect on choices they did not make in the process. Art, for example, often serves as a deep language of personal and organizational identity (Essex & Mainemelis, 2002; Hjorth, 2005). Fraiberg (2010) suggested that imaginary poetry spaces allow writers to address, express, and relieve workplace emotions. She identified themes of anger, rage, and despair in office-life poetry and suggested that through the evoked knowledge of those poems we can create shared understandings about such workplace emotions and their evolution over time.

Driver (2008) noted that because the performative nature of creativity is contested and contestable, creativity can be understood as an imaginary construction of the self that requires social interactions for validation. The imaginary creative self tries but often fails to produce something novel that is validated as useful. If a playful psychological space is available for engagement with the failure, individuals can reflect on such failures not as disturbances to be corrected, but as powerful identity markers. According to Driver, people play out their struggles with imaginary creative selves in the contradictory space of knowing yourself as a creative person versus producing or being produced by social interactions that validate and legitimize such creative self-images. Considering that creative professionals routinely encounter rejection and resistance to their ideas (Mainemelis, 2010), we need more research on how they actively relate to their contested and contestable creative identities.

Kark (2011) proposed that play spaces facilitate the development of creative leadership. She noted that the between-and-betwixt reality of play, in conjunction with its boundaries in time and space, allow professionals to experiment with, rehearse, and develop new leadership identities as well as conceptual and cognitive creativity-related skills. Furthermore, the communal and social nature of group play can facilitate the development of relational, collective, and shared leadership identities. Kark suggested that psychological safety moderates the relationship between play and creative leadership development. To advance this stream of research, she called for studies that identify specific types of play that enable identity play and facilitate the development of creative leadership identities.

De Vries (2012) described a leadership development program built on the principles of organizational play therapy. He observed that, in comparison to childhood play, adult play combines both purposeful and playful characteristics and is a much less overt and transparent process. He suggested that executive development programs can function as adult play spaces insofar as they give leaders the opportunity to fulfill four basic play needs: for personal time and creative freedom, for make-believe and daydreaming, for mastery, and for meaning. De Vries stressed that the creation of a safe, transitional play space is essential for triggering and sustaining play in leadership development programs.

A common theme in the works of Kark (2011), De Vries (2012), and Ibarra and Petriglieri (2010) is that professional education contexts can offer a safe haven where individuals can play or experiment with their creative identities. Such contexts are viable research spaces for further examining the nature and processes of identity play. Furthermore, considering that many authors called for research on creative forms of leadership (e.g., Kark, 2011; Mainemelis & Epitropaki, 2013; Mueller, Goncalo, & Kamdar, 2011), future research could examine how various forms or instances of play may facilitate the development of creative leadership identities, attitudes, and behaviors.

Flow

In a 1975 article entitled "Play and Intrinsic Rewards," Csikszentmihalyi used the term "flow" to describe a playful state of total involvement with the activity (p. 43):

> "Flow" denotes the wholistic sensation present when we act with total involvement. It is the kind of

> feeling after which one nostalgically says: "that was fun," or "that was enjoyable." It is the state in which action follows upon action according to an internal logic which seems to need no conscious intervention on our part. We experience it as a unified flowing from one moment to the next, in which we feel in control of our actions, and in which there is little distinction between self and environment; between stimulus and response; and between past, present, and future."

Employing structural phenomenology, Csikszentmihalyi (1990) developed a theory focused on individuals' subjective experiences of flow states. Engeser and Schiepe-Tiska (2012) noted that Csikszentmihalyi's introduction of the concept of flow in his 1975 book, *Beyond Boredom and Anxiety*, might be contrasted with Skinner's 1971 book, *Beyond Freedom and Dignity*. All in all, flow theory may be seen as a par excellence eudaemonic view on human flourishing and probably the most influential basis of the more recent field of positive psychology.

Operationalization of Flow

Marotto, Bart, and Victor (2007) noted that all peak performances, like flow, are peak experiences, but the inverse is not true. Some peak experiences (e.g., religious and mystical experiences) may be passive and contemplative, whereas peak performances (e.g., flow, timelessness, virtuosity) are action-driven. Keller and Bless (2008) also stressed that flow experiences are active, energetic, and skill-focused. Furthermore, flow has varied levels of intensity and ranges from microflow experiences (e.g., daily incidents of flow such as while driving or walking) to "extremely intense and complex flow experiences [that] probably occur at best only a few times in a lifetime" (Csikszentmihalyi & LeFevre, 1989, p. 818).

Based on the analysis of data from several interview studies, Csikszentmihalyi (1990, 1997) suggested that individuals describe the flow state with the following nine elements: working with a clear goal in an activity, a balance between challenges and skills, receiving immediate feedback from the activity, the merging of action and awareness, intense concentration on a task, a sense of heightened control, forgetting one's self, forgetting time, and an activity that becomes autotelic or an end in and of itself.

The operationalization of these nine elements in empirical studies has resulted in some conceptual ambiguity. Engeser and Schiepe-Tiska (2012) noted that some of the nine elements may be conditions rather than core components of flow. Rodriguez-Sanchez, Schaufeli, Salanova, and Cifre (2011) observed that it is difficult to discriminate between the proximal antecedents of flow and the flow experience itself. Csikszentmihalyi and LeFevre (1989), for example, treated the perceived balance between challenges and skills both as an antecedent of flow and as the flow experience itself. Moneta and Csikszentmihalyi (1996) used the perceived balance between skill and challenge as a predictor of four dimensions of optimal subjective experience: concentration, involvement, happiness, and wish to do the activity. Ceja and Navarro (2012) likewise noted that the perceived balance between challenges and skills is a predictor of flow, whereas the other eight elements are its dimensions. Similarly, Baumann and Scheffer (2010) described balance between challenges and skills, immediate unambiguous feedback, and clear goals as conditions of flow.

Rodriguez-Sanchez et al. (2011) argued that the perceived balance between challenges and skills and intrinsic motivation do not constitute elements of flow but are important proximal antecedents of or prerequisites of flow, whereas absorption and enjoyment are the two core elements of flow. Csikszentmihalyi (1997) whimsically observed that, while in flow, we are not happy, because if, for instance, a rock climber takes time out to feel happy while attempting a risky move, he or she may fall off the mountain. Mainemelis (2001) proposed that enjoyment is a proximal outcome of flow, something that individuals experience after they emerge from the activity, whereas total immersion (absorption) in the activity is experienced only in the flow state itself. Delle Fave and Massimini (2005) also commented that the core and most stable element of flow is its cognitive component, absorption. However, Rodriguez-Sanchez et al. (2011) stated that because flow is intensely positive in itself, even as an a posteriori affective evaluation, the positive affective component must be included in its definition. Similarly, Engeser and Sciepe-Tiska (2012) observed that although immersion and the merging of action and awareness likely represent the more central aspects of flow, flow is a holistic sensation and thus comprises all the other elements.

The operationalization of flow has important implications for interpreting the findings of organizational creativity studies. Mainemelis (2001) and Demerouti (2006) observed that among the

nine elements of flow, several are identical or similar to the core job-motivating characteristics of Hackman and Oldham's (1980) job design model (i.e., intrinsic task interest, skill variety, task identity, task significance, feedback, and autonomy). Several studies have found that these six factors are positively associated with employee creativity (e.g., Oldham & Cummings, 1996; see also Shalley, Zhou, & Oldham, 2004). Therefore, if these six elements are included in the operationalization of flow, we should expect that flow will generally be positively associated with employee creativity. This further implies that flow research is more likely to make distinct and novel contributions to our understanding of individual creativity in the workplace by operationalizing flow in terms of other elements that have rarely attracted the attention of organizational creativity research to date (e.g., absorption, merging of action and awareness, transformation of time).

Patterns of Flow

In a pivotal study of flow, Csikszentmihalyi and LeFevre (1989) followed 78 adults (managers, clerical workers, and blue-collar workers) for 1 week using the ESM. They measured flow as the balance between challenges and skills. They found that flow occurred more than three times as often in work as in leisure (54% of the time at work, 17% in leisure). Managers spent more time in flow at work (but not at leisure) compared with the other two groups. Managers and blue-collar workers reported the lowest levels of creativity during leisure nonflow. Although motivation levels were higher in flow than in nonflow periods, leisure responses were always higher for motivation than work responses. Csikszentmihalyi and LeFevre (p. 821) suggested that this is a paradox, one of "people having many more positive feelings at work than in leisure, yet saying that they 'wish to be doing something else' when they are at work, not when they are in leisure." This finding has triggered investigations of defining and measuring flow and of examining the affective experiences of flow.

Rodriguez-Sanchez et al. (2011) examined daily flow patterns related to work and non-work tasks among 40 healthy and 60 unhealthy (i.e., burned-out) individuals who were asked to keep a daily diary. They operationalized and measured flow as absorption and enjoyment using the ESM. They found that levels of flow were higher for healthy than non-healthy individuals, although the daily pattern of flow did not differ between healthy and non-healthy individuals. Absorption was related to work tasks, whereas enjoyment was related to non-work tasks. In addition, lower levels of flow were more frequent during working hours; levels of flow tended to increase at the end of the day; and levels of flow, particularly enjoyment, were higher during weekends. An interesting finding of this study was that absorption and enjoyment shared only 36% of their variance. The authors argued that because absorption and enjoyment are relatively independent at least on the momentary level, they may be related to, respectively, eudemonic and hedonic perspectives of well-being. Work, in this sense, provides challenging activities that require concentration and promote personal growth and eudemonic well-being. Fullagar and Kelloway (2009) also suggested that flow is a momentary form of eudemonic well-being.

Moneta and Csikszentmihalyi (1996) noted that a unique feature of flow theory is that it does not impose a maximum or equilibrium point onto the function of flow experience. Flow experiences are inherently unstable and fleeting and may grow in complexity over time. Ceja and Navarro (2011) used the ESM to capture patterns of flow experiences in a sample of 60 employees. They found that flow experiences present a high-degree of within-individual variability. Low levels of flow were related to a random pattern, medium levels to a linear pattern, and high levels to a chaotic pattern. Employees who showed a chaotic pattern in their flow experiences had the highest levels of flow in their jobs and also spent more time in the flow state. In a closely related study, Ceja and Navarro (2012, p. 1117) found that perceived challenge and skill are "powerful predictors of work-related flow" and that at different levels of challenge and skill the dimensions of enjoyment, interest, and absorption may present both linear and nonlinear changes. They found that high levels of flow (characterized by the sudden merging of action and awareness) are marked by discontinuous and abrupt changes and are best modeled by nonlinear (catastrophe) models rather than traditional linear models.

Contextual Conditions of Flow

Csikszentmihalyi and LeFevre (1989) found that challenging as opposed to routine activities contribute to flow. In an ESM study in the field of architectural work, Fullagar and Kelloway (2009) operationalized and measured flow as a nine-factor construct and found that it has both state and trait components. In their study, 74% of

the variable in flow was due to situational characteristics as opposed to dispositional factors. They found that skill variety and autonomy were significant predictors of flow, whereas feedback, task significance, and task identity were not. They also found that lagged flow was a predictor of positive mood, whereas lagged mood was not related to subsequent flow.

Bakker (2005) found that autonomy, performance feedback, social support, and supervisory coaching positively related to students' flow experience through their teachers' experience of flow. Demerouti (2006) found that the Motivational Potential Score (Job Diagnostic Survey's combined index of autonomy, skill variety, task significance, and task identity; Hackman & Oldham, 1980) has a strong positive association with flow at work. Makikangas, Bakker, Aunola, and Demerouti (2010) found a cyclical positive association between the levels of and changes in flow and five job resources—autonomy, performance feedback, social support, opportunities for personal development, and coaching by supervisors. Overall, the job design characteristics of Hackman and Oldham's (1980) model appear to foster both creativity (Oldham & Cummings, 1996) and flow. Some studies reviewed later in this chapter have suggested that flow is a mediator in the relationship between these contextual characteristics and creativity (e.g., Mainemelis, 2001; Sosik, Kahai, & Avolio, 1999).

In an ESM study involving 58 line managers in an elder care center and an accounting organization in Denmark, Nielsen and Cleal (2010) found that participants' perceptions of the more stable characteristics of their jobs (e.g., cognitive demands, influence, role clarity) did not predict flow, whereas engagement in three types of activities—planning, problem solving, and evaluation—did predict flow. Engagement in brainstorming, on the other hand, did not predict flow. Nielsen and Cleal suggested that the lack of association between flow and brainstorming may be due to the fact that flow entails the elements of clear goals and control over the activity, whereas brainstorming is often a situation in which the individual does not feel clear on what he or she is doing, nor in control of the situation. This explanation, however, seems to confound the concept of clear goals and control over an activity with that of predictable, routine, and/or non-challenging activities. Litchfield, Fan, and Brown (2011) found that creativity and novelty are higher in brainstorming sessions when individuals show high goal commitment to a difficult novelty goal (see also Shalley, 1991). Also, considering that other studies found that individuals experience flow when tackling tough, ill-defined problems (e.g., Baumann & Scheffer, 2010, 2011; Csikszentmihalyi, 1997) and that task cues influence whether individuals will engage playfully in the task (e.g., Sandelands, 1988), future research can focus in greater detail on how various structural and social aspects of brainstorming influence the likelihood of experiencing flow.

Nielsen and Cleal (2010) also found that elder care managers experienced more flow states than their accounting counterparts. They suggested that the difference may be related to the fact that the accounting managers worked in a less structured environment and had a wider range of responsibilities. Future research can investigate specific types of activities as they relate to flow in various organizational contexts.

Dispositional Influences on Flow

Eisenberger, Jones, Stinglhamber, Shanock, and Randall (2005) observed that in Csikszentmihalyi and LeFevre's (1989) study, about half of the employees expressed greater motivation in the high-challenge/high-skill condition, whereas the other half expressed greater motivation under the low-skill/low-challenge condition. Eisenberger et al. hypothesized that these differences are due to dispositional differences in employees' need for achievement. In two field studies, they found that workers' need for achievement moderated the relationship between perceived challenge and skill and three dimensions of optimal subjective experience. Employees with a high need for achievement showed greater positive mood, greater intrinsic task interest, and greater organizational spontaneity (extra-role performance) when experiencing the high-challenge/high-skill condition compared with other challenge–skill combinations. In contrast, among employees with a low need for achievement, the high-challenge/high-skill condition was not associated with increases in positive mood, task interest, and organizational spontaneity.

In an attempt to operationalize autotelic personality, Baumann and Scheffer (2010, 2011) introduced the achievement flow motive as the intrinsic element of the achievement motive. They suggested that that the achievement flow motive consists of two functional components: see(k)ing and mastering difficulty. In a mix of field and laboratory studies, they found that the achievement flow

motive was stable for 2 years and was related to self-determination and efficiency at work. Individuals with higher achievement flow motives were more likely to become immersed in their work tasks and to experience flow across different tasks and situations. The direct relationship between achievement flow motive and flow experience was mediated by the combination of seeking difficult behaviors (planning, analytical problem solving, and task focus) and mastering difficulty behaviors (commitment, optimism, and staying power). Baumann and Scheffer suggested that because confrontation with difficulty is associated with reductions in positive affect and mastering difficulty helps restore positive affect, jointly activating or alternating between difficulty and mastery may promote flow through affective change. Affective change, therefore, may be more essential to flow than positive affect per se (Baumann & Scheffer, 2010).

Freitas and Higgins (2002) found that high regulatory fit increased participants' enjoyment of, perceived success at, and willingness to repeat a novel laboratory task. These effects were independent of participants' actual success at the task. Other studies have found that individuals with low self-regulatory skills or weak internal locus of control are less likely to experience flow even if task demands are dynamically adjusted to their skill level (Baumann & Scheffer, 2011; Keller & Bless, 2008; Keller & Blomann, 2008).

Keller and Bless (2008) tested the moderating role of the volatility–persistence component of action-orientation in the relationship between challenge/skills balance and intrinsic interest and enjoyment. In two experimental studies, they manipulated the fit between challenges and skills by creating three distinct play modes in the Tetris video game. In the boredom condition (skills > challenges), the Tetris objects fell at a very slow rate; in the overload mode (challenges > skills), the objects fell at a very fast and increasingly faster rate; and in the adaptive mode (challenges = skills), the fall rate was progressively adapted to the player's actual performance. In comparison to individuals in the boredom or overload conditions, participants in the adaptive condition achieved higher game scores, indicated that they spent less time (than the actual time spent) playing the game, and reported higher levels of intrinsic interest and enjoyment. Participants in the boredom condition reported the highest level of perceived control over the activity, participants in the overload condition reported the lowest level, and participants in the adaptive model reported a level between those two. Keller and Bless also found that the *perceived* fit between challenges and skills was higher in the adaptive mode and that this partially mediated the effect of the condition on intrinsic interest and enjoyment. Actual performance did not mediate this relationship. Finally, they found that action orientation moderated the relationship; in other words, individuals who scored high on action orientation experienced higher levels of intrinsic interest and enjoyment in the adaptive condition.

In a study with 113 employees in the Netherlands, Demerouti (2006) modeled personality not as an antecedent of flow but as a moderator in the relationship between flow and job performance. She found that flow (i.e., absorption, enjoyment, and intrinsic motivation) was positively associated with peer ratings of both in-role and extra-role performance, but only for employees who scored high on conscientiousness. Employees who scored low on conscientiousness enjoyed flow states as well, but their flow experiences did not translate to tangible performance outcomes. While many studies on flow have assessed job performance through self-reports, Demerouti's study is rare in that it assessed job performance through ratings by principal informants. We clearly need more studies on flow that assess specifically creative performance through supervisor ratings, peer ratings, number of patents, and other measures beyond self-reports.

Kauanui et al. (2010) found that flow is related to individuals' general orientation toward life. In a study of 112 entrepreneurs, they found that those who experienced flow more frequently were more spiritually connected to their business. Most importantly, they found that the flow elements of autotelic experience, loss of ego, focus concentration, and balance between challenges and skills were particularly lacking for entrepreneurs with a nonspiritual connection to their work. This finding suggests that different elements of flow may reflect individuals' differential associations with a wide range of personal and contextual factors. Kauanui et al. also found that entrepreneurs who were spiritually connected to their work and experienced flow were more open to cultivating an organizational culture that nurtures well-being.

Outcomes of Flow

Csikszentmihalyi and LeFevre (1989) found that self-reported measures of affect, potency, concentration, satisfaction, and motivation were higher in flow than in non-flow in both work and

leisure and that people were more happy in leisure flow and least happy in non-work flow. All three occupational groups in their study reported higher-than-average levels of creativity, potency, and concentration during work flow.

Makikangas et al. (2010) found that employees' level of exhaustion was negatively associated to both job resources and flow. Employees with a low level of initial exhaustion were more likely to follow a trajectory in which both job resources and flow were high and remained high over time, whereas employees with high levels of initial exhaustion were more likely to follow a trajectory of low or decreasing job resources and flow.

Lovelace, Manz, and Alves (2007) proposed that flow can help alleviate the negative effects of high-strain jobs and also can promote increased engagement. Demerouti, Bakker, Sonnentag, and Fullagar (2012) assessed flow as absorption, enjoyment, and intrinsic motivation in a diary study of 83 employees in Europe. They found that absorption was positively associated with vigor at work, whereas intrinsic motivation was positively associated with vigor at home. Enjoyment was positively associated with vigor and negatively associated with exhaustion at the end of the work day when employees had low recovery after breaks at work, but not when they had high recovery after breaks. Employees scoring high on enjoyment during work experienced lower exhaustion at bedtime when they detached from work while at home, compared with people scoring low on detachment.

The findings of Demerouti et al. (2012) show that in high-paced work environments, flow helps rejuvenate depleted energy resources and has significant spillover effects to the non-work domain. In addition, Mainemelis and Ronson (2006) noted that finding affective pleasure in challenge is the hallmark of play, and of the flow state in particular, and Kark (2011) suggested that in play people experience heightened vigor and vitality. In a study of 128 employees, Kark and Carmeli (2009) found that vitality was positively related to creative involvement. A promising direction for future research is the investigation of the possibility that high-arousal positive feelings, such as vigor and vitality, as induced in flow, make subsequent and sustainable positive contributions to employee creativity in high-demand jobs.

Csikszentmihalyi and LeFevre (1989) found that self-reported creativity was higher in flow than in non-flow in both work and leisure, and that all three occupational groups in their study reported above-average levels of creativity during work flow. Sosik et al. (1999) measured flow as a higher-order construct with lower-order dimensions of intrinsic motivation, feedback, and concentration in a laboratory setting. They found that in the condition of anonymity, flow mediated the positive effects of transformational leadership on creativity. Furthermore, flow mediated the effects of transactional contingent–reward leadership on creativity irrespective of the level of anonymity. Sosik et al. noted that anonymity likely encourages participants who are moving into a flow state to become engrossed in the activity and to overcome their inhibitions to offer creative input.

Gevers and Demerouti (2013) examined the association between task absorption and creativity over 4 weeks in a diary study of 32 IT employees in the Netherlands. Controlling for general levels of absorption, they found that weekly absorption was positively related to self-reported individual creativity across the 4 weeks.

In a rare participant observation study in a conservatoire orchestra, Marotto et al. (2007) investigated how individual virtuosity experiences become collective virtuosity experiences. They found that collective virtuosity consists of engaged interaction and deep experience at the cognitive, affective, and social levels. The state of collective virtuosity was actively catalyzed by the interaction of leader characteristics (e.g., charisma), task characteristics (e.g., ennobling task), and group characteristics (e.g., empowerment). Furthermore, although musicians' love for the musical tasks remained constant during the 3-week rehearsal period, "the rare and fleeting moments of group level peak performance did not occur consistently throughout the three weeks" (p. 400). Stressing the fleeting and fragile nature of collective virtuosity, Marotto et al. suggested that collective virtuosity is lost when the members' aesthetic experience of collective performance is distracted.

Flow appears to foster creativity and high-quality performance. That said, we need much more empirical work on the relationship between flow and creativity. In addition, future studies on flow should assess creative performance with both self-report measures and with non–self-report measures of employee creativity (cf. Ng & Feldman, 2012).

Keller and Bless (2008) and Engeser and Schiepe-Tiska (2012) noted that flow does not necessarily relate to positive ethical or prosocial behavior, in part because it can become addictive (e.g., excessive playing of video games, gambling, flow

in combat) and in part because it can be experienced when individuals engage in antisocial activities. This applies to other forms of play as well. For example, playing violent video games may increase both short- and long-term aggression, especially among men with aggressive personality traits (Anderson & Dill, 2000). Future studies, therefore, should also investigate the potential addictive, subversive, and antisocial aspects of playful behaviors.

Timelessness

Drawing on perspectives on flow (Csikszentmihalyi, 1997), ecstasy (May, 1994), and subjective inner duration (Bergson, 1960), Mainemelis (2001, 2002) described timelessness as a complex experience associated with an intense state of consciousness in which total involvement in the task at hand results in loss of self-consciousness and loss of the sense of time. He conceptualized timelessness as a higher-order factor manifested in four dimensions: immersion in the task, time distortion, a sense of mastery, and a sense of transcendence. Mainemelis noted that timelessness is experienced in the more complex levels of flow, which occur less often than micro-flow experiences. He also suggested that other elements of flow (e.g., balanced between skills and challenges, intrinsic task motivation, feedback) are proximal contextual conditions of timelessness. He proposed that timelessness is a high-quality state of intense engagement with creative work that facilitates personal creativity.

In three studies involving business students, industrial designers, and R&D employees, Mainemelis (2005) found support for the higher-order representation of timelessness, as well as positive associations between timelessness and self-reported creativity. In a nomological study in an R&D organization sample, he found that timelessness was positively associated with supervisor ratings of employee creativity. Furthermore, timelessness was positively associated with intrinsic task motivation and autonomy.

In a study of 40 young professionals working in an architectural practice, a structural engineering firm, and a construction company, Sturges (2013) found that those who experienced work as a resented obligation did not experience timelessness. In contrast, those who associated their work with enjoyment and intrinsic rewards spent more time at work, experienced more timelessness (immersion and time distortion), and felt that work time was closely linked to indulging in a passion. Sturges found that the experience of timelessness was linked to creative engagement and creative problem solving more among the architects and less among the other professionals. A promising direction for future research, therefore, is investigation of the occupational and environmental conditions that foster timelessness specifically in the context of creative engagement versus other forms of work engagement.

Unlike other conceptualizations of flow, the concept of timelessness draws attention to the temporal dynamics that foster or hinder states of deep immersion in creative tasks. In this vein, Bakker, Boros, Kenis, and Oerlemans (2013) experimentally manipulated time frames in a study of 267 managers working in creative project teams. Teams working in shorter time frames had a time orientation that was more focused toward the present, were less immersed in the task, and employed a more heuristic (versus a systematic) mode of information processing. Bakker et al. noted that a short time frame may lead individuals to focus on task completion (getting the work done) rather than the process that supports it.

Focusing on the demands of the immediate present is not synonymous with becoming immersed in the activity. In fact, some studies have shown that confidence in planning over long time frames is positively associated with creativity (e.g., Zampetakis, Bouranta, & Moustakis, 2010). The positive association between long time frames and task immersion in Bakker et al.'s (2013) study corroborates theoretical descriptions of timelessness (Mainemelis, 2001) and flow (Csikszentmihalyi, 1997). Mainemelis (2001) suggested that immersion requires a person's attention resources to become fully invested in the task at hand. Short time frames, especially tight deadlines, arouse feelings of concern, stress, or anxiety, which consume scarce attention resources and thus function as cognitive distractions that hinder total involvement with the activity. To further investigate this issue, future studies can explore how affective reactions moderate or mediate the effects of time frame on task immersion.

Gevers and Demerouti (2013) noted that individuals have varied styles for pacing their work. Some prefer to concentrate efforts later in task execution (deadline-action pacing style), some prefer to spread out work effort evenly (steady-action pacing style), and others prefer to combine both early and later effort distribution (U-shaped pacing style). In a diary study with 32 IT employees in

the Netherlands, Gevers and Demerouti found that supervisors' temporal reminders related positively to task absorption for individuals with a strong preference for the deadline-action pacing style but negatively for individuals with a strong preference for the steady-action or the U-shaped action style. Controlling for general levels of absorption, Gevers and Demerouti found that weekly absorption was consistently positively related to individual creativity across 4 weeks.

Antes and Mumford (2009) and Byrne, Shipman, and Mumford (2010) found that time orientation, time pressure, and forecasting have complex interactive effects on creative processes. Therefore, future studies on timelessness, flow, and other playful states of intense involvement with work tasks should carefully consider the interactions between the wide range of temporal constructs (cf. Halbesleben, Novicevic, Harvey, & Buckley, 2003), the various types of tasks, and the various stages and processes involved in creative work.

Conclusions

While in the past research on play in organizations was limited, fragmented, and dispersed, in the last decade we have witnessed the development of integrative conceptual frameworks as well as the formation of research substreams, especially those focusing on serious play and flow. Recent empirical studies have employed a wide range of methods, including survey, laboratory, ESM, interview, ethnographic, case study, participant observation, and action research designs. Equally encouraging is the proliferation of critical perspectives stressing the need for balanced analyses of the institutionalization of play in organizations. Considering that play is polymorphous, complex, and elusive, methodological and theoretical pluralism is important for advancing our understanding of play at work.

Taken together, the studies reviewed in this chapter suggest that play, flow, and timelessness tend to be positively associated with creative engagement, creative performance, innovation, well-being, and social connection in the workplace. That said, the field of play research and its extant body of empirical findings are still nascent. We need more studies, and more focused studies, on a wide range of issues pertaining to the personal and contextual conditions of play, flow, and timelessness; their associations with creativity, innovation, and entrepreneurship; and their interactions with other moderating and mediating factors in the work environment. We also need more research that focuses on the differences among various conceptualizations of play, flow, and timelessness and the various ways in which these three constructs influence creativity, innovation, and entrepreneurship. As the field evolves, its conceptual arguments and empirical designs are likely to grow in accuracy and precision, leading to more elaborate portrayals of the intricate and complex manifestations of play in organizational life.

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CHAPTER

9 The Mood and Creativity Puzzle

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Abstract

The role of mood during acts of creativity is addressed. A mainstream position, in which the facilitating effects of positive mood on creativity is maintained, has long dominated debate on this issue. An extensive amount of research based on both laboratory and field studies is reviewed. Contrary to a one-dimensional view, in both streams of research a complex picture emerges, suggesting that both positive and negative moods may contribute to creativity under different conditions. In line with a new trend emphasizing dual routes from mood to creativity, a dual process theory grounded in a general problem-solving perspective is developed. Here, differential effects of positive and negative moods are prescribed for different core aspects of the creative act. A special role for dual or mixed moods under conditions of complex creativity is also suggested.

Key Words: mood, creativity, problem solving, cognitive styles, organizational behavior

Introduction

Sizzling terms such as "affect revolution" have been used to describe the recent upheaval in research on the significance of affect in organizational behavior (e.g., Brief & Weiss, 2002). According to Barsade and Gibson (2007), traditional models of organizational behavior that emphasize rational agents as ideal players in the organizational theater are seriously limiting our understanding of the life and blood of organizational behavior, which is seen to be "permeated by affect" (p. 36).

In a large number of studies this notion is justified by showing that affect significantly influences important aspects of cognition and social behavior, as well as having strong effects on an impressive array of task and job performance features (cf. Forgas, 2008; Forgas & Koch, 2013; George, 2008, 2011).

The relevant literature is, however, still plagued by considerable ambiguity in the use of terms. Some use *affect* and *mood* interchangeably (Forgas & Koch, 2013; Isen, 1999, 2008), whereas others distinguish carefully between affect, moods, and feelings. Davis (2009) and Vosburg and Kaufmann (1999) suggested that affect may best be seen as a superordinate term comprising feelings, emotions, and mood. Affect is here most frequently conceptualized in terms of core affects in the sense of pure, dispostitional, and universal entities. Mood is often seen as comprising more diffuse or generalized affective background states that are not usually directed at any particular object or event, as feelings and emotions are (e.g., Davis, 2009; Morris, 1989). Empirical studies, particularly in the domain of task performance, have often focused on the dimension of mood, but in some studies individual differences in affect dispositions are addressed.

Creativity is another concept that is gaining considerable momentum in the field of organizational behavior. Creativity essentially involves the development of a novel idea or solution to a problem that has value for the individual and/or a larger social group (Hennessey & Amabile,

2010; Zhou & Hoever, 2014). Increasing demands on employees to engage in complex problem solving that involves creativity coincide with, and are compounded by, a complementary urge among employees to work with stimulating and challenging tasks that provide intrinsic motivation and an opportunity for self development (Zhou & Shalley, 2008, 2011). These parallel developments in the contemporary workplace have lifted the concept of creativity to an increasingly significant position on the management agenda of contemporary business organizations (Florida, 2002). In fact, recent surveys among Fortune 500 executives place creativity and innovation squarely at the top of their priority list (e.g., Bronson & Merryman, 2010).

It is to be expected that these two new streams of research, on affect and creativity, would interface in contemporary research in organizational behavior. This has indeed happened, as evidenced by a long roster of research, for more than 25 years, on the relationship between mood and creativity (Baas, De Dreu, & Nijstad, 2008; cf. Frese & Rank, 2008).

The Mainstream View

In the new perspective of understanding work life and organizational behavior, the significance of positive affect is strongly celebrated, and negative affect is either seen as predominantly disruptive or, at best, relegated to a more uncertain status (Barsade & Gibson, 2007; Tsai & Chen, & Liu, 2007).

In line with this general trend, the extant literature on mood and creativity highlights the facilitating effect of positive mood on various measures of creativity (Amabile, Barsade, Mueller, & Staw, 2005; Fredrickson, 2001; Fredrickson & Branigan, 2005; Hirt, 1999; Hirt, Dreyers, & McCrae, 2008; Isen, 1997, 1999, 2008; Martin, 2000; Staw & Barsade, 1993). The predominant explanatory narrative behind this position is based on the premise that positive material is more abundant, better organized, and more extensively connected in memory than neutral or negative material (e.g., Isen, 2008; Isen & Daubman, 1984).

The mood congruence principle states that positive mood triggers positive material in memory. This mechanism is held to provide access to a broad and diverse range of associates that allows for the kind of increased cognitive flexibility seen to be crucial to creativity (Ashby, Isen, & Turken, 1999; Isen, 1997, 1999, 2008; Isen, Daubman, & Nowicki, 1987; Isen, Niedenthal, & Cantor, 1992). A similar implication follows from Fredrickson's broaden-and-build theory of positive mood effects on cognition (Fredrickson, 2001; Fredrickson & Branigan, 2005).

Mood and Creativity in the Laboratory

Most of the extant research on the effects of mood on creativity has been performed in a laboratory task context. This approach allows for fairly precise testing of theory-derived hypotheses, and much of the research has centered on the idea that a positive mood is most congenial to problem solving and decision making in the context of creativity requirements.

The Case for Positive Mood

It has indeed been found that induced positive mood leads to more inclusive conceptual categorizations and more unusual associations to neutral words and concepts (Hirt, 1999; Hirt et al., 2008; Isen & Daubman, 1984; Isen, Johnson, Mertz, & Robinson, 1985). In a series of four experiments, Isen et al. (1987) demonstrated that induced positive mood enhanced performance on a number of different creativity tasks, including an insight problem, a categorizing task, and a remote associates task (cf. Greene & Noice, 1988). These findings are consistent with results from other studies showing positive mood to increase fluency in divergent thinking tasks (Abele, 1992a, 1992b). More recently, Phillips, Louise, Bull, Adams, and Fraser (2002) and Hirt et al. (2008) replicated these findings in a positive–neutral mood contrast. Vosburg (1998a, 1998b) recorded mood at arrival through an adjective checklist immediately prior to task performance and found that positive mood facilitated and negative mood inhibited fluency of idea production.

In a different approach, Martin, Ward, Achee, and Wyer (1993) promoted a hedonic contingency theory of mood and information processing. A central tenet of the theory is that people strive to uphold their positive mood and may prefer to engage in playful creative activities as part of this endeavor. Recently, Hirt et al. (2008) found that induced positive mood had a facilitating effect on various measures of divergent thinking. They argued that the results could best be explained in terms of a mood maintenance mechanism.

According to the cognitive tuning theory originally proposed by Schwarz (1990) and further developed by Schwarz and Bless (1991), Clore, Schwarz, and Conway (1994), and Schwarz and Clore (2003), the essential function of emotional

states is to inform the individual about the state of the current task environment (cf. Frijda, 1986, 2007). Negative mood indicates a problematic situation, whereas positive mood signals a satisfactory state of affairs. On this theoretical premise, it was argued that individuals in negative mood will more likely be tuned to an analytic style of processing, in which the situation is treated in a more cautious and careful manner, along the lines of what Fiedler (1988) has termed "tight" processing. In contrast, positive mood individuals feel safe and good about the situation and consequently are inclined to relax on the processing requirements, in the form of "loose" processing and simplifying heuristics (Fiedler, 1988; Forgas, 2008). As a consequence, they are held to be more willing to explore novel procedures and possibilities that could increase the likelihood of finding creative solutions. In the evidence reviewed by Abele (1992b), Ashby et al. (1999), Davis (2009), Kaufmann (2003), and Isen (2008), positive mood seems to fairly consistently yield facilitating effects on various standard indicators of divergent, creative ideation under controlled laboratory conditions.

These findings were all from studies conducted at the micro, individual level. We may ask whether they can be generalized to the meso, group level, at which individuals are working together in a team and a whole different set of dynamics is at play. Grawitch, Munz, and Kramer (2003) addressed this issue and examined the hypothesis that positive mood promotes cognitive flexibility in a group dynamic context. In their study, 57 temporary workgroups received positive, negative, or neutral mood instructions, after which performance on a creative problem-solving task that required organized cooperation was examined. Negative mood created a stronger relationship focus than positive or neutral mood, in which task focus was more prominent. It was found that positive mood increased creative performance, particularly in the implementation stage of the process.

In a similar study, Grawitch, Munz, Elliot, and Mathis (2003) assessed group performance during a brainstorming kind of idea production under positive versus neutral mood inductions. It was observed that positive mood increased the originality of ideas. Overall, the authors considered their findings to support the general hypothesis that positive mood facilitates strategies that increase engagement with the environment, in contrast to negative mood, which tends to promote avoidance of harmful aspects of the environment.

The Case Against Positive Mood

Despite this mainstream trend of research on the effect of mood on creativity, it is important to recognize that significant exceptions to this pattern of findings also have been reported in the early literature on this issue. Jausovec (1989) observed a confusing pattern of results wherein the effect of positive mood on creative problem-solving tasks varied from task to task. In one task, a facilitative effect of positive mood was obtained, but in another, a detrimental effect emerged. In two other tasks, no significant differences between positive and neutral mood were found. These findings call into question the robustness of the results reported in the classical study by Isen et al. (1987), which is frequently cited in support of the singular stance that positive mood promotes creativity.

On an even more discordant note, Kaufmann and Vosburg (1997) demonstrated a reversal of the positive mood/creative problem solving effect. In several studies, positive mood was found to have a *detrimental* effect on performance compared with both neutral and negative mood. On their account, positive mood triggered a satisficing problem-solving strategy in these tasks, in contrast to negative mood, which promoted optimizing. In a typical deceptive insight task, in which the individual is lured into a faulty problem space where no good solutions exits, positive mood may entice the participants to opt for quasi-solutions based on previous success in similar problems. The paradoxical results observed by Kaufmann and Vosburg (1997) have more recently been replicated in a Web-based study by Verleur, Verhagen, and Heuvelman (2007).

Notwithstanding the notion that positive mood may encourage playful and loose processing, we may also clearly see the other side of the coin here. This is the mechanism by which positive mood promotes rapid processing based on readily available previous experience, which is also part of the premises of the cognitive tuning model described earlier. This orientation may run against creativity by preventing people with induced positive mood from detecting the typical impasse in these tasks, for which familiar solutions no longer work most effectively or may even be illusory and fail all together (cf. Ash & Wiley, 2006). Detecting the impasse is a necessary prerequisite to make the critical redefining maneuvers required to achieve entry to a new solution space harboring high-quality, original, and insightful solutions (see Ohlsson, 2013). On the Kaufmann-Vosburg account, then, positive mood could inhibit and negative mood could facilitate

creative problem solving when the main charge is to realize and effectively deal with the impasse of a typical creative insight problem. By promoting extended search beyond half-solutions, apparent quasi-solutions, and even clear-cut non-solutions, negative mood may increase the likelihood of striking at the key required reframing of the problem space, eventually leading to a highly original and insightful solution.

A key task in the creative cognition tradition explored by Finke and Slayton (1988) and by Finke, Ward, and Smith (1992) is the so-called creative mental synthesis task. Here, the subject is presented with randomly generated shapes and alphanumeric figures, such as a line, a square, or the capital letters L, D, or X. The task is to combine a given number of such elements into a recognizable pattern. An example of an easy task is giving the subjects a J and a D and asking them to combine them into a meaningful figure. Most people can easily visualize an umbrella. This kind of task can be made very difficult by adding number of elements to three and five and can be scored on both correspondence (i.e., how well integrated the different constituent elements are) and originality (i.e., how novel and ingenious the configuration of the elements is).

Anderson, Arlett, and Tarrant (1995) directly investigated the effect of mood on performance in this task by comparing the effect of induced positive, negative, and neutral mood with various indicators of problem-solving performance. The Velten mood induction procedure was employed, wherein the subjects were given 60 statements, happy or sad, and asked to experience each statement fully. The results showed that positive mood had a significantly *negative* effect on performance, particularly in comparison with the neutral mood condition. The authors suggested that the detrimental effect of positive mood occurs during the process of constraining the elements into a whole pattern, when subjects prematurely settle for solutions with poor correspondence and lower creativity.

Closely related to these findings, Gasper (2003) observed that induced positive mood, compared with induced negative mood, promoted the classical Einstellung effect that leads to mental fixation in problem solving under conditions in which the problem in question can no longer be solved by the standard rule used to solve a previous series of similar problems. Interestingly, though, there was a tendency for positive mood to spontaneously favor varied solutions under more unconstrained conditions in which the standard and an alternative procedure were both possible options.

In support of such findings, Vosburg (1998a, 1998b) found that positive mood at arrival favored unconstrained idea production but failed to make a difference under constrained conditions at a later stage in the idea production process. In line with all of these findings, Kaufmann and Vosburg (2002) observed a disordinal interaction in which induced positive mood (compared with negative mood) facilitated idea production in early, unconstrained idea production and impeded idea production in subsequent idea production under more constrained and degraded idea production conditions.

Similar findings have recently been observed by Baas, De Dreu, and Nijstad (2011), with anger and sadness as main contrasts. Anger promoted idea production in the early stages, whereas sadness was significantly more predictive of creativity in the later stages of idea production. Such findings are particularly interesting because they suggest a steep production gradient for positive mood, whereas negative mood seems to promote a flatter idea production gradient. In the influential classical association theory of creativity promoted by Mednick (1962), a steep gradient is linked to more conventional responses in idea production, and the flat gradient is more characteristic of a response pattern that may more likely lead to new and original ideas. Such findings deserves closer attention because of the potentially important general implications for understanding the relative roles of positive and negative mood in creativity.

In a study by Akinola and Mendes (2008), positive and negative mood were manipulated by way of positive and negative feedback on a task unrelated to the experimental task. Creativity was measured through a standardized artistic collage task developed and validated by Amabile (1982, 1996). The results showed that the negative mood manipulation had a significant facilitating effect on creativity.

In an original study, Hu and Yu (2011) explored the relationship between mood and musical creativity. They developed three objective measures of creativity in rock lyrics (e.g., the number of unique terms in a piece of text divided by the total number of terms) and divided the songs into positive, negative, active, and passive moods by using a standard index (Mood Tag Dataset). A total of 2715 unique songs were included in the dataset. The results were strikingly clear and showed higher creativity level in sad lyrics based on all three creativity measures.

By various comparisons, it was shown that the most creative songs included more sad and negative lyrics, while the least creative ones were made up of happy and positive lyrics. No effect of the active–passive dimension was observed. This study is, of course, limited to the specific domain of lexical creativity, but it offers an interesting new way of studying the relationship between mood and creativity in a squarely quantitative and objective manner that may perhaps be transferred to other domains of creativity.

At the level of team-based creative problem solving, we also find results that turn against the mainstream notion that positive mood promotes creativity and tend to favor the opposite idea, that under relevant conditions, a negative mood may benefit creativity. Jones and Kelly (2009) had three-person groups perform a creative problem-solving task that consisted of generating slogans for a fictitious company after receiving a positive or a negative mood induction. Negative mood groups outperformed the positive groups. These effects were present only at the group level and did not obtain at the individual level. It seems, then, that under certain conditions, we may observe a reversal of the posited facilitating effect of positive mood on creativity also at the group level. In line with the theories of Kaufmann and Vosburg (1997) and George and Zhou (2002), Jones and Kelly (2009) advocated an interpretation of their findings to the effect that a negative mood may promote an optimizing strategy and lead to extended effort in problem solving that eventually results in ideas of greater insight and creative quality solutions. They also presented evidence to support the idea that creativity under negative mood conditions at the team level is mediated by persistence on the slogan-generation task.

A theory that favors a facilitating role of negative mood under specified conditions during creative problem solving holds the premise that negative mood signals a current problematic state of affairs. Consequently, negative mood may promote greater openness and attention to new information that is discrepant with a conventional way of approaching and solving the problem. This was the leading hypothesis in a recent study of problem solving in groups conducted by Kooij-de Bode, van Knippenberg, and van Ginkel (2010). In this study, the influence of mood was examined under conditions in which information was either distributed among group members or fully shared among group members. The main finding confirmed the hypothesis and showed that group member negative mood was associated with greater elaboration of distributed information and higher-quality decisions than was the case with positive group member mood. Thus, negative mood may heighten sensitivity to new information that may contradict prediscussion preferences and premature group consensus during group decision making. These findings are in line with more general observations to the effect that individuals in a negative mood conform less to the opinion of others compared with those in a neutral or positive mood (e.g., Tong, Tan, Latheef, Selamat, & Tann, 2008; cf. Forgas, 2013).

From Paradox in the Laboratory to Paradox in the Field

The findings reported previously were obtained under rather contrived laboratory conditions and are based on quite specific measures of creativity. Here, it is relevant to consider the findings reported by Friedman, Förster, and Denzler (2007) to the effect that positive mood facilitates creative efforts in tasks that are "fun and silly," whereas creativity in serious and important tasks is promoted by negative mood. What happens when we leave the playground of the laboratory and enter the serious arena of a real business organization? It seems that the apparent paradox of strongly conflicting findings reintroduces itself.

In a comprehensive field study, Amabile et al. (2005) obtained evidence on creative problem solving in real worklife contexts based on both quantitative and qualitative longitudinal data from the daily diaries of 222 employees in seven companies in different industries to examine the relationship between affect and creativity at work. The results came down consistently on the side of the hypothesis that positive affect promotes creativity at work (cf. Binneweis & Wörnlein, 2011). No support was obtained for alternative hypotheses in favor of negative or ambivalent affect. The effect was straightforward with no indication of curvilinear relationships. Time-lagged analyses also indicated that positive affect causally preceded creativity.

A potentially important limitation of the study lies in the ipsative measurement of affect on a one-sided 7-point scale of pleasantness ranging from high to low positive. In a context of testing alternative hypotheses in an unbiased way, we would like to see normative measures of independent scales of positive and negative affect, which would also enable a more direct measure of mixed (ambivalent) mood. Such measures were obtained

through the standard Positive and Negative Affect Scale (PANAS) in a field study by George and Zhou (2002) which was conducted among workers in a company that manufactured helicopters. Creativity was measured with a 13-item scale by way of supervisor ratings.

George and Zhou (2002) operated from a mood-as-input model in which a leading hypothesis was that mood effects on creativity are contingent on contextual conditions (cf. Zhou & Hoever, 2014). More specifically, they argued that meaningful mood effects depend on organizational recognition and reward for creativity, as well as clarity of feelings (i.e., the extent to which people experience and understand their feelings). In striking contrast to the findings reported by Amabile et al. (2005), George and Zhou found that under the specified contextual conditions, negative mood was positively related to creativity when recognition for creativity and clarity of feelings were high. Conversely, under the same parameters, positive mood was negatively related to creativity. The authors explained these paradoxical findings with reference to a cognitive tuning perspective in which negative mood signals that the status quo is problematic and that improvements and more effort are needed. In contrast, positive mood is held to encourage confidence with current efforts and to being satisfied at lower levels of creative performance, as was also suggested by Kaufmann and Vosburg (1997) as an explanation for their discrepant laboratory findings. Interestingly, in the study by Amabile et al., a similar observation was made on the basis of narratives wherein the participants, after repeated failure to solve complex problems, reported a strong negative mood in the form of feelings of frustration, followed by creative thought. According to Amabile et al., (p. 396): "It is possible that, under the state of frustration with the task, a person might . . . allocate more time and effort to the problem" and that this, in turn, could "increase the likelihood of a breakthrough on the problem."

Such a mixed bag of findings is also obtained from research on affect and creativity in the context of entrepreneurial creativity. As pointed out by Foo, Uy, and Baron (2009), the standard image of an entrepreneur is one of a passionate, enthusiastic, and persistent individual working incessantly in the face of threats and challenges. Such an image may easily lead one to the position that the kind of creativity and innovation involved in entrepreneurial activity must be driven by positive affect. A theory that works from this premise has been championed by Baron (2008), who stands by the standard conception that positive affect promotes cognitive flexibility.

In one study, Baron and Tang (2011) obtained data on affective dispositions, entrepreneurial creativity, firm-level innovation, and environmental dynamism. More specifically, they proposed and tested the hypothesis of a moderated-mediation model of the role of affect in entrepreneurial creativity, which in turn promotes firm-level innovation. This mediated effect of affect-based creativity on innovation was further held to be moderated by environmental dynamism (i.e., the degree of stability and change in the environment of the organization). In general, support was obtained for the model. However, several shortcomings of this study should be pointed out. Only positive affect was measured, so no contrast between positive and negative mood could be assessed. Creativity was measured on a self-rated scale tapping to which extent respondents' own work involved new ideas, new long-term visions, new technical applications, risk taking, and radical new ideas. The literature on affect and cognition is, however, replete with observations to the effect that people high on positive mood tend to inflate their own self-image and overrate their performance compared with neutral- and negative-mood individuals (e.g., Forgas & Koch, 2013). The proposed hypothesis is interesting and important, but we need more objective and independent data in order to subject it to a more critical empirical test.

In the study by Foo et al. (2009), a much stronger design was implemented. Here, the authors assessed entrepreneurial creativity on a within-subjects basis with an experience sampling methodology based on cell phone wireless application protocol (WAP) technology. On the basis of a feeling-as-information model, these authors proposed the hypothesis that negative mood may drive creative problem solving on the immediate basis, whereas positive affect comes to its own in creative idea production on a more future-oriented scale. The venture efforts of 46 entrepreneurs were measured twice daily for 24 days. The findings showed that negative mood did indeed facilitate venture efforts toward tasks that required immediate attention. Not expected was the finding that negative affect also showed a lagged effect on venture efforts on the next day. Positive affect had no relationship to immediate problem solving but did predict long-term, future-oriented ideation efforts. Thus,

positive affect seems to be more geared toward proactive creativity, constructing future desired states, whereas negative affect is more adept in dealing with reactive creativity (i.e., discrepancies in the existing problem space). (See Kaufmann, 2004, for a more detailed discussion of this distinction between different forms of creativity.)

The Case from Above

We have seen that whether we approach the issue of the relationship between mood and creativity from the laboratory or from the field, we run into a set of highly conflicting findings. In this kind of situation, the temptation is great to call for some sort of higher court decision based on a weighted overall view of the research findings. Recently, we have seen the publication of two meta-analyses of the complicated pattern of results obtained in the field. Davis (2009) concluded his meta-analysis of the literature on the mood and creativity relation in favor of a kind of contingency model. The facilitating effect on creativity of positive versus neutral mood was affirmed, but it was held to be moderated by a number of boundary conditions, such as type of task. The contrast between positive and negative mood was not significant.

Unfortunately, Davis's analysis suffers from many serious shortcomings. Inclusion criteria were designed in such a way that several findings favoring negative mood as facilitative and positive mood as inhibitive of creativity were excluded. In addition to these limitations, clear mistakes in the classification of tasks were made. For instance, remote associates tasks were labeled as idea production tasks, on par with open-ended divergent thinking tasks, rather than as insight tasks, with one ideal, correct solution, which is the standard way of categorizing tasks in the creativity field (e.g., Bowden, Jung-Beeman, Fleck, & Kounios, 2005). Reclassification of these tasks would probably have a significant impact on the general conclusions that can be drawn from this meta-analysis.

The other meta-analysis was conducted by Baas et al. (2008). This is a far more comprehensive and inclusive analysis in which the results of the preceding 25 years of research in the field are reported and analyzed. Although the authors affirmed the reality of the facilitating effects of positive mood, they also joined forces with other reviewers of the literature (e.g., Kaufmann, 2003) to argue for a more balanced view on the relationship between mood and creativity. Interestingly, Baas et al. advocated a dual-track model (cf. De Dreu, Baas, & Nijstad, 2008) in which positive mood is held to facilitate cognitive flexibility (crossing categories in idea production). Negative mood is also seen to hold promise as a facilitator of creativity, but through the different route of triggering persistence in solution search efforts within a more narrowly and strategically defined area of the problem space. Persistence in search of a solution is often seen as a core requirement in creative thinking (e.g., Newell, Shaw, & Simon, 1979). Another potentially significant moderator of the valence effect of mood on creativity, according to Baas et al., is level of activation. They argued that the effects of positive and negative mood may occur most reliably, and perhaps only, at high activation levels.

The more specific dual-pathway suggestion (i.e., a flexibility route and a persistence route) is, however, open to serious criticism. In particular, the positive mood-cognitive flexibility proposition does not seem to stand up to scrutiny based on available empirical evidence. The hypothesis is mainly based on consistent empirical findings to the effect that positive mood facilitates between-category, rather than within-category, fluency and originality in idea production. The idea is that shifting categories require cognitive flexibility (cf. Nijstad, De Dreu, Rietzschel, & Baas, 2010). As pointed out by Ionescu (2012), however, the concept of cognitive flexibility is a notoriously multifarious term and extends far beyond this attribute. According to Ionescu, it should be seen as a more fundamental property of the cognitive system, for which the common denominator is finding novel and adaptable solutions to changing demands. There were no changing demands in the tasks employed by De Dreu and his coworkers. Shifts of category occurred on the spontaneous discretion of the individual and might or might not have been adaptive.

In a series of experiments by Phillips et al. (2002) on mood and executive functions, it was shown that positive mood significantly facilitated aspects of ideational fluency (unusual uses of objects) but was detrimental to shifting to a new rule, as measured by the Stroop task of flexibility. Even more problematic for the positive mood/cognitive flexibility hypothesis are the findings cited earlier by Gasper (2003). Here, positive mood, as opposed to negative mood, was shown to promote persistence and mental fixation in problem solving under conditions in which the problem in question could no longer be solved by the standard rule used to solve a previous series of similar problems. A straight generalization to the effect that positive

mood facilitates cognitive flexibility seems to be firmly rejected by the empirical evidence at hand.

We can now clearly see that the singular proposition that positive mood facilitates creativity has outlived its empirical usefulness. Creativity, in its Janusian sense of delivering a product that is both novel and appropriate, logically seems to require a successful balancing of a highly complex set of interrelated, sometimes opposing activities. It should not come as a surprise that it may be tuned by both positive and negative moods.

Mixed Mood and Creativity

So far we have considered positive and negative mood separately. But there is also the possibility that a state of mixed mood may occur and may incrementally influence creativity, particularly under the condition of high-level creativity. This has been argued in another stream of mood and creativity research, in which vulnerability to bipolar mood disorders is linked to elevated forms of creativity (Jamison, 1993; Kaufman, 2014; Kaufmann & Kaufmann, 2014a).

In a laboratory context, this issue has been addressed in an interesting way by Fong (2006). She argued that a mixed mood (i.e., a simultaneous experience of both positive and negative mood) is real and occurs fairly frequently despite our schematic conceptions of mood experiences as falling discretely into the two moods of positive and negative. (See Feldman Barrett & Russell, 1999, for a review of this debate.)

From a cognitive tuning perspective, Fong (2006) argued that the experience of an ambivalent mood naturally will lead to the experience of the current situation, or task at hand, as unusual, anomalous and atypical. The implication of this conception of the task environment is, according to Fong, that it opens up the problem space to allow for more unusual and incongruent associations. In two experiments, this core hypothesis was tested by inducing positive, negative, neutral, and mixed mood through autobiographical recall and specially designed film clips. Creativity was measured by performance on the Remote Associates Test. The results showed that it was indeed possible to induce an ambivalent mood that could be distinguished from positive, negative, and neutral mood states. Moreover, the ambivalent mood conditions yielded higher creativity performance than all the comparison mood conditions. These findings are in line with recent observations by Rees, Rothman, Lehavy, and Sanchez-Burks (2013) to the effect that induced emotional ambivalence, compared with sadness or happiness, was observed to be an important condition in facilitating receptivity to alternative perspectives on the task at hand.

Such findings were also supported in a multivariate study of our own (Kaufmann & Kaufmann, 2014b), which was designed to study the relationships between elevated, positive mood (hypomania); negative, depressed mood; and various measures of creativity. A total of 215 participants had a diverse range in educational background and age, measures of depression, hypomania, and indicators of creativity. These included creative accomplishments in everyday activities; measures of idea production of the open-ended, divergent thinking type; and performance on creative problem-solving tasks requiring insight and highly original solutions. An indicator of complex creativity was designed by combining the various indicators of creativity, and hierarchical regression analysis was performed to examine the relationships between the affect variables and complex creativity. The leading hypothesis was that elevated positive mood (hypomania) would predict the everyday creativity of creative accomplishments and divergent thinking, whereas bipolarity (simultaneously high on both negative and positive moods) would predict performance on the complex creativity index, as measured by an aggregate score across task categories. We found that the lowest score on the creativity index was obtained in the category of those scoring high on negative and low on positive mood. Elevated positive mood predicted divergent thinking and creative accomplishments, and, as posited, the simultaneous combination of high negative and high positive mood predicted complex creativity and outweighed the effect of elevated positive mood at this level of creativity. Interestingly, those who scored high on elevated positive mood and low on negative-depressed mood exhibited a medium to low performance on the complex creativity index.

The results of these studies show that mixed or dual moods may be significantly related to high levels of creativity, and may even, under certain conditions, outstrip the effects of singular moods.

Dual Moods and Creativity in the Field

Findings parallel to these observations have been obtained in natural contexts in work life settings. In a study by George and Zhou (2007), set in the context of a large oil field services company, positive and negative moods were assessed by having the participants rate their moods on the

standard PANAS scale over a 1-week time frame. Creativity was indexed by way of supervisor ratings. A dual-tuning effect of mood on creativity was obtained. Creativity was observed at its highest level under the conditions of both high positive and negative mood, given a supportive context for creativity (e.g., developmental feedback, interactional justice or trust). The authors concluded by favoring a dual-tuning model of the effect of mood on creativity. Here, positive mood is seen to signal a safe situation and to favor playfulness and a looser, more expansive and divergent form of thinking. Negative mood signals a problematic state of the existing problem space and encourages extended efforts and improvements on the existing state of affairs that are less dependent on preexisting schemas and scripts. We may readily see that both of these processing orientations may be relevant under the full requirements of both novelty and appropriateness of a creative solution to complex, real-life problems in a work setting.

In a recent study, To, Fisher, Ashkanasy, and Rowe (2011) took as their point of departure the dual-track model as originally proposed by De Dreu et al. (2008) and examined the effect of mood in the more complex, real-life situation of doctoral and postdoctoral students working on their thesis. A within-subjects experience sampling methodology was used in which the participants frequently reported their mood on an adapted version of the standard PANAS scale. Creativity scores were obtained by way of a self-report, a standardized measure of creative process engagement (CPE), and supervisory ratings. The results showed that both positive and negative activating moods were related to concurrent CPE. Deactivating positive and negative moods were both negatively related to CPE. Activating negative moods had a significant lagged effect on creativity, whereas activating positive moods did not. These findings stand in direct contradiction to the quantitative findings reported by Amabile et al. (2005), cited earlier, and are more in line with their qualitative observations.

In a recent study, Bledow, Rosing, and Frese (2013) argued in favor of the view that creativity draws on both positive and negative mood. They also criticized current perspectives on the grounds that such views are static and do not take into account the dynamics of shifting moods. Specifically, they argued in favor of the view that creativity may benefit more strongly from a condition in which a positive mood is preceded by an episode of negative affect. The idea is that negative mood may trigger a bottom-up mode of processing and assist in detecting discrepancies and drawing attention to problematic aspects of the current situation. Positive mood may then help to broaden and expand and explore the problem spaces targeted by the preceding problem representation. In several studies, based on both experience sampling and experimental inductions, it was shown that the sequence of a negative mood followed by a positive mood, termed *affective shift*, was particularly beneficial for creative problem solving, especially if the ensuing positive mood was accompanied by a decrease in negative mood. They concluded that a dynamic interplay of positive and negative mood favors the implementation and coordination of the different types of cognitive processes that are involved in creativity.

An emphasis on dual modes of affect is also reflected in some recent work within the domain of strategy focusing on sensemaking processes. Sensemaking is defined as the process in which individuals and groups are engaged in explaining and dealing with novel, unexpected, or confusing events (e.g., Maitlis & Christianson, 2014), and it has taken on increasing importance in the study of organizations (e.g., Weick & Sutcliffe, 2007). The concept of sensemaking at the organizational level embraces a number of events and issues within the domain of strategic change and decision making, and creativity and innovation is a key part of the process. Maitlis, Vogus, and Lawrence (2013) made the point that emotion is an underexplored aspect of sensemaking and set the agenda for exploring a number of relevant issues in this context. Here, we are dealing with problem detection, search for alternative solutions, and settling for a satisfactory solution to a significant discrepancy. They emphasized the interplay between positive and negative emotions in navigating through this complex problem-solving cycle.

A recent development within this area is the concept of mindful organizing, which is defined as a "collective behavioral ability to detect and correct errors and adapt to unexpected events" (Vogus, Rothman, Sutcliffe, and Weick, 2014). In line with the emphasis on dual tuning in general and mixed moods in particular, these authors emphasized the importance of emotional ambivalence in the sense of a simultaneous experience of positive and negative emotions as being most conducive to the required attitudes and kinds of processing involved in mindful organizing. With reference to the work of Fong (2006), cited earlier, they posited that

emotional ambivalence is particularly conducive to making people more open to alternative perspectives, and this is seen to promote the kind of cognitive flexibility that is needed to anticipate failures and deal with unexpected events in the most productive and effective way.

Coordinating the Two Streams of Research

We have now seen a converging picture emerge from the laboratory and the field literature on the effects of mood on creativity. In line with the more general, recent literature on mood effects on cognition (e.g., Forgas & Koch, 2013), the research shows that both positive and negative moods may contribute in a concerted way to influence task performance. Positive mood seems to enhance idea production and variation in the sense of promoting cross-categorization of ideas. This is seen in a range of tasks that include idea production, formation of remote associates, and breadth of categorizing. But there is also a place for negative mood. This is observed in tasks that require insight and adaptive flexibility in response to novel challenges in the task environment in the areas of both human resource management, strategic decision making, and entrepreneurial activity.

Such findings are clearly in line with theories arguing for dual pathways and dual-tuning mechanisms in creative problem solving (De Dreu et al., 2008; George & Zhou, 2007; Kaufmann, 2003; Kaufmann & Kaufmann, 2014a). In such theories, positive mood is often seen to signal a safe state of the current task environment and to trigger a satisficing ("good enough") orientation. On the upside, such a relaxed attitude may lead up to playful, loose, and unconstrained idea development, in contrast to a more selective and analytically targeted focus favored by negative mood. On the downside, positive mood may also encourage a premature closure of problem-solving efforts in which the problem-solving space is not thoroughly examined for new and better solution possibilities. In contrast, negative mood stimulates a lack of satisfaction with the status quo or the existing state of affairs. In this capacity, negative mood may promote an optimizing orientation that favors a persistent and more constrained search for improvements and higher-quality solutions in a more targeted area of the problem space. Last but not least, there is also evidence in both streams of research indicating that mixed moods may be a distinct condition that also can favor creativity over and above the separate effects of positive and negative moods.

Mapping Dual Moods onto Dual Thoughts

The findings described previously may be said to differ quite radically from what we would expect from the mainstream ideas that have dominated the first generation of research on the issue of mood effects on creativity. In fact, the findings of the extant research at the individual, group, and organizational levels strongly invite a new and improved framework to understand the complexities of navigating through the more general mood-and-creativity maze described earlier. What seems to be needed is a theory of cognitive processing that allows us to translate dual tuning of moods into dual modes of processing in a way that may help us to resolve the apparent paradoxes of findings that are consistently reported.

A theory that has generated a lot of research and laid the ground for integrative perspectives in the field of thinking and reasoning is the dual-process theory of reasoning (e.g., Evans, 2008). There are many versions of this model, in which the relative focus is on different aspects of thinking. These theories are often subsumed under the more general scheme of System 1 and System 2 thinking (e.g., Kahneman, 2011; Västfjäll & Slovic, 2013). The core features of System 1 are that it is fast, automatic (unconscious/preconscious), implicit, heavily reliant on past experience, heuristic, associative, and intuitive, in the sense of responding readily to hunches and impressions. In contrast, System 2 is held to be slow, deliberate, conscious, explicit, analytical/logical, and systematic/methodical and to rely on logical rules of inference.

It is often assumed, implicitly and explicitly, that creative thinking belongs to System 1, where loose, associative, and intuitive thinking is prevalent. In line with such assumptions, we see that the bulk of the research conducted within laboratory-based mood and creativity research has used some sort of divergent idea production as a measure of creativity (cf. Davis, 2009). But these are contentions and operational adaptations that are highly fallible for a number of reasons. As pointed out by many researchers in the field, most of the thinking that adequately, or even minimally, meets the criteria for creativity needs to draw on both implicit and explicit types of processes in order to be successful (e.g., Allen & Thomas, 2011; Dreyfus, 2009; Hélie & Sun, 2010). Thus, Zeng, Proctor, and Salvendy (2011) are clearly justified in claiming that only a half-baked measure of the driving forces behind creative thought can be delivered by idea production tasks of the divergent thinking type, even on the standard of minimal construct validity!

Zeng et al. (2011) claimed that, at the least, the two criteria of novelty and appropriateness (value) have to be met by a valid operationalization of creativity. In the standard tests of idea production normally used in the field, there is a fundamental lack of taking into account the latter main ingredient. Moreover, to arrive at creative solutions to problems, there has to be an integration of the processing involved in problem definition, development of ideas, and deciding on a solution that adequately meets the constraints of the task. Such integrated processing may be tapped through insight problems and indirectly captured through measures of creative accomplishments in the field, but it is not fully captured through the standard idea production tasks.

The latter point is made forcibly in a new theory of creative problem solving offered by Hélie and Sun (2010). They distinguish between implicit and explicit thinking processes, and place creativity at the intersection of the integration of the results of both implicit and explicit processes. A significant element in their theory is the thesis that problem spaces often are represented both at the explicit and at the implicit level. This is a nice adaptive feature of cognition in the sense that redundancy and increased understanding of the problem may be achieved through multiple representations. In the context of creativity, however, they highlight conditions in which implicit and explicit thinking are discrepant and yield different outcomes. Solving such conflicts is often crucial to arriving at new and insightful solutions to complex creative problems (cf. Allen & Thomas, 2011). Often, creativity is crucially contingent on a reframing of the initial representation of the problem space in such a way that access to a new and more fruitful problem space is opened (see Ohlsson, 2013).

Theories of the dual-process kind have largely been developed within the reasoning tradition dealing with various sorts of logical thinking tasks. This is a somewhat closed task domain in which the focus is on judgment and decision-making aspects of task performance. Normally, the task is firmly set, and there is little room for exploratory search of the problem space and divergent development of a diverse manifold of solution alternatives that may eventually lead to new discoveries and fresh and insightful solutions to complex problems and new challenges. Thus, we agree with the arguments put forward by Newell et al. (1979) in their classical analysis of the concept of creativity to the effect that the processes of creative thinking can better be understood from the more general perspective of problem solving that includes, but also extends beyond, the territory of judgment and decision making.

To meet these requirements, we have developed a model that is a further development of the original formulations suggested by Kaufmann (2003) and may be regarded as a problem-solving variant of a dual-process theory. The most recent version of the model is described in detail in Kaufmann and Kaufmann (2014a). Here, we will summarize the main ingredients with particular reference to the issue of mood effects on the creativity dimension of human problem solving.

A Theory of Mood Effects on Creative Problem Solving

A theory of mood effects on creative problem solving needs to be anchored in a more general theoretical perspective on the functions of emotions, particularly with respect to their role in cognition. In general, we agree with Frijda's (1986) functionalist account of emotions, where emotions are seen as basically having a signal or heuristic cue function (cf. Kaufmann, 2003). More specifically, we agree with the basic premise behind the cognitive tuning theory developed by Clore et al. (1994; see also Schwarz, 2000). Here, a positive emotional state signals a satisfactory state in the task environment, whereas a negative emotional state sends the opposite message and signals that the task environment is problematic. Thus, mood may induce a frame of mind (cf. Morris, 1989) that serves as a mental backdrop for choosing a particular strategy or mode of processing to deal with the task at hand.

The principles stated earlier may now be applied more specifically to different aspects of problem solving, and testable hypotheses may be derived. Various levels of abstraction may be chosen for the development of a theory in this field. For the present purpose, we will focus on four general dimensions of problem solving: (1) *problem perception* (i.e., how the problem is represented to the individual in general terms), (2) *solution requirements* (i.e., what are the criteria for an adequate solution to the problem), (3) *process* (i.e., what type of processing of problem information is most adequate to deal with the problem at hand), and (4) processing *strategy* (i.e., what kind of general method or tactic of solving the problem is required).

Mood and Problem Perception

Fundamental to problem perception is the question of whether we will or can understand the existing task environment in terms of familiar schemas that need only modifications within a familiar frame, or whether the current situation contains discrepancies that requires a more fundamental restructuring and redefinition to be handled appropriately. In the first case, we are talking about what Piaget (1976) called assimilation, and in the second we are dealing with the complementary function of accommodation.

On cognitive tuning theory, we will expect a positive mood to elicit the frame of the current situation as satisfying and safe, making the problem solver more ready to rely on an assimilative style of problem perception and to place the problem within the comfortable reach of previous experience. This works well when the conditions of familiarity are met and may result in rapid and highly effective processing and problem solving in many cases. If these conditions are not met, however, and the conditions are such that a reorganizing of existing schemata or scripts is required to meet the requirements for an adequate solution, it becomes necessary to take a closer look at the crucial elements that are discrepant. A System 2 type of handling now becomes apt and may even be essential. A negative mood may more easily provide the relevant cue for framing the situation as problematic, uncertain, and in need of accommodative System 2 processing in order to move forward in the task environment. Here, we may also add a note on what Guilford (1967) reminded us when he pointed to the crucial importance of *problem sensitivity* in creativity.

The notion that a positive mood encourages assimilative, top-down processing whereas a negative mood more readily triggers an accommodating, bottom-up style of thinking has been championed by Bless and Fiedler (2006), and they reported significant evidence in favor of such an account (see also Forgas, 2013). Considerable creativity may feed into assimilative efforts at finding novel applications for existing schemata (cf. Boden, 2003). It becomes clearly wrong, however, when Bless and Fiedler (2006) save positive mood for creativity by linking creativity predominantly to the assimilative style of thinking. Quite to the contrary, it should be emphasized that accommodation was Piaget's preferred mechanism for creative thinking, when a deeper and more far-reaching restructuring or re-ordering of schemata was required (e.g., Furth, 1969, see also Kaufmann, 2004).

Mood and Solution Requirements

A cardinal consideration in specifying the requirements for problem solutions is found in the distinction between optimizing and satisficing criteria originally proposed in a seminal work by Herbert Simon (Simon, 1956) and further developed by Simon (1977) and March (1994). At the satisficing end of this continuum, the individual is held to construct a simplified mental model of the solution space and to accept the first solution that meets the corresponding aspiration level for an adequate solution. At the optimizing end of the continuum, the individual attempts to perform an exhaustive search and rational evaluation of the expected utilities of all alternative solutions available. From the theory presented earlier, it follows that being in a positive mood will lead to perceiving a task as less requiring of high-quality solutions than being in a negative mood, where a stricter criterion for an acceptable solution is more likely to be upheld and an extended search is required. Positive mood is also expected to lead to a higher level of confidence (cf. Hélie & Sun, 2010), which may compound such satisficing effects.

Mood and Type of Process

In cognitive information processing theory, the kind of process is often distinguished in terms of level of processing and breadth of processing (Anderson, 1990). Level of processing refers to the question of whether processing occurs at a surface level, such as the sensory level, or at a deeper level, such as the semantic level, where information is further processed in terms of meaning and organizational structure in memory. Breadth of processing refers to the distance between informational units that are related during processing. Broad, shallow processing is here regarded as System 1 type of processing, whereas narrow, deep processing is held to be System 2. We may readily realize that in meeting the requirements of both novelty and appropriateness for a full-fledged creative solution, a flexible coordination of both modes of processing may often constitute an optimal mindset.

As we have seen, the breadth dimension has been particularly targeted by mood theories (e.g., Baas et al., 2008; Isen & Daubman, 1984; Isen et al., 1985), and we should expect that positive mood promotes both a higher-level and broader information processing than negative mood. In our theory, however, positive mood is linked to broader information processing on the premise that positive

mood promotes a less problematic perception of the task, leading to a relaxation of the constraints of the processing requirements for the task in question. Thus, positive mood may lead to a more confident, less cautious, and more playful approach to the task than negative mood. The upside is to expand the problem space by extending the categorical boundaries of information in search for a creative solution. The downside of this attitude is that it also may lead to a more superficial processing. More precisely, our theory implies that positive mood promotes broad and shallow processing, whereas negative mood leads to more narrow but deeper processing. Broad processing may be an advantage in an explorative stage of a task that requires the generation of new ideas, but it may be detrimental when the task requires careful considerations and deeper processing.

Mood and Processing Strategy

As stated earlier, several theorists claim that positive mood increases the likelihood of employing heuristic-intuitive strategies, whereas negative mood promotes the use of controlled, systematic, and analytic information processing methods.

A hallmark of a heuristic strategy is simplification. Analytic strategies are costly in terms of cognitive economy, and often the problem solver has to resort to cruder and more general strategies in dealing with a fairly complex task. From the proposition that positive mood encourages a perception of current affairs as satisfactory and safe, it follows that positive mood would increase the likelihood of employing heuristic, short-cut strategies, whereas negative mood should lead to more cautious, analytic, and systematic methods of dealing with the task at hand. With respect to creativity, however, we have also argued that System 2 includes the kind of sustained analysis of problem spaces that resembles rumination (Kaufmann & Kaufmann, 2014a), which also involves extensive use of counterfactual thinking, shown to be favorable to creative thought (e.g., Markman, Lindberg, Kray, & Galinsky, 2007). Interestingly, in the context of this issue, Verhaeghen, Joormann, and Khan (2005) reported an empirical study that included various measures of depression (in the past versus currently), several indicators of creativity (creative interests, creative behavior, and creative ability), and a measure of self-reflective rumination. The results showed that rumination is related to both depression and several aspects of creativity. Therefore, there may be both destructive and constructive consequences of negative mood-induced ruminations (cf. Kaufmann & Kaufmann, 2014a).

Mixed Mood and Mixed Thought

We have now seen that there are ample grounds to argue that creativity in most cases is not just about taking a casual stroll in the task environment, where positive mood may assist in setting the stage for a brainstorming kind of idea production. This may be an important, and, indeed, vital component of the process, but it does not cover the whole territory to justify sweeping and one-sided claims to the effect that "positive mood promotes creativity" (e.g., Isen, 2008; Johnson, Murray, Fredrickson, Youngstrom, Hinshaw, Bass, et al., 2012). On the contrary, we have seen that there are very good theoretical reasons to expect that, under important conditions, negative mood may provide the most appropriate mental frame for choosing the kind of processing that is required to arrive at insightful solutions to complex problems. Importantly, under such conditions, positive mood may be expected to have negative consequences, in the same way as a negative mood may work strongly against the kind of loose, icebreaker type of processing that is often a necessary constituent in tasks of creative thinking, particularly in the early, lift-off, explorative stage.

The empirical evidence described and discussed previously also shows many examples in which there is a separate, independent effect of a mixed mood on creativity that is incremental to the separate effects of positive or negative mood. It is therefore likely that a comprehensive theory of mood effects on creativity also must provide a conceptual space for such effects. Here, it is important to address the question of specifically what is meant by a mixed mood. It could encompass both successive swings from one mood to another, which is the interpretation favored by Bledow et al. (2013), George and Zhou (2007), and To et al. (2011), or the simultaneous experience of both a positive and a negative mood, as understood by Fong (2006) and by Vogus et al. (2014). These different versions of mixed mood mechanisms could both be real and, indeed, turn out to have different kinds of effect on creative problem solving. Rapid shifts, we expect, could lead to enhanced flexibility in shifting between different modes of thinking, as described in System 1 and System 2 models. A simultaneous experience of both positive and negative mood could lead to the perception of the existing situation as atypical and

anomalous, which in turn may lead to opening up the problem space to incorporate unusual associations and promote the simultaneous entertainment of opposing ideas, which is seen as a hallmark of high-level creativity by Rothenberg (1990) in his theory of Janusian thinking.

Boundary Conditions of Mood Effects

A relevant but unresolved problem in mood research is the question of how wide-reaching the effects of mood on task performance are, compared with the driving requirements of the task and the more general context in which it is embedded. We may also ask whether there are individual differences in the reliance on mood as a heuristic cue to information processing. Is it possible, for example, that people with an intuitive cognitive style rely more on mood in their choice of strategy and process than do individuals with an analytic cognitive style, who are less affected by mood as a heuristic cue for choice of mode of information processing? These are important questions to consider, and little is known about what the answers may be. In a study by Kuvaas and Kaufmann (2004), the typical and normally robust mood congruency effect in memory and judgment was obtained only for subjects low in need for cognition, suggesting marked boundary effects for mood effects in complex cognition. On the other hand, in a recent series of experiments, De Vries, Holland, Corneille, Rondeel, & Witteman (2012) obtained significant mood effects even in a decision task with dominated choices, where preferences are supposed to be unambiguous. It was found that positive mood led to significantly more departures from valid rules than did negative mood.

Mood Effects and Task Constraints

So far, research indicates that mood seems to have its strongest effect in ill-structured compared with well-structured tasks. Degree of structure is determined by uncertainty on the nature of one or all of the three main ingredients of a problem solving task (i.e. initial condition, goal condition, and choice of operators to move from initial to goal situation), as opposed to highly familiar tasks, where there is a simple and direct access to a preexisting response. Such is the core message of the well-known Affect Infusion Model (AIM) developed by Forgas (1995, 2008, 2013), where mood is held to have maximal influence when open and constructive information processing is required. Conversely, when task requirements can be met with standard operations, there is no need for affect. More research is, however, needed to validate these general claims in the context of problem solving and creativity. The most significant limitation of this model is that it does not specify the respective roles of positive and negative moods during constructive processing. Neither does the theory deal with issues relating to mixed moods and affective shifts.

Mood Effects and Feedback

In the mood-as-information and mood-as-input models, it is generally maintained that mood provides people with information about their task environment (Schwarz & Clore, 2003) and that the significance of this information depends on the contextual conditions of the task (Martin, 2000). When we move from the constrained environment of the laboratory to creative problem solving in natural settings in the work environment, the moderating influence of contextual factors of mood effects on performance will naturally take on greater significance. This point was emphasized by George and Zhou (2002, 2007). In a series of studies, they have argued for, and shown the importance of, support from supervisors, in the form of developmental feedback, displaying interactional justice, and being trustworthy. It is reasonable to expect that the potentially constructive effects of negative mood as involved in dissatisfaction with the status quo and expressing dissent may be sensitive to this kind of supportive work climate. The tolerance necessary for dealing with wild and even outlandish ideas is also important, in order to keep the problem space sufficiently open to divergent exploration of new ideas. In support of their dual-tuning account of mood effects on creative problem solving, George and Zhou (2007) found that the positive effect of negative mood on supervisor-rated creativity is most clearly observed when leader support is high and when positive mood is also high during the time frame provided for mood ratings.

Conclusion

In line with this reasoning, we have seen that in more recent theoretical accounts of creative thinking, creativity is not placed exclusively on the side of System 1 thinking. Rather, it is also seen to crucially operate at the interface of System 1 and System 2 thinking. The model developed by Hélie and Sun (2010) is particularly interesting in the present context. They see the crux of creativity as

the processing required when implicit and explicit thinking entail discrepant representations of the problem, setting the stage for a cognitive conflict, much like that involved in the impasse situation in insight problems. Solving such conflicts is often crucial to arriving at new and insightful solutions to complex creative problems (cf. Allen & Thomas, 2011).

We have argued that the framework presented here may serve as an integrative theory to understand the kind of mood effects observed in both laboratory and field studies of mood and creativity. Positive and negative mood effects unfold on both arenas in a theory-consistent way, as does mixed mood as an experiential frame of mind for dealing with more complex cases of creative thought. Thus, there is also a significant place for mood volatility and mixed moods in the understanding of the manifold of findings in both streams of research. In this capacity, the theory may also serve as a prism to understand some of the cognitive mechanisms involved in the relationship between high-level creativity and elevated frequency of mood disorders, in particular under Bipolar 2 conditions (e.g., Kaufmann & Kaufmann, 2014a, 2014b).

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CHAPTER

10

Does Passion Fuel Entrepreneurship and Job Creativity? A Review and Preview of Passion Research

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Abstract

The notion of passion has received increasing attention from management scholars in the last decade. One particularly intriguing question is whether passion fosters entrepreneurship and job creativity. This chapter provides a detailed review of the passion literature and then highlights the definitions, antecedents, and outcomes of entrepreneurial passion and passion for work. The review reveals important research gaps that need urgent scholarly attention. Specific suggestions that will be instrumental in carrying out future research to study the role of passion in entrepreneurship and creativity are offered. Research on passion provides a promising avenue to generate novel and useful knowledge for advancing management theories and improving managerial practices.

Key Words: entrepreneurship, creativity, passion for work, harmonious passion, obsessive passion, entrepreneurial passion

Introduction

Passion, a word that is often reserved for love and artistic work, has received increasing attention from management scholars in the last decade (e.g., Baron & Hannan, 2002; Baum & Locke, 2004; Cardon, 2008; Cardon, Wincent, Singh, & Drnovsek, 2009; Chen, Yao, & Kotha, 2009; Forest, Mageau, Crevier-Braud, Bergeron, Dubreuil, & Lavigne, 2012; Forest, Mageau, Sarrazin, & Morin, 2011; Liu, Chen, & Yao, 2011; Murnieks, Mosakowski, & Cardon, 2014). As an important ingredient of motivation, passion is theorized to trigger meaningful workplace outcomes (Cardon et al., 2009; Liu et al., 2011). In work and organizational settings, passion has been linked to entrepreneurship (Chen et al., 2009) and to creativity (Liu et al., 2011). Although organizational research on passion is prosperous, numerous issues regarding the conceptualization, measurement, and analysis of passion need to be addressed in future research. In this chapter, we provide a comprehensive and critical review of the existing passion literature by summarizing research progress, identifying research voids, and proposing directions for future research in the realm of work and organizations.

To thoroughly review the current state of the scholarship on passion, we searched multiple databases, including APA PsychNET, Business Source Complete, Google Scholar, ISI Web of Knowledge, LexisNexis, Proquest, PsychInfo, and Scopus. In the sections that follow, drawing on the findings from this comprehensive literature review, we first theorize about passion and elaborate on its core attributes. We then discuss the existing psychological measures of passion. Next, we discuss the antecedents and consequences of passion with a

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particular focus on entrepreneurship and creativity in organizational settings. Finally, we outline an agenda for future research on passion.

Definitions of Passion and Its Dualistic Model

Although scholars in different disciplines (e.g., philosophy, politics, social psychology, management) have defined passion in different ways (see Table 10.1 for a summary), these definitions have overlapped in identifying three core attributes:

1. Passion is accompanied by intense positive feelings.
2. Passion regulates individual behavioral tendencies.
3. Passion is a target-specific construct.

The emphasis on positive feelings in defining passion dates back to the philosophers' classic view that passion is always associated with intense emotions that are positive and overpowering, arousing individual energy and desires (Rony, 1990). According to the psychological research on affect (e.g., Russell, 2003; Schwarz & Clore, 2007), passion can be understood as involving consciously experienced positive and activated emotions, such as excitement, elation, and joy. As shown in Table 10.1, in characterizing passion, scholars have either described general affective expressions, such as "intense positive feeling" (Cardon et al., 2009), or used specific emotional experiences such as love, like, enthusiasm, joy, zeal, and desire (e.g., Baum & Locke, 2004; Cardon, Zietsma, Saparito, Matherne, & Davis, 2005; Smilor, 1997).

The second attribute commonly articulated by scholars in their definitions of passion is that people are motivated to act in a certain way when experiencing passion. For example, in the definition put forth by Vallerand, Blanchard, Mageau, Koestner, Ratelle, Léonard, et al. (2003), passion is characterized as a motivational construct containing not only affective but also cognitive and behavioral components (i.e., investing time and energy). Similar theoretical emphasis on the motivational nature of passion has appeared in other studies as well. Some researchers defined passion as an implicit energy, drive, or force (e.g., Bierly, Kessler, & Christensen, 2000; Bird, 1989; Chen et al., 2009; Murnieks et al., 2014). Others depicted passionate individuals' deep engagement in activities as representing part of their personal identity (Cardon et al., 2009).

The target-specific nature of passion is its third attribute (Chen et al., 2009; Murnieks et al., 2014). A specific activity is not only the origin of one's affective experiences but also the target toward which one is motivated to exert persistent effort. Without a clear target, it is unlikely for individuals to generate passion. Our literature review indicates three broad clusters of target activities that have been studied in passion research. The first cluster centers on general activities, mostly amateur activities, such as gambling (e.g., Mageau, Vallerand, Rousseau, Ratelle, & Provencher, 2005), physical activities (Rousseau & Vallerand, 2008), music (Bonneville-Roussy, Lavigne, & Vallerand, 2011), and Internet and online games (Wang & Chu, 2007). The second cluster focuses on entrepreneurial passion, namely entrepreneurs' passion toward creating and building ventures (e.g., Cardon et al., 2009; Chen et al., 2009). The third cluster investigates employees' passion for work, including teachers' passion toward teaching (Carbonneau, Vallerand, Fernet, & Guay, 2008), nurses' passion toward health care (Vallerand, Paquet, Philippe, & Charest, 2010), coaches' passion toward coaching athletes (Lafrenière, Jowett, Vallerand, & Carbonneau, 2011), and employees' passion for work in organizational settings (e.g., Liu et al., 2011).

Taking these findings together, we propose that passion can be theorized as a motivational hybrid involving an individual's positive affective experience and intense behavioral tendency to engage in, sustain, and identify with a given activity. Among the literature we have reviewed (see Table 10.1), it seems that the majority of studies of passion (21 out of 32) have adopted Vallerand et al.'s (2003) dualistic model. We therefore will describe this model in detail and the relevant research findings testing this model.

The Dualistic Model of Passion

Treating passion as a motivational construct, Vallerand et al. (2003) developed a dualistic model of passion, defining passion as "a strong inclination toward an activity that people like, that they find important, and in which they invest time and energy" (p. 757). The central tenet of the dualistic model of passion is that passion has the effect of a double-edged sword, such that some people intrinsically enjoy activities and have autonomy in deciding whether or not to engage in these activities, while others are enforced to continue the activities due to external regulations. To differentiate between these two types of passion, Vallerand et al. (2003) proposed the concepts of *harmonious*

Table 10.1 A Review of Contemporary Literature on Passion

Authors	Definition of Passion			Research Attributes		Main Findings
	Affect	Motivation	Domain	Type	Focus	
Baron & Hannan (2002)	Love	Identification with the company	Entrepreneurial passion	Empirical–survey	Outcome	Founders' passion is associated with lowest likelihood of organizational failure.
Baum & Locke (2004)	Love, attachment, and longing	—	Passion for work	Empirical–survey	Outcome	Passion indirectly facilitates venture growth through communicated vision, goals, and self-efficacy.
Baum et al. (2001)	Love	—	Passion for work	Empirical–survey	Outcome	Passion indirectly facilitates venture growth through competency, motivation, and competitive strategy.
Bélanger et al. (2013)	Vallerand et al. (2003)	Vallerand et al. (2003)	General activity	Empirical–experiment	Outcome	Obsessive passion predicts greater alternative goal suppression than harmonious passion does.
Bierly et al. (2000)	—	The drive to overcome barriers and initiate change	Passion for work	Theoretical	Outcome	Passion makes people feel pride, commitment, empowerment, energy, and work is meaningful; passion triggers motivation and innovation.
Bird (1989)	Emotional spirit	Energy and drive	Entrepreneurial passion	Empirical–survey	Outcome	Passion increases entrepreneurs' persistence and motivation, internalizes ventures' development as personal events.
Bonneville-Roussy et al. (2011)	Vallerand et al. (2003)	Vallerand et al. (2003)	Music	Empirical–survey	Outcome	Harmonious passion predicts the use of mastery goals, which leads to deliberate practice and performance, whereas obsessive passion predicts approach and avoidance goals, which are negatively related to performance. Only harmonious passion is a positive predictor of subjective well-being.
Carbonneau et al. (2008)	Vallerand et al. (2003)	Vallerand et al. (2003)	Passion for teaching	Empirical–survey	Outcome	Harmonious passion increases work satisfaction and decreases burnout symptoms, whereas obsessive passion is not related to these outcomes. Both types of passion increase teacher-perceived adaptive student behavior.

(continued)

Table 10.1 Continued

Authors	Definition of Passion			Research Attributes		Main Findings
	Affect	Motivation	Domain	Type	Focus	
Cardon (2008)	A positive and enduring feeling	—	Entrepreneurial passion	Theoretical	Outcome	Entrepreneurial passion leads to employee passion via the mediating mechanisms of emotional mimicry and social comparison.
Cardon et al. (2009)	Positive feeling	Identity meaning and salience	Entrepreneurial passion	Theoretical	Outcome	Entrepreneurial passion has positive effects on entrepreneurial behaviors and effectiveness. both directly and indirectly. via goal-related cognitions.
Chen et al. (2009)	Affective passion: Intense affective state	Cognitive passion: Preparedness	Entrepreneurial passion	Empirical–experiment and survey	Outcome	An entrepreneur's cognitive passion rather than affective passion has a significantly positive effect on venture capitalists' funding decisions.
Forest et al. (2012)	Vallerand et al. (2003)	Vallerand et al. (2003)	Passion for work	Empirical–experiment + longitudinal survey	Antecedent and outcome	Increases in the use of signature strengths reported by participants from the experimental group were related to increases in harmonious passion, which in turn led to higher levels of well-being.
Forest et al. (2011)	Vallerand et al. (2003)	Vallerand et al. (2003)	Passion for work	Empirical–survey	Outcome	Harmonious passion was associated positively with mental health, flow, vitality, and affective commitment, partly mediated by satisfaction of the basic psychological needs of autonomy, competence, and relatedness. Obsessive passion directly and negatively predicted mental health and weakly but positively predicted autotelic experience.
Lafrenière et al. (2011)	Vallerand et al. (2003)	Vallerand et al. (2003)	Passion for coaching	Empirical–survey	Outcome	Harmonious and obsessive passion for coaching are associated with coaches' autonomy-supportive and controlling behaviors, respectively. The former leads to high quality of coach–athlete relationships.

Liu et al. (2011)	Vallerand et al. (2003)	Vallerand et al. (2003)	Passion for work	Empirical–survey	Antecedent and outcome	Harmonious passion for work mediates the effects of organizational autonomy support and individual autonomy orientation on employee work creativity.
Luh & Lu (2012)	Vallerand et al. (2003)	Vallerand et al. (2003)	Design activities	Empirical–survey	Antecedent and outcome	Harmonious passion is positively related to creative achievement, but obsessive passion is not. Harmonious passion plays a mediating role between innovative cognitive style and creative achievement.
Mageau et al. (2011)	Vallerand et al. (2003)	Vallerand et al. (2003)	Card game	Empirical–survey	Contingency	For people who have an obsessive passion, the more they report experiencing self-esteem fluctuations that covary with their performances in their passionate activity, the greater is the impact of performance on their state self-esteem.
Mageau et al. (2009)	Vallerand et al. (2003)	Vallerand et al. (2003)	General activity	Empirical–survey	Antecedent	Identification with the activity, activity specialization, parents' activity valuation, and autonomy predict the development of passion.
Mageau et al. (2005)	Vallerand et al. (2003)	Vallerand et al. (2003)	Gambling	Empirical–survey	Outcome	Harmonious passion is associated with affective and cognitive outcomes, whereas obsessive passion is related to negative consequences. Type of gambling moderates the effects of both harmonious and obsessive passion.
Murnieks et al. (2014)	Positively valenced inclinations	Intensity of the force	Entrepreneurial passion	Empirical–survey	Antecedent and outcome	Entrepreneurial identity centrality is a precursor of entrepreneurs' passion. Entrepreneurial passion is positively associated with entrepreneurial self-efficacy and behavior.

(continued)

Table 10.1 Continued

Authors	Definition of Passion			Research Attributes		Main Findings
	Affect	Motivation	Domain	Type	Focus	
Philippe et al. (2010)	Vallerand et al. (2003)	Vallerand et al. (2003)	General activity and work	Empirical–survey	Outcome	Harmonious passion is positively related to the quality of interpersonal relationships within the context of the passionate activity via positive emotions, whereas obsessive passion is negatively related to interpersonal relationships via the mediator of negative emotions.
Philippe et al. (2009)	Vallerand et al. (2003)	Vallerand et al. (2003)	General activity	Empirical–survey	Outcome	Harmonious passion toward an activity contributes significantly to both hedonic and eudaimonic well-being.
Ratelle et al. (2004)	Vallerand et al. (2003)	Vallerand et al. (2003)	Gambling	Empirical–survey	Outcome	Obsessive passion for gambling is associated with poor vitality and concentration in daily tasks, as well as negative mood, negative emotions, and problem gambling.
Rousseau & Vallerand (2008)	Vallerand et al. (2003)	Vallerand et al. (2003)	Physical activity	Empirical–survey	Outcome	Harmonious passion is positively related to subjective well-being of older adults via the positive affect experienced during activity engagement, whereas obsessive passion is negatively related to subjective well-being.
Rousseau et al. (2002)	Vallerand et al. (2003)	Vallerand et al. (2003)	Gambling	Empirical–survey	Scale development	The gambling passion scale is a useful and valid scale for research on gambling.
Séguin-Levesque et al. (2003)	Vallerand et al. (2003)	Vallerand et al. (2003)	Internet	Empirical–survey	Outcome	Harmonious passion and obsessive passion toward the Internet are associated with positive and negative interpersonal relationships, respectively.
Shane et al. (2003)	Selfish love	—	Passion for work	Theoretical	Outcome	Passion facilitates entrepreneurial motivation (opportunity recognition, idea development, and execution)

Smilor (1997)	Enthusiasm, joy and zeal	Persistent desire to succeed	Entrepreneurial passion	Theoretical	Antecedent	Passion comes from one's pursuit of purpose and emerges when one has freedom and the chance to pursue one's dream.
Thorgren & Wincent (2013)	Vallerand et al. (2003)	Vallerand et al. (2003)	Entrepreneurial passion	Empirical–survey	Outcome	Via role conflict, harmonious passion has an indirect positive relationship on role opportunity search, whereas obsessive passion has an indirect negative relationship on role opportunity search.
Vallerand et al. (2003)	An inclination toward an activity that people like	Invest time and energy	General activity	Empirical–survey	Construct, scale development, outcome	Harmonious passion promotes healthy adaptation, whereas obsessive passion thwarts it by causing negative affect and rigid persistence.
Vallerand et al. (2010)	Vallerand et al. (2003)	Vallerand et al. (2003)	Passion for work	Empirical–survey (nurses)	Outcome	Harmonious passion decreases burnout by increasing work satisfaction and decreasing conflict, whereas obsessive passion increases conflict.
Vallerand et al. (2007)	Vallerand et al. (2003)	Vallerand et al. (2003)	Dramatic art and psychology class	Empirical–survey	Outcome	Harmonious passion is positively related to performance via deliberate practice and is positively related to subjective well-being. Obsessive passion is either unrelated or negatively related to subjective well-being.
Wang & Chu (2007)	Vallerand et al. (2003)	Vallerand et al. (2003)	Online games	Empirical–survey	Outcome	Obsessive passion leads to addiction to online computer games, whereas harmonious passion does not.

passion versus *obsessive passion*. Harmonious passion refers to an autonomous internalization that motivates individuals to engage in a preferable activity, whereas obsessive passion refers to an enforced internalization that leads individuals to engage in a preferable activity with external pressure.

The dualistic model of passion is developed on the basis of the self-determination theory (SDT; Ryan & Deci, 2000). SDT delineates the determining process of intrinsic motivation with an emphasis on the importance of satisfying human needs for autonomy (the freedom of choice to engage in activities) and needs for relatedness and competence. In particular, SDT suggests five types of motivation that vary in degree of autonomy (from high to low): intrinsic, integrated extrinsic, identified extrinsic, introjected extrinsic, and externally regulated (i.e., extrinsic) motivation.

Consistent with this differentiation in individual feelings of autonomy, Vallerand et al. (2003) suggested that when people engage in activities and pursuits that are inherently enjoyable or aligned with their personal identity, they feel they have chosen these endeavors, and this sense of choice, coupled with enjoyment or alignment, underpins harmonious passion. In contrast, obsessive passion emerges when people feel forced to undertake some activities due to external regulations without internalizing them into their identity.

Measures of Harmonious and Obsessive Passion

Vallerand et al. (2003) first developed and validated the harmonious–obsessive passion scale, which has been prevalently used by later researchers. There are 14 items in this passion scale, with 7 items measuring each type. The satisfactory reliability and discriminant validity of this scale were not only demonstrated in Vallerand's original work, but have also been illustrated in studies that were conducted in various cultural contexts (e.g., Liu et al., 2011, in China; Luh & Lu, 2012, in Taiwan; Thorgren & Wincent, 2013, in Sweden; Vallerand et al., 2010, in Canada). Furthermore, based on this general passion scale, researchers have developed specific passion scales for certain activities, such as the passion scale for gambling (Ratelle, Vallerand, Mageau, Rousseau, & Provencher, 2004; Rousseau, Vallerand, Ratelle, Mageau, & Provencher, 2002) and the passion scale for online games (Wang & Chu, 2007).

Marsh and colleagues (2013) systematically evaluated the construct validity of this two-factor passion scale and substantiated its qualified psychometric attributes. Specifically, using an archival dataset of the passion scale responses consisting of 19 independent samples (a combination of published and unpublished data), they demonstrated that this scale has a sound factor structure, good internal consistency, and robust construct validity. Moreover, tests of measurement invariance supported the complete equivalence of this two-factor model over different languages (French vs. English), passion activity clusters (leisure, sport, social, work, and education), and gender (male and female).

In addition to measuring harmonious and obsessive passion using Vallerand et al.'s (2003) scale, Bélanger, Lafrenière, Vallerand, and Kruglanski (2013) created protocols to prime participants for either harmonious or obsessive passion in one of their experimental studies. Specifically, to induce harmonious passion, the authors asked participants to write, as vividly as possible, about a time at which their favorite activity was harmonized with other facets of themselves and enabled them to enjoy a variety of experiences. For priming obsessive passion, participants were asked to write, as vividly as possible, about a time at which they could not control an urge to complete their favorite activity and felt this task was the only pursuit they enjoyed.

While both the passion scale and situational priming are successful in assessing the extent to which individuals are passionate toward a certain activity, these two methods have different assumptions concerning the nature of passion. Comparatively, it will be appropriate for scholars to use Vallerand et al.'s (2003) passion scale if their conceptual assumption of passion is a dispositional attribute of individuals, being relatively stable across different situations or contexts. On the other hand, the experimental manipulation (priming) of passion is suitable when researchers conceptualize passion as a dynamic construct that is influenced by various situational factors and internal conditions. These two conceptualizations of passion are not contradictory. Rather, they are consistent with the notion that psychological constructs can be alternatively seen and measured either as stable individual differences or as expressions of situational forces (Higgins, 1998).

Antecedents of Harmonious and Obsessive Passion

We summarize the overall key findings of the studies adopting the dualistic model of passion in Figure 10.1.

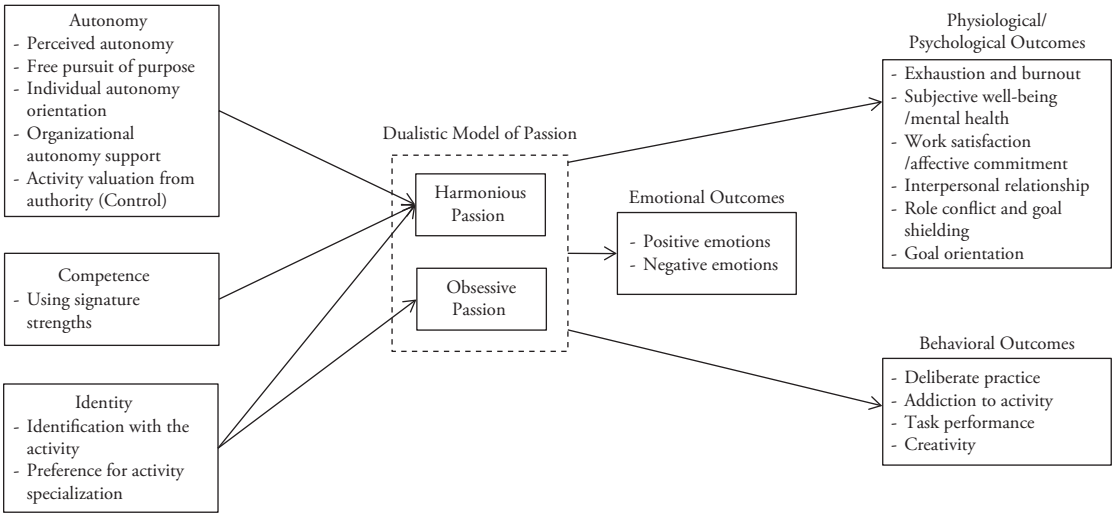

Fig. 10.1 A Summary of Research Findings on the Dualistic Model of Passion.

One assumption drawn from SDT is that perceived *autonomy* during one's engagement in an activity is a crucial factor in determining whether the harmonious or obsessive passion will be cultivated. According to Mageau and colleagues (2009), when individuals feel they are granted autonomy to complete a task, they are more likely to experience harmonious rather than obsessive passion. Empirical studies have illustrated this assertion in different contexts. For example, Mageau et al. (2009) demonstrated that children were more likely to experience harmonious rather than obsessive passion toward activities if they were given choices from adults. They also found that parents who highly value their children's activity (external pressure) tend to foster a more obsessive than harmonious passion. In the organizational context, research has shown that employees are more likely to experience harmonious passion when they have strong autonomy orientation and/or receive autonomy support from the organization (Liu et al., 2011).

Passion can also be developed when individuals are strongly engaged in and feel personally connected with the activity (i.e., *enhanced identity*). In addition to revealing the significant effect of autonomy on harmonious passion, Mageau et al. (2009, Study 3) found that for teenagers who were in the very first steps of activity involvement, deriving a sense of identity from the activity and preference for activity specialization both led to the development of harmonious and obsessive passion months later, but the development of obsessive passion was found to be stronger compared with the development of harmonious passion. Their findings are intriguing because they imply that identity may cultivate harmonious and obsessive passion. The significant influence of identity on one's development of passion was also found in Murnieks et al.'s (2014) study. Specifically, those authors documented that *identity centrality*, which refers to the relative importance an individual places on a focal identity compared with other identities, was a significant precursor of passion.

In a longitudinal study, Forest et al. (2012) revealed an interesting finding that the emphasis of one's *personal strengths* facilitated the generation of harmonious passion. Specifically, they manipulated individual use of signature strengths at work through an intervention whereby participants were asked to complete a survey that identified five of their key strengths, encouraged to utilize two of their strengths in ways they had not done before, and then told to imagine the benefits they would have if they utilized these strengths. Results showed that the increasing use of signature strengths was positively related to the increase in harmonious passion. This finding suggests that the fulfillment of personal need for *competence* may be another pivotal source of passion, in addition to autonomy and identity.

In sum, three major insights emerge regarding the antecedents of harmonious and obsessive passion. First, harmonious passion can be cultivated when individuals are autonomous in pursuing activities or receiving autonomy support from

higher-level agents (e.g., authority and organization), whereas obsessive passion is likely formed when individuals are externally controlled in continuing the activities. Second, an activity that is in alignment with personal identity may promote both harmonious and obsessive passion, but the promotion of obsessive passion is likely to be stronger. Third, strengthened individual perception of competence is associated with increased passion, particularly harmonious passion. These insights are consistent with the central arguments of SDT that highlight the fulfillment of three basic human needs (i.e., autonomy, relatedness, and competence) in fostering one's intrinsic motivation.

Consequences of Harmonious and Obsessive Passion

With respect to the research on the consequences of harmonious and obsessive passion, most scholarly attention has been devoted to exploring and comparing the differential effects of harmonious and obsessive passion on individuals' emotional, psychological/physiological, and behavioral outcomes. Consistent with Vallerand et al.'s (2003) original reasoning that harmonious passion is associated with the experience of positive affect and the absence of negative affect, whereas the opposite is true for obsessive passion, subsequent research has documented convergent findings that harmonious passion contributes to individuals' positive emotions while obsessive passion leads to some negative emotions (Mageau et al., 2005; Philippe, Vallerand, Houlfort, Lavigne, & Donahue, 2010; Ratelle et al., 2004).

For example, in analyzing individual outcomes of passion toward gambling, Mageau et al. (2005) found that during the engagement in gambling, harmonious passion was positively related to individual feelings of amusement, fun, and general positive emotions (e.g., "I feel cheerful") but negatively related to feelings of guilt. Obsessive passion, on the other hand, was found to have significant positive relationships with feelings of guilt, anxiety, and other general negative emotions (e.g., "I feel unhappy") but had significant negative relationships with positive affective outcomes in terms of feelings of amusement and fun, as well as other general positive emotions. Moreover, harmonious passion and obsessive passion were found to be significantly related to general positive and negative emotions, respectively, even after controlling for engagement in gambling activities.

Individuals' psychological and physiological outcomes associated with the two types of passion have attracted much attention from scholars as well. In general, harmonious passion has been demonstrated to be associated with positive outcomes, such as increased subjective well-being and mental health (Forest et al., 2011; Rousseau & Vallerand, 2008; Vallerand, Salvy, Mageau, Elliot, Denis, Grouzet, et al., 2007), increased work satisfaction and affective commitment (Carbonneau et al., 2008; Forest et al., 2011), enhanced interpersonal relationship (Lafrenière et al., 2011; Philippe et al., 2010), decreased exhaustion and burnout (Carbonneau et al., 2008; Vallerand et al., 2010), less role conflict (Thorgren & Wincent, 2013), and less goal shielding (Bélanger et al., 2013). However, these studies have also shown that obsessive passion was either unrelated or negatively related to those positive consequences (see the review by Vallerand, 2008).

Scholars have also examined the behavioral outcomes of passion. Taking the research on gambling as an example, studies have shown that obsessive, rather than harmonious, passion toward gambling often culminates in problem gambling (Philippe & Vallerand, 2007; Ratelle et al., 2004). Likewise, in their examination of passion toward online games, Wang and Chu (2007) revealed that obsessive passion was related to addiction, but harmonious passion was not.

Research has also supported the assumption that harmonious passion, instead of obsessive passion, facilitates persistence and performance. For example, Forest et al. (2011) found that only harmonious passion was associated positively with three elements of flow (i.e., concentration, control, and autotelic experience), a sign that individuals feel immersed in their activity. Vallerand et al. (2007) demonstrated that harmonious passion had a positive effect on motivation (deliberate practice), which in turn increased performance. However, although obsessive passion was found to have an indirectly positive effect on performance via motivation in Study 1, this effect was insignificant in Study 2. Similar findings were reported in a study by Bonneville-Roussy et al. (2011) of a group of expert musicians: it was harmonious rather than obsessive passion that had a positive relationship with the attainment of an elite level of performance.

Taking these research findings together, we conclude that both harmonious and obsessive passion can drive individual attention and motivation to the focal activities they are engaged in.

However, positive emotions, psychological and physiological reactions, and behavioral outcomes likely result from harmonious passion, whereas negative outcomes (e.g., internal struggling) follow when the passion is obsessive. Because passion is a target-specific construct, in the next session, we will discuss how the passion construct, and harmonious and obsessive passion in particular, are manifested and function in the entrepreneurial and the general organizational context.

Entrepreneurial Passion

Although abundant passion research has been conducted in social psychology, especially in relation to harmonious and obsessive passion, research on entrepreneurial passion is still in its early stage. An interesting observation on the existing research in entrepreneurial passion is that it has not yet adopted the dualistic model (Vallerand et al., 2003). Nevertheless, entrepreneurial passion studies have adopted a similar definition of passion and regard entrepreneurial passion as a mix of positive affect and motivational force that is beneficial to venture-related activities. We summarize the existing research frameworks in the field of entrepreneurial passion in Figure 10.2. Next, we will highlight several noteworthy theoretical and empirical advances that have deepened our understanding toward the theory of entrepreneurial passion and investigate its antecedents and consequences.

Early entrepreneurship research tended to consider passion a component of leader personality traits. For instance, Baum and his colleagues (Baum & Locke, 2004; Baum, Locke, & Smith, 2001) conceptualized passion as one critical component of a CEO's individual traits, reflective of love, affective attachment to, and longing for work. Their empirical findings showed that CEOs' traits had an indirect effect on the objectively measured growth of ventures via a variety of mechanisms, including psychological (e.g., self-efficacy and motivation), behavioral (e.g., goals and communicated vision), and strategic (e.g., competitive strategy) conduits.

Diverging from the trait perspective on passion, Chen et al. (2009) took a motivational approach to investigating how entrepreneurial passion affects venture capitalists' funding decisions. The major contributions of this study are twofold. First, these authors conceptually distinguished the affective component from the cognitive component of entrepreneurial passion and named them *passion* and *preparedness*, respectively. Second, they developed a scale of perceived passion and preparedness that further demonstrated the conceptual difference between the affective and cognitive components of passion in a venture-funding context. The reliability and validity of this scale were robustly illustrated via multiple approaches (qualitative, experimental, and field studies) used in the study. The most intriguing and counterintuitive finding was that only the cognitive aspect, rather than the affective component, of entrepreneurial passion was a significant and positive predictor of venture capitalists' decisions to fund ventures. To sum up, Chen et al.'s study provided a novel way of analyzing the effect of entrepreneurial passion on venture-related consequences by demonstrating the differential influences of affective and cognitive components of passion.

The theoretical work of Cardon et al. (2009) also has prominent implications for understanding the nature of entrepreneurial passion and the

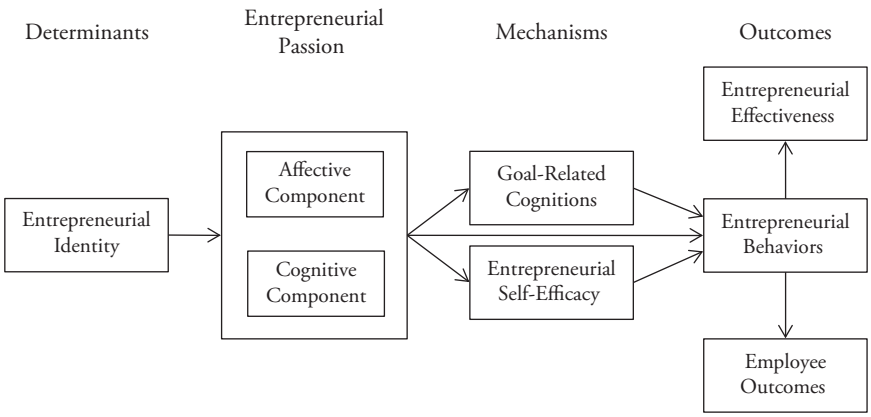

Fig. 10.2 A Summary of the Existing Research Frameworks on Entrepreneurial Passion.

mechanisms through which it influences entrepreneurial behaviors (e.g., creative problem solving, persistence, absorption), which eventually influence entrepreneurial effectiveness (e.g., opportunity recognition, venture creation, venture growth). These authors did not conceptually differentiate the affective component from the cognitive component of entrepreneurial passion, but they drew on the affect and identity literatures and defined entrepreneurial passion as "consciously accessible, intense positive feelings experienced by engagement in entrepreneurial activities associated with roles that are meaningful and salient to the self-identity of the entrepreneur" (Cardon et al., 2009, p. 517). This definition underscores the critical elements of affect and identity in defining entrepreneurial passion.

In particular, Cardon et al. (2009) highlighted the importance of entrepreneurial role identity, arguing that the effects of entrepreneurial passion on different aspects of entrepreneurial effectiveness are contingent on the nature of the entrepreneurial role identity that is activated. The authors conceptualized three different entrepreneurial role identities in accordance with the three major venture-related activities: inventor identity with opportunity recognition, founder identity with venture creation, and developer identity with venture growth. Based on this conceptual differentiation, they proposed that entrepreneurial passion is most likely to enhance a certain aspect of entrepreneurial effectiveness only when the corresponding role identity is activated and dominant. Meanwhile, they also cautioned against the potential obsessive passion that could rise from these role identities.

Besides role identity, Cardon et al. (2009) also theorized that the affective component is important in defining entrepreneurial passion. Specifically, they suggested that passion is accompanied by positive affect, which could have a significant direct or indirect effect on individual behaviors via enhanced motivation, according to the affect and motivation literatures (Fredrickson, 1998; Seo, Barrett, & Bartunek, 2004).

Interestingly, Cardon et al. (2009) pointed out that although, in general, passion is beneficial to entrepreneurial behaviors, too much passion could have an adverse effect on entrepreneurs' creative problem solving, a typical entrepreneurial behavior. This proposed inverted-U relationship between entrepreneurial passion and creative problem solving was based in part on the dualistic model of passion (Vallerand et al., 2003). That is, obsessive passion (i.e., extremely intense passion) may cause a rigid rather than flexible manner of engagement in venture-related activities, thereby decreasing the likelihood of suggesting creative solutions. According to this counterintuitive yet reasonable proposition, it should be worthwhile to directly incorporate the dualistic model of passion into entrepreneurial passion research in future studies.

Thorgren and Wincent's (2013) study provides a good example for this extension. Using a sample of Swedish owner-managers who had developed new ventures for at least 2 years, the authors found that harmonious passion toward running a business has an indirect positive relationship with role opportunity search through the mediator of role conflict, whereas obsessive passion has an indirect negative relationship with role opportunity search.

A recent empirical study conducted by Murnieks et al. (2014) has mapped a more comprehensive picture regarding entrepreneurial passion. Using a longitudinal survey with a population of entrepreneurs in a large metropolitan area in the midwestern part of the United States, the authors not only demonstrated a mediating role of entrepreneurial self-efficacy in the positive relationship between entrepreneurial passion and entrepreneurial behavior but also illustrated that entrepreneurial identity centrality, which reflects the extent to which an individual places importance on entrepreneurial identity compared with other identities, was a significant precursor of entrepreneurial passion. The demonstrated theoretical path from entrepreneurial identity to entrepreneurial passion, then to entrepreneurial self-identity, and finally to entrepreneurial behavior is consistent with the research findings regarding the dualistic model of passion (see Figure 10.1). As such, the study by Murnieks et al. (2014) provides support for the utility of the dualistic model of passion in entrepreneurship research.

Instead of looking at how entrepreneurial passion affects entrepreneurs' venture-related behaviors and effectiveness, Cardon (2008) theorized a conceptual framework of passion contagion to illustrate how entrepreneurial passion is transformed into employee passion, which was defined as a combination of employees' positive and intense feelings (affective component) with their perceptions of organizational meaningfulness (cognitive component). Cardon postulated that emotional mimicry and social comparison are likely the two fundamental mechanisms underlying the process of passion contagion.

Moreover, Cardon put forward an interesting proposition that entrepreneurs who experience passion are likely to show transformational leadership to their employees, and this, in turn, may enhance the social comparison process of passion contagion. These propositions regarding passion contagion are insightful because they provide a third-party perspective to investigate the consequences of entrepreneurial passion and build the theoretical link between entrepreneurial passion and leadership style.

Passion and Job Creativity

Very limited research has been conducted to examine employees' passion for work in the context of work and organizations. In particular, researchers are yet to sufficiently delve into the organizational context and establish a solid nomological framework concerning the relationship between employees' passion for work and their job creativity. To date, most of the passion research done in the workplace continues to draw on the dualistic model of passion (e.g., Carbonneau et al., 2008; Vallerand et al., 2010). Scholars have compared the influence of harmonious passion for work with that of obsessive passion for work on employee outcomes across a variety of occupations. For example, Forest et al. (2011) surveyed 439 French-speaking employees from a large service company in Canada about their feelings of passion toward work and a few outputs at work and found that harmonious passion for work was positively related to individual mental health, flow, vitality, and affective commitment, and these relationships were partially mediated by the fulfillment of individual basic psychological needs of autonomy, competence, and relatedness, supporting the basic reasoning derived from SDT. Conversely, they found that obsessive passion for work had a direct and negative effect on individual mental health and a positive effect on autotelic experience.

Although passion has been theorized as an important catalyst for job creativity by scholars from diverse areas (e.g., Amabile & Fisher, 2009; Bierly et al., 2000; Goldberg, 1986), few studies have empirically examined this relationship. One indirect piece of evidence came from Elsbach and Kramer's (2003) qualitative study of Hollywood pitch meetings. These authors documented how studio executives and producers engaged in prototype matching to assess the creative potential of relatively unknown screenwriters (pitchers). Through analyzing the field observation notes, they found that within the first few minutes of a pitch, producers quickly categorized the pitcher into a preexisting prototype, such as "artist," or "storyteller," that belonged to a creative category, or "journeyman," that belonged to an uncreative category. More interestingly, one of the most important attributes the studio executives used in identifying the creative prototypes was passion. In all forms of their data (interviews, observations, and archives), the attributes that led to a match with the creative prototypes all included the word "passionate," whereas for the uncreative prototypes, that word was not mentioned. These findings suggest that being judged as passionate or not is directly related to the perception of creativity.

A direct test of the passion–creativity relationship was conducted by Liu et al. (2011), who provided supporting empirical evidence that employees' harmonious passion for work can significantly foster their job creativity. These authors drew on SDT and established a multilevel model that highlighted the pivotal role of harmonious passion for work in transforming organizational autonomy support and individual autonomy orientation into job creativity. Through two field studies, they revealed several convergent findings that provided useful insights. First, they demonstrated that autonomy support from a higher organizational level compensated for the effect of autonomy support from a lower organizational level or individual autonomy orientation on employees' harmonious passion. This research finding has broadened the current knowledge that autonomy is a vital element for cultivating passion, because autonomy support from different organizational levels interacts with individual autonomy orientation to influence one's harmonious passion. Second, employees' harmonious passion mediated the interactive effects of autonomy support from different organizational levels with individual autonomy orientation on job creativity.

The most intriguing finding of this paper is the compensation effect of the organizational context in promoting job creativity. That is, those who are naturally more autonomy oriented are more passionate about their work and thus more creative in doing their job, regardless of what organizational context they are in. On the other hand, for those who are low in autonomy orientation, the organizational context in terms of autonomy support makes a significant difference in evoking the passion for work that enhances job creativity. These findings add valuable knowledge to the underlying

motivational mechanisms by which environmental stimuli and personal dispositions affect employee job creativity.

Directions for Future Research

From the review we have presented, it is evident that significant progress has been made in conceptualizing passion and examining its antecedents and consequences in various domains. On the other hand, substantive knowledge gaps remain in understanding what entrepreneurial passion and passion for work are and how they can be transformed into a variety of entrepreneurial outcomes and workplace effectiveness. In this section, we identify the theoretical and empirical gaps and provide specific suggestions on how to further organizational research on the role of passion in entrepreneurship and creativity.

Theoretical Gaps and Future Directions

The research frameworks shown in Figures 10.1 and 10.2 capture the current state of affairs regarding the theoretical work on passion for work and entrepreneurial passion, respectively. We observe two major gaps in the frameworks. The first is that the occupational context has not been fully integrated in theorizing the construct of passion for work. The second is the absence of levels in building the theory of entrepreneur passion.

As discussed earlier, passion is a target-specific construct; however, in theorizing passion for work, similar definitions (i.e., those of Vallerand et al., 2003; see Table 10.1) have been used in the various occupations being studied. Although some aspects of passion might be context-free, others may be context-dependent. For example, the manifestation of passion for coaching could be very different from passion for playing games on the Internet, which would also be different from passion for nursing. With regard to contextualizing the passion construct, we advocate the approach that has been taken in conceptualizing entrepreneurial passion.

In considering the context of business-plan competition, Chen et al. (2009) defined "entrepreneurial passion" as an entrepreneur's intense affective state accompanied by cognitive and behavioral manifestations of high personal value. The high personal value here refers to the business venture that might be established after receiving funding from the venture capitalist. Cardon et al. (2009) defined entrepreneurial passion as a result of the engagement in activities that confirm a salient entrepreneur identity, which is composed of three types of role identities related to being an entrepreneur: an *inventor* identity, a *founder* identity, and a *developer* identity. We strongly encourage researchers to take the occupational context into consideration in conceptualizing passion for work.

The failure to include multilevel factors in the theory of entrepreneurial passion is another major weakness of this line of research. The current research mainly focuses on the individual-level antecedents and consequences, missing a great opportunity to study this phenomenon in a broader context that can be more dynamic and meaningful. In addition to conceptualizing individual characteristics (e.g., identity) as precursors of entrepreneur passion, contextual factors such as a vibrant economic condition or a national or organizational culture that values individuality and uniqueness, a strong social norm that promotes a spirit of entrepreneurship (e.g., Silicon Valley), or a leadership approach that delegates and empowers people could all foster passion to be entrepreneurial.

Meanwhile, a person's current state of affairs or newly encountered events could also trigger passion for entrepreneurial activities. For example, when the company a person is working for is going bankrupt, or when the skill set a person has is not wanted by the companies one is interested in joining, or when a brilliant new idea a person developed has not been adopted by the company he or she is working for, the frustrations induced as a result could fuel the passion to start one's own business.

With regard to consequences, although the current empirical work focuses on entrepreneurial behaviors, it will be worthwhile to include venture-level outcomes such as venture creation and venture growth (Cardon et al, 2009). In particular, is entrepreneurial passion related to the likelihood of venture survival and success (e.g., revenue, profit, return on equity)? What about development of new products, services, technologies or general competitiveness in the market? It will also be worthwhile to include downward influences in the model——for instance, how entrepreneurial passion influences other employees' emotion and cognition about the venture, and how these emotions and cognitions influence their passion for work and job creativity.

Considering the close and complex interpersonal interactions among employees in new ventures that are generally small with little organizational hierarchy, it will be conducive to test Cardon's (2008) theoretical model of

entrepreneurial passion contagion. Researchers can explore the cascading effect of a founding CEO's entrepreneurial passion on subordinates' entrepreneurial passion (vertical contagion), or they can examine how a founding team member's entrepreneurial passion may be shared by his or her teammates (horizontal contagion). Based on the rationale of passion contagion and multilevel theories, another meaningful extension is to investigate entrepreneurial passion at some higher organizational levels, such as developing theoretical models of passion climate in teams, departments, and organizations. Including multilevel variables in the model will significantly enrich the current theory of entrepreneur passion.

In addition, we may also elevate the construct of passion for work to the group level, and expand Liu et al.'s (2011) work on individual creativity to study the link between team passion for work and team creativity. Through social interactions and role modeling, team members may develop collective passion toward teamwork, which may not only motivate individual members to be creative but accentuate the team's overall creativity. It will also be meaningful to look at other outputs caused by employee passion for work——for example, whether employees' passion for work will ignite the pro-social fire or generate more extra-role behaviors, such as organizational citizenship behavior, taking charge, or voice. According to the dualistic model of passion and Liu et al.'s finding, we can expect that harmonious passion for work may significantly increase both in-role performance and extra-role behavior, whereas obsessive passion for work may have positive effects only on one's motivation and in-role activities.

Empirical Gaps and Future Directions

From the literature we reviewed in this chapter, it is clear that the empirical work on entrepreneurial passion and passion for work is still scarce. We have identified two areas that hold great promise for future research. One is scale development, and the other is the testing of multilevel theories of entrepreneurial passion.

In the majority of the research conducted so far, the scale used to measure passion for work was a more or less modified version of Vallerand et al.'s (2003) harmonious and obsessive passion scale, which was designed to measure passion for general activities. Although the modified versions to measure passion for specific activities such as work, coaching, nursing, gambling, or gaming (e.g., Lafrenière et al., 2011; Liu et al., 2011; Vallerand et al., 2010) have demonstrated adequate reliabilities and validities, this scale might not be the one that accurately captures entrepreneurial passion. First, the entrepreneurial context itself is different from normal work settings where one's job assignment and job description are clearly defined. Entrepreneurial work involves more moving parts than regular jobs, such as coming up with ideas about new products/services, identifying market opportunities for these products/services, and maneuvering resources to implement them (Cardon, et al., 2009). Second, entrepreneurs need to interact with a greater variety of people than those who have a regular job. They not only need to work with people within the company, but they also need to interact with venture capitalists, suppliers, vendors, in some cases government officials, and so on. Third, the job responsibility for entrepreneurs is much broader than for regular job holders. They oversee the entire operation of the venture, from research and development to production, marketing, and sales. They are accountable for all the people working in the venture, and they are also responsible for the welfare of their own family. As a result, entrepreneurial passion is distinct from the general passion for work.

So far there has not been any progress in developing a valid scale to measure entrepreneurial passion. The closest attempt might be the one measuring perceived entrepreneurial passion (Chen et al., 2009), but that scale adopted an observer point of view. To capture the emotional and cognitive states entrepreneurs experience when they are passionate, we need to get inside their head and heart. Future research should adopt qualitative approaches (e.g., interviews, case studies, focus groups) to discover the not easily observable attributes of passion and develop a psychometrically sound measure to accurately capture the distinct characteristics of entrepreneurial passion.

Relatedly, although the measure of harmonious passion for work used by Liu et al. (2011) has shown desirable psychometric properties and has been significantly related to job creativity, the approaches or scales to measure creativity and innovation may need improvement. In studies that adopt experimental methods to study creativity, researchers have used the Remote Association Test (RAT) to measure divergent and creative thinking by testing the ability of individuals to identify associations between words that are not normally associated (Fong, 2006; Mednick, 1962). Individuals who

score higher on the RAT are using their associative abilities to perform better at a creative task. RAT is one of the most commonly used measures of creativity and has been demonstrated to correlate with supervisor ratings of creativity (Mednick, 1963). On the other hand, RAT is a relatively remote measure of creativity because it is not creativity itself, which is defined as novel and useful ideas related to a specific target or problem (Fong, 2006). We therefore encourage more efforts to be made in developing target-specific or task-specific creativity measures to capture the nuances involved in different experimental tasks.

In field studies, the most widely used measure of creativity is George and Zhou's (2001) 13-item scale, which has demonstrated solid psychometric properties such as reliability and validity across samples from different cultures (Montag, Maertz, & Baer, 2012). The strength of this scale is that it captures the meaning of creativity at an abstract level, and the items are general enough to be applied to a variety of organizational contexts. On the other hand, it may not be able to reflect the specific or unique features of creativity for different settings. For example, the manifestation of creativity for doctors and nurses might be very different from that for teachers and students, and the meaning of creative behavior in the research and development office might be very different from that for people who work on the assembly line. More refined and context-specific measures of creativity may be desirable when we pursue more in-depth understandings of human creativity.

As mentioned earlier, in addition to scale development, it will be fruitful for future research to empirically examine multilevel factors that could influence the strength of entrepreneurial passion. These include the national, societal, and local environments (e.g., policies, regulations, infrastructure); the subjective culture (e.g., values, norms, beliefs); and individual characteristics (e.g., personal identity, autonomy orientation). Future research can also explore the multilevel consequences of entrepreneurial passion. These include venture-level objective outcomes (e.g., return on equity, market share, new product development) and subjective outcomes (e.g., passion climate, identity with the venture, commitment to the venture). They can also include individual-level outcomes such as entrepreneurs' behaviors, top management team members' engagement and commitment, and employees' identification with the venture and job creativity.

Conclusion

In this chapter, we conducted a comprehensive and critical review of the research on passion in the last decade or so, with an emphasis on entrepreneurial passion and passion for work. Our review indicates that the dualistic model of passion seems to dominate the passion for work research but the contextualization of the passion construct in this area (e.g., studying the relationship between passion and creativity at multiple organizational levels) is lacking. On the other hand, the research on entrepreneurial passion is still nascent, and there is great room for future scholars to make theoretical and empirical contributions.

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CHAPTER

11 Creativity in Teams: A Key Building Block for Innovation and Entrepreneurship

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Abstract

Teams are assumed to be good for creativity, yet research in this arena remains limited. This chapter examines the definition of team creativity and reviews the literature using Rhodes' Four-P's framework: person(s), process, press, and product. Regarding person(s), differences between the composition and compilation approaches used to examine team creativity are described. Next, the chapter discusses how team creativity has been studied as a process and how other team processes affect creativity. For the press perspective, work suggesting that the environment (press) serves to moderate many of the relationships with team creativity is reviewed. Lastly for product, it is proposed that although creativity is often conceptualized as an outcome, more detailed consideration is needed at the team level. The chapter closes with a discussion of the importance of team creativity to entrepreneurship and a call to action for future scholars.

Key Words: team creativity, team creative processes, team creative outcomes, Four P's, creativity

Introduction

Creativity in teams is a topic that has long been discussed, debated, and deliberated in the academic and practitioner literatures (e.g., Agrell & Gustafson, 1996; Osborn, 1963; Paulus & Nijstad, 2003; Sternberg, 1999; West, 2002). This is hardly surprising given that working in teams has been found to be advantageous for creative tasks (Paulus, Larey, & Ortega, 1995) or when a creative solution is the desired outcome (Hargadon, 2002; Perry-Smith, 2006). In fact, it often seems that everyone has an opinion regarding team creativity:

> The director and the other creative leaders of a production do not come up with all the ideas on their own; rather, every single member of the 200- to 250-person production group makes suggestions.
> *Catmull (2008)*

> Our experience tells us that although individual creativity can be unpredictable and uncontrollable, collective creativity can be managed.
> *Brown and Anthony (2011)*

> Creating new, value-added ideas is what teams do best.
> *Miller (2012)*

> Although creativity is often considered a trait of the privileged few, any individual or team can become more creative—better able to generate the breakthroughs that stimulate growth and performance.
> *Capozzi, Dye, and Howe (2011)*

> Most of us now work in teams, in offices without walls, for managers who prize people skills above all. Lone geniuses are out. Collaboration is in.
> *Cain (2012)*

What these quotes imply is a shared belief in the value of team creativity. It is surprising, therefore, that although team creativity is frequently discussed, it remains an area in need of detailed empirical research and longitudinal analysis (George, 2007; Mathieu, Maynard, Rapp, & Gilson, 2008).

In their review of the creativity literature, Shalley, Zhou, and Oldham (2004) concluded that creativity research has predominantly been conducted at the individual level, leading them to propose that more attention should be directed toward team creativity. In the decade since their review was published, it appears that not much has substantially changed. A simple count of team creativity studies published between 2005 and 2013 in management and psychology journals in the Web of Science database[1] revealed that of the 58 articles on team creativity, only 38 were empirical, whereas of the 196 articles on individual-level creativity, only 97 were empirical. (See Appendix 1 for a list of the journals used for publication counts.) In contrast, searching only for the term "teams" using the same database revealed 1,029 articles and for the term innovation, a staggering 4,774; we did not check how many of each these were empirical.[2]

What these somewhat anecdotal findings all suggest is that there remains a need for more research on team creativity. Accordingly, much of this chapter focuses on future research directions to set the stage for more work in this area. To better understand creativity in teams, this chapter is structured as follows. First, we review definitions of team creativity and consider the distinction between team creativity as a process and as an outcome. Next, we introduce Rhodes' (1961) classic Four P's framework as the organizing mechanism for a selective review of some of the current research on team creativity to illustrate what has been done in each of the areas. The goal here is to highlight inconsistent findings, describe gaps, and delineate areas in need of further consideration. We then use the same framework to offer a future research agenda in the area of team creativity. The chapter concludes with an integration of team creativity, innovation, and entrepreneurship.

Definitions of Team Creativity

Over the last two decades, across organizational types, size, location, and industry, teams are being increasingly deployed and retained as a means to increase organizational productivity, competitiveness, and innovation (e.g., Cohen & Bailey, 1997; Ilgen, 1999; Mathieu et al., 2008; McGrath, 1997). Although a great deal of research has examined team inputs, processes, and outcomes (see Mathieu et al., 2008; Mathieu & Gilson, 2012 for reviews), less is known about team creativity (George, 2007; Shalley et al., 2004).

In trying to understand why team creativity may not have received as much research attention as other constructs, one reason that springs to mind is the complexity and multifaceted nature of its very definition. What is team creativity? More specifically, is *team creativity* best defined as the sanctioned display of individual creativity within a team context and in support of team goals, or is it something more? Put differently, is creativity always or almost always a fundamentally individual-level phenomenon (Glynn, 1996; Woodman, Sawyer, & Griffin, 1993), or can the locus of some substantial aspect of creativity in organizations be characterized at the group level? If the latter, can individual models of creativity simply be extended to the group level with little or no modification (e.g., Amabile, 1988), or does team creativity require its own body of theory (e.g., Hargadon & Bechky, 2006)? In this chapter, we propose that the answers to these questions might depend on what aspect of creativity one is discussing.

Most of the organizational literature concerned with creativity theorizes the phenomenon in terms of outcomes, often called *creative products*, that are "novel, potentially useful ideas" (Shalley et al., 2004, p. 934). However, creativity and other effectiveness outcomes are also recognized to arise as the result of distinct *creative processes*. Such processes are often proposed as a separate and distinct, but necessary, first step toward innovation (Amabile, 1988), although creative processes can also be nested at various time points within larger innovation projects (Drazin, Glynn, & Kazanjian, 1999). In other words, team creativity encompasses both the *processes* of developing novel and useful ideas and new and appropriate *outcomes* that can be leveraged toward innovation.

Teasing these concepts apart, we can define team creative processes as a collective phenomenon that encompasses the "doing" by which members behaviorally, cognitively, and emotionally define problems, generate ideas, and attempt new ways of going about their work (Gilson & Shalley, 2004). Given that creativity is defined as a purposeful phenomenon in organizations (Amabile, 1988; Ford, 1996; Glynn, 1996), individual engagement in creativity is a prerequisite for team creative processes (Drazin et al., 1999) even though such engagement may not be sufficient for team creative processes to emerge. For instance, individuals must try to generate ideas in order for a team to generate ideas, but an individual's efforts are no guarantee that a

team will agree that idea generation is warranted at a given time (Ford & Sullivan, 2004). Creative processes can be applied to routine or creative work because the focus is on the steps used by the team rather than the output associated with said steps. For instance, a team that collectively identifies problems, generates ideas, and tries out new solutions only to select an off-the-shelf remedy for a problem may not have a creative outcome but will have engaged in creative processes that may serve to enhance their performance.

In contrast, team creativity as an outcome is the creativity rating (novelty and usefulness) of something produced by the team (Amabile, 1988; Ford, 1996). In other words, ideas can be rated as creative, as can plans, designs, budgets, and products. Here the focus is on whether the team output itself is creative regardless of the type of work (be it advertising campaigns or orchestral compositions). The definition of creativity as purposeful means that creative processes are often considered *necessary* preconditions for creative outcomes. That said, assessments of work products are, of course, sometimes conducted without knowledge of the processes that went into making them. Hence, it can be difficult to claim that the rating of an outcome as creative always gives definitive knowledge about the process that came before. At the team level in particular, the presence of individual creative processes might lead to team-level creative outcomes in some instances even in the absence of team creative processes. For example, team-level processes related to creativity have sometimes been found to be irrelevant to whether a team's output was rated as creative (see Taggar, 2002, Footnote 3). Indeed, although the generalizability of many aspects of the findings from the brainstorming literature to organizational environments is open to criticism (Litchfield, 2008; Sutton & Hargadon, 1996), one robust finding is that so-called nominal groups, which merely aggregate individuals' contributions, consistently lead to group-level ideas that are more creative than those of interacting groups (Mullen, Johnson, & Salas, 1991).

Extant Team Creativity Literature

In this section, we consider team creative processes and outcomes in more detail using Rhodes' (1961) classic Four P's framework. Our goal here is not to produce a comprehensive review (for such reviews, see Paulus & Nijstad, 2003; Reiter-Palmon, Wigert, & de Vreede, 2012); rather, we will highlight what we view as interesting intersections between the creativity and team literatures. More importantly, our goal is to use this section as the foundation to identify areas still in need of research attention and future directions in this field of inquiry.

Four P's Framework of Creativity in Teams: Person(s), Process, Press, and Products

Although there are several commonly used creativity frameworks (i.e., Amabile, 1983, 1988; Ford, 1996; Rhodes, 1961; Woodman et al., 1993), for this chapter we chose Rhodes' Four P's because it provides an integrated approach within which to review the extant literature on team creativity and propose avenues for future research. Based on more than 40 definitions of creativity (struggles with the definition of creativity are not new!) from various research streams, Rhodes defined creativity as a prism that is made up of four strands that "overlap and intertwine" (p. 307). He described them as follows;

> One of these strands pertains essentially to the person as a human being. Another strand pertains to the mental processes that are operative in creating ideas. A third strand pertains to the influence of the ecological press on the person and upon his mental processes. And the fourth strand pertains to ideas. Ideas are usually expressed in the form of either language or craft and this is what we call product. Hereafter, I shall refer to these strands as the Four P's of creativity, i.e., (1) person(s), (2) process, (3) press, (4) products.

In this framework, the *person(s)* component focuses on characteristics and properties of people who are more likely to be creative than others (i.e., intellect, temperament, traits, attitudes, self-concept, values). This perspective is similar to Amabile's (1983) componential model in which she proposes that individual domain and creativity-relevant skills interact with intrinsic motivation to produce creativity. Likewise, research by Jabri (1991) and Kirton (1976) on cognitive style, by Gough (1979) on creative personality, and by Tierney and Farmer (2002) on creative self-efficacy have all proposed and found that there are individual characteristics of a person(s) that are more likely to result in their being creative. Therefore, we review, at the team level, how person(s) characteristics play out when individuals work together. In other words, how does the combination of individual characteristics in a team affect creative processes and creative outcomes?

The *process* perspective focuses on engagement in the steps or stages associated with creativity, especially cognitive processes. Rhodes (1961) conceptualized process as thinking, communication, learning, and incubation—something that can be taught. Ford's (1996) theory of creative action specifically defines engagement in creative acts regardless of creative outcomes, and thus the behaviors rather than personal characteristics that can result in creativity. Similarly, work by Amabile (1983) has delineated the different stages necessary for creativity: problem identification, preparation, idea generation, and idea validation. Within team contexts, processes are what converts inputs into outcomes—the "how" things get done. Much of the team creativity literature has proposed various processes (e.g., Reiter-Palmon, Herman, & Yammarino, 2008; Sawyer & DeZutter, 2009) that either help or hinder a team in producing creative outcomes.

The *press* perspective considers creativity as a result of the interaction between people and their work context or environment. Included in the press dimension are environmental factors such as relationships with supervisors and coworkers (Oldham & Cummings, 1996; Shin & Zhou, 2007), the team climate (Edmondson, 1999; Kessel, Kratzer, & Schultz, 2012; Tsai, Chi, Grandey, & Fung, 2012), as well as the work context (Scott & Bruce, 1994; Shalley, Gilson, & Blum, 2009; Zhou & George, 2001). This perspective maps closely to work by Woodman and colleagues (1993), who proposed an interactionist perspective that addresses the importance of considering social factors (e.g., leader, coworkers) and contextual factors (e.g., organizational characteristics, culture) in conjunction with those of the person or individual to better understand the drivers of creativity.

Lastly, the *product* perspective of creativity refers to the outcomes or artifacts that are produced, and this is the conceptualization of creativity that has received the most research consideration. Here, the focus of Rhodes' (1961) work was on creative outcomes or the rating of outputs, ranging from ideas to archeological artifacts, with regard to creativity. Although Rhodes separated product into its own stream, the product perspective on creativity is considered to a certain degree in most organizational literature as the dependent variable or outcome. For example, Amabile (1982, p. 1001) assessed creativity as a product based on the consensual definition of creativity:

> A product or response is creative to the extent that appropriate observers independently agree it is creative. Appropriate observers are those familiar with the domain in which the product was created or the response articulated. Thus, creativity can be regarded as the quality of products or responses judged to be creative by appropriate observers, and it can also be regarded as the process by which something so judged is produced.

Building on Amabile's (1982) view of creativity as a subjective assessment of products, Ford (1996) specified the concept of the creative product as "a domain-specific, subjective judgment of the novelty and value of an outcome of a particular action" (p. 1115). Similarly, Woodman et al. (1993) emphasized the importance of construct validity issues in creativity measurement and proposed that creativity researchers should choose appropriate measures in order to accurately capture their theoretical frameworks of interest. Although most frameworks emphasize the importance of creativity as an outcome or product, the production of creative products itself has received only limited attention in the team literature. In fact, a recent review of team effectiveness by Mathieu and Gilson (2012, p. 910) stated that team effectiveness itself remains the Achilles' heel of team research and that,

> . . . in the teams research arena, the focus to date has predominantly been on who is a member of the team, how they work together, and what they do to perform their work—hence, the construct of performance has been "less systematically addressed"
>
> *(Ilgen, 1999, p. 131)*

Team Creativity From a Person(s) Perspective

Team research has long considered team member attributes as a critical compositional input in team effectiveness models (i.e., Cohen & Bailey, 1997; Hackman & Morris, 1975; Ilgen, Hollenbeck, Johnson, & Jundt, 2005). Similarly, team creativity research also has focused on various team member characteristics, including surface- and deep-level characteristics, job-related attributes, and personality (see Reiter-Palmon et al., 2012, for a review). In aggregating individual-level attributes to the team level, researchers rely on two different methodological approaches: *composition* and *compilation* (Kozlowski & Klein, 2000; Mathieu et al., 2008). In composition models, team-level attributes represent the means or variances of individuals' attributes in a team,

assuming that individuals are presumed to be comparable and weighted equally in the construction of the team-level construct. In contrast, compilation models reflect complex combinations of diverse individual-level attributes. As classic inputs into team input-process-output (IPO) models, one would expect that composition variables would likely be considered primarily in terms of their impact on team creativity as a *process*. However, this is not the way the literature has unfolded. Instead, team creativity research has tended to consider the effects of composition variables on team creativity as an outcome, either directly or in combination with one or more contextual or traditional team process variables in an interactionist paradigm.

Composition models of person(s) attributes. To date, the majority of team creativity research has used composition models to consider the relationship between person(s) characteristics and team creativity. Furthermore, the preponderance of research has sought to link personality to team creativity. This makes sense given the stability of these dimensions and their prevalence in the broader team and creativity literatures. Within the team creativity literature, work by Baer, Oldham, Jacobsohn, and Hollingshead (2008) examined the personality mix (across people and traits) that is necessary for group creative outcomes on an idea-generation task. This work found that for teams with high levels of creative confidence, team creativity increased quadratically when members had high levels of extraversion, high openness to experience, and low conscientiousness. However, having members with a high level of neuroticism and a low level of agreeableness did not influence creativity. On a similar note, Somech and Drach-Zahavy (2013) explored the relationship between creative personality and creative ideas generated by teams. Based on data from 110 primary care teams in a large health maintenance organization in Israel, they found that teams with higher average levels of creative personality generated more creative outcomes (ideas).

Another well-studied person(s)-level input to team creativity falls under the broader heading of diversity. The prevailing assumption is that team creativity will benefit by broadening the knowledge pool with regard to demographic or job-related attributes. However, whereas interest in the effects of member diversity on team creativity is not new, it is interesting to note what diversity characteristics have been considered. As the recent review by Reiter-Palmon et al. (2012, p. 297) illustrates, the findings are often mixed and inconclusive:

> Paletz, Peng, Erez, and Maslach (2004) reported no differences in creativity between ethnically diverse and ethnically homogenous teams, and McLeod et al. (1996) found ethnic diversity to hinder team creativity. Choi (2007) found that groups that were diverse in terms of gender were less creative, whereas groups with age diversity were more creative. Curşeu (2010) found that team diversity (defined as gender, age, and national diversity combined) was moderately and positively related to the creativity of team output. Adding to the complexity, Baer et al. (2008) found that demographic diversity was negatively related to team creativity in an initial task, but not in a later task.

The recent work by Somech and Drach-Zahavy (2013) examined, in addition to creative personality, the effects of demographic diversity (i.e., gender and education) and functional diversity (i.e., organizational roles embodied in the team) on team creativity and found that functional diversity was positively related to team creative outcomes, yet demographic diversity was unrelated to creativity. Another work on diversity and team creativity examined this relationship in a virtual setting (Martins & Shalley, 2011). Using a sample of MBA student teams working on a virtual team project as part of their class curriculum, they found that demographic differences (i.e., race, sex, age, and nationality) provided a varied set of associations with team creativity as an outcome. Specifically, although differences in age, sex, and race were not directly related to team creativity, nationality diversity had a strong negative direct effect on team creativity, especially when there was a larger difference in technical experience between virtual collaborators. Difference in age was positively related to team creative performance when there was high establishment of rapport or more equal participation by collaborators, yet negatively related to team creative performance when there was high process conflict or a larger difference in technical experience between team members.

Taken together, what these findings suggest is that person(s) characteristics on their own are not enough to reliably affect team creativity. However, when diversity is examined in conjunction with team context or processes (discussed in more detail later), some of the results are quite interesting. For instance, Shin and Zhou (2007) examined the relationship between diversity in educational

specialization and team creativity outcomes with leadership as a moderator and team creative efficacy as a mediator. Using data from 75 research and development (R&D) teams in 44 Korean companies across various industries, they found that diversity in educational specialization was positively related to team creativity when transformational leadership was high. Although this work did not directly hypothesize the relationship between demographic diversity and team creativity, the results suggest that none of the demographic measures (i.e., age, gender, team tenure, educational specialization) was directly related to team creativity. Similarly, Hoever, Van Knippenberg, Van Ginkel, and Barkema (2012) examined the relationship between diversity in perspectives and knowledge on team creativity outcomes as moderated by the effect of perspective taking. The results of this laboratory experiment demonstrated that diversity in perspectives and knowledge and perspective taking did not have significant associations with team creativity. However, more diverse teams generated more creative ideas when perspective taking was high because perspective taking enabled the teams to elaborate and integrate each other's ideas and inputs.

Beyond the Big Five personality dimensions and traditional diversity measures, there are a few studies that have focused on other person(s) attributes in teams, such as value orientation, self/social orientation, narcissism, domain-relevant skills, prior task experience, cognitive style, and knowledge stock. Several studies also have examined team member experiences and prior job-related knowledge and expertise. For example, Gilson and Shalley (2004) found that moderate amounts of tenure are positively associated with team creative processes. With regard to prior experience, Gino, Argote, Miron-Spektor, and Todorova (2010) examined the effects of different types of prior experience on team creative outcomes using a series of origami tasks in a laboratory setting. The results suggested that, when compared to indirect task experience, direct task experience leads to higher levels of team creativity.

In a study by Sung and Choi (2012) using data from sales teams in Korea, team knowledge utilization, but not team knowledge stock, was positively related to team creative outcomes. This finding, like several of the previous ones discussed, suggests that what is important is not what the team possesses with regard to person(s) but rather how the attributes are used. This is the rationale proposed in the categorization–elaboration model, which argues that information processing and elaboration are necessary to turn team member attributes (diversity) into creative outcomes (Van Knippenberg, De Dreu, & Homan, 2004). (This line of thinking is discussed in more detail later.)

Team creativity, as both a process and an outcome, also was found to be related to narcissism (Goncalo, Flynn, & Kim, 2010). In a study in which student teams were asked to generate novel and useful plans that an organization could implement, team creativity was measured both as a process (systematic thinking) and as an outcome (a solution that was characteristically novel). The result showed that the relationships were curvilinear at the team level, suggesting that having more narcissistic members was better for team creative process and for team creative outcomes, but only to a point, after which having too many narcissists in fact lessened both creative processes and creative outcomes.

In a study of individualistic versus collective values and the creativity of team outcomes, Goncalo and Staw (2006) demonstrated that teams that held more individualistic rather than collectivist values, and who were instructed to be creative, generated more novel ideas, more unique ideas, and a greater range of ideas (flexibility); they also were better able to choose a single, most novel idea from among the ideas they generated. Similarly, research has found that teams whose members have a pro-self rather than a pro-social orientation generated more original ideas when working on creative tasks (Beersma & De Dreu, 2005). The explanation offered here is that pro-self individuals compare their outcomes to those of others in their group and are motivated to come up with more ideas regardless of the consequences this might have on others.

Finally, two studies by Kurtzberg (2005) found that diversity in cognitive style was beneficial for producing many ideas in an experimental setting yet was detrimental for members' perceptions of creative performance (i.e., affect and self-rated creativity) in a field setting. These findings seem to imply that team creativity in a field setting may require more complicated team member interaction (including team dynamics and work processes) compared with the interaction levels necessary within typical laboratory settings.

Our review suggests that although several studies on team creativity have looked at person(s) characteristics using composition models, it is difficult to tie them all together and draw a set of coherent

conclusions. To make matters even more complex, researchers in recent years have started considering person(s) characteristics using compilation models. Some of their findings are discussed in the next section.

Compilation models of person(s) attributes. Whereas composition models share the variance among team members by looking at averages and how the mix affects outcomes, compilation models embrace the more nuanced complex combinations of individual-level attributes. Compilation models suggest that team creativity may be influenced by a team's having just one or a few individuals with high or low levels on specific characteristics. This way of looking at individual-level attributes in a team setting is interesting because there are many instances in which one team member's ideas are needed as the seed for a project that the team will subsequently develop (Morley & Silver, 1977). For example, research examining string quartets has found that the second violinist plays a critical role with regard to how creative ideas are brought forward and selected (Murnighan & Conlon, 1991). This finding posits that the significant factor is not how the team scores on an attribute, but rather the importance of having one person possessing critical attributes or playing a key role. However, the role of lead creator can be a tricky given that highly creative individuals are often labeled as "deviant" (Moscovici, 1976), eccentric, sensitive, self-confident, introverted, and intuitive (Gough, 1979; Guilford, 1959; MacKinnon, 1962, 1975). Therefore, the characteristics necessary for team creativity may not be high levels of individual creativity per se, and highly creative individuals may not make the best team members.

Work by Schilpzand, Herold, and Shalley (2011) examined the effect of personality (openness to experiences) on team creative outcomes by employing both a *composition* approach (i.e., average and standard deviation) and a *compilation* approach (i.e., maximum and minimum score). More specifically, in their study of 31 graduate student teams performing a project in their innovation management class, they found that whereas diversity on openness to experience was significantly related to team creativity, the average measure of team members' openness to experience was not (composition). Further, having one or more members of the team who were assessed as very low on openness (compilation) was actually most desirable when it came to generating creative ideas.

Similarly, Robert and Cheung (2010) looked at the relationship between personality and product creativity using both average scores of conscientiousness (composition) and minimum score of conscientiousness (compilation). They found that the higher the team members' conscientiousness, the lower the team's creative performance. However, teams with one or more members who were very low on conscientiousness actually generated more creative outcomes.

Like personality, diversity has been examined using both a composition and a compilation approach. Curşeu (2010) examined the effects of different types of diversity on team creativity using two different conceptualizations of diversity (i.e., diversity as *disparity* and diversity as *variety*; for a more detailed review, see Harrison & Klein, 2007). Based on data from a cross-sectional study of 60 student teams working on a website design task, they found that diversity as *disparity* was negatively related to team creativity outcomes, yet diversity as *variety* was positively related to the creativity of team products. Results of this study support Harrison and Klein's proposition that diversity as variety promotes team creativity as the pool of knowledge within the team increases and broadens, but diversity as disparity hinders team creativity because of process losses from unevenly distributed resources in the team. These findings suggest that diversity can be both beneficial and detrimental to team creativity depending on the way in which it is conceptually defined or aligned with an appropriate operationalization. This finding further supports the importance of conceptualizing team-level constructs using different methodologies to more clearly unpack the effects of individual-level attributes on team-level creativity.

Overall, research from the person(s) perspective suggests two different things. First, when considering individual-level attributes at the team level, the compilation approach has the potential to add detailed explanatory power beyond the findings explained by the composition model. Second, the results may on the surface appear counterintuitive in that they suggest team creativity may be enhanced by having a member who is less creative, rather than, or as a well as, one highly creative genius. These findings push us to rethink how personal characteristics of team members influence team creativity and what gets lost in the simple aggregation of member attributes. Also, these findings suggest the need to examine the key role that less creative individuals might play in team

contexts. The natural inclination is to focus on the more creative team members, but what this body of work seems to suggest is that in some instances, for team creativity, less may be more. Further, work in the creative industries has revealed that highly creative individuals are often ostracized or marginalized (Gilson, in press), drawing further into question their role, the role of less creative team members and of team member(s) who can draw out the specific contributions of others (perhaps akin to a second violinist), and the key role that team processes and context play in moderating the person(s) effects.

Team Creativity From a Process Perspective

Rhodes' (1961) definition of the creative process states that it comprises four stages: (1) identifying a problem or opportunity, (2) gathering information and resources, (3) generating ideas, and (4) evaluating, modifying, and selecting ideas. Despite the prevalence of multistage creativity models (e.g., Amabile, 1983; Reiter-Palmon & Illies, 2004; Rietzschel, De Dreu, & Nijstad, 2009), most empirical studies have examined the idea-generation process, which is closely tied to brainstorming (Osborn, 1957). With regard to group brainstorming, the vast majority of studies have found that group interaction is detrimental to the generation of creative ideas (e.g., Diehl & Stroebe, 1987; Larson, 2010; Mullen et al., 1991).

A review by Paulus (2000) identified a number of factors that inhibit (i.e., social anxiety, social loafing, illusion of productivity, matching, downward comparison, production blocking, task-irrelevant behaviors, and cognitive load) and promote (i.e., competition/accountability, upward comparison/goals, novel association/priming, attention, conflicts, heterogeneity/complementarity, divergent style, and incubation) idea generation in teams, but the overall message of laboratory brainstorming research suggests that group interaction rarely benefits the generation of creative ideas. The amount of field research on brainstorming is so small that it is impossible to draw any firm conclusions about group processes for creativity in this idea-generation paradigm, but researchers do seem to agree that adopting a rigorous process for structuring idea generation is likely to be beneficial (Litchfield, 2013).

Whereas most studies on team creativity have examined antecedents to creative outcomes, a few have sought to tease out factors that influence a team to engage in the creative process. For instance, Taggar (2002) showed that team creativity-relevant processes at the individual level were positively related to extraversion, conscientiousness, and agreeableness. At the team level, creativity-relevant processes influenced team creative outcomes and moderated the effect of aggregated individual creativity on team creativity. This interaction result suggests that team creativity is highest when both aggregated individual creativity and team creativity-relevant processes are high, yet the effect is neutralized when team creativity-relevant processes are low, supporting the importance of creativity as a team process. Nemiro (2002) examined team creative processes in virtual team settings. Based on interviews with team members from nine participating teams, she also identified four stages of the creative process—idea generation, development, finalization/closure, and evaluation—and found that different stages of team creative processes were influenced by different communication methods and work design approaches.

Using creative processes as the dependent variable, Gilson and Shalley (2004) found that teams engaged in more creative process when (1) their jobs required creativity, (2) their tasks were highly interdependent, (3) goals were shared among the members, (4) members actively participated in problem solving, (5) the team climate was supportive of creativity, (6) members had a moderate amount of organizational tenure, and (7) members spent time socializing with each other. Sawyer and DeZutter (2009) examined team creative processes in a theater group using an *interaction analysis*—defined by Jordan and Henderson (1995) as "videotaping collaborations over time, and documenting the step-by-step emergence of cognition from the contributions of each group member"—to examine the real-time process of creativity. By analyzing a series of five theater performances developed in rehearsal, they concluded that, in a theater setting, creative processes are distributive, meaning that they emerge from a "situation where collaborating groups of individuals collectively generate a shared creative product" (p. 82). Similarly, when reviewing the history of The Beatles, Clydesdale (2006) concluded that the success of the band was not a result of creative genius but could rather be attributed to creative processes. Further, the band's creative processes were enhanced by competition both internal and external to their team.

When creative processes were considered as a predictor of team outcomes, Gilson, Mathieu,

Shalley, and Ruddy (2005) found that team creative processes were positively related to team performance but unrelated to customer satisfaction. However, team creative process did have a positive influenced on customer satisfaction when work standardization was high. These results suggest that team engagement in creative processes by themselves may not always be sufficient to result in the desired outcome—in other words, other team processes need to be considered in the equation.

This discussion on creative processes is relatively short because there is limited work that has considered team creativity as a process in the management field. However, there is considerable research that has considered how other team processes affect team creativity as an outcome. This is not surprising, given (1) the mixed results at the person(s) level discussed previously and (2) the fact that within the team literature, processes are the integral mechanism through which inputs affect outcomes.

In the team literature, processes describe how team inputs—individual, team, and organizational factors that enable and constrain members' interactions—are transformed into outcomes. Consequently, processes play a central role in most team effectiveness models (e.g., Gist, Locke, & Taylor, 1987; Guzzo & Shea, 1992; Hackman, 1983). Team processes are described as member interactions and actions that unfold over time and are directed toward task accomplishment (Marks, Mathieu, & Zaccaro, 2001). Processes have been further delineated into three types: transition, action, and interpersonal. Transition processes are those in which members focus on activities such as mission analysis and planning, goal specification, and strategy formulation. During action processes, members concentrate on task accomplishments, monitoring progress and systems, coordinating work, and monitoring and backing-up their fellow members. Lastly, interpersonal processes deal with interactions among members on a personal level, such as conflict management, motivation and confidence building, and affect management. In the following section, we will briefly review some of the current research on team processes and creativity using the Marks et al. (2001) conceptualization of processes.

Transition processes and creativity. Of the three primary transition processes (i.e., mission analysis and planning, goal specification, and strategy formulation), goal specification has been the one most integrated into the team creativity literature. Findings here suggest that having a shared goal is beneficial to team creativity (Gilson & Shalley, 2004). Research by Mitchell, Nicholas, and Boyle (2009) found support for the positive effect of shared goals on new-idea generation (labeled as knowledge creation), arguing that cooperation goals allow team members to discuss their different perspectives and opinions more freely, increase their motivation to listen to others' arguments, and engage them more thoroughly in team decision making. However, the effects of shared goals of cooperation on new-idea generation were mediated by open-mindedness norms and comprehensiveness in the group decision-making process.

Although both the aforementioned studies support the link between shared goals and creativity, neither addresses the content of the goals, leading us to question whether all goals are beneficial for team creativity. This question has yet to be answered by empirical research, but research at the individual level suggests that goal content can be influential in creative production (Litchfield, 2008; Litchfield, Fan, & Brown, 2011; Shalley, 1991, 1995). At the team level, although the relationship was not explicitly tested, Mitchell et al. (2009) argued that competitive goals would decrease team creativity because competitive goals might lead team members not to interact with certain other team members or to reject others' opinions (i.e., *closed-minded approaches*). However, Sutton and Hargadon (1996) found that competition among engineers at the design firm IDEO resulted in "status auctions" that may have spurred employees to take group idea generation more seriously, possibly leading to improved creativity.

Loosely related to shared goals are studies that have examined shared team cognition as a mediating mechanism. Team cognition can be conceptualized as shared mental models and transactive memory systems. Although both constructs are premised on the *sharedness* of knowledge among team members, shared mental models are defined as team members' shared, organized understanding and mental representation of knowledge or beliefs about key elements of the relevant performance environment (Klimoski & Mohammed, 1994), whereas transactive memory systems are defined as team members' shared awareness of who knows what (Moreland, 1999). A major difference between these two constructs is based on whether knowledge is held in common by team members or distributed among them.

Over the last decade, both shared mental models and transactive memory systems have been examined in the team literature (DeChurch & Mesmer-Magnus, 2010), yet these ideas have been considered in conjunction with creativity in only a couple of studies. For instance, Mumford, Feldman, Hein, and Nagao (2001) found that shared mental models caused teams to produce creative solutions as well as a larger number of viable alternative solutions. Gino et al. (2010) found that transactive memory systems were positively associated with team creative outcomes and fully mediated the effect of direct task experience on team creativity. This limited attention suggests that there is a great deal of future opportunity to consider how shared mental models and transactive memory systems, separately and in combination with one another, influence team creativity.

Action processes and creativity. Knowledge sharing, knowledge utilization, and communication are a few of the action processes most frequently examined in the team creativity literature. Zhang, Tsui, and Wang (2011) examined knowledge sharing, which they defined as sharing of task-relevant information, knowledge, and suggestions among team members (see also Srivastava, Bartol, & Locke, 2006). With regard to team creativity, they proposed and demonstrated that knowledge sharing helps individuals gain access to non-redundant information, thus leading to higher team creative performance.

Similar yet distinct from knowledge sharing, knowledge utilization also has been found to be positively related to team creativity as an outcome. Work by Sung and Choi (2012) showed that whereas knowledge utilization positively affected team creativity, knowledge stock did not. This finding suggests that mere possession of knowledge among team members may not be sufficient for teams to be creative; rather, knowledge and expertise need to be activated and used during decision-making processes. Gilson, Lim, Luciano, and Choi (2013) examined the cross-level effects of tenure diversity and knowledge sharing on individual knowledge and creativity. They found that there was no significant relationship between tenure diversity and individual knowledge, but tenure diversity became negatively related to individual knowledge when knowledge sharing was low. These findings start to shed some light on the mixed person(s) findings discussed previously in that they suggest that action processes may play a key role in enabling team creative outcomes.

Two investigations of communication and creativity have examined how different types of communication processes affect team creativity. Leenders, Van Engelen, and Kratzer (2007) distinguished four different communication characteristics—subgroups, frequency of communication, disagreement, and centralization of communication, and examined their effects on team creative performance (measured as generation of new ideas, methods, approaches, inventions, and applications). Their findings demonstrated a differentiated pattern of results based on the communication characteristic. Specifically, team creativity decreased when communication was conducted within subgroups or was centralized via a certain member. Communication frequency had an inverted U-shaped effect on team creativity, meaning that, in order to be creative, modest levels of communication frequency were most desirable. These results parallel those from the brainstorming literature, where it has been found that teams are likely to generate more creative ideas when individuals engage in a task in isolation rather than as a group.

Another study by Giambatista and Bhappu (2010) compared different means of communication (i.e., computer-mediated communication, face-to-face communication, and nominal group technique) as moderators of the effects of diversity on team creativity. The results of two studies using undergraduate students showed that the relationship between personality diversity and creative performance differed based on the communication channel. Specifically, in study 2, both ethnic and agreeableness diversity were negatively related to creativity performance in teams using face-to-face communication channels, whereas diversity on the openness characteristic was positively related to creative performance when teams used computer-mediated communication. Taken together, these studies suggest that creative outcome can be affected by team action processes, but there is not enough replication and extension for clear patterns of relationships to have emerged.

Interpersonal processes and creativity. Conflict is probably the most studied team process in the creativity literature. With regard to conflict, it is almost universally believed that it is beneficial for creativity, but only up until a certain point (curvilinear), and only when the conflict revolves around the task. In a study of 71 project teams in a Chinese information technology (IT) company, Farh, Lee, and Farh (2010) found that team creative

output was highest when task conflict was at moderate levels. In addition, the curvilinear effect was strongest during the early stage of a team's life cycle but not significant at the later stages.

Similarly, Chen (2006), using two samples (one from service-driven project teams and the other from technology-driven project teams), found that the effects of conflict on team creative outcomes were different depending on the types of project team and the stage of the project life cycle. Specifically, in service-driven project teams, interpersonal conflict was negatively related to team creative outcomes, whereas task conflict was not. On the contrary, in technology-driven project teams, task conflict was positively related to team creativity but interpersonal conflict was not. Furthermore, team creativity in service-driven teams was lowest when both task and interpersonal conflict were high at later stages (e.g., testing phase), whereas team creativity in technology-driven teams was highest when both task and interpersonal conflict were high at early stages (e.g., design phase).

In contrast to the studies detailed earlier, others have considered conflict in several different ways; for instance, Jehn, Rispens, and Thatcher (2010) explored the effect of team conflict asymmetry on team creative outcome after controlling for the average levels of team conflict. These results demonstrated that task conflict *asymmetry* (defined as the degree to which members differ in their perception of the level of conflict in their team) was negatively related to team creative outcomes, yet relationship conflict asymmetry was not significantly related to team creativity. Similarly, Kratzer, Leenders, and Van Engelen (2006) examined the relationship between team *polarity* (defined as the level of disagreement among the team members) and creativity. Using data from 51 innovation teams from various companies, they showed that team polarity had a negative relationship with team creative performance under conditions of low product and process change but an inverted U–shaped relationship under conditions of high product and process change. Furthermore, the relationship also differed depending on the phase of the innovation activity. More specifically, team polarity had an inverted U–shaped relationship with team creativity during the conceptualization phase but a negative relationship during the commercialization phase.

These findings, taken together, suggest that the relationship between interpersonal processes and team creativity is different at different points in time, suggesting that the role of time may need further consideration in team creativity research (see Gilson, Litchfield, & Gilson, in press).

Other interpersonal process constructs that have received considerable attention are team creative efficacy and cohesion. Derived from self-efficacy theory (Bandura, 1977; Bandura, 1982), team efficacy is defined as team's shared belief in its ability to perform in a particular situation (Bandura, 1997). A study by Zhang et al. (2011) found that collective efficacy positively related to team creative performance and mediated the effect of different types of leaderships on team creativity. However, more recently, researchers have started to consider *creative efficacy* at the team level in terms of "team members' shared beliefs in their teams' capabilities of producing creative ideas" (Shin & Zhou, 2007, p. 1712). In a follow-up to Shin and Zhou's study (described earlier), Zhang, Chen, and Kwan (2010) used longitudinal data from R&D teams in Chinese IT companies and found that team creative efficacy mediated the relationship between empowering leadership and team creative outcomes, especially when task complexity was high.

Cohesion is a team-level conceptualization of a psychological bond that has been defined in many ways, ranging from attraction to the group, to commitment to the group, to pride in the group (Hülsheger, Anderson, & Salgado, 2009). Cohesion has been shown to increase team performance and effectiveness (Kozlowski & Bell, 2003). At least some form of cohesion has generally found to be beneficial to creativity and innovation in teams (Hülsheger et al., 2009), but the lack of theoretical consistency about what it is, and how it works, remains a contributing factor to at least some mixed findings. For instance, Jaussi and Dionne (2003) found that cohesion could be positively related to team creative performance when teams had a high level of intrinsic motivation for creativity, whereas cohesion was negatively related to team creative performance under conditions of low intrinsic motivation for creativity. This result is intriguing and suggests the need for further work to explore other possible boundary conditions (e.g., press or environment) under which cohesion might be beneficial to team creativity. To further muddy the cohesion conversation, Marks et al. (2001) argued that cohesion is not a process but rather a team emergent state. They proposed that emergent states are cognitive, motivational, or affective states that do not involve member interaction but also can mediate the team input–outcome relationship.

Team Creativity From a Press Perspective

In his 1961 work, Rhodes used the term *press* to describe the relationship between people and their environment and to emphasize the importance of context in advancing creativity research. The interactionist perspective of creativity put forth by Woodman et al. (1993) proposes that complex social settings at multiple levels need to be included in creativity research. In this theoretical work, the authors argued that the interactions between person(s) and situation exist at every level (i.e., team, organization) and, as such, team creativity is a function of the interplay between group composition or characteristics, processes, and context. In the review by Shalley et al. (2004), several contextual antecedents were discussed as important for individual creativity, but nothing was mentioned with regard to team creativity.

Context is a critical component in most team effectiveness models; it is suggested that teams are nested within larger entities, which in turn influence how they behave and perform (e.g., Cohen & Bailey, 1997; Ilgen et al., 2005; Mathieu et al., 2008). Contexts can further be delineated depending on the level where they reside. For example, Zellmer-Bruhn and Gibson (2006) differentiated between a *micro-context,* which is tailored to specific team needs including leadership, climate, and relationships among coworkers and supervisors, and a *macro-context* that is related to the larger organizational environment and can consist of organizational culture, climate, and reward systems, as well as the larger environment outside the organization. Another way of conceptualizing this divide is that micro-contexts refer to characteristics that vary between teams (i.e., team-level constructs), whereas macro-contexts refer to characteristics that do not vary between teams but rather between higher-level units such as departments, organizations, and the work environment.

In addition to work context (both micro and macro), it has been argued that teams behave and perform based on their temporal contexts (McGrath, Arrow, & Berdahl, 2000). However, the temporal aspects of context have received scant attention in the creativity literature (Gilson et al., in press), as well as in organizational behavior research in general (Ancona, Goodman, Lawrence, & Tushman, 2001; Shipp, Edwards, & Lambert, 2009). Next, we will review empirical works on the influence of these three aspects of context (micro-, macro-, and temporal) on team creativity before moving to Rhodes' final "P" for product.

Micro-contexts. The most frequently studied micro-context in the team creativity literature is leadership. The effects of leadership have been considered in different samples, with different dependent variables, across various conceptualizations of leadership, and with different moderators and mediators. For example, Shin and Zhou (2007) examined the moderating role of transformational leadership on the relationship between educational specialization heterogeneity and creative outcomes. The correlation between transformational leadership and team creativity was significantly positive (r = .28), and transformational leadership boosted the positive relationship between a team's educational specialization heterogeneity and creative performance as mediated by team creative efficacy. Also examining transformational leadership, Wang and Zhu (2011) found it to be positively related to team creative performance through team creative identity. Lastly, Zhang et al. (2011) found transformational leadership to have a positive effect on team creative performance and to be mediated by both knowledge sharing and collective efficacy. Interestingly, these authors further found that the negative relationship between authoritarian leadership and team creativity also was mediated by knowledge sharing and collective efficacy. Their findings suggest that members' behavioral and attitudinal responses are influenced differently depending on leadership style.

Moving to empowering leadership, in a longitudinal study, Zhang et al. (2010) reported that the positive relationship with creative performance was mediated by team learning behavior and team creative efficacy. What is consistent among these studies is that they all found that at the team level, the leadership–creativity relationship was significantly influenced by team processes and emergent states. In particular, it appears that team creative efficacy consistently plays an important role.

At the micro-context level, task complexity (Zhang et al., 2010), conformity pressure (Goncalo & Duguid, 2012), team climate for creativity (Gilson & Shalley, 2004), and relationships with coworkers and supervisors (Wang & Hong, 2010) have each been examined in concert with team creativity. For example, the study by Zhang et al. previously mentioned with regard to leadership, also reported that team task complexity moderated the mediating effects of team learning behavior and team creative efficacy on the relationship

between empowering leadership and team creative performance. Specifically, when team tasks were more complex, empowering leadership was more positively related to team learning and team creative efficacy, in turn leading to higher creative performance.

Goncalo and Duguid (2012) investigated the joint effects of conformity pressure, norm content, and group personality composition on the number of ideas generated (creative outputs) in order to understand the boundary conditions (*press*) under which conformity pressure can either stifle or boost team creative outcomes. In a series of laboratory experiments, the researchers manipulated conformity pressure (high vs. low level) as well as norm content (individualistic vs. collective) and found that (1) teams generated less creative ideas when conformity pressure was high, (2) teams with highly creative people generated more creative ideas when conformity pressure was low, and (3) teams with less creative people generated more creative ideas when norm content was individualistic and conformity pressure was high. These finding provide interesting insight into some of the previous discussions on person(s) and suggest that, although conformity pressure alone can negatively influence team creativity, when applied to teams of individualistic, less creative individuals, it can in fact be beneficial for their creative performance.

Moving to team climate, Gilson and Shalley (2004) examined the effect of a team's supportive climate on team creative process. They argued that team members were more likely to feel comfortable tasking risks and exchanging information when the team's climate was supportive of creativity, and they found that teams who reported their climates to be more supportive also were more engaged in creative processes. Finally, Wang & Hong (2010) considered the effects of both supervisory support and work group support on team creative outcome. Analyzing a sample of MBA students in China, they found that team creativity was positively influenced by both supervisory support and work group support. Further, they found that psychological safety (measured at the team level) mediated both the supervisory support–team creativity and work group support–team creativity relationships. Together, these finding lend support to the importance of team climate as a critical contextual factor necessary for team creativity.

Macro-contexts. At the more macro level, organizational and environment factors such as psychological safety (Kessel et al., 2012), organizational support and control (Tu, 2009), organizational culture (Barczak, Lassk, & Mulki, 2010), and environmental uncertainty (Sung & Choi, 2012) have all been considered in the team creativity literature. Similar to the positive effect of psychological safety on individual creativity (Amabile, Conti, Coon, Lazenby, & Herron, 1996; Carmeli, Reiter-Palmon, & Ziv 2010), Kessel et al. found a positive relationship between psychological safety and team creative performance. Likewise, for organizational support and control, team-level results also have been found to mirror those at the individual level. For instance, Tu found that in new-product development teams, organizational support and control moderated the relationship between a team's negative affective tone and team creative performance. More specifically, negative affective tone was positively related to team creative performance when organizational support was high and organizational control was low. However, neither organizational support nor organizational control moderated the relationship between positive affective tone and team creative performance. These findings suggest that under certain circumstances, a negative team affect tone can be harnessed and result in the generation of creative outcomes (ideas).

Still at the macro level, in a study on collaborative organizational culture—a culture that values teamwork, respect and empowerment, communication, risk, and diversity (Lopez, Montes Peon, & Vazquez Ordas, 2004)—Barczak et al. (2010) found that collaborative culture positively influenced team creative performance. Although this result seems to straddle both press and process, it seems to imply that encouraging team members to share information and to cooperate with one another may occur at the organizational rather than the more traditional team level of analysis.

Lastly, Sung and Choi (2012) considered environmental-level factors as moderators of the relationship between team knowledge management (i.e., knowledge stock and knowledge utilization) and team creativity. Their data revealed that the positive relationship between knowledge utilization and team creative performance was stronger when the business environment was unpredictable and unfamiliar (i.e., high level of environmental uncertainty). These results suggest that the factors of person(s) and processes can be exacerbated by the macro-context, and here the authors reported that what team members know (knowledge stock) and how it is used (knowledge utilization) are more critical for team creativity when teams face an unpredictable, uncertain environment.

Temporal contexts. The last press category we consider is the temporal context. The importance of considering time in creativity research has started to generate some traction at all levels of analysis (see Gilson et al., in press). Within the team literature, time has predominantly been examined as it relates to the life cycle of a project (Ford & Sullivan, 2004). For example, longitudinal work by Gilson and Madjar (2011) found that team members were more likely to engage in radical creativity during the earlier phases of a project and more likely to engage in incremental creativity during the later stages. In addition, Farh et al. (2010) found that the curvilinear relationship between task conflict and creativity is evident only in early phases of a team's project life cycle. This suggests that early in a project, moderate levels of conflict are beneficial for creative outcomes because they result in ideas' being valued, discussed, and incorporated.

Contrary to the usual assumption that premature evaluation can harm creativity, in an inductive qualitative study of collective engagement in health care policy groups in the United Kingdom, Harvey and Kou (2013), found that evaluation-centered group processes can still produce creative engagement. These findings propose that ongoing or concurrent idea evaluation, rather than stifling idea generation, helps groups stay focused on their goals, incorporate feedback, harness group member diversity, and improve the creative output. (For a similar view, see Nemeth, Personnaz, Personnaz, & Goncalo, 2004).

Within the team creativity literature, it appears that time has been considered solely as it relates to the team project and has yet to be considered as a person(s)-level characteristic (i.e., time orientation of team members). Later in this chapter, areas for future research with regard to time context will be discussed, but first we move to the last of Rhodes' P's—product.

Team Creativity From a Product Perspective

Rhodes (1961) named creativity as a product when an idea becomes embodied into any kind of tangible form. The organizational creativity literature defines creative products as ideas that are judged to be both novel and useful by some authority (Amabile, 1988). At the individual level of analysis, most creativity research has examined creative outcomes as rated by subject matter experts (Amabile, 1996), supervisors or other authoritative groups (Oldham & Cummings, 1996), or objective measures such as research reports (e.g., Tierney, Farmer, & Graen, 1999). Similarly, team creativity research has examined products produced by teams using ratings made by experts (Baer et al., 2008; Somech & Drach-Zahavy, 2013; Taggar, 2002), managers (Farh et al., 2010), or other trained raters (Hoever et al., 2012). However, even though most creativity measures in organizational contexts are perhaps best characterized as outcome measures, only some of this research has examined specific creative products.

Another common strategy for studies of both individual and team creativity is to use retrospective supervisory measures of the general tendencies of a team that, although ostensibly regarded as outcomes, arguably confound product, person(s), and process. For instance, Shin and Zhou (2007) had supervisors of R&D teams rate them and compare them with other teams for "How well does your team produce new ideas?" and "How useful are those ideas?" (p. 1714). Here, the referent for these items is other *teams* rather than *ideas,* suggesting a team rather than a product perspective even as the items themselves emphasize ideas (although not specific ideas).

Another example is found in a recent paper by Jia, Shaw, Tsui, and Park (2014), who measured team creativity using items including measures of the extent to which a group "is a good role model for creativity" and "seeks new ideas and ways to solve problems" (p. 22). The first of these items again seems to take a team perspective, whereas the second suggests a process perspective. Jia et al. also included in their measure an item about the extent to which a group "generates ground-breaking ideas related to the field," suggesting a product perspective. The point of highlighting these measurement strategies is that it is not always clear when an outcome measure of team creativity should be considered synonymous with a team creative product measure.

An example that might serve as a partial model for measuring team creative output as a product in an organizational survey study is found in the work of Farh and colleagues (2010). In this work, the authors sought to measure creativity in project teams within a highly creative company. Recognizing that project teams surveyed at any given point in time would likely be at different stages of their project life cycle, they identified the project stage for each team and then had managers rate the team's creative output for that specific

stage. Managers indicated the degree to which the team's output was "creative" as well as "original and practical." However, this study also included a team perspective through the addition of a third item concerned with the degree to which the output demonstrates the team's creative capability.

Another significant issue in the output versus product question is the confounding of creativity with quantity. Some team creativity studies have combined the number of creative products generated with the rated creativity of those products to form either independent or composite output measures (Pearsall, Ellis, & Evans, 2008; Somech & Drach-Zahavy, 2013). For instance, Somech and Drach-Zahavy calculated a team's creative output as "the product of the number of ideas and the average score for creativity" (p. 11). Although the number of creative products, outcomes, or ideas has long been recognized as an indicator of the creative ability of an individual, in which case it is called *fluency* (Guilford, 1957), the amount of products generated by definition cannot be a part of the creativity of any *individual* product (for discussion, see Litchfield et al., 2011; Nijstad, De Dreu, Rietzschel, & Baas, 2010).

Taken together, team studies suggest that although most common definitions of organizational creativity reference the product perspective (Amabile, 1988, 1996; Ford, 1996; George, 2007; Shalley et al., 2004), "pure" measures of creative products seem to be relatively rare—especially in field research. The unified perspective on creativity suggests that this may not be a problem if the goal is to study creativity as an overall construct (Rhodes, 1961; Runco, 2004). However, the importance accorded to defining creativity from a product perspective in the organizational creativity literature is incommensurate with its empirical treatment in team creativity research to date. Because the development of team creative capabilities, processes, and outcomes might each be valued outcomes in organizational contexts, it is important to consider whether these should begin to be more explicitly separated in future research.

Future Directions in Team Creativity Research

Thus far, we have reviewed much of the current organizational team creativity research using Rhodes' (1961) Four P's framework. Within this review, we have sought to highlight where the bulk of the extant research resides. Furthermore, in each subsection we have grouped work according to methodology, types of variables, and relevant theoretical frameworks from the team literature. In doing so, patterns and inconsistencies are both highlighted. In the following section, our focus shifts away from what we "know" to what we "don't know." Here, we highlight areas that, based on our review, are in need of future theoretical and empirical consideration. In doing so, we hope to lay out a research agenda that will be helpful to scholars in this arena. We again loosely arrange this section using the Four P's framework, although we acknowledge that there is a fair amount of conceptual crossover between the various sections.

To start the discourse on future directions, we want to return to the definition of team creativity along with construct conceptualization and measurement. Given the range of definitions used, we implore future scholars to define up front what they mean when they use the term team *creativity*. Is team creativity (1) a process that teams use to generate outcomes, creative or otherwise? (2) the creative rating of a product produced by a team? or (3) a referent regarding how creative a team is in comparisons to other teams? We propose that all these conceptualizations are valid and warrant additional consideration, but in order for this line of inquiry to advance, it is imperative that scholarship be comparable across studies, and this needs to start with a clearly defined conceptualization of team creativity that then fits with the measurement of the construct. In other words, research needs to specify whether creative person(s), products, processes, or situations are being investigated, and in doing so, ensure that appropriate measures for the proposed constructs are being employed (Woodman et al., 1993).

Almost all team-level studies consider creativity as an outcome. This is particularly interesting given the importance of processes in the team literature. Therefore, team creative processes are in need of a great deal more careful theorizing and empirical research attention. In addition, are team creative processes commensurate with creative outcomes? That is, should they be conceptualized and measured as the engagement in novel and useful means of doing work? Evidence is increasing that creative outcomes might be arrayed along a continuum ranging from incremental to radical (Gilson, Lim, D'Innocenzo, & Moye, 2012; Gilson & Madjar, 2011; Madjar, Greenberg, & Chen, 2011)—Is the same true for engagement in creative processes? Furthermore, does "useful" mean the same at the process and product levels? To discuss some of

these issues in more detail, the next section proposes areas for future research using Rhodes' Four P's framework.

Person(s)

Rhodes' (1961) "P" for person(s) is probably the area where the most team-level creativity research has been conducted (as evidenced by our current review). However, despite the amount of work, consistent findings and relationships are yet to emerge. In part, this might be attributed to the methodological issues discussed, with some studies considering the average effects of person(s) characteristics (composition) while others examine more nuanced variance (compilation). In addition, most team creativity research proposes to examine the effects of person(s) attributes on creative outcomes. The team literature has long worked within an IPO framework, suggesting that the relationship between inputs (i.e., person(s) attributes) and team outcomes (creativity and other outputs) are mediated by team processes. However, team research has not considered team creativity as a process, and therefore the mediation effects remain unexplored. Moving forward, work is needed to address whether team creative processes mediate the relationship between person(s) attributes and measures of team effectiveness (Mathieu & Gilson, 2012) as well as creativity as an outcome.

As mentioned earlier, a possible reason why person(s)-level findings are inconsistent is the way in which individual-level attributes are aggregated to represent team-level attributes. Most studies on team creativity have focused on the composition approach; however, a limitation of this approach is that each individual's attributes are presumed to be weighted equally in representing team-level attributes. With regard to creativity, this might be particularly problematic, because work at the individual level has long found that individuals differ in their creative ability (Sternberg, 1988) or characteristics that facilitate creativity (Jabri, 1991). Teams are generally considered to be more than just a sum of their individual parts, so future research on team creativity from a person(s) perspective should consider person(s) attributes at the team level using both a composition and a compilation approach in a more comprehensive IPO framework.

Although the compilation approach is more common in the team literature and has started to receive attention in team creativity research (Curşeu, 2010; Robert & Cheung, 2010; Schilpzand et al., 2011), more of this type of work is needed, particularly across contexts and projects. All of the studies to date have looked at different person(s) attributes, such as conscientiousness (Robert & Cheung, 2010), openness to experience (Schilpzand et al., 2011), and diversity (Curşeu, 2010), and to some degree, the implications across studies are consistent: The effects of person(s) attributes on team creativity can be more clearly understood when person(s) characteristics are not averaged. In other words, a certain member's personality (or other attributes) may be more influencial in explaining team creativity (Robert & Cheung, 2010; Schilpzand et al., 2011). This becomes particularly interesting when we start to think about new team contexts. For example, what happens in virtual teams where members are brought together because of a specific expertise? What mix of person(s)-level attributes are most desirable when creativity is added into the mix? Further, what happens if team members rotate on and off a team depending on the stage of the project or the requirements of the task—Are there some individuals who, because of their unique attributes, whether or not they are releant to the task, need to be kept on the team to ensure that the team is creative?

Although we acknowledge that it is hard to publish, the team creativity literature at the person(s) level is in great need of replication and extension. Studies have considered different attributes and how their association with creativity is mediated and moderated by a different set of processes and emergent states. What is now needed is some sort of consolidation to advance our understanding of how members' characteristics can influence team creativity (processes and outcomes).

Processes

In the section on team creative processes, we reviewed studies that considered the relationship between team processes and creativity using Marks et al. (2001) categorization. However, creativity as a process is not addressed within that framework. As detailed previously, creative processes are described as a collective phenomenon in which members behaviorally, cognitively, and emotionally define problems, generate ideas, and attempt new ways of going about their work (Gilson & Shalley, 2004). Accordingly, team creative processes involve the sharing of ideas that stimulate associations and result in identifying problems, linking ideas from multiple sources, constructively dialoguing possible solutions, and generating novel and useful suggestions for outcomes (Taggar, 2002; Torrance,

1988). This definition in and of itself is multifaceted, hence it can be argued that while creative processes are a distinct process, there is also conceptual overlap with both transition and action processes—this would not be surprising given that team processes have an average correlation of r = .83; (LePine, Piccolo, Jackson, Mathieu, & Saul, 2008).

Transition processes involve planning and deciding how work should be organized. As such, a part of this process should involve thinking differently (creatively) about how and when different parts of a task are handed off between team members. For example, are the components of a task always completed and passed off, once completed, in a sequential manner? What would happen if tasks were rotated back and forth between members regardless of whether a specific piece of work had been finished? Research on polychronicity and creativity has found that individuals differ with regard to their preferences for handling more than one task at the same time (Madjar & Oldham, 2006). However, the number of creative ideas generated at the individual level did not differ between rotation and sequential task conditions. That said, individuals who scored more highly on a polychronic measure generated more creative ideas when they rotated through tasks, whereas more monochronic individuals were more creative when they completed tasks in a sequential manner. How would these individual process preferences play out in a team setting? How do other team transition processes (e.g., mission analysis and planning, goal specification, strategy formulation) and creative processes interact to affect team effectiveness?

If transition processes are thought of as the planning phase, action processes can be conceptualized as the doing phase. Here again, creative processes should play a critical role. The question is not whether new approaches to a task are encouraged (transition); rather, are new methods employed or used to complete a task? Are ideas played with, risks taken, outside input sought, linkages made where none were previously considered? Although there are times when teams need to perform their work in a very standardized or procedural way, there also may be times when accomplishing a task means breaking with tradition, taking a step away from the status quo, and doing things that at the time may not seem completely appropriate or necessary. How do these two similar yet different processes work together? Research by Gilson et al. (2005) found that standardization and creative processes worked in concert with one another to influence team performance and customer satisfaction. This work further showed that standardization was distinct from creative process, but standardization is only one category of action processes. How do team creative processes influence and interact with other action processes (e.g., knowledge sharing, knowledge utilization, communication)?

Moving forward, disentangling the relationships among transition, action, interpersonal, and creative processes is an area greatly in need of theoretical and empirical consideration. Are creative processes a fourth type of team process, or are they a component part of the others? Instead of looking at creative processes as parts of transition and action processes, an alternative way of looking at creative processes is to consider them as distinct. Independently from the team literature, creativity theories have identified several stages or processes including problem identification, information search and preparation, idea generation, idea evaluation, and selection (Amabile, 1983; Reiter-Palmon et al., 2008). Generally, the first three stages are considered as the idea-generation process, and the last stage is considered as the idea-evaluation/selection process. Because idea generation and idea selection require individuals to engage in different thinking styles (i.e., divergent vs. convergent style, respectively), the team-level inputs necessary for the idea-generation process may differ from those that will best facilitate the idea-evaluation/selection process. Recent book chapters by Reiter-Palmon et al. (2008) and Shalley (2008) have proposed several team cognitions, inputs, and processes that should influence team creative processes differently.

It is also interesting to note that whereas team creative processes are most often studied as a dependent variable, with the inherent assumption that they will lead to a number of positive outcomes—particularly innovation (Gilson, 2008; Gilson & Shalley, 2004; Shalley et al., 2004), transition and action processes are usually considered as mediators in team IPO models (Hackman, 1983; Mathieu et al., 2008). With this in mind, a number of interesting questions emerge as to how creativity as a process would play out in the more traditional IPO framework. Whereas it can be argued that, to some extent, planning and doing are necessary processes for all team tasks, would creative processes work in the same way? Do all team members need to be involved in creative processes?

Recent work on shared leadership has argued for the importance of having multiple team members exerting influence on their fellow teammates in order to realize team objectives (Carson, Tesluk, & Marrone, 2007; Pearce & Sims, 2002). In this stream of work, it has been argued that having different team members assume responsibility for various aspects of the team task and process can be an effective strategy (Carson et al.). Should a team member be responsible for the creative process? What are the outcomes influenced by team creative process? And, are there any conditions that promote or inhibit the effect of team creative process on team outcomes?

Teams may engage in creative processes regardless of whether the outcome itself is creative; therefore, the effect of team creative processes may not always be beneficial for creativity as an outcome but may facilitate other facets of effectiveness (Mathieu & Gilson, 2012). For example, Zhang and Bartol (2010) found that individual performance was highest when an individual's engagement in creative process was at the modest level. Gino and Ariely (2012) found a dark side of creativity, revealing that creativity led individuals to more frequently engage in dishonest behavior. However, both of these findings are at the individual level. It would be interesting to extend this work to the team level and examine whether the results are similar.

Press

Despite the large volume of research aimed at specifying aspects of creative environments, many directions in the micro, macro, and temporal environments remain underexplored, particularly with regard to team creativity. In terms of micro-context, a glaring research need concerns the relationships among coworkers. (This line of inquiry might also be considered under the heading of interpersonal processes.) When do relationships, and what sorts of relationships, between coworkers foster productive climates for team creativity? Further, are coworker relationships those that exist between team members or between teams? Although research has examined how processes related to relationships such as communication can foster team creativity, and the role of conflict has received a great deal of attention, little or no research has directly addressed the strength of relationships in terms of environmental constraints. Relationships among coworkers also can be considered as a more macro-context level: Different departments or organizations may focus more heavily on these types of relationships and, in some cases, try to foster certain types of working relationships (amicable or competitive) between team members and between teams.

The situation is better for leadership, especially when it is considered as a process variable. However, one might still examine leadership from a press perspective by considering such questions as boundary conditions or positive effects of support or assigned goals for team creativity. On the macro-context side, reward systems are emerging as a potentially interesting aspect of individual creativity and are a topic that has been debated for years (Byron & Khazanchi, 2012). Yet, so far, reward systems have not received detailed attention in the domain of team creativity. This may be a particularly important gap because there are many acknowledged complexities in developing effective team-based reward systems (Aime, Meyer, & Humphrey, 2010). Given that rewards seem to exhibit persistent positive effects on creativity in individuals (Byron & Khazanchi), but rewards can have differential effects on incremental and radical creativity (Gilson & Madjar, 2011); future research might examine how incentives can be structured to affect team creativity.

One other particularly interesting macro-context factor is creative culture. There are many indications that the ways in which organizations send messages about what they value and norms for expected behavior can affect creativity (e.g., Ford, 1996; Mainemelis, 2010; Woodman et al., 1993), and at least some work suggests that this also affects team creativity (e.g., Sutton & Hargadon, 1996). Cultural studies of team creativity are particularly demanding to conduct because they seem to implicate research across multiple organizations with identifiably different cultural profiles. Yet, given the widespread belief that cultures such as those of Bell Labs, Xerox PARC, Apple under Steve Jobs, and Google have been influential in fostering innovation, future research might seek out examples regarding what specific aspects of said cultures enable team creativity and subsequent innovation. Ideally, future research also might seek to move away from merely studying outstanding examples of innovative cultures and pursue a broader range of questions about cultural variables that may negatively affect team creativity. Here, cross-organizational studies that examine the creative industries (Gilson, in press) compared with other types of work environments may provide

some good insight into not only stages of project cycles but the larger organizational culture, climate, leadership, and environment.

Product

Future research on team creative products might benefit from further clarification of the component terms *team* and *product.* With regard to the former, a potentially interesting question for team creativity scholars is whether an idea from a team member, unmodified by the team, can qualify as a team-level creative product merely through the act of having been voiced within and blessed by a team. We imagine that for many research purposes this approach may be completely appropriate. Nevertheless, such an approach might be *inappropriate* for some research questions. For instance, imagine a hypothetical researcher who is interested in the degree to which creative team products that arise from acts of *collective* creativity (Hargadon & Bechky, 2006) are more likely to be implemented than those that reflect unmodified acceptance of individual creative ideas. In such a project, it might be important to differentiate team creative products that arise from each type of process and to measure their creativity independently in order to compare their subsequent implementation while controlling for the creativity of the ideas. Future research is needed to understand whether distinguishing between such types of creative team products makes a difference within creativity and innovation processes.

Future researchers might also add value by being clear about the difference between *products* and *outcomes,* and by measuring consistently with their chosen theoretical perspective. Although the Four P's framework itself seems to license creativity measures that confound various aspects of the construct, organizational creativity research has been specific about theorizing a privileged position for the creative product (Amabile, 1988; George, 2007; Shalley et al., 2004). Accordingly, we generally do not think that *organizational* creativity research is likely to be best served by, say, mixing measures of the outcome of developing creative capability with measures of the creativity of a team's ideas to measure creativity—just as team scholars do not seem to advocate that measures of capability and performance should be mixed to investigate team performance. Rather, our view is that for most research purposes in the organization sciences, these might be separate though possibly related variables of interest. What this means for the substantial body of research that does not track specific creative products is that a great deal of work on measure development is needed. Earlier, we pointed to two items used by Farh et al. (2010) as a possible starting point. Perhaps items reflecting the degree to which ideas are "novel and useful" and "ordinary and of limited value" (reverse coded) might be added and tested to develop a reasonable multi-item measure of the creativity of a team's products. Future research is needed to determine the value of such proposals.

Integrating Team Creativity into Entrepreneurship and Innovation

Entrepreneurship

Entrepreneurship is a microcosm of many of the situations described thus far in the chapter. Creativity is regarded as an essential element necessary for entrepreneurship (Amabile, 1997; Ward, 2004; Zhou, 2008), as is the entrepreneurial team (Chowdhury, 2005; Francis & Sandberg, 2000; Higashide & Birley, 2002). It is therefore surprising that very little research has been constructed at the intersection of the two. What role does team creativity play in determining the success of the entrepreneurial venture?

Ending this chapter with a discussion on entrepreneurship is particularly appropriate given that creativity and entrepreneurship are inexorably linked in the extant literature (Fillis & Rentschler, 2010). The role of creativity in entrepreneurship has been applied to three distinct areas: (1) the process of opportunity recognition (Heinonen, Hytti, & Stenholm, 2011; Hills, Shrader, & Lumpkin, 1999), (2) the development of the opportunity into a product (Baron & Tang, 2011), and (3) the innovative steps necessary to develop the new venture from product to profitable business. The first two areas require that creative skills be employed to generate ideas and search for solutions that will eventually result in the development of a product, but all three areas require creativity in the development of processes—Whether we are talking about leveraging creative processes or processes in general is a question that remains to be examined. However, this description of three areas involving creativity in entrepreneurship is somewhat arbitrary. For example, Dimov (2007) expanded the first area of opportunity recognition into two subdimensions: the formation of the original idea and the development of that idea into an opportunity. Suffice is to say that creativity is part of all steps in the creation of new ventures. So, where does the

notion of the team or, more specifically, team creativity come into play?

The creative aspects of entrepreneurship can further be considered within the framework of Rhodes Four P's. For instance, there is a considerable body of research that has investigated what attributes of the entrepreneur lead to greater levels of creativity (Ciavarella, Buchholtz, Riordan, Gatewood & Stokes, 2004; Krueger, Reilly, & Carsrud, 2000; Rauch & Frese, 2000). Process has been investigated through the lens of opportunity recognition (Hills et al., 1999). The concept of product in entrepreneurship is complicated because of the distinction between idea and opportunity (McMullen & Shepherd, 2006), although opportunities are generated from ideas and not all ideas lead to opportunities. Finally, the concept of press in the context of entrepreneurship is inexorably linked to the social setting in which the entrepreneur develops her or his opportunities (Gemmell, Boland & Kolb, 2012).

What is not addressed in the prior paragraph, however, is that the definition of team in entrepreneurship is not straightforward. Ideas and opportunities are frequently generated by teams, and entrepreneurial ventures are often started by teams, but due to resource constraints, these teams are often composed of members who are outside of the company (Dimov, 2007), and these relationships can be thought of as an extension of the traditional concept of the team. There also is a strand of entrepreneurial research that has focused on the necessity of social networks to the success of new ventures (Gemmell et al., 2012); this too is considered within the broader definition of *teams* in the entrepreneurial setting.

There is a considerable body of research examining the importance of teams in entrepreneurship. For example, Kamm, Shuman, Seeger, and Nurick (1990) proposed a research agenda for investigating all aspects of entrepreneurial teams. Interestingly for the conversation here, the role played by teams in the creative processes of the new venture was not included in their agenda. Much of the research into entrepreneurial teams has examined the *effectiveness* of the teams (Watson, Ponthieu, & Critelli, 1995). Because a great deal of the work of entrepreneurial teams requires creativity, much of this research is implictly investigating teams and creativity. There are articles that consider the role of entrepreneurial teams on the creative aspects of new ventures (Harper, 2008; West, 2007), but these are few and far between. Therefore, questions arise, such as, Do the person(s) characterstics described within the team creativity literature play out in the same manner in an entrepreneurial context? With entrepreneurship, timing is critical (Srivastava & Lee, 2005); for example, ideas that are held for too long can miss the window of opportunity with regard to starting a business. Research on team creativity suggests that creativity is often most critical in the earlier phases of a project (Ford & Sullivan, 2004): Are entrepreneurial ventures the same as a project, and by extension, is team creativity more critical at some junctures than at others?

Given that the types of opportunity vary depending on the degree of novelty (Amabile, 1997; Cliff, Jennings, & Greenwood, 2006), we propose that certain antecedents will facilitate entrepreneurs or entrepreneurial teams in recognizing more creative opportunities rather than imitative opportunities. Because the creativity literature has provided a well-grounded framework and findings of the potential antecedents on creativity (e.g., Amabile, 1983, 1996; Shalley et al., 2004), integrating insights from this literature into the opportunity recognition literature contributes to the further theoretical development of entrepreneurship by enabling us to understand what makes some entrepreneurial teams better able recognize creative opportunities. However, is this a creative process or a product question? And again, what is the definition of team applied?

Thus, there appears to be a significant gap in our understanding of entrepreneurial teams and creativity. Future research should be directed toward examing some of the following questions: What are the attributes of entrepreneurial teams that lead to success in the recognition of opportunities and the development of these opportunites into a successful venture? How does the entrepreneurial team's networks affect the recognition of opportunites?

One of the most important directions for future research in entrepreneurship might be to study the process of the entrepreneurial opportunity (Eckhardt & Shane, 2003) as it separates the field of entrepreneurship from other fields such as strategic management, economics, and other social sciences (Venkataraman, 1997). Surprisingly little is known about the role of teams within this question. For example, opening a franchise of an existing business in a different region is an imitative opportunity because it does not require a high level of novelty. On the other hand, coming up with a "new-to-the-world product or service, a pure invention" is a creative opportunity because

it requires a significant level of novelty. Do teams play a different role depending on the level of novelty of an opportunity? Are team members more necessary for something that is more established or something that is more novel? Given the central importance of frame-breaking opportunities to the theory of opportunity recognition, it is appropriate for investigators to disentangle the role of teams in both creative and imitative opportunities. Thus, the question of why some entrepreneurs, not others, recognize creative opportunities should also be considered at the team level in order to better understand creativity in the entrepreneurial context.

Innovation

Innovation has been defined as the implementation of new products or services that help meet organizational goals with regard to financial performance, customer satisfaction, and efficient delivery. In the creativity literature, innovation is positioned as a separate and distinct step that follows the development of novel and useful ideas and solutions (i.e., creativity) (Amabile, 1988). In contrast, within the innovation literature, creativity is more often positioned as a subprocess or an early stage of innovation (Anderson, De Dreu, & Nijstad, 2004). In other words, creativity and innovation are subsumed into one definition (Hülsheger et al., 2009; West & Farr, 1990). For example, Yuan and Woodman (2010, p. 324) stated that "creative behaviors can be considered as one type of innovative behavior because innovative behaviors include not only generating novel ideas by oneself but also adopting others' ideas. . . . [C]reative behavior concerns new idea generation, whereas innovative behavior includes both generation and implementation." However, unlike creativity, innovation follows a more "efficiency-oriented perspective" (Yuan & Woodman) that focuses on what is novel but also rational. For innovation, the efficiency or rational component is in effect a gauge of appropriateness or practicality that helps minimize foolishness (Litchfield, 2008; West, 2002). With this lens in place, the role of team becomes even more critical. Previously, we discussed the role of team in creative processes and creative outcomes; when the discussion shifts to innovation, is the role of the team the same? How should a team be conceptualized and formed, and what processes will help facilitate the implementation of novel and useful ideas?

Although it is outside of the scope of this chapter, we propose that many of the team attributes (person(s), process, press, and product) that are desirable for creativity may not work in the same way with innovation. For instance, the team composition most desirable for creativity may not be the same as that which is best suited for implementation. Baer and colleagues (2008) found that team demographic diversity was negatively related to creativity on an initial task but not later in the task; could this be because at the later stages, the task takes on an implementation rather than a creativity focus? Future work is needed to teases apart the role of team in creativity and innovation. Organizations may need to have different teams in place depending on what is being considered. Thus, from a research perspective, looking at these highly related constructs in concert with one another is a needed step forward.

Conclusion

The goal of this chapter has been to discuss some of the current team creativity research and, in doing so, to highlight that this is an area that remains in need of theoretical and empirical consideration. Given the calls to action that took place almost a decade ago, it was surprising to us that more work has not been conducted in this arena. In part, we argue this can be attributed to a great deal of construct confusion and lack of clarity regarding what we mean when we talk about team creativity. We hope that in using Rhodes' Four P's framework we have been able to lay out an agenda for future research and that 10 years from now, chapter writers will be struggling to decide which works to include in their reviews.

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Notes

1. Studies were searched using keywords and phrases such as team (or group) creativity, individual (employee) creativity, teams, and innovation.
2. We did not conduct a count for entrepreneurship because the journals included for creativity and innovation might not best represent the entrepreneurship domain.

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Appendix
List of Management and Psychology Journals Used for Publication Counts

Academy of Management Annals
Academy of Management Journal
Academy of Management Review
African Journal of Business Management
Asia Pacific Journal of Management
Creativity and Innovation Management
Creativity Research Journal
European Journal of Work and Organizational Psychology
Group Decision and Negotiation
Group Dynamics: Theory Research and Practice
Group Organization Management
Human Performance
Human Relations
Human Resource Management
International Journal of Human Resource Management
Journal of Applied Psychology
Journal of Business and Psychology
Journal of Business Research
Journal of Creative Behavior
Journal of Experimental Social Psychology
Journal of Management
Journal of Occupational and Organizational Psychology
Journal of Organizational Behavior
Journal of Personality and Social Psychology
Journal of Product Innovation Management
Journal of Psychology
Journal of Vocational Behavior
Leadership
Leadership & Organization Development Journal
Leadership Quarterly
Management and Organization Review
Management Decision
Management Science

Organization Science
Organization Studies
Organizational Behavior and Human Decision Processes
Personality and Individual Differences
Personality and Social Psychology Bulletin
Personnel Psychology
Psychology of Aesthetics Creativity and the Arts
R&D Management
Research in Organizational Behavior
Small Group Research
Social Behavior and Personality
Thinking Skills and Creativity

CHAPTER

12 Social Networks, Creativity, and Entrepreneurship

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Abstract

The "lone genius" view is no longer the sole paradigm used to understand creativity, consistent with the highly collaborative environments in which many entrepreneurs and workers operate. This chapter reviews the body of research that views creativity through a social network lens to fully understand the social aspects of creativity. First is a discussion of why understanding creativity from a social network perspective is important for all organizations and is particularly relevant to the study of entrepreneurship. Then creativity and social network research is categorized into relational and structural perspectives, with the former emphasizing tie strength and other aspects of relationship quality and the latter emphasizing local and global network structure. Consistencies and inconsistencies are highlighted, and some of the contingencies that scholars have identified are reviewed. The chapter concludes by suggesting avenues for future research that can potentially resolve some of the existing contradictions.

Key Words: creativity, innovation, social networks, entrepreneurship, relationships

Introduction

Why are some people more creative than others? Consider eminent creatives in art or science such as Vincent Van Gogh or Albert Einstein. Curiosity abounds about why these individuals were so creative and how they were able to alter fields and prompt new ways of doing things. A similar curiosity surrounds highly successful entrepreneurs who changed markets and fields by virtue of their creativity and drive. Steve Jobs, founder of Apple, is an interesting example. Widely thought to be a visionary and a technological genius, his life and discovery process have been studied with great interest (e.g., Isaacson, 2013). One approach to understand the creativity of these notables and, by extension, their creative albeit less groundbreaking counterparts, is to assume that it is something about the person that drives his or her creativity—in other words, that the relevant explanatory factors are intraindividual. Perhaps they are born with the innate tendency toward creativity or the requisite personality characteristics (McCrae, 1987; Simonton, 1999). An implicit assumption of the personality view is that individuals can be highly creative on their own, and that creativity is the purview of the lone genius.

However, the lone genius view of creativity is inconsistent with how many people work and may also be inconsistent with the entrepreneurial process. Given greater complexity and specialization, prospective entrepreneurs may need to interact with a variety of others to generate, refine, and implement their ideas. Coinciding with this reality, the idea that creativity is a social process is well-accepted wisdom in some circles (Amabile, 1983; Simonton, 1984; Woodman, Sawyer, & Griffin, 1993). The general notion is that interacting with others helps with the generation of ideas. For example, research on the creativity of teams is based on the premise that exchanging ideas with others stimulates novel ideas (Taylor & Greve, 2006; Woodman et al., 1993). In addition,

relationships with certain important others, such as leaders, have been studied. For example, individuals with leaders who support and encourage creativity feel more capable of creative work and are more creative (Tierney & Farmer, 2004, 2011; Tierney, Farmer & Graen, 1999). Similarly, assessments of what is and is not creative have been described as being socially determined and a function of what is accepted by the field rather than a matter of fact (Csikszentmihalyi, 1999). All of this important work suggests that in addition to a personality view of creativity, a social view of creativity is a highly relevant approach to answering the question of why some people are more creative than others. That is, an individual's social context may contribute to his or her creativity or lack thereof.

In particular, there has been steady growth in research applying a social network perspective to the study of creativity. This research extends the general view that creativity is a social process to a more social-centric view in which relationships are primary and the complexity of the social context is captured. Importantly, this approach crosses disciplinary perspectives because at the heart of a social network perspective of creativity is a multilevel view involving social psychology and relationships between people, as well as sociology and patterns of relationships via networks. Interestingly, for those who study social networks first and specific outcomes as a more secondary concern, the role of social context is assumed and personality is minimized. For example, in contrast to the person-centric perspective of psychologists, Brass (1995), in one of the early creativity pieces to focus decisively on social networks, quipped via the title of his chapter, "Creativity: It Is All in Your Social Network." Since that publication and other early assessments of creativity as a general social process, the role of social context has been clarified, but at the same time, areas of inconsistency have emerged.

The purpose of this chapter is to review the body of research emphasizing a social network view of creativity. We disentangle the literature by separating studies according to two dimensions of social capital, relational and structural (Nahapiet & Ghoshal, 1998), and we highlight consistencies and inconsistencies worthy of further study. Other reviews of social networks (e.g., Kilduff & Brass, 2010) have summarized the field from the perspective of networks, with the outcomes of networks being secondary. Importantly, we see creativity as not just another outcome of networks but rather as a unique outcome with distinct inputs, processes, and contextual needs. Social psychological approaches to creativity are premised on this perspective (see Shalley, Zhou, & Oldham, 2004, for a review). Thus, a review of network research specific to creativity is warranted.

Our approach has the potential to inform the creativity, innovation, and social network literatures and, in addition, should be particularly informative for the entrepreneurship literature, given the combined importance of creative thought (Ward, 2004) and social embeddedness (Hoang & Antoncic, 2003) for entrepreneurs. Our review proceeds as follows: first, we provide an overview of relevant aspects of the creativity, social networks, and entrepreneurship literatures to ground our review. Then, we review relevant research and classify results into relational and structural characteristics of the social context. Finally, we offer possibilities for future research.

An Overview of Creativity, Social Context, and Entrepreneurship

The development of an entrepreneurial new idea, like other creative ideas, traverses across two stages. First, one must come up with a viable and novel idea. The identification of an opportunity worth pursuing is the first stage of any entrepreneurial activity (McMullen & Shepherd, 2006). During this phase, entrepreneurs scan the environment for unanswered needs and unexploited resources, trying to identify entrepreneurial opportunities. Entrepreneurial opportunities are those situations in which new products or services can be introduced and sold in a profitable way (Casson, 1982). Although economically viable opportunities can be seen as objective phenomena, their recognition and identification is largely a subjective process, depending on individuals' cognitive abilities and private information (Shane & Venkataraman, 2000). The information necessary to recognize an opportunity is not widely distributed across the population (Hayek, 1945). As a consequence, people who obtain timely and better information about misallocated resources or new discoveries can elaborate better solutions to catch the opportunity and exploit it (Schumpeter, 1934).

Information, however, is a necessary but not sufficient condition for identifying an opportunity: individuals need also to possess the ability to make new connections and create new means-ends relationships. Individuals vary in their ability to combine existing concepts into new ideas (Ward, Smith, & Vaid, 1997), and this leads to a great

differentiation in the ability to identify entrepreneurial opportunities. Research has shown that successful entrepreneurs are more likely to see opportunities where others see risks (McMullen & Shepherd, 2006; Sarasvathy, Simon, & Lave, 1998), and they are more likely to avoid counterfactual thinking (Baron, 2000).

Subsequent to idea generation, one must gain support for the idea and successfully implement it. This stage is typically captured by studies of innovation and networks (e.g., Rodan & Galunic, 2004), and it overlaps with the resource mobilization and new venture creation phases of the entrepreneurship process. After discovering an opportunity, a potential entrepreneur must decide to pursue it. To do so, he or she needs to mobilize the resources necessary to create the new venture (Shane & Venkataraman, 2000). These resources can be economic, in terms of financial capital, or social, in terms of support, championing, and help-giving. Resources can be owned by the entrepreneur herself (Evans & Leighton, 1989), but more often they are obtained by external resource providers.

Whereas economic resources are necessary to start the new venture and pursue the identified opportunity, social resources have an important signaling function for potential investors. In the uncertain and dynamic conditions under which entrepreneurial and creative activity occurs, resource holders are likely to seek information that helps them gauge the underlying potential of a venture or an idea. Prospective entrepreneurs and creators seek legitimacy to reduce this perceived risk by associating with, or gaining explicit certification from, well-regarded individuals and organizations (Hoang & Antoncic, 2003). This function underlines the importance of social networks in this phase. Aldrich and Zimmer (1986) reviewed research findings that showed that being connected to others willing to provide resources enhanced the probability of opportunity exploitation.

Although gaining support for one's idea, selling its virtues to a broader audience, and ultimately gaining both resources and legitimacy credits are critical for implementation, we primarily emphasize social networks and generative creativity. Consistent with the creativity literature, we emphasize the generation and development of the idea, solution, or process devoid of any social or political process associated with gaining acceptance for the idea or implementing it. By *generation*, we do not mean generation in the brainstorming sense, which involves coming up with lots of ideas, some of which are crazy and nonsensical, and which typically does not include selecting an idea (see Perry-Smith & Shalley, 2014, for an overview of creativity relative to related constructs such as brainstorming and innovation). Our focus is on novel and appropriate or useful ideas, consistent with definitions of creativity in the literature (Amabile, 1983; Shalley, 1991). This also has been referred to as "generative creativity" (Fleming, Mingo, & Chen, 2007) or "idea creation" (Ruef, 2002).

Notably, although we focus on creativity and the generation of ideas or processes, we do not see creativity as applicable only to the opportunity identification phase for entrepreneurs. Entrepreneurs must be able to think creatively to solve the host of problems and challenges that arise in mobilizing resources and creating new ventures (Shalley & Perry-Smith, 2008). Although our view of generative creativity is applicable to both the opportunity recognition and the resource mobilization phases, we exclude research specifically on networks and innovation (e.g., Rodan & Galunic, 2004; Tsai, 2001), which typically emphasizes only the implementation of creative ideas (e.g., Baer, 2012; Ibarra, 1993) or the implementation and diffusion of innovative products or ideas at the organizational level (e.g., Guler & Nerkar, 2012; Schilling & Phelps, 2007). We focus primarily on studies of creativity at the individual level rather than studies of teams or organizations. However, where relevant, we incorporate some of these team and organizational studies to the extent that the results inform individual-level results. Thus, our review focuses on the social context and its effect on generative creativity, primarily at the individual level.

Creativity as a social process is premised on the idea that exposure to and interaction with others stimulates the generation of new ideas. When individuals engage in an ideal creative thought process, ideas are subjected to a free and relatively unconstrained recombination, resulting in novel and useful permutations (Campbell, 1960; Simonton, 2003). Cognitive processes such as broad categorizations in the mind and remote association are critical for creativity and can allow for the type of flexibility and breadth expected to yield creative outcomes. While personality can facilitate the effective utilization of these processes, the social context can similarly allow for and encourage them (Amabile, Conti, Coon, Lazenby, & Herron, 1996; Simonton, 2003).

The social context can help expand the available inputs to creativity by providing a greater variety of ideas or information. Domain-relevant knowledge is required for creativity to emerge, not only as the basis for recombination but also for the capacity to understand what is novel and possible in a field and determine what is appropriate and useful (Amabile, 1983). In addition, increasing exposure to a broad range of ideas from contacts can change the organization of information in the mind, resulting in more flexible and complex schemas (Perry-Smith & Shalley, 2014), essentially enhancing cognitive flexibility and creative thinking. Thus, the social context can help provide the setting that allows an individual to think freely and creatively and, ultimately, to generate and select highly creative ideas.

Accordingly, the literature has extended seminal theories of creativity that are premised on the social environment (i.e., Amabile, 1983; Woodman et al., 1993) to produce a more fine-grained social view of the individual largely driven by a social network perspective. Social networks are a powerful approach to studying social context and creativity for a variety of reasons. First, network theory and methods emphasize the relationships themselves. For example, they may focus on the strength of the relationship (Baer, 2010; Sosa, 2011), the number and nature of contacts (Perry-Smith, 2006; Zhou, Shin, Brass, Choi, & Zhang, 2009), the type of content exchanged (De Stobbleleir, Ashford, & Buyens, 2011), or the level of resources received (Aral & Van Alstyne, 2011; Madjar, Oldham, & Pratt, 2002). Second, a network perspective emphasizes the pattern of connections or the structure of ties beyond individual relationships. For example, this might take the form of the level of redundancy, the extent to which one's contacts are connected to each other (e.g., Burt, 2004; Fleming et al., 2007), or an individual's position in the overall web of relationships in the form of centrality (Perry-Smith & Shalley, 2003; Perry-Smith, 2006) or coreness (Cattani & Ferriani, 2008). Thus, a network approach addresses questions such as: What is the distribution of relationships? What is their pattern? And what is the spread of resources across ties? (see Borgatti & Halgin, 2011; Burt, Kilduff, & Tasselli, 2013; Kilduff & Brass, 2010; and Phelps, Heidl, & Wadhwa, 2012, for reviews of social network research).

In a similar fashion, the entrepreneurship literature has moved from viewing entrepreneurs as isolated economic actors to recognizing their embeddedness in a network of social relationships. In particular, the entrepreneurship literature has focused on the effects of three network constructs: the content transferred through ties, network governance, and network structure (Hoang & Antoncic, 2003). The first line of research has shown how networks can provide entrepreneurs with access to both tangible (e.g., Zimmer & Aldrich, 1987) and intangible (e.g., Birley, 1985; Bruderl & Preisendorfer, 1998; Shane & Cable, 2002) resources, with the latter including information, emotional support, and legitimacy. The second line of research has concentrated on the governance mechanisms that are thought to coordinate network exchange. Network governance is characterized by high levels of trust among network members (Lorenzoni & Lipparini, 1999) and relies on informal social mechanisms such as power and influence (Krackhardt, 1990). Finally, research on network structure has concentrated on the dynamics of social structures and their impact on entrepreneurial phenomena. Existing literature has recognized that entrepreneurs' positioning within the network structure has a relevant impact on the success of their entrepreneurial efforts (Hoang & Antoncic, 2003). Research on social networks and entrepreneurship has not generally explored the role of social networks and creativity, with a few exceptions that we highlight throughout the chapter. We suggest that consistent with the general premise that entrepreneurs are embedded in a social context, a review of social context and creativity can inform approaches to the study of entrepreneurship.

To facilitate our review, we summarize research on social context and creativity within two dimensions of social networks: relational and structural. Our *relational* dimension emphasizes studies that focus on the quality of the relationship. This primarily involves the strength of relationships, which can include how frequently two individuals interact with one another, how long individuals have known one another, or the level of closeness between individuals (Granovetter, 1973). However, the creativity literature also emphasizes other aspects of quality that we also include in the relational dimension. Examples are level of emotional support received and extensiveness of feedback received. Our *structural* dimension emphasizes patterns of ties and position within a network. For example, this may include the extent to which an individual's alters are connected to one another, the extent to which an actor's ties are redundant (i.e., connecting him or her to individuals who

are connected to each other), and the extent to which an individual is central in the global network and can reach others with the fewest number of links. Although there is some overlap between the two approaches, this distinction is a useful way to understand key findings, inconsistencies, and unanswered questions within the field.

Our conceptualization of relational and structural dimensions differs slightly from approaches suggested by others, because our focus is on creativity. In particular, much of the literature describes ties in a structural way (e.g., Borgatti & Halgin, 2011; Kilduff & Brass, 2010; Nahapiet & Ghoshal, 1998). For example, some have argued that the theorized benefits of weak ties derive primarily from their posited structure (Borgatti & Halgin, 2011; Burt, 1992). Our approach to the relational dimension, in contrast, emphasizes strength as an important characteristic of ties but not only because of structure. For creativity in particular, although there is a structural component to tie strength, which we explain in the next section, the effects of strength also have been disentangled from structure (e.g., Baer, 2010; Sosa, 2011), such that strength alone may have important implications for creativity. Thus, we believe it is helpful to include studies that focus on tie strength, of weak or strong ties, as relational studies.

The Relational Perspective

A growing collection of research has studied various aspects of relationship quality and their effect on creativity. Tie strength has been defined as a combination of emotional closeness, frequency of interaction, and duration of interaction (Granovetter, 1973). Intuitively, stronger ties can be thought of as higher-quality ties in terms of depth of interaction and reciprocity. Therefore, we include studies representing a higher depth of interaction within our review of strong ties. However, as we describe throughout the review of weak ties, quality should not be assumed to mean that these ties are preferred in terms of their effects on creativity. Conversely, a significant body of work emphasizes the benefits of weak ties for creativity, and other work emphasizes the benefits of strong ties. We start by reviewing theory and results supporting the weak tie perspective of creativity, followed by research supporting the benefits of strong ties, and conclude this section with a review of contingencies. Although we do not attempt to reconcile the inconsistent results, in the final section of the chapter we offer ideas for future researchers to explore that may provide more insight.

Weak Ties

The rationale behind why weak ties are beneficial for creativity emanates from Granovetter's seminal and counterintuitive "strength of weak ties" theory (1973, 1983). According to this theory, weak ties are more likely to provide access to different pockets of knowledge within the organization and to people who are different on some dimension. The original logic is premised on the idea that weak ties are more likely to be bridging ties, whereas strong ties are more likely to form redundant clusters. For example, an individual's friends are likely to know one another through interaction with him or her. And, given that strong ties imply some basis of similarity, the individual's friends are likely to form a tie when interacting with one another. As a result, although a tie may not initially exist between an actor's strongly tied contacts, one is likely to form.

With weak ties, in contrast, the "open space" between nodes, or lack of a tie between alters, is likely to remain. The implication is that strong ties tend to involve dense clusters of redundant ties where information circulates and repeats itself. Weak ties, in contrast, are associated with greater reach. This means that weak ties are theorized to provide exposure to a greater variety of information that is non-redundant, although not necessarily novel or creative. In his seminal article on the topic, Granovetter (1973) demonstrated that weak ties are the best means to get information about job opportunities. Bouty's (2000) study of research and development (R&D) scientists suggested that the transfer of instrumental information is more easily and effectively vehiculated by weak ties rather than strong ties. Similarly, the results of Hansen's (1999) study support the argument that weak ties have an information search advantage and lead to the effective sharing of information that is more easily codified.

Another very important aspect of weak ties is the exposure they provide to individuals who are different. Strong ties involve some level of similarity. This can happen either initially, through similarity attraction processes by which individuals are attracted to others who are similar (Lincoln & Miller, 1979; McPherson, Smith-Lovin, & Cook, 2001), or over time, as similarity in thinking increases via repeat conversations and interactions. As closely tied contacts discuss ideas, issues, and controversies, their views begin to converge over time (Burt, 1991). Empirical research has consistently shown that weak ties are more likely to connect people who

belong to different social circles, whereas strong ties tend to exist between people who share similarities. For example, Ibarra (1992) studied the effects of gender-based homophily in an advertising company and found that similar people tend to be connected by strong ties. Hinds, Carley, Krackhardt, and Wholey (2000) studied software development groups and found that, when selecting future group members, people are biased toward others of the same race. Finally, Kossinets and Watts (2009) studied the members of a university community in order to identify the drivers of tie formation. Their results showed that members who were similar under different personal and affiliation characteristics were far more likely to become acquainted than dissimilar individuals.

A third interesting aspect of weak ties, which has been given less attention, derives from a disadvantage of strong ties—that is, the time and reciprocity involved with strong ties (Mueller & Kamdar, 2011; Perry-Smith & Shalley, 2003). Mueller and Kamdar argued that there are several costs associated with seeking help from others. First, seeking advice from others can accumulate to distract from the focus and attention the task may require, and second, seeking advice comes with the expectation that the help seeker will reciprocate. As individuals spend time giving advice to others, this again distracts from focusing on their own work. Similar arguments have been made about strong ties (e.g., Hansen, 1999; Perry-Smith & Shalley, 2003). The time required to reciprocate advice and information sharing from strong ties is an unintended cost. Moreover, the existence of a strong relationship and the ease and comfort level associated with it increase the likelihood of repeat contacts, limiting the need to go to other sources and thus reducing the exposure to different perspectives and ideas (Hansen, 1999).

The advantages of weak ties prompted scholars to reason that weak ties are beneficial for creativity for a variety of reasons. The more non-redundant components of information to which an individual is exposed, the more likely he or she can recombine existing information and associate seemingly disconnected ideas or information bits to create something new (Granovetter, 1983; Perry-Smith & Shalley, 2003). Additionally, individuals need an extensive repository of information in order to be creative, so that judgments can be made about what is novel and appropriate (Amabile, 1983). Furthermore, exposure to alters with diverse perspectives and viewpoints facilitates cognitive flexibility and autonomous thinking (Perry-Smith, 2006; Perry-Smith & Shalley, 2003; Zhou et al., 2009). Through weak ties, individuals can receive information or perspectives from others without pressure to conform or adopt their views. Strong ties, in comparison, are detrimental for creativity, according to the weak tie perspective of creativity, because interacting with the same alters on a regular basis may generate homogenization and routinization, limiting cognitive capacity and divergent thinking and, consequently, the ability to generate novel ideas (Baer, 2010; Delmestri, Montanari, & Usai., 2005; Kratzer, Leenders, & van Engelen, 2004). Further, the limited social influence pressure from weak ties reduces pressure to conform (Granovetter, 1973; Ibarra, 1992). This allows for more experimentation than with strong ties (Ruef, 2002). Finally, one implication of the reciprocity associated with strong ties is that giving advice may solidify the advice giver's view and perspectives, leaving her less open to different perspectives (Mueller & Kamdar, 2011) and with less time in which to be creative.

Empirical evidence in a variety of settings supports the assertion that weak ties facilitate creativity. Delmestri et al. (2005) studied the collaboration patterns of directors in the Italian feature film industry and found that directors with weaker horizontal ties, or ties with production crew colleagues, generated more creative movies. Perry-Smith (2006) found that research scientists in an applied research institute with a higher number of weak ties were more likely to generate creative ideas. In an important extension, Zhou et al. (2009) focused on the ego networks of the employees of a high-tech company in China and found that the highest levels of creativity were achieved by individuals with an intermediate number of weak ties, rather than a lower or higher number. Additionally, the results of a study of engineers in a multinational firm supported the downside of strong ties, and by implication the beneficial aspects of weak ties, by finding that the extent to which individuals seek advice and give advice undermines creativity (Mueller & Kamdar, 2011). Perry-Smith and Shalley (2014) found that teams composed of members with weaker outside ties exhibited higher team creativity. In an experimental study, Perry-Smith (2014) found that participants receiving informational advice from weak ties were more creative than participants receiving informational advice from strong ties.

Strong Ties

Whereas the weak tie perspective of creativity has received increasing support, an alternative perspective emphasizes the benefits of strong ties. Amabile's seminal componential theory of creativity (1983) posited not only that creativity is a function of domain-relevant knowledge and cognitive skills but that intrinsic motivation is paramount. The general principle is that individuals should be interested in the task because of the internal positive feelings and enjoyment experienced while engaging in the task in order to be able to play around with ideas, overcome obstacles, and persist, all of which is necessary for creativity. Although there is empirical support for the intrinsic motivation principle (e.g., Amabile, 1985; Amabile, Hill, Hennessey, & Tighe, 1994), other work is less supportive (Dewett, 2007; Shalley & Perry-Smith, 2001), making the link between motivation and creativity somehow equivocal. Nevertheless, the logical proposition that individuals should be motivated in order for creativity to emerge has remained compelling. One line of reasoning put forward to explain why strong ties facilitate creativity is that individuals who are linked through a strong tie are more motivated to help one another and to engage with a problem (e.g., Sosa, 2011; Tortoriello & Krackhardt, 2010).

In addition, some have emphasized the importance of trust and positive affect. First, trust is theorized to facilitate sharing of unique ideas and being able to fully process and understand different perspectives (Chua, Morris & Mor, 2012; Tortoriello & Krackhardt, 2010). Strong ties are characterized by a greater level of dyadic trust and social support (Ibarra, 1992; Krackhardt, 1990). Hansen's (1999) results support the notion that knowledge sharing between organizational subunits is favored by strong ties when information is tacit and relatively complex because trust and affect increase the likelihood to share such information. Individuals consider information to be more credible and useful when it is received from strong ties because they have greater trust in the source than when information is received from weaker ties (Levin & Cross, 2004). Second, positive affect and associated theories are important lenses for understanding creativity (e.g., Amabile, Barsade, Mueller & Staw, 2005; George & Zhou, 2002, 2007; Isen, Daubman, & Nowicki, 1987). Positive affective states are associated with broader categorizations in the mind and with making remote associations. Strong ties are associated with closeness and positive affect, so this is an alternative rationale given for why strong ties facilitate creativity (e.g., Madjar et al., 2002; Sosa, 2011).

The expectation that strong ties facilitate creativity is supported by empirical findings in a variety of settings and by related perspectives of relationships and collectives. Sosa (2011) studied dyads in a software development firm and found that individuals were more likely to report generating creative ideas when receiving advice from another as the strength of the tie connecting the two increased. In a study of cultural metacognition, Chua et al. (2012) found that strong network ties between individuals from different countries facilitated self-reported sharing of creative ideas with an alter when the alter possessed cultural metacognitions, or an awareness of distinct cultures and the tendency to adapt and learn. This effect was mediated by affect-based trust. Although less specific to social networks, results from related perspectives also support the importance of strong ties. For example, in a study of firms in the Bulgarian knitwear industry, support for creativity from family or friends was found to facilitate positive mood, which in turn enhanced creativity (Madjar et al., 2002). In a study of four consulting firms, De Stoebbleleir et al. (2011) found that the extent to which individuals sought feedback from others was positively related to creativity. These studies suggest that deeper and more extensive exchanges, characteristic of strong ties, facilitate creativity.

Moreover, research on creativity within teams supports the importance of strong ties among team members. Groups characterized by a high level of interaction in terms of help giving and help seeking usually exhibit a higher level of interpersonal trust and communication, which results in increased information sharing. This, in turn, helps individuals generate novel insights and stimulates precipitating moments of collective creativity (Hargadon & Bechky, 2006). Empirical evidence from a variety of contexts supports these findings. A meta-analysis (Hülsheger, Anderson & Salgado, 2009) supported the proposition that closeness among team members facilitates the creativity of the team by finding that cohesive teams are more creative. Amabile et al. (1996) surveyed individuals in an electronics company and found that those who perceived high levels of work-group support (i.e., effective communication, interpersonal trust, help giving) and cohesion tended to perform more creatively. Gilson and Shalley (2004) conducted a study in a strategic business unit of a large multinational

company and showed that when employees socialized with each other, they were more involved in creative processes. Lastly, Chen's (2009) study of Taiwanese project teams revealed that teams characterized by the presence of good personal relationships (called *guanxi* in Chinese culture), both internally and externally, rated their performance as a team as more creative. It is important to note that what is beneficial for team creativity could become detrimental for individual members. In particular, Mueller and Kamdar's (2011) study of engineers in a multinational firm suggests that excessive levels of help seeking and help giving can be detrimental for individual creativity (Mueller & Kamdar, 2011).

Contingencies

Some research suggests that the effects of tie strength are contingent upon factors such as the characteristics of knowledge, alter characteristics, and personality. In this section, we review results related to these three contingencies. Although these studies do not fully resolve inconsistencies, they provide important insight into when and why strong or weak ties affect creativity. Later, we suggest ideas for future researchers to explore that may provide more insight into the inconsistencies.

Knowledge characteristics. Information and knowledge are fundamental to how relationships are theorized to affect creativity. Recall that one theorized advantage of weak ties is that they provide access to non-redundant information, and thus more information, whereas strong ties facilitate the transfer of complex and proprietary information. Although there are few direct tests of this effect, Levin and Cross (2004) found that weak ties are significantly related to the perception that the knowledge received is useful, but only when trust and competence are controlled. Some have suggested that tie strength and information diversity are not perfectly correlated and that knowledge character (i.e., diverse or redundant) may differ at various levels of strength (e.g., Baer, 2010; Perry-Smith, 2014; Sosa, 2011). As a result, whether tie strength facilitates or constrains creativity may depend on the characteristics of the knowledge received. Thus, one important trend has been to further understand the characteristics of knowledge that enhance exposure to distinct and new information.

The effects of strength appear to depend on the breadth of knowledge received—that is, receiving knowledge that is varied and that comes from distinct knowledge sources. In the case of weak ties, Baer (2010) found that the heterogeneity of alters' functional areas moderates a quadratic relationship between weak ties and creativity. He argued that exposure to diverse viewpoints is a fundamental aspect of the strength of weak ties perspective on creativity, but that weak ties do not guarantee this type of exposure. Results from a global agricultural-processing firm revealed that weak ties that reached people in different functional departments and reflected moderate-sized networks facilitated creativity in comparison to other conditions, including networks of strong ties. This finding suggests that the characteristics of the ties, as well as the extent to which they provide breadth by reaching individuals with different knowledge domains, may be an important moderator of the weak tie effect.

Related work provides insight into the contingent effect of knowledge characteristics for strong ties. For example, Aral & Van Alstyne (2011) found that strong cohesive ties lead to novel information particularly when alters possess knowledge that covers many distinct domains and when the information refresh rate is high. The researchers inferred that stronger ties are more important in creative contexts where knowledge complexity exists. When contexts are dynamic and alters' knowledge is varied, stronger ties can expose the actor to non-redundant information. Importantly, this work does not directly measure strength in terms of frequency, closeness, or long duration of the ties, but rather assumes strength from structure (e.g., redundant cohesive ties are strong).

In addition, creative outcomes are not directly measured. Nevertheless, one possible extension is that when the context includes knowledge that is diverse, broad, and rapidly changing, strong ties may facilitate creativity because they can lead to exposure to diverse perspectives and insights in that situation. Sosa (2011) studied interactions among the entire development department of a European software development company and how they affected creativity. The results showed that strong ties favor idea generation particularly when they transmit a wide set of knowledge domains, suggesting again that knowledge breadth moderates the relationship between tie strength and creativity. On the same note, De Stobbleleir et al. (2011) found that creativity is facilitated by the breadth of the information received—that is, the extent to which feedback seeking is spread across different targets (e.g., supervisors, coworkers, peers

in other departments). The authors did not use a pure network-based approach; they measured respondents' feedback-seeking behavior in general rather than emphasizing the pattern and types of ties that made up their feedback-seeking network. Nevertheless, this work speaks to the importance of knowledge characteristics.

Collectively, this work does not resolve conflicting results in the literature between strong and weak ties. It appears that both weak ties and strong ties that reach distinct functional areas or breadth of knowledge facilitate creativity in certain cases. Tortoriello and Krackhardt's study (2010) of an R&D division comes closest to empirically resolving the role of knowledge breadth for strong and weak ties. They directly tested the hypothesis that strong ties that span intraorganizational boundaries, or ties that cross laboratories, are more strongly associated with generative innovation than weak ties that span intraorganizational boundaries. However, they found that neither weak nor strong ties that reached different laboratories were significant. They inferred that the strength of cross-laboratory ties makes little difference. However, this is contrary to the results of Baer (2010) and an experimental study by Perry-Smith (2014), which revealed that certain content received from weak ties facilitated creativity more than when the same content was received from strong ties. We elaborate on the role of knowledge in the "Future Research Directions" section.

Alters' characteristics. It has been proposed that the characteristics of alters—the actors one is connected to—may influence the relative benefits of strong versus weak ties for creativity. For example, Ruef (2002), in a study involving 766 entrepreneurs and 421 multimember entrepreneurial teams, emphasized entrepreneurs' directed ties (i.e., monodirectional ties that flow from the actor out, but not in the opposite direction). In this study on creativity among entrepreneurs, Ruef found that ties directed toward abstract alters, such as in expert discourse (e.g., business press, technical papers), were more beneficial for creativity than ties directed toward concrete alters, such as experts or opinion leaders, because they satisfied the need for information without being subjected to the social influence processes that might lead to conformity. In addition, Ruef distinguished between ties directed toward family members and friends and ties directed toward business associates. He reasoned that entrepreneurs whose networks are rich in ties with business associates will have access to novel information about different markets and fields, increasing their ability to identify entrepreneurial opportunities. On the contrary, ties with family and friends tend to have a more emotional content, which enhances pressure for conformity. Friends and family who are consulted regarding new business ideas may be insulted when these ideas are changed in a way that clashes with their own way of doing things. Although the study referred to business associates as weak ties and to family and friends as strong ties, it did not measure tie strength directly. We therefore decided to report its results in this section, treating the kind of contact (business vs. family and friends) as a potential contingency that can help to shed light on the relative benefits of different ties for creativity.

Delmestri et al. (2005) argued that functional membership can be an important contingency for the usefulness of weak ties. In their study on creative teams in the Italian movie industry, they distinguished ties to individuals based on their belonging to the production team versus the creative crew function. The results showed that strong horizontal ties (i.e., ties between people from the same function) were negatively related to a movie's artistic merit, whereas strong vertical ties (i.e., ties between people from different functions) were positively related to its economic performance.

Culture or nationality is another alter characteristic that has been studied. Alters' cultural characteristics have been found to be an important contingency for the relative benefits of tie strength. An experiment conducted by Chua et al. (2012) showed that strong ties facilitated creativity when they were directed toward an alter possessing cultural metacognition, which can be defined as a set of mental processes directed at acquiring, comprehending, and calibrating cultural knowledge (Ang, Van Dyne, Koh, Ng, Templer, Tay, & Chandrasekar, 2007). Strong ties help if individuals are willing and ready to pay attention to cultural differences. On the other hand, Perry-Smith and Shalley (2014) calculated the nationality heterogeneity of team members' outside ties and calculated heterogeneity separately for weak and strong ties. They found that when teams were composed of members with nationality diverse outside ties that were weak, the team was more creative. Nationality diverse outside ties that were strong had no effect. Importantly, Chua et al. took a dyadic approach, whereas Perry-Smith and Shalley took a compilation approach and emphasized the configuration of multiple ties.

Actor's individual attributes. Some scholars have proposed that actors' characteristics, and in particular their personality, may be an important contingency for the relationship between tie strength and creativity. Zhou et al. (2009) analyzed the effect of personal values on the relationship between weak ties and employee creativity in the context of a Chinese high-tech company. Their findings revealed that conformity value—the individuals' preference to respect others, social expectations, and norms—moderated the curvilinear relationship between number of weak ties and creativity, such that employees exhibited higher levels of creativity when they maintained a moderate (not too high, not too low) number of weak ties and their level of conformity was low. This means that employees with low levels of conformity value are able to exploit the information advantage provided by weak ties, whereas individuals high in conformity value are not able to do so. In another study, Baer (2010) found that individuals benefited more from maintaining networks of moderate size, weak strength, and high diversity when they were open to new experiences. Finally, Madjar et al. (2002) found that employees with less creative personalities displayed higher levels of creativity when they received support from family and friends. Taken together, these findings suggest that individuals with less creative personalities are more likely to benefit from strong, emotionally intense ties, but individuals with more creative personalities benefit from weaker ties.

Ego network size versus dyadic strength. Whereas some researchers (e.g., Perry-Smith, 2006; Zhou et al., 2009) have concentrated on the number of weak ties, others have focused on average tie strength (e.g., Sosa, 2011; Tortoriello & Krackhardt, 2010). The first line of research emphasizes the importance of the combination of ego network size and strength as the critical drivers of exposure to diverse perspectives and information and finds that having a higher number of weak ties facilitates creativity (e.g., Perry-Smith, 2006). Baer (2010) disentangled the two and clarified the roles of strength and number of ties. In particular, his work suggests that having a moderate number of ties that are weak and that provide exposure to different functional areas facilitates creativity relative to other combinations of strength and information diversity.

The second line of research focuses on average tie strength from a dyadic viewpoint rather than ego network size. The aim is to understand aspects of tie strength such as emotional closeness, frequency, and duration (Granovetter, 1973) at the dyad level. This work suggests that discussions with a strongly tied alter (i.e., dyadic tie) prompt the focal actor to think more creatively (e.g., Sosa, 2011). Although they are different in their emphasis, these two approaches are in fact complementary, because they explore how relational network characteristics can shape creativity at different levels of analysis. Nevertheless, the two approaches suggest an alternate contingency. We return to this point in the final section of the chapter.

The Structural Perspective

A structural perspective of social networks focuses on the patterns of relationships and actors' positions within networks and relates them to actors' outcomes (Borgatti & Halgin, 2011). Rather than focusing on relationship characteristics and content, research in this area emphasizes the pattern of ties from the perspective of both individual actors within the network and the network as a whole. As Kilduff and Brass (2010, p. 325) put it, "by addressing patterns of network structure, social network analysis allows for the simultaneous study of the whole and the parts of social networks." Research focusing on network parts has so far concentrated on groups of two interconnected actors, called dyads (e.g., Borgatti & Cross, 2003; Sosa, 2011); groups of three interconnected actors, or triads (e.g., Burt, 1992; Ryall & Sorenson, 2007); and larger groups of mutually interconnected actors, known as cliques (e.g., Uzzi & Spiro, 2005; Watts, 1999). On the other side, research focusing on the whole network has so far emphasized actors' position within the network by looking at their prominence, conceptualized as centrality (e.g., Brass, 1984, 1985; Ibarra, 1992) or as coreness (e.g., Cattani & Ferriani, 2008; Dahlander & Frederiksen, 2011).

Network structure also has been conceptualized in terms of local versus global structure (Scott, 1991). The "whole" approach represents global structure. In this case, the characteristics of an entire network, bounded by some socially relevant boundary such as the organization or profession, and an individual's position within the network are considered (Marsden, 1990). Local structure, on the other hand, involves the structure of ties surrounding an individual and encompasses the redundancy of ties, or lack thereof (i.e., structural holes). We utilize the global versus structural distinction to classify structural approaches to creativity.

Local Structure

Sociological theory offers two different perspectives on the relative benefits of local structure, or the structure surrounding an actor's ego network. One emphasizes structural holes, and the other emphasizes closure. On one side, Burt (1992) focused on the individual actor and on the information and control consequences of social capital. He created and popularized the concept of "structural holes" to refer to particular positional advantages of individuals that result from how they are embedded in networks. An actor is said to span a structural hole when she is connected to two alters but these two alters are not connected to each other. In this situation, the actor derives an advantage from her position, because she has two alternative exchange partners that can interact only with the actor and not each other. This provides her with distinctive competitive advantages. Burt proposed that sparse, disconnected networks offer opportunities to control the flow of different resources, including power, information, and referrals from grateful alters. Extant research suggests that structural holes are effective in a variety of levels and empirical settings (see Kilduff & Brass, 2010, for a review). For example, network structure can affect outcomes as diverse as compensation (Burt, 1997), performance (Mizruchi & Stearns, 2001), and career advancement (Burt, 1997; Podolny & Baron, 1997). At the team level, Oh, Chung, and Labianca (2004) showed that groups with greater numbers of bridging ties with leaders of other groups displayed higher effectiveness in their performance. At the organizational level, a study conducted by Ryall and Sorenson (2007) showed that spanning structural holes provides firms with advantages over competitors in the same market, especially when the actors broker the relationships between more than two parties. On the same note, Zaheer and Bell (2005) showed that mutual fund companies were able to translate their innovative capabilities into superior performance only when they were brokering a large number of relationships.

One of the primary theorized benefits of structural holes for creativity is access to knowledge and options otherwise unseen. The more an individual has exposure to different knowledge and information, the more likely the ideas can be recombined to create novel approaches and ideas (Burt, 2004; Hargadon & Sutton, 1997; Fleming et al., 2007; Tortoriello & Krackhardt, 2010; Zou & Ingram, 2013). In this case, individuals are prompted by the lack of consistency within the context to integrate disparate perspectives and ideas (Uzzi & Spiro, 2005). Fleming et al. (2007) described examples in a variety of fields such as music and science, where path-breaking novelty can be traced to the recombination of prior inputs. A more micro-level explanation harkens back to discussions of broad categorization in the mind, where cognitive structures that promote breadth (Dane, 2010) and cognitive skills that promote remote association (Isen et al., 1987) are expected to facilitate creativity. Moreover, distinct experiences from disconnected social circles can increase an individual's psychological readiness to accept ideas from unfamiliar sources, thus facilitating information recombination (Zou & Ingram, 2013). Lastly, spanning structural holes is theorized to provide a vision advantage whereby individuals can readily identify new opportunities and be able to communicate them effectively to distinct parties (Burt, 2004).

Contrary to the benefits of structural holes, this perspective suggests that closed cohesive structures, characterized by mutual collaboration, are generally expected to undermine creativity. Structures in which one's friends are also friends with each other can lead to recycling of the same ideas and an increased possibility of groupthink (Fleming et al., 2007). This structure encourages an insular view at the expense of a more cosmopolitan one; individuals are less likely to look beyond the closed clique for advice or new information. In addition, mutual friendship can inappropriately elevate the status of friends who may not contribute to the same degree as others (Uzzi & Spiro, 2005).

Empirical results support the association between structural holes and creativity. Burt (2004) studied interaction patterns within the context of an electronics company and found that managers bridging structural holes are more likely to generate good ideas that are more likely to be implemented and evaluated as valuable. Hargadon and Sutton (1997) showed that both IDEO, a successful product design firm, and its designers are able to generate highly innovative outcomes because they act as technological brokers. They exploit their network position to gain access to a wide array of information that they subsequently recombine to create new products. Fleming et al. (2007) analyzed data on utility patents in the careers of 35,400 inventors and found that bridging structural holes was positively associated with individual creativity.

Although spanning structural holes is usually considered to be beneficial for creativity, some authors have argued that this might not always be

the case. In particular, they argue that the relative benefits of dispersed versus cohesive structures on creativity depends on structural and social characteristics. Tortoriello and Krackhardt (2010) studied the relationships among R&D scientists and found that bridging ties are conducive to innovation only when the ties are Simmelian (i.e., the extent ties are surrounded by third-party ties). The logic suggests that the Simmelian component of structure provides the requisite communality to allow individuals to understand and utilize the distinct information accessed through bridging ties. Similarly, Zou and Ingram (2013) found that bridging structural holes is beneficial for creativity particularly when they span organizational boundaries. Fleming et al. (2007) suggested that the benefits associated with brokerage depend on some contingencies, namely the experience breadth and extended networks of the actors and their collaborators.

Although local non-redundancy appears to facilitate creativity in many cases, an alternative theoretical perspective highlights the advantages of redundant ties and closed network structures. Coleman (1988, 1990) focused on the collectivity, highlighting the solidarity benefits of cohesive networks. According to Coleman, network closure—that is, the degree to which members of the network are interconnected in a dense web of relationships—yields significant benefits for performance. Closed, cohesive networks are characterized by the presence of shared and effective norms that promote trustworthiness within an organization or community, thus strengthening social capital (Rost, 2011). For Coleman, social capital represents a particular kind of resource, whose value lies in "outstanding credit slips," through which individuals are willing to mutually help each other.

The importance of cohesion in building social capital has been theorized and empirically tested in a variety of contexts and settings. Karlan, Mobius, Rosenblat, and Szeidel (2009) argued that cohesion should be beneficial for economic transactions because dense networks generate bonding social capital and trust, allowing for the efficient transaction of valuable assets. Moreover, they found that being part of a cohesive network increased informal money borrowing within the context of two low-income shantytowns in Peru. On a similar note, Gulati (1995) showed that the existence of a cohesive network favors the creation of new alliances between firms, because it provides them with relevant information about the reliability and capabilities of potential partners. Uzzi (1997) found that entrepreneurial firms embedded in a dense web of social relationships sustained better economic performance thanks to their ability to efficiently exchange complex information. Fleming et al. (2007) argue that, although structural holes are positive for idea generation, they are negative for idea implementation and use. In order to be effectively implemented, the idea needs to be fully understood and appreciated by the social system, to be the result of a dispersed and shared collaboration, and to be diffused easily and widely. These conditions are better guaranteed by a cohesive structure, which is thus argued to be more beneficial for implementation.

One important distinction may be the independent actor who draws advantages from the social context, as invoked by the structural holes studies, compared with the collaborator who builds a community of supporters and collaborators to push forward creative ideas. For example, at the team or organizational level, cohesion may be most helpful. Powell, Koput and Smith-Doerr (1996) focused on interorganizational networks in biotechnology and found that organizations operating in rapidly changing fields are likely to receive performance benefits from the transfer of complex knowledge to the extent that they themselves are part of a cohesive alliance network of collaboration. These findings were supported by research from Obstfeld (2005) and Lingo and O'Mahony (2010), who focused on contexts in which employees must be coordinated around complex or innovative projects. In these cases, a cohesive network characterized by intense collaboration and idea sharing may be more functional than a dispersed network. We come back to this point in the last section of the chapter.

Global Structure

Whereas relationships and local structure refer to the ego network of the actor, the concept of centrality refers to the actor's embeddedness in the global structure. Considering actors' position within the whole network allows researchers to consider not only direct ties but also the indirect ties that may be created by means of their direct connections. Centrality describes an actor's position relative to the entire social network to which she or he belongs (Freeman, 1979). Central actors are prominent within the network, with reference to other actors, because they occupy a privileged position. This can happen for a variety of reasons, either because they are in touch with a high number of individuals within the network or because

they act as a fundamental link between otherwise disconnected network members.

Centrality, in fact, is not a unitary construct but has been conceptualized in many different ways (see Freeman, 1979, for an exhaustive review). The proposed alternatives are not derived from any broader theory but are ad hoc formalizations of plausible ideas (Friedkin, 1991). This means that initially network scholars mostly focused on developing measures of network centrality that describe actors' positions in terms of features of their network environments (Friedkin). Among these measures, three are often emphasized in the literature: degree, closeness, and betweenness centrality.

Degree centrality, although a local measure of centrality, was originally calculated as the number of direct ties an actor has to other actors (Freeman, 1979; for practical applications, see Powell et al., 1996; Tsai, 2001). A later modification proposed by Bonacich (1987) provides a more global approach; it takes into consideration not only the number of alters, but also alters' connections, and uses them as a weight for the standard measure of degree centrality (for practical applications, see Ibarra, 1993). Closeness centrality represents the ability of the actor to reach many other actors in the network and is calculated as the average distance between an actor and other members of the network (Sabidussi, 1966; for practical applications, see Gulati, 1999; Perry-Smith, 2006). Finally, betweenness centrality represents the degree to which an actor connects other actors who have no direct connections (Freeman, 1977; for practical applications, see Gilsing, Nooteboom, Vanhaverbeke, Duysters, & van den Oord, 2008; Tsai & Ghoshal, 1998).

Actors occupying a central position enjoy a variety of advantages. An actor's centrality has been found to affect outcomes as diverse as individual power (Brass, 1984; Brass & Burkhardt, 1993), career progression (Brass, 1984, 1985), status (Ibarra, 1992), perceptions of freedom (Krackhardt, 1990), risk taking (Ibarra & Andrews, 1993) and team performance (Balkundi & Harrison, 2006).

Scholars have applied various approaches to centrality, depending on the research question and theory, to argue that occupying a prominent position within a network positively also can affect creativity, because it provides exposure to different perspectives (Perry-Smith & Shalley, 2003). Central individuals are in the middle of the web of relationships that constitute the network and can get in touch, directly or indirectly, with a large proportion of the network's members. More central individuals are able to reach distant social circles, thus gaining access to solutions, problem-solving strategies, and ways of thinking that are unknown to their immediate contacts (Hargadon & Sutton, 1997; Dahlander & Frederiksen, 2011). This, in turns, increases their cognitive flexibility, the likelihood that they will take informed risks (Perry-Smith & Shalley, 2003), and their tendency to be open to new experiences and perspectives (Perry-Smith, 2006). In addition, being central means also being able to influence other network members by exploiting one's prominent position. Thus, individuals who are more prominent within a network can use their position to mobilize support and approval of creative ideas, increasing the likelihood that those ideas will be positively evaluated by the field and that they will receive credit for their ideas (Cattani & Ferriani, 2008; Dahlander & Frederiksen, 2012).

However, an excessive level of coreness and centrality can become constraining; actors who are too central may find it difficult to recharge the freshness of their ideas and escape the pressures to conform to the established norms of the field (Cattani & Ferriani, 2008; Dahlander & Frederiksen, 2011; Perry-Smith & Shalley, 2003). Moreover, individuals who are too prominent may spend too much time dealing with their contacts, thus reducing the time they can devote to creative activities (Perry-Smith & Shalley, 2003). Lastly, these individuals may experience reduced intrinsic motivation to be creative as they rely on existing formulas for success (Cattani & Ferriani, 2008; Faulkner & Anderson, 1987). As a result, there exists a core–periphery trade-off (Cattani & Ferriani, 2008) in which the advantages of centrality and prominence are counterbalanced by the disadvantages.

Empirical studies conducted in a variety of settings support the existence of the core–periphery trade-off. In their study on collaboration patterns in the Hollywood feature film industry, Cattani and Ferriani (2008) found that creators occupying an intermediate position between the core and the periphery of the network were judged to be more creative by the domain. This happens because individuals in intermediate positions possess the legitimacy associated with the core but are also able to reach out to the periphery and access new and non-redundant information. A study conducted in the context of user communities by Dahlander & Frederiksen (2011) showed that individuals occupying an intermediate position within the community were able to generate more innovations.

Finally, research conducted by Uzzi and Spiro (1997) on the creative teams of Broadway productions showed that teams belonging to networks characterized by an intermediate presence of small worlds—clusters of creators who maintained frequent outside ties with other clusters or single creators—displayed higher levels of creativity. These results are consistent with the core–periphery trade-off: teams belonging to networks with an optimal number of small worlds are able to combine the benefits of prominence with the benefits of being connected with the periphery, thus exhibiting higher levels of creativity. However, contrary to the studies discussed earlier, Uzzi and Spiro's research was conducted at the team and network level; therefore, the results and mechanisms described for these levels may not apply for the individual level of analysis.

Future Research Directions

We have reviewed research on creativity as a social process, focusing on studies of social networks and social relationships. The social network perspective of creativity has received increased attention and has generated a body of evidence that provides important insight into which aspects of the social context facilitate or constrain individual creativity. As described throughout the review, there are consistencies as well as inconsistencies in the results. The findings regarding structure are fairly consistent with regard to generative creativity. Structural holes appear to facilitate creativity for individuals. Some research exists to indicate that closure, rather than structural holes, enhances creativity, but the evidence suggests that this is true primarily for groups or collectives. The results regarding the relational perspective are less clear: both weak and strong ties appear to facilitate creativity. Although some contingencies have been identified, they do not fully resolve the discrepancies. We see resolving the inconsistencies between weak and strong ties as one of the most critical paths for future research. In addition, a variety of unanswered questions remain to truly capture the depth and complexity of the social context. In this section, we suggest a few possible avenues for future research to help move the field forward.

The first issue worthy of clarification is the role of information and tie strength. Research exploring the moderating role of information diversity or breadth and tie strength essentially suggests that weak or strong ties facilitate creativity when these ties provide exposure to a breadth of information (e.g., Baer, 2010; Sosa, 2011). Other work leads to a similar conclusion by focusing on structural breadth, or the extent to which ties cross relevant organizational boundaries, and finds that the strength of these ties is not significant by itself, but the structural breadth is (Tortoriello & Krackhardt, 2010).

One interpretation of these results is that it is all about breadth of information, and strength of tie is irrelevant. This is consistent with debates in the network literature in which some have suggested that the proximate advantages of weak ties derive from their structure (Borgatti & Halgin, 2011; Burt, 1992) and that therefore structure should be emphasized rather than strength. However, research that controls for breadth-related constructs (e.g., non-redundancy) suggests that strength of ties matters over and above non-redundancy (e.g., Hansen, 1999; Perry-Smith, 2006; Perry-Smith & Shalley, 2014; Zhou et al., 2009).

One possibility is that tie strength is important for creativity but for reasons other than exposure to non-redundant information. Although information benefits are often suggested, few studies have directly tested the effect of tie strength on non-redundant information, and these studies have not shown that weak ties yield the anticipated diversity of information under all the circumstances (Anderson, 2008). In addition, there is no test of the complete conceptual path in which information novelty or breadth mediates the relationship between tie strength and creativity. This raises the important question of whether the benefits of weak ties are really due to information.

In general, social network research tends not to provide empirical evidence of theorized mechanisms. For example, researchers rarely directly test the mechanism associated with the most notable theories of social networks, such as structural holes or strength of weak ties. However, making implicit assumptions explicit can benefit the field by clarifying results and allowing for more fine-grained predictions. With regard to entrepreneurship in general, future research should try to disentangle the resources obtained through social relationships from network structure and relationship characteristics (Gedajlovic, Honig, Moore, Payne, & Wright, 2013; Hoang & Antoncic, 2003). This would provide us with a more fine-grained understanding of the entrepreneurial process and how network characteristics can enhance or impair entrepreneurial activities.

With regard to creativity in particular, theories on the relative benefits of tie strength and dispersed versus cohesive structures rely on the existence of explanatory mechanisms such as knowledge acquisition and enhanced motivation and social capital (e.g., Perry-Smith, 2006; Sosa, 2011). However, to date these mechanisms remain largely untested. In one exception, Perry-Smith (2014) has tested a moderated mediation model in an experimental setting. Future research should explicitly test the theorized mechanisms in order to increase our understanding of the relationship between network dimensions and creativity. Empirical evidence that answers the question of why weak or strong ties facilitate creativity will likely provide important insight into the discrepant results.

Another promising avenue for future investigation is research that combines the relational and structural perspectives. Tortoriello & Krackhardt (2010) did this explicitly. They found that two aspects of structure are significant: the extent to which ties cross organizational boundaries and the extent to which ties are surrounded by third party ties, also known as Simmelian ties. They found that strong ties that are bridging and are Simmelian are positively related to creativity. Baer (2010) implicitly incorporated structure by measuring different knowledge sources, which in many organizations involves different units or departments. Sosa (2011) also simultaneously measured both dyadic network strength and dyadic network cohesion. This line of research offers a promising avenue toward understanding the discrepant results. For example, the results suggests that for dyads, strong ties that reach different knowledge pockets facilitate creativity (Sosa, 2011; Tortoriello & Krackhardt, 2011), but for individuals and their compilation of ties, a moderate number of weak ties that reach different knowledge sources facilitate creativity (Baer, 2010). At a minimum, it is very important for future researchers to measure strength and structure simultaneously, so that the effects of each can be disentangled. Future researchers could go even further by theorizing and testing additional aspects of structure and strength and their combination.

We also encourage researchers to carefully conceptualize creativity and innovation. In this chapter, we were deliberate about primarily reviewing studies that emphasized generative creativity, which allowed us to highlight theorized mechanisms and results specific to creativity. This is important because, as one considers selling ideas and gaining resources to facilitate innovation, the effects of networks on creative outcomes may differ (e.g., Baer, 2012). One very exciting aspect of a social view of creativity is that it is cross-disciplinary, but one resulting challenge is that scholars view research questions from different lenses. Although this is exciting and useful, it means that accumulating research to draw a decisive conclusion can be difficult. For example, some scholars invoke innovation but really are referring to creativity (Taylor & Greve, 2006; Tortoriello & Krackhardt, 2010). McFadyen & Cannella (2004), while talking about knowledge creation, were actually focusing on the number of citations obtained by academic publications, thus measuring the impact and usefulness of ideas rather than the number of ideas generated. Our primary point is that while each of these examples and others like them provide very important insight to the study of creativity and social networks in different ways, greater clarity as the field moves forward will facilitate the accumulation of research and the interpretation of conflicting results.

This is more than a semantic issue, primarily because creativity and innovation are arguably different phases of the broader process of going from a standard, well-accepted way of doing things to something more path-breaking. Accordingly, each phase has different social needs, as some work has started to reveal (e.g., Fleming et al., 2007). In addition to theorizing and testing effects based on a clear conceptualization of the piece of the broader process, it would be very useful to consider different phases simultaneously (e.g., Delmestri et al., 2005; Fleming et al., 2007). Furthermore, elaborating on the phases of creativity and innovation beyond the typical generation and implementation phases is potentially a very useful avenue for future research. For example, Mainemelis (2010) described the elaboration phase as the phase during which, after having generated the idea, individuals express it and discuss it with others, using the feedback to further elaborate and develop the idea.

Another important avenue for future research is to disentangle the role the alter plays in the entrepreneurial and creative process. Whereas network development can be affected by existing network structure, it is also true that actors can actively influence the evolution of social networks in an attempt to achieve desired outcomes and benefits. Actors' ability to influence network features and structure depends on some personal, social, and contextual characteristics. Future research in entrepreneurship should further pursue this issue, trying

to understand why and how actors are able to influence network structures and use them to increase the odds of new venture success.

Other issues related to actors' role in the creative process are also worth pursuing. Some scholars implicitly assume that network alters are more like collaborators who collectively work through the idea with the actor. For example, individuals and their alters may be seen as a collective in which creativity cannot be assigned to any particular individual (Hargadon & Bechky, 2006). Or, it may be believed that the actor needs to actively involve others in the integration process (e.g., Lingo & O'Mahony, 2010; Obstfeld, 2005) even though the actor is ultimately responsible for the creativity of the output. Other scholars implicitly assume that alters act more as bystanders who via conversation may stimulate something in the focal actor or provide something for the focal actor, such as information or advice, that encourages creativity. For example, scholars who describe recombination processes or creativity-relevant cognition take this view (e.g., Baer, 2010; Perry-Smith 2006). In this case, the actor is the sole driver, and alters provide the context that shapes his or her creativity.

The role of the alter and his or her involvement in the creative process also raises questions about network level, which is another relevant area for future research. In this chapter, we focused on individual creativity, but there are different ways of conceptualizing the individual actor and his networks. One approach is to take a dyadic view and consider how a relationship dyad affects individual creativity. For example, Sosa (2011) focused on creativity at the dyadic level, looking at the characteristics of each actor-to-actor interaction and the characteristics of the knowledge exchanged within each relationship. The results showed that strong ties vehiculating diverse knowledge were beneficial for the knowledge recipient's creativity. Another approach is to consider how an individual's collection of direct ties influences her creativity. For example, Perry-Smith (2006) found that having a large number of weak ties is beneficial for creativity. Zhou et al. (2009) found that an excessive number of weak ties can become detrimental for idea generation and that the highest level of creativity is achieved with an intermediate number of weak ties. This is a question of the role of multiple ties, as in the number of ties versus the characteristics of the dyad. The distinction between the dyadic and the relationship compilation views may be informative and may explain some of the discrepant results.

Another issue related to the level of analysis is theoretical isomorphism across levels. Most research assumes that the same mechanisms are at play at every level of analysis, using causal explanations developed for networks at one level and applying them to every level of analysis (Phelps et al., 2012). For example, it is not clear to what extent it is possible to claim that the presence of a strong tie between two teams increases trust between all the members of these teams. For example, the strong tie may be related to a strong interpersonal relationship between team leaders, which may not be present among team members and thus may not lead to increased knowledge sharing. In the same fashion, a team can be central because of one exceptional individual; this, however, does not mean that the reputational capital of the individual will be transferred to the team as a whole. A configural approach may be particularly informative as scholars apply theories at different levels. Perry-Smith and Shalley (2014) found that configural outside ties, the compilation of individual member ties outside of the team, facilitated team creativity but global outside ties, aggregate ties outside of the team, did not. Finally, as suggested by the studies from Ruef (2002) and Uzzi and Spiro (2005), an internally cohesive team may be embedded in a sparse, diverse network, or vice versa, with the two combinations having significantly different effects on individual and team creativity. Future research should try to understand and empirically test the extent to which results obtained within levels are homologous to other levels. In addition, scholars are strongly encouraged to look at cross-level effects and alternative approaches to aggregating across levels. This is not just a methodological issue, because doing so will help clarify how network parameters affect creativity and has the potential to inform contradictory results.

Finally, future research should further explore the role of time. Adopting a dynamic perspective could help resolve some of the existing tensions in the literature by explicitly considering how time affects the relationship between network dimensions and the generation of novel and useful ideas. For example, perhaps duration of ties and other forms of strength (e.g., closeness) may interact such that the effect of strength differs depending on the time period. The necessity to explicitly model time dimensions into network and creativity research has been highlighted by others (Kilduff & Brass, 2010; Phelps et al., 2012). In particular, Perry-Smith and Shalley (2003) have suggested a dynamic view of

centrality and creativity in which the relationship between centrality and creativity changes over time. However, minimal theoretical or empirical steps have been taken to further explore the role of time.

In particular, three avenues of research look particularly worth pursuing. First, research should look at how network evolution over time can influence creativity at the individual level. As suggested by Phelps et al. (2012), the aging of relationships may be an important contingency variable in explaining when a particular type of ego-network structure will improve an actor's creativity. Second, research should consider how network characteristics can have different effects on creativity at different points in time, both within and across projects. One characteristic might be more or less effective depending on the stage of the creative process or the moment of the professional career the individual is experiencing: What is beneficial at the beginning of a career or in the initial stages of the creative process may become detrimental at the end of the career or in the final stages. Third, research should investigate how the timing of access to different resources can affect the success of new ventures. Although the importance of this issue has been underlined by existing literature (e.g., Hoang & Antoncic, 2003), more research on this topic is warranted to gain a better understanding of when and how networks affect the generation of entrepreneurial ideas as well as the survival and performance of entrepreneurial activities.

The objective of this chapter was to review the existing body of literature on the effects of social networks on creativity that are relevant to the study of entrepreneurs. After having assumed for decades that creativity can be explained mainly by interpersonal differences and personality characteristics, research has come to recognize that creativity and entrepreneurship are essentially social processes. Thus, scholars have started to apply a social network perspective to the study of creativity. In particular, research has focused on the structural and relational characteristics of social networks and on how they can influence idea generation. We reviewed the theoretical and empirical efforts made so far, underlining existing inconsistencies in findings and the contingencies that have been proposed to explain them. Additionally, we sought to point out promising future lines of inquiry. We proposed that future research on social networks, entrepreneurship, and creativity should concentrate on conceptualizing and distinguishing creativity and innovation, in order to gain a better understanding of how the same network characteristics can have different effects in the various phases of the creative process. We also suggested some promising avenues for future inquiry on social networks: Researchers should try to disentangle the role played by actors and to better understand the mechanisms associated with social network theories and the possible interaction between structural and relational characteristics. Moreover, scholars should give careful thought to issues that can have both methodological and theoretical relevance, such as the level of analysis and the role played by time. We believe that these are promising avenues for future research. These avenues can inform the creativity literature by enhancing our understanding of social network mechanisms and how they affect individual creativity and entrepreneurship.

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CHAPTER

13 A Cross-Level Perspective on Creativity at Work: Person-in-Situation Interactions

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Abstract

This chapter provides a review of individual creativity at work from a person-in-situation perspective. Trait activation theory and related frameworks are used to ground this review and show how individual characteristics—most notably creative personality and cognitive style, Big Five personality factors, and goal orientation—interact with situational influences. This analysis organizes the current literature to more clearly identify both consistencies and apparent inconsistencies between studies. To address these inconsistencies, future research should consider not only trait-activating and -inhibiting person × situation interactions but also interactions in which situational influences substitute for trait-based creative drive or channel a trait toward either a positive or a negative influence, as well as trait's potential buffering effect against the influence of situational factors. The study of such influences as cross-level rather than individual-level interactions is promoted on both methodological and conceptual grounds.

Key Words: creativity, personality, trait activation, multilevel theory, cross-level theory, person-in-situation

Introduction

Increasingly, creativity is seen as a cornerstone of organizational viability and sustainable competitive advantage (e.g., Amabile, 1996). The importance of creativity puts a premium on understanding the factors influencing creativity at work. A long-standing perspective in this respect is the notion that by virtue of their personality or abilities some individuals are more inclined to be creative than others. An equally valid perspective accords an important role to situational influences on creativity at work: Factors such as leadership, coworkers, and the structuring of the work may all influence how creative people are (Mumford & Gustafson, 1988; Zhou & Shalley, 2008). In this chapter, we explore the integration of these two perspectives and review the evidence for interactive influences of individual characteristics and situational influences (cf. Amabile, 1996; Shalley, Zhou, & Oldham, 2004; Woodman, Sawyer, & Griffin, 1993). The importance of developing this *person-in-situation perspective* is suggested by growing evidence that the influence of individual differences on organizational behavior is better understood from the perspective of moderating influences of the context in which the individual is embedded (e.g., Barrick, Mount, & Li, 2013; van Knippenberg, 2012)—and the implication of this evidence that the impact of situational influences is also better understood as contingent on individual characteristics. Our jumping-off point for this chapter thus is the claim that researchers and practitioners interested in understanding individual creativity at work are better off focusing on the interplay of situational influences and individual characteristics than trying to capture either aspect in isolation or in additive rather than interaction models.

Creativity at work is understood as the generation of something novel and useful (Amabile, 1988; Oldham & Cummings, 1996), such as a

solution to a workplace problem, a new product, a new way of organizing the work. Creativity at work is typically a process influenced and constrained by practicalities and guided by the requirements, needs, and desires suggested by the work context (cf. Shalley, 1991). The work context in which the individual is embedded may thus exert a powerful influence on individual creativity. At the same time, creativity by its very nature is not a process that can be "enforced" by formal procedures and job descriptions even when the job is creative work (e.g., research and development), leaving ample room for individual differences to express themselves in individual creativity. Indeed, in many work contexts, creativity is at least in part extra-role behavior and not part of formal job descriptions. It is not surprising, then, that both individual characteristics and social influences have been on the agenda in the study of creativity; more surprising is the modest level of attention that has been given to the interaction of these personal and situational influences.

In assessing the state of the science in person-in-situation research in creativity, we work from a broad understanding of individual characteristics that is not limited to stable traits such as intelligence and personality but also includes more state-like differences such as self-efficacy, mood, and goal motivation (i.e., goal orientation, regulatory focus). The rationale for this is pragmatic and two-fold. First, several of the psychological states that have been studied in creativity research have trait counterparts (i.e., self-efficacy, regulatory focus, goal orientation, affect). That is, they reflect concepts that have both stable trait elements and more situationally contingent state elements. Although state and trait elements of the same construct do not necessarily always have identical influences, conceptually they draw from the same source, and studies of the one may be indicative of what to expect from the other. Second, compared with the study of individual differences and the study of social influences on creativity in isolation or in additive models, the study of person × situation interactions on creativity is a much more underdeveloped field. Therefore, by casting a wider net, we increase the potential to learn from and integrate insights in this emerging field.

In this chapter, we first review the evidence pertaining to the relationship between individual characteristics—intelligence and personality—and creativity. Next, we discuss the broader theoretical rationale for a person-in-situation perspective before focusing on the evidence concerning person × situation interactions that have been studied at the individual level of analysis. This also opens up the discussion to individual characteristics that are non-dispositional. Next, we outline why the multilevel study of person × situation interactions, in which situational influences are considered to be (potentially) shared among individuals, is more appropriate than an analysis at the individual level only. We follow up with a discussion of the more limited evidence from studies that treat person × situation interactions from a cross-level perspective, and we close with a conclusion integrating the available evidence and theory to identify ways forward in the cross-level perspective on person-in-situation creativity.

Individual Differences and Creativity

The definitional emphasis in creativity research on originality ("different from the ordinary") probably provides an intuitive linkage to individual differences. Indeed, it seems fair to say that creativity research began with the study of creativity as an individual difference variable and that an argument had to be made for situational influences on creativity to open up the field for the study of both individual traits and social psychological influences (Amabile, 1983). Studies of individual differences in creativity can roughly be divided into those concerning intelligence, those concerning demographic or biographic characteristics, and those concerning personality and related psychological traits. The study of intelligence as a predictor of individual creativity has a long-standing tradition (Barron & Harrington, 1981; Mumford & Gustafson, 1988), and research has established small to modest positive correlations between the two (Batey & Furnham, 2006). To the best of our knowledge, however, this stream of research finds no follow-up in person-in-situation perspectives—at least not in studies of creativity in work contexts. Therefore, it will not be discussed further here. For the same reason, we also do not concern ourselves with studies of demographic or biographic characteristics (the exception being a study by Binnewies, Ohly, and Niessen, 2008). Whereas such characteristics may predict creativity (Mumford & Gustafson, 1988; Simonton, 1997), these studies too do not seem to find a follow-up in the person-in-situation perspective on creativity at work. Of course, this is not to dismiss the study of intelligence (or other abilities) or biographic/demographic characteristics from the person-in-situation perspective; it is merely to note

that for a discussion like ours, which is grounded in a review of the empirical literature, there is hardly any material for discussion.

The third stream of research in individual differences and creativity, that on personality and personality-like traits, can be divided roughly into three lines of research: the study of creativity-specific individual difference constructs (creative personality, cognitive style), the study of general personality structure as captured by the five-factor model (the so-called Big Five), and the study of more specific traits related to goal-directed behavior (e.g., goal orientation, regulatory focus). We briefly review each of these lines and share an assessment of their promise for further theory development.

Creative Personality and Cognitive Style

The notion that some individuals are dispositionally more creative than others has inspired the development of measures to specifically capture dispositional differences in creativity—that is, creative personality. Most strongly associated with this perspective is Gough's (1979) Creative Personality Scale (CPS). The CPS captures a set of traits, including broad interests, self-confidence, tolerance for ambiguity, attraction to complexity, intuition, and aesthetic sensitivity. Speaking to the predictive validity of the CPS, CPS scores are predictive of different assessments of creative performance (Barron & Harrington, 1981; Feist, 1998; Gough, 1979; McCrae, 1987).

This evidence comes with an important caveat, however. A consequence of the approach of developing a measure and implied construct that is defined in terms of the outcome it is designed to predict is, first and foremost, that the measure and construct should be understood and judged in terms of predictive validity. A measure that is defined in terms of its ability to predict individual creativity should predict individual creativity. However, it is less clear what we learn from such evidence conceptually, because measures such as the CPS do not follow from a *theory* of creative personality. Even so, for the study of person × situation interactions, a measure such as the CPS is of interest because it helps us develop theory about how the situation can bring out an individual's creative potential. That is, even when we take the CPS to be a measure of creative disposition without associated theory, we can build situational theory about how the situation can bring out this creative disposition. At the same time, however, the empirically derived nature of the CPS (and earlier measures on which it was built) limits our potential to develop theory about person × situation interactions, because the CPS itself is not a source of such theory.

In a related vein, Kirton (1976, 1994) developed a measure of cognitive style to capture individuals' preferred means of problem solving on a continuum ranging from adaptive to innovative cognitive style. People with a more innovative cognitive style are more likely to redefine problems, seek and integrate diverse information, and generate original ideas—in other words, they are more creative thinkers. As would be expected on the basis of a conceptualization with such overlap with creativity, there is a positive relationship between cognitive style and creativity (e.g., Keller, 1986; Tierney, Farmer, & Graen, 1999). As with the CPS, however, one can raise the question of how much this goes beyond establishing predictive validity for a measure that by and large can be understood as capturing creative thinking. For cognitive style, then, we can reach a conclusion that is similar to that for creative personality: Its study can enrich our understanding of person × situation interactive influences, but has its limitations due to the conceptual overlap between cognitive style and creativity.

Five-Factor Model of Personality

The second main stream of research is that on the five-factor model of personality, or the Big Five (Digman, 1990; Goldberg, 1990; McCrae & Costa, 1997): extraversion, conscientiousness, openness to experience, agreeableness, and emotional stability (also known by the label capturing the other side of its continuum, neuroticism). More extraverted people are more sociable, outgoing, active, and assertive and tend to experience more positive affect. Conscientiousness reflects the disposition to be industrious, achievement-oriented, and sensitive to obligations and responsibilities. Openness to experience captures the tendency toward autonomy, nonconformity, and imagination. More agreeable people are more trusting, caring, and gentle and more focused on harmonious relationships. Emotional stability or neuroticism captures the disposition toward poor emotional judgment and negative affect such as insecurity, anxiety, and hostility. Like the CPS and cognitive style, the Big Five have been derived empirically rather than from a theory of personality. In contrast to these other measures, however, the aim was not to predict a specific outcome but rather to explain as much variance in personality as possible with a limited number of factors.

When it comes to this latter ambition, the Big Five seem to have become the gold standard of personality research, particularly for research in organizational behavior and applied psychology (e.g., Barrick & Mount, 1991; Barrick et al., 2013; Judge, Bono, Ilies, & Gerhardt, 2002). From the perspective of capturing personality in a relatively concise way, then, it is not surprising that the Big Five have also been related to creativity. A meta-analysis by Feist (1998) pointed to openness to experience (positively) and conscientiousness (negatively) in particular as Big Five dimensions predicting creativity, and a more recent narrative review by Batey and Furnham (2006) seemed to leave these conclusions essentially unchallenged.

In comparison to creative personality and cognitive style, the Big Five have the advantage of not, in essence, predicting creativity from creative disposition, where a relationship should exist for measurement of the construct to be valid. However, Big Five research suffers from the same handicap as research on creative personality in that the model is derived empirically rather than from theory. Thus, it is not a theory of personality that drives hypotheses about Big Five–creativity relationships, but rather a combination of reasoning from the description of the factors and findings from prior research as "empirical arguments" (which cannot replace theory; Sutton & Staw, 1995). The study of the Big Five seems to hold greater promise in developing our understanding of person × situation interactions in creativity because the model is not definitionally bound to creativity and can draw from a much broader body of research, but the lack of an underlying theory forms a limitation to the potential of the Big Five in this respect.

Goal Orientation and Regulatory Focus

Even though there is a clear case for developing understanding of the relationship between the Big Five dimensions and creativity based on the notion that the Big Five are a reliable and concise way to capture differences in personality, there is also a clear argument in favor of understanding personality and creativity on the basis of perspectives that have stronger conceptual grounding—even if they have more modest claims in terms of the coverage of personality. Two perspectives in particular stand out as promising in this respect: goal orientation and regulatory focus. Both represent perspectives on trait as well as state differences in goal pursuit and associated self-regulation, and they are therefore conceptualized in terms that should be particularly relevant to creativity at work.

Goal orientation refers to individuals' goal preferences in achievement contexts that affect their self-regulatory strategies in goal pursuit (Dweck, 1986; Dweck & Legget, 1988). The primary distinction is between learning goal orientation, a focus on developing mastery and improving one's knowledge and skills, and performance goal orientation, a focus on realizing a favorable impression of one's abilities and performance. Performance goal orientation can be subdivided into performance-approach (or performance-prove) goal orientation, a focus on proving one's qualities by performing well, and performance-avoidance (or performance-avoid) goal orientation, a concern with avoiding to appear to be a poor performer by staying clear of challenging performance situations (VandeWalle, 1997). (A similar subdivision between approach and avoidance can be made for learning goal orientation [Elliot & Church, 1997], but because this is not reflected in creativity research, we ignore it here.) Goal orientations are relatively stable individual differences that also have state expressions that may be influenced by the situation (Button, Mathieu, & Zajac, 1996).

Creativity is contingent on intrinsic motivation, domain-relevant knowledge, and creativity-relevant skills (Amabile, 1988, 1996): People are more likely to be creative when they are driven by an intrinsic enjoyment of the work and a belief in its value, have ample job-relevant expertise to draw on, and master the skills required for creative performance. Moreover, because the pursuit of creative outcomes inherently carries the risk of failure (compared with safer, more routinized, tried-and-tested approaches to work challenges), creativity benefits from a willingness to accept this risk of failure. These considerations suggest that learning goal orientation should be positively related to creativity, because learning goal orientation is associated with a focus on task mastery and acquisition of knowledge. Moreover, because the emphasis in learning goal orientation is on developing mastery rather than on performance, people with a strong learning goal orientation are accepting of failure and tend to treat failure as a source of learning. Not surprisingly, then, learning goal orientation has been found to be positively related to creativity (Gong, Huang, & Farh, 2009; Hirst, van Knippenberg, & Zhou, 2009; cf. Janssen & Van Yperen, 2004).

Performance-avoidance goal orientation, in contrast, can be expected to invite people to shy away from creative challenges and thus to be negatively related to creativity. The key concern for individuals

with a performance-avoidance goal orientation is to avoid appearing to be incompetent. This stimulates people with a performance-avoidance goal orientation to seek out achievement situations that are safe in that they are routinized and well-known and more or less guarantee successful performance. By the same token, performance-avoidance goal orientation invites people to shy away from more challenging situations where the risk of failure is higher—exactly the kind of challenges that would provide the greater opportunity for creativity. Confirming this reasoning, Hirst, van Knippenberg, Chen, and Sacramento (2011) found that performance-avoidance goal orientation is negatively related to creativity.

Performance-approach goal orientation lies somewhere between these other two goal orientations. Performance-approach goal orientation, with its focus on demonstrating competence, is associated with a greater willingness to take risks than performance-avoidance goal orientation, because the emphasis is more on the opportunity to demonstrate competence than on the risk of appearing to be incompetent. At the same time, performance-approach goal orientation does not intrinsically motivate task performance and the development of domain and creativity-relevant knowledge and skills as does learning goal orientation, and failure is more of a concern with performance-approach goal orientation because of its focus on performance rather than self-development. Therefore, there seems to be less reason to expect a direct relationship between performance-approach goal orientation and creativity—and, as we discuss later, all the more reason to expect this relationship to be contingent on the situation. For whatever it is worth to draw conclusions from null findings, performance-approach orientation has not been found to have a direct relationship with creativity (Hirst et al., 2009, 2011; cf. Janssen & Van Yperen, 2004).

Regulatory focus theory represents a related but distinct framework to capture individual and situational differences in goal pursuit. Regulatory focus theory distinguishes a promotion focus—the motivation to pursue certain goals due to the desire to approach gains—and a prevention focus—the motivation to pursue certain goals due to the desire to avoid losses (Higgins, 1987, 1996). Promotion and prevention foci are associated with specific cognitive and affective processes and therefore can lead to different outcomes even in the pursuit of the same goal (i.e., one can approach a certain goal from a focus on the consequences of success in achieving the goal or from a focus on the consequences of failure to achieve the goal). Of most relevance to creativity, promotion focus is associated with a greater willingness to take risks in goal pursuit than is prevention focus (i.e., because the potential gains from goal success compared with the potential losses from goal failure loom larger for promotion-focused than for prevention-focused individuals). Promotion focus is also associated with a more open-minded, holistic, and associative thinking style than prevention focus. Accordingly, promotion focus should be associated with greater creativity, and research shows that indeed it is (Crowe & Higgins, 1997; Friedman, Fishbach, Förster, & Werth, 2003; Friedman & Förster, 2000, 2001, 2002, 2005; Rook & van Knippenberg, 2011). Whereas these findings rely on situationally induced regulatory focus, trait and state regulatory focus can be expected to have the same influence (Stam, van Knippenberg, & Wisse, 2010a). Therefore, even though these studies offer no direct evidence regarding personality, they are indicative of such personality influences.

In sum, there is clear evidence that individual differences may predict creativity. At the same time, effect sizes tend to be small to modest, and findings do not always replicate over studies. One important issue here may be the situational contingency of trait influences (Barrick et al., 2013; Diener, Larsen, & Emmons, 1984; Mischel, 1977; Tett & Burnett, 2003). Not only is there a general case to make for these situational contingencies, but there also is a case for situational influences on individual creativity (Mumford & Gustafson, 1988; Shalley et al., 2004). For instance, Shalley et al. identified job complexity, relationships with or support from supervisors and coworkers, rewards, feedback, deadlines and goals, and spatial configuration of work settings as situational influences on creativity. This begs the question of whether a person-in-situation perspective may add value in developing our understanding of creativity. Before we turn to that question, we first outline the person-in-situation perspective more generally.

A Person-in-Situation Perspective

Core to the person-in-situation perspective is the notion that the fact that personal characteristics dispose people to act in certain ways should not be equated with actually acting in that way. The case here is probably most clear for personality, but it also applies to other individual characteristics.

Personality reflects the disposition to think, feel, and act in certain ways. Importantly, disposition does not mean that the individual always thinks, feels, and acts in that particular way; it means that the individual is more likely to do so than others who are less disposed in this way. A similar logic applies to more state-like individual characteristics (e.g., state goal orientation, state regulatory focus): The fact that one experiences a certain psychological state cannot be equated with *acting* on that state. Once we recognize that personality (or psychological state) cannot be equated with the actions that are associated with it, we have the key ingredients for a person-in-situation perspective: Situational influences may influence the extent to which disposition or psychological state translates into action.

One influential perspective on the translation of disposition into action is found in the notion of the psychological strength of the situation, or *situation strength* (Mischel, 1973, 1977). Situation strength refers to the extent to which the situation conveys clear cues as to what is appropriate and inappropriate behavior in that situation. Psychologically stronger situations send out stronger, clearer signals to that effect and thus are more influential in stimulating behavior that is consistent with the "requirements" of the situation. Put differently, strong situations convey clear behavioral expectations and thus invite people to behave in a relatively uniform way. Psychologically weak situations, on the other hand, are characterized by the absence of behavioral cues to guide and regulate behavior. They are less clear on what is expected or appropriate, and leave far more degrees of freedom for individuals to behave as they see fit. Take, for example, the difference between being part of a marching band and being part of a crowd on a dance floor. The latter invites one to creatively follow one's own choreography, whereas the former holds the clear expectation that one will rigorously stick to a well-rehearsed choreography. The important implication is that weaker situations provide more freedom for the expression of individual differences than stronger situations do. The situation strength perspective thus suggests that to the extent that we are able to capture the strength of the situation, we are able to predict the degree to which personality will influence behavior. Put differently, the situation strength perspective suggests we can predict person × situation interactions on the basis of an assessment of how situational characteristics are related to situation strength.

The more recent trait activation theory (Tett & Burnett, 2003; Tett & Guterman, 2000) recognizes the importance of situation strength but proposes that it captures only half of the issue at stake in person × situation interactions. In addition to situation strength, trait activation theory includes the notion of *situation trait relevance*. A situation has trait relevance to the extent that "it is thematically connected by the provision of cues, responses to which (or lack of responses to which) indicate a person's standing on the trait" (Tett & Burnett, 2003; p. 502). Trait relevant cues lead to *trait activation*, the expression of the trait in question. For example, a trait leading individuals to deviate from the ordinary in their dancing is more likely to be activated on a dance floor with accompanying music than in the absence of music or at a location not designated for dancing: Dance music and the dance floor location are trait-relevant cues. Trait activation theory thus holds that both situation strength and situation trait relevance are important for trait expression. Strong situations may inhibit trait expression, but weak situations only invite the expression of a trait to the extent that the situation contains trait-relevant cues to activate the trait.

Depending on how broadly one wishes to understand the concept of situation trait relevance, a third kind of situational moderator may be added: the extent to which the situation provides the resources to achieve the outcomes inspired by one's trait (cf. Chen & Kanfer, 2006). That is, even when situation trait-relevant cues invite the expression of the trait, resources, or the lack of resources, in the situation may render individuals more or less likely to act on their trait. Arguably, one could also see such resources as trait-relevant cues; We merely propose this third category here to help appreciate how the situation may influence trait expression and not to make a principled case for a three-category model of situational influences.

We summarize the person-in-situation perspective in Figure 13.1, which captures the previous discussion in a creativity-specific way. The figure shows that individual characteristics can express themselves in individual creativity. Whether they do so, however, is contingent on three situational influences: situation strength, situation trait relevance, and situational resources. However, despite the current emphasis on trait activation and situation strength as activating or inhibiting trait expression, other expressions of these situational influences are also possible and potentially plausible. Arguably, for instance, individual

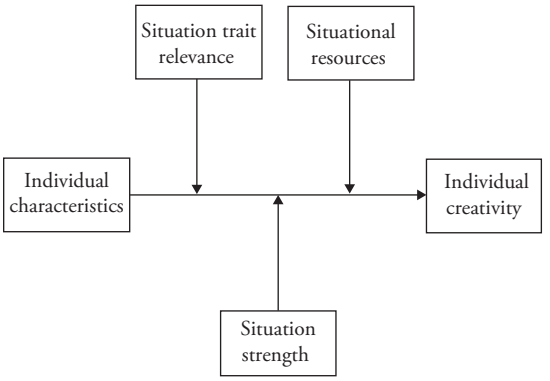

Fig. 13.1 A Person-in-Situation Perspective on Individual Creativity at Work.

characteristics may also render one more resilient against creativity-discouraging situational influences. In such cases, situations discouraging creativity would have a greater impact on people who are less dispositionally inclined to pursue creativity, and the trait would have a buffering effect against the situational influence. Alternatively, intrinsic encouragement of creativity derived from personal characteristics may substitute for situational encouragement. In such cases, situations encouraging creativity would have a greater influence on people who are less dispositionally inclined to pursue creativity. Finally, it is also possible that situational influences could have what may be called a channeling effect—determining whether the trait has a positive or negative influence, and these influences too are implied by the model portrayed in Figure 13.1. The model thus comes with the important note that situational influences need not always be more evident in the creativity of those more dispositionally inclined to be creative.

In the following discussion, we review the evidence that speaks to such person × situation interactions in creativity. To appreciate the relatively low number of studies capturing such interactions and the lack of strong programmatic lines of research in person × situation interactions in creativity, it helps to first take a step back for a bit more of a historical perspective. Person × situation interactions are the domain of psychological theory. In psychology, traditionally one of the dominant responses, if not the dominant response, has been to study phenomena from an individual difference perspective. Only later have researchers followed up with social-psychological influences, and only after these were established with attention to person × situation interactions. (A good case in point is leadership research; see van Knippenberg, 2012). Creativity research in this respect is no exception.

As described in the previous section, research on individual creativity started out from the perspective that some individuals dispositionally are more creative than others—that creativity is uniquely tied to the person. An important development was research making the case for situational influences on creativity. Amabile's work (1983, 1988) stands out here as pushing the field toward consideration of the social psychology of creativity. Conceptual analyses of social influences on creativity, such as those by Amabile (1983) and Woodman et al. (1993), recognized the case for both dispositional and situational influences, and Woodman et al. even referred to their analysis as an interactionist perspective. In the end, however, these earlier analyses do not advance specific theory about person × situation interactions. (For example, Woodman et al.'s propositions focus on how group influences may affect the individual, not on how individual characteristics and group influences interact to affect creativity). Moreover, such framing does not provide precise predictions about the nature of the interactions (e.g., when variables will interact additively or in a disordinal manner) that enable cumulative theory development. Thus, these analyses seem to have primarily inspired the investigation of social influences on creativity. This, of course, is a key contribution in setting the stage for an integrative person × situation approach. Once the evidence for situational influences was unambiguously there, the field was better positioned for the study of person × situation interactions, which by necessity relies on insights into both the dispositional influences on creativity and the situational influences on creativity. Inevitably, then, research on person × situation interactions in creativity is more rare and more recent than research on trait influences or social influences.

Person × Situation Interactions in Individual-Level Research

We review the empirical literature on person-in-situation interactions by first considering studies at the individual level of analysis. We then make the case for the importance of the multilevel study of person × situation interactions and review the more limited evidence from such studies. The first part of our review can be roughly divided into studies of creative personality and cognitive style, studies of Big Five factors, and studies of other individual characteristics including psychological states.

Studies of creative personality and cognitive style. Oldham and Cummings (1996) studied how the relationship between creative personality and creativity was contingent on three situational influences in a four-way interaction: job complexity, supportive supervision, and noncontrolling supervision (i.e., the absence of controlling supervision). The relationship between creative personality was most positive when all of these situational influences were high.

Zhou and Oldham (2001) experimentally tested how different developmental assessment strategies (self-administered, other-administered, and no assessment) interacted with creative personality and found the strongest influence of creative personality when participants anticipated a self-administered assessment (i.e., an opportunity to assess their own work in order to develop their creativity-relevant skills).

Madjar, Oldham, and Pratt (2002) studied the relationship between creative personality and creativity from the perspective of situational support. They did not replicate the moderating role of work support (i.e., combining coworker and supervisor support) implied by Oldham and Cummings' (1996) four-way interaction, but they did find that non-work support (i.e., from family and friends) was more important to the creativity of individuals who were *lower* in creative personality. This is a finding that does not seem to fit well into the currently dominant perspective of the situation as bringing out or inhibiting the expression of traits. However, it can be understood as a case in which the situation provides the external motivation to pursue creativity and thus substitutes for the internal drive provided by creative personality. It is not so much creative personality that is invited to express itself by support for creativity as it is the lack of creative personality that is inhibited from evidencing itself by the support for creativity.

Zhou (2003) studied the three-way interaction of creative personality, supervisor close monitoring, and the presence of creative coworkers and found that the absence of close monitoring was particularly important for the creativity of individuals low in creative personality in the presence of creative coworkers. One reading of these findings is that creative personality renders individual creativity less contingent on external stimulation (creative coworkers) and inhibition (close monitoring). Understood in this way, these findings are consistent with the findings of Madjar et al. (2002) but would be somewhat in opposition to those of Oldham and Cummings (1996) and Zhou and Oldham (2001).

Looking at the related concept of cognitive style, Tierney et al. (1999) found that leader–member exchange (LMX), the quality of the (social exchange) relationship between leader and follower, interacted with cognitive style. Adapters were more creative with higher LMX, but innovators' creativity was unaffected by LMX. LMX can thus be understood as a situational stimulator of creativity that may compensate for a lower dispositional tendency to be creative.

Also studying cognitive style, Baer, Oldham, and Cummings (2003) found a three-way interaction of cognitive style, job complexity, and rewards. People with an innovative cognitive style working on complex jobs—arguably the combination most conducive to creativity—were unaffected by extrinsic rewards. In contrast, for the combination that could be expected to be least conducive of creativity—adaptive cognitive style and simple jobs—rewards stimulated creativity. For the combinations that could be seen as being in-between in terms of creative potential—innovative style in simple jobs and adaptive style in complex jobs—rewards were detrimental to creativity. If one accepts that creativity thrives on intrinsic motivation (Amabile, 1988), then extrinsic rewards arguably are a last resort. From a person-in-situation perspective, then, these findings can be understood as saying that people with a creative cognitive style are better not confronted with rewards—at best they do not make a difference; at worst, they are harmful—whereas the creativity of individuals with a less creative cognitive style can benefit from rewards, provided there are no other situational stimulants to engender creativity. Interestingly and importantly, the Baer et al. study thus illustrates more sharply than other studies that the influence of the one situational factor is contingent on the other situational factor.

On balance, then, person-in-situation research on creative personality and cognitive style shows that there is a clear case for person × situation interactions for these individual difference variables. That said, the issue of how the situation affects the relationship between these individual differences and creativity is not so straightforward. There is some evidence that could be interpreted from a trait activation perspective: Situational influences conducive of creativity, or the absence of influences inhibiting creativity, bring out the creative potential of an individual's personality (Oldham &

Cummings, 1996; Zhou & Oldham, 2001). At the same time, there are also findings that are better understood as indicating that creative personality or cognitive style renders individuals more resilient to negative influence and more insensitive to positive influences, whereas individuals with less creativity-stimulating traits are influenced more by the situation (Madjar et al., 2002; Tierney et al., 1999; Zhou, 2003). In a related vein Baer et al.'s (2003) findings suggest that individuals who are more disposed to be creative stand less to gain and more to lose by situational influences on creativity. For these two personality traits, then, there lies a clear challenge for research to determine when the trait-activating influence of the situation predominates and when the greater sensitivity of situational influences for those less disposed to be creative is more important.

Studies of Big Five factors. George and Zhou (2001) studied the moderating role of situational influences on the relationships of openness to experience and conscientiousness with creativity. For openness, they observed two related three-way interactions. Openness was more strongly positively related to creativity when feedback valence was high and there was little clarity about how to find a solution to a problem (labeled high unclarity about ends)—a stimulating context demanding creativity that can be understood to be trait activating—than when both were low. Perhaps surprisingly, however, the openness to creativity relationship was actually negative when feedback valence was low and unclarity was high, as well as when valence was high and unclarity low. A similar pattern of results was found for a three-way interaction with unclarity about means rather than ends.

George and Zhou also observed three-way interactions for conscientiousness. Conscientiousness is a factor that has been established as negatively related to creativity (Feist, 1998), presumably because of associated conformist tendencies, and trait activation here could thus be understood as bringing out a negative relationship with creativity. Supervisor close monitoring and inaccurate communication from coworkers jointly moderated the influence of conscientiousness, such that its relationship with creativity was negative with high close monitoring and high inaccuracy—the conditions least conducive to creativity. However, the relationship was also negative with low close monitoring and low inaccuracy, and it was actually positive with high close monitoring and low inaccuracy. Conscientiousness also interacted with close monitoring and unhelpful coworkers (cf. support) and with close monitoring and negative work environment (cf. support) in similar ways. Close monitoring combined with low scores for unhelpful coworkers, or negative work environment, actually resulted in a positive relationship between conscientiousness and creativity, whereas this relationship was negative under other circumstances. A trait-activation perspective thus seems to cover only part of the processes operating here.

Baer and Oldham (2006) focused on the curvilinear relationship of time pressure with creativity—creativity was highest at moderate levels of time pressure. They established that this was especially the case when support for creativity from supervisor and coworkers was high and individuals were high in openness to experience—a three-way interaction. This interaction can be understood in terms of trait activation: Situational stimulation (moderate time pressure, social support) invites the creative benefits of openness to experience.

Baer (2010) also focused on openness to experience, but in a quadratic four-way interaction of openness × network size × weak ties × network diversity in functional background. He found that the creative benefits of openness to experience were most apparent for functionally diverse networks of moderate size (i.e., an inverted U-shaped relationship) with weak ties. Both the influence of weak ties and that of functional diversity can be understood from the informational benefits of such networks. Social networks represent a pool of information individuals can tap into and thus are probably best understood as a situational resource more than a trait-activating one. Network size is related to the processing demands of networks as sources of information, and the curvilinear effect in that sense represents the balance between the size of the resource and the manageability of the resource—again, an interpretation in terms of situational resources.

The evidence to date therefore seems to support the notion that the creative benefits of openness to experience can be reaped both through trait activation and by providing situational resources. In that sense, the evidence seems quite consistent across the studies reviewed. Findings for conscientiousness in the George and Zhou (2001) study are also partly consistent with this trait activation perspective. However, negative influences of openness to experience and positive influences of conscientiousness in that study would seem to demand a more complex explanation—although with such three-way

interactions obtained in a single study it is also a fair question whether these unanticipated relationships would be replicated in repeated testing.

Studies of other individual characteristics. A number of studies have focused on other characteristics than creative dispositions and the Big Five, and some of these will be reviewed when we focus on cross-level studies. Here, we structure our discussion by moving from roughly the most stable, trait-like variables to the most transient state variables.

Age obviously changes with time—but only with time, and only in one direction. In that sense, it is a characteristic that is untouched by situational influences. Binnewies et al. (2008) focused on the interactions of age with job control and with support for innovation. They found that age was positively related to creativity for high job control, and negatively related for low job control. They also found that age was negatively related to creativity for low support for innovation. Age is qualitatively different from personality and individual differences, and it is therefore difficult to characterize these interactions in terms of activation or inhibition.

Shalley, Gilson, and Blum (2009) focused on growth need strength—the extent to which individuals desire self-development (Hackman & Oldham, 1980)—as a predictor of self-reported creativity. They found that growth need strength was most strongly positively related to creativity with high support from the work context and low job complexity or with low support from the work context and high job complexity. Because both support for creativity and job complexity can be seen as trait activating, these findings can be understood to say that *some* situational stimulation (i.e., high support but low complexity, or low support but high complexity) brings out the difference between individuals higher and lower in growth need strength, whereas low situational stimulation (i.e., low support with low complexity) or high stimulation (i.e., high support with high complexity) leads high and low growth need individuals to respond alike to the situation: that is, situational strength becomes so strong that it tends to discourage (low, low) or encourage (high, high) creativity across the board.

Two studies have focused on the overlapping notion of conformity and conservation value as relatively stable individual characteristics. Shin and Zhou (2003) showed that transformational leadership was more predictive of creativity for individuals scoring higher on conservation value (i.e., valuing conformity, propriety, and harmony in relationships). Zhou, Shin, Brass, Choi, and Zhang (2009) showed that weak social ties were more conducive to creativity in moderate number (cf. Baer, 2010), especially for individuals with lower conformity value. Conformity value should be detrimental to creativity, because creativity more or less by definition thrives on deviation from the norm. Zhou et al.'s findings can thus be seen as reflecting an influence of a trait on people's ability to benefit from the situational resources offered by their social network—albeit, in nice counterpoint to Baer's study, a negative rather than a positive influence. Shin and Zhou's findings, in comparison, are probably better understood as reflecting a case in which people less disposed toward creativity need more situational encouragement to be creative (cf. Madjar et al., 2002; Zhou, 2003), with transformational leadership understood to be such a situational encouragement (but see van Knippenberg & Sitkin, 2013, for some important misgivings about the conceptualization and measurement of transformational leadership).

Zhang and Bartol (2010) focused on empowerment role identity, the extent to which one sees oneself as someone who wants to be empowered. They found that follower empowerment role identity moderated the relationship between empowering leadership and psychological empowerment, and empowerment ultimately led to individual creativity. Put differently, empowering leadership as a situational creativity-stimulating influence is effective only to the extent to which individuals are disposed to be receptive to this influence: Empowering leadership is trait activating.

In the same study of cognitive style discussed earlier, Tierney et al. (1999) also studied the interaction of supervisor and subordinate intrinsic motivation. Intrinsic motivation is more state-like—at least in the sense that it is more tied to a specific context—and is seen as a core influence on creativity (Amabile, 1996). Tierney et al. found that supervisor motivation brought out the creative influence of subordinate motivation—an influence consistent with the notion of trait activation.

Somewhat in the same domain as intrinsic motivation, Zhou and George (2001) focused on job satisfaction, although they emphasized the negative end of the continuum—dissatisfaction. They showed that the combination of continuance commitment (commitment to the organization based on lack of good alternatives) and useful coworker feedback brought out a positive influence of dissatisfaction on creativity. In combination

with low continuance commitment—that is, when dissatisfaction may motivate withdrawal from the organization—useful coworker feedback brought out the most negative influence of dissatisfaction.

In two studies George and Zhou (2002, 2007) focused on the creative influence of mood states. Positive moods are typically seen as more conducive to creativity (e.g., Amabile, Barsade, Mueller, & Staw, 2005; Visser, van Knippenberg, Van Kleef, & Wisse, 2013), and George and Zhou focused on the conditions under which negative mood stimulates creativity (cf. George, 2011). George and Zhou (2002) studied the moderating role of the combination of recognition/reward for creativity and clarity of feelings (a psychological state that is not necessarily situational) in this respect. Under these conditions, negative mood had a positive influence on creativity, and positive mood a negative influence. When conditions provided less clear stimulation to channel negative mood to positive creative ends, negative mood was less beneficial and positive mood more beneficial for creativity. George and Zhou (2007) then studied the interactive influence of positive and negative mood contingent on the supervisor supportive context. The latter was understood to be reflected in separate moderating influences of developmental feedback, interactional justice, and trust in leader. Consistent with their earlier findings, they demonstrated that a context supportive of creativity helped bring out a positive influence of negative mood when positive mood was high. When supportive context was low, however, negative mood was most detrimental to creativity in combination with positive mood. These studies add further complexity to the notion of trait activation by showing that situational influences may channel individual characteristics to have both positive and negative impacts on creativity.

Building and testing trait activation theory, Q. Zhou, Hirst, and Shipton (2012) proposed and tested conditions in which promotion focus would be most positively related to employee creativity. Although supervisor intellectual stimulation enhanced the positive association between promotion focus and creativity, they found this relationship to be most positive when participation was also high. The authors concluded that for promotion-focused individuals, greater decision-making latitude and coaching to grapple with and resolve challenging problems was a particularly potent combination. In this context, the individual benefitted both from opportunities to influence the context and from positive encouragement and mental stimulation increasing their perceived sense of the likelihood of achieving their desired goals.

Stam, van Knippenberg, and Wisse (2010b) experimentally induced state regulatory focus (promotion or prevention focus) in a study of visionary leadership. They showed that a more personal (vs. less personal) appeal in a visionary speech about innovative management interacted with regulatory focus, such that the more personal appeal invited higher creative performance (as would be expected if participants internalized the visionary appeal) for people with a promotion focus (i.e., for whom the appeal was a better fit with their regulatory state—a trait-activating influence) but not for people with a prevention focus.

Also speaking to state regulatory focus, Rook and van Knippenberg (2011) experimentally induced promotion or prevention focus and crossed this with a manipulation of high-quality versus low-quality creative exemplars (i.e., an example object that could be used to guide one's own creative performance on a creative building task), arguing that promotion focus would render people more sensitive to positive exemplars whereas prevention focus would render people more sensitive to negative exemplars. They found that a high-quality exemplar invited more imitation of the exemplar, and thus reduced creativity, from promotion-focused compared with prevention-focused participants, and the reverse pattern obtained for low-quality exemplars. It is not clear whether this is better interpreted in terms of trait-activating influences or in terms of differential use of situational resources.

This set of studies moving beyond personality to include less stable and even transient individual characteristics illustrates how the person-in-situation perspective can be extended to include such characteristics. At the same time, for more state-like influences, it is not always clear to what extent these have dispositional or situational origins—or, as in the case of experimental studies, it is clear that they are situationally induced. In that sense, some of these findings may reflect interactive influences of situational characteristics more than "true" person-in-situation interactions. To some extent, this need not concern us too much when there are clear trait parallels to such states—such as for affect and regulatory focus. Even so, we should not simply assume that what holds for state also

holds for trait, and future research should replicate such findings with trait measures before that conclusion can stand (cf. Stam et al., 2010a).

Why a Cross-Level Perspective?

The review in the previous section concerns studies at the individual level of analysis. However, a key message of this chapter is that for person-in-situation research, the more appropriate approach is a multilevel or, more specifically, a cross-level perspective. Multilevel theory and research considers influences at different levels of analysis simultaneously (Klein & Kozlowski, 2000). For person-in-situation research in creativity, the most obvious levels to consider are the individual level at which individual characteristics and individual creativity should operate and the level at which situational influences operate—typically, the level of the immediate work group or team (i.e., including one's direct supervisor). Methodological as well as conceptual considerations suggest that such a cross-level approach is more appropriate than the more frequently encountered individual-level perspective.

A first consideration is probability values in hypothesis testing. Statistical analysis at the individual level assumes independence of observations; that is, one observation is not informative about another. This assumption is likely to be violated when individuals are exposed to the same situational influence. A straightforward example here is team size. In a study of team size as a predictor of individual creativity, members of the same team shared the same team size—if the team size score for one member of the team is known, we also know the team size score for the other members of the team. Using team size at the individual level of analysis (i.e., as if team size scores were independent within the team) violates the assumption of independence of observations. This is not a trivial matter, because such a violation leads to underestimation of probability values—that is, we may conclude that a relationship is different from zero when a more appropriate multilevel analysis would lead to the conclusion that it is not.

Team size is an obvious example because, by definition, there cannot be within-team variation in team size. Team size is by definition a team-level construct, and its influence on individual creativity should therefore be modeled in multilevel analysis as a cross-level influence. For many of the influences of interest in person-in-situation research on individual creativity, matters are not so clear cut as the team size example, but we should at least be open to the possibility that they concern influences that are shared at the team, work group, or supervisor level. For instance, support from supervisor or coworkers need not be the same or similar for all members of a team (i.e., statistical dependence is not a dichotomy). Supervisors may adapt their behavior from individual to individual (Graen & Scandura, 1987), and coworkers may support the one colleague more than another (Triana, Porter, DeGrassi, & Bergman, 2013). Whether such an influence should be treated at the individual level or at the team level of analysis is a matter of both empirical (i.e., to determine dependency of observations) and conceptual consideration (Chen, Mathieu, & Bliese, 2004; Klein & Kozlowski, 2000).

Adopting or at least explicitly considering a cross-level perspective in person-in-situation research thus is a matter of methodological appropriateness and conceptual accuracy. It is also a potential source of important new insights. For instance, recent research in the dyadic perspective on leadership (i.e., LMX; Graen & Scandura, 1987) showed that the impact of the quality of the dyadic relationship between leader and follower is contingent on the quality of the other relationships the leader has with followers within the same context (Henderson, Liden, Glibkowski, & Chaudry, 2009). For example, a good relationship with one's team leader that also singles one out as having a better relationship with the leader than the rest of the team will be experienced differently, and will have a different influence, than a good relationship in a context in which other team members have very similar quality relationships with the team leader. Even if conceptual and methodological considerations suggest that a particular situational influence (e.g., relationship quality) should be considered at the individual level of analysis, the experience of others within that same situation may still form a team-level backdrop against which this influence is analyzed (e.g., in terms of team-level variability or team central tendency in this experience as a team-level predictor).

Research on team and organizational climates similarly suggests that perceptions of situational influences can be meaningfully considered at the individual level of analysis (i.e., psychological climate) as well as at the team or organizational level of analysis as socially shared perceptions (i.e., team or organizational climate; Schneider & Reichers, 1983; van Knippenberg, Homan, & van Ginkel, 2013). Again, determining the appropriate level of analysis for such influences is more than a matter of methodological appropriateness and conceptual

accuracy: Perceptions of the work context typically are more influential when they are socially shared within the team or work group (Tindale & Kameda, 2000; van Knippenberg, van Ginkel, & Homan, 2013), and the extent to which situational influences are shared may thus play a role in their effects on the relationship between individual characteristics and creativity. Thus, issues of level of analysis may also yield important insights that go beyond capturing relationships that could also be studied at the individual level of analysis in a more appropriate way.

We therefore argue that cross-level research comes at a premium in the person-in-situation perspective. To clarify one last issue, we take this to refer to research in which the individual-level relationship between individual characteristics and individual creativity is studied as contingent on higher-level (typically team-level) situational influences—cross-level interaction effects. Studies of analogous processes at different levels of analysis or studies aggregating individual-level influences to the team level (e.g., Mathisen, Martinsen, & Einarsen, 2008; Taggar, 2002) are not part of this consideration set. In the following discussion, we review the limited evidence for such cross-level person × situation interactions.

Person × Situation Cross-Level Interactions

Cross-level investigations of person-in-situation interactions are a recent affair in creativity research. The first such study was conducted by Hirst et al. (2009), who adopted a trait activation perspective to study the moderating role of team learning behavior (Edmondson, 1999) in the relationship between goal orientation and individual creativity. In a sense bringing together earlier observations that dispositions favorable to creativity can render individuals both more sensitive and less sensitive to situational encouragement, Hirst et al. found a cubic relationship between learning goal orientation and creativity for high levels of team learning behavior. When team learning behavior was low, learning goal orientation had a linear positive relationship with creativity. When team learning behavior was high, however, at low to moderate levels higher learning goal orientation was associated with greater creativity—a trait activation effect—but at higher levels of learning goal orientation this relationship leveled off—a lowered sensitivity to external influences of people with a strong intrinsic drive. For performance-approach orientation, the relationship with creativity was positive only with high team learning behavior—a trait activation effect in which the external cue that learning is valued provided by team learning behavior channeled the achievement motivation of performance-approach oriented individuals toward creativity.

Hirst et al. (2011) also studied the creative influence of goal orientations but in the context of team bureaucracy, captured by centralization of decision making and formalization of rules and procedures, as a situational influence inhibiting the expression of traits. Their results showed that learning goal orientation was more strongly positively related to creativity with lower centralization, whereas performance-avoidance goal orientation was less negatively related to creativity with lower centralization (i.e., the latter is inconsistent with this trait-inhibition logic). Performance-approach goal orientation was more positively related to creativity with lower formalization, but lower formalization made the negative influence of performance-avoidance goal orientation worse.

Shin, Kim, Lee, and Bian (2012) focused on creative self-efficacy—the self-evaluation that one has the capabilities for creative performance (Tierney & Farmer, 2002). The relationship of individual creative self-efficacy with creativity was moderated by team cognitive diversity—a situational resource from which creativity may benefit—such that creative self-efficacy was more conducive to individual creativity with greater team diversity.

Richter, Hirst, van Knippenberg, and Baer (2012) also focused on the cross-level interaction of creative self-efficacy and team diversity (functional background diversity) but added the moderating influences of the team's shared "knowledge of who knows what," and the team's shared knowledge of its distributed expertise (e.g., van Ginkel & van Knippenberg, 2009; cf. transactive memory; Wegner, 1987). Shared knowledge of who knows what can also be considered a situational resource, because it is highly instrumental in accessing the creativity-relevant information that is in principle available to the team. Accordingly, functional diversity may be expected to have greater stimulating potential when it is complemented by high levels of knowledge of the distribution of this functional expertise. The greater use of this resource by individuals with higher creative self-efficacy should thus express itself in a three-way interaction, which is exactly what Richter et al. observed.

A first thing to note in assessing these four cross-level studies is that each study established empirically as well as conceptually that the cross-level perspective (i.e., as opposed to the more

traditional individual-level perspective) was more appropriate and more accurate in terms of levels of analysis. This underscores our conclusion that a cross-level perspective on person-in-situation interactions in creativity research is the more appropriate perspective. A second thing to note is that, as described previously, the current set of studies has not moved beyond capturing relationships that could also be studied at the individual level of analysis in a more appropriate way. Whereas this is valuable in and of itself for the reasons outlined earlier, further development of the cross-level perspective could fruitfully extend this perspective by exploring the influence of variables uniquely associated with such multilevel issues as the social sharedness of situational influences. For instance, is it more creativity stimulating when one is singled out within the team for support for creativity or when all team members receive high levels of support?

A Short Summary of the Evidence

To provide a summary of our review, Table 13.1 captures the main conclusions in terms of the observed situational factors interacting with individual characteristics in influencing creativity. Following our discussion of the person-in-situation perspective captured in Figure 13.1, these interactions are categorized as activating, inhibiting, buffering, substituting, and channeling. Activating and inhibiting interactions are understood as interactions in which the relationship of a trait with creativity is brought out (activating) or suppressed (inhibiting) by the situational influence (as per trait activation theory). Buffering effects are understood as interactions in which the trait stands in the way of a creativity-reducing situational influence (i.e., a high level of the trait is associated with no effect of the situational factor, whereas a low level of the trait is associated with a negative influence on creativity). Substituting effects are understood as interactions

Table 13.1 A Summary of Research Findings

Individual Characteristic	Interacting Factors	Interaction Type
Creative personality	Job complexity × supportive supervision × controlling supervision (Oldham & Cummings, 1996)	Activating, inhibiting
	Self-assessment (Zhou & Oldham, 2001)	Activating
	Non-work support (Madjar et al., 2002)	Substituting
	Close monitoring × creative coworkers (Zhou, 2003)	Buffering, substituting
Cognitive style	Leader–member exchange (Tierney et al., 1999)	Substituting
	Job complexity × rewards (Baer et al., 2003)	Buffering, substituting
Openness to experience	Feedback valence × clarity about ends Feedback valence × clarity about means (George & Zhou, 2001)	Activating, inhibiting, channeling
	Support × time pressure (Baer & Oldham, 2006)	Activating
	Network size × weak ties × network diversity (Baer, 2010)	Activating
Conscientiousness	Close monitoring × accurate communication Close monitoring × helpful coworkers (George & Zhou, 2001)	Activating, inhibiting, channeling

(*continued*)

Table 13.1 Continued

Individual Characteristic	Interacting Factors	Interaction Type
Age	Job control Support for innovation (Binnewies et al., 2008)	Channeling
Growth need strength	Support × job complexity (Shalley et al., 2009)	Activating, substituting
Conservation value	Transformational leadership (Shin & Zhou, 2003)	Substituting (for creativity-discouraging trait)
Conformity value	Weak ties (Zhou et al., 2009)	Buffering (positive influence)
Empowerment role identity	Empowering leadership (Zhang & Bartol, 2010)	Activating
Intrinsic motivation	Intrinsic motivation supervisor (Tierney et al., 1999)	Activating
Job satisfaction	Continuance commitment × feedback (Zhou & George, 2001)	Channeling
Mood	Recognition/reward × clarity of feelings (George & Zhou, 2002)	Channeling
	Opposite valence mood × supportive context (George & Zhou, 2007)	Channeling
Regulatory focus	Intellectual stimulation × participation (Q. Zhou et al., 2012)	Activating
	Visionary appeal (Stam et al., 2010b)	Activating
	Creative exemplar (Rook & van Knippenberg, 2011)	Activating
Learning orientation	Team learning behavior (Hirst et al., 2009)	Activating, substituting
	Centralization (Hirst et al., 2011)	Inhibiting
Performance-approach orientation	Team learning behavior (Hirst et al., 2009)	Activating
	Formalization (Hirst et al., 2011)	Inhibiting
Performance-avoidance orientation	Centralization Formalization (Hirst et al., 2011)	Activating (negative) Inhibiting (negative)
Creative self-efficacy	Cognitive diversity (Shin et al., 2012)	Activating
	Functional diversity × knowledge of who knows what (Richter et al., 2012)	Activating

in which high levels of the trait lead to creativity irrespective of the situational influence, but the situational influence is required to bring people with low levels of the trait to creativity. Channeling is understood as a moderating influence that leads a trait to be either positively or negatively related to creativity contingent on the moderator. Notice that to capture these influences, we have sometimes relabeled the factors introduced by the authors to conform to more common usage of the terms, such as our reference to job satisfaction rather than dissatisfaction and to controlling supervision rather than noncontrolling supervision.

This summary comes with the important caveat that our classification of interactions as activating, inhibiting, buffering, substituting, or channeling in a number of cases may be somewhat of a forced fit. It is not always obvious how to best classify an influence, and the value of a summary based on our shorthand classification inevitably comes at the price of judgment calls that are open to debate.

Conclusions

The number of studies of person × situation interactions on individual creativity is modest. Even so, these studies do yield quite consistent evidence that situational influences matter for the creative influence of individual characteristics—or, put differently, that individual differences impact the creative influence of situational forces. The current state of the science puts a premium on developing the person-in-situation perspective in individual creativity. At the same time, our review illustrates that across studies a number of questions emerge that currently do not have satisfying answers substantiated by empirical evidence. For instance, we lack an adequate understanding of when situational influences substitute for creative drive derived from individual characteristics—presumably a strong situation—and when situational influences bring out the creative drive derived from individual characteristics (a trait activation effect), because these diverging influences are sometimes observed for what appears to be the same situational influence (e.g., social support). In many ways, then, this review concludes with an invitation to researchers to further develop the person-in-situation perspective on creativity much more than with satisfied conclusions about all the things we do know.

Our review also clearly speaks to the importance of developing the person-in-situation perspective as a cross-level perspective and not as an individual-level perspective. Findings from multilevel research consistently point to the greater methodological appropriateness and conceptual accuracy of such a perspective. Moreover, multilevel theory and research in social sharedness points to substantive insights to be learned from further development of this perspective to include influences that are uniquely tied to such multilevel considerations. Given the importance of creativity to today's organizations, these are challenges well worth taking on.

This is not to say that a cross-level perspective is not associated with what could be seen as research drawbacks. Conceptually, a cross-level perspective would never be inferior to an individual-level perspective, but it need not always offer substantive enough added benefits to be worth the "costs" in terms of the methodological requirements associated with a cross-level perspective. Specifically, where for an individual-level study each observation requires data from one individual, for a multilevel study one also needs a sufficient number of observations at the higher level of analysis (e.g., the team or leader) as well as a reasonably high response rate within the higher-level unit for reliable aggregation when individual-level data are the basis for the assessment of variables at the higher level of analysis (e.g., for team processes or leadership; cf. Hirst et al., 2009, 2011). Such considerations place restrictions on researchers that we should accept if we are to advance our understanding of person-in-situation influences on creativity. Even so, there may be research questions for which situational influences are less likely to be shared by individuals (e.g., concerning interactions between traits and non-work variables). For such research questions, an individual-level perspective may be as appropriate to model person × situation interactions, and the added "costs" to bring in higher-level controls on sharedness may not be worth the investment. The current message thus clearly is not that all person-in-situation research in creativity should be cross-level research; rather, it is that for the influences typically studied, a cross-level perspective is more appropriate.

Given the linkages between creativity, innovation, and entrepreneurship—and clearly in view of the brief of this volume—it is also worthwhile to consider whether a person-in-situation perspective may add value for research in innovation and entrepreneurship. It is not our intention to add a review of research in innovation and entrepreneurship as an afterthought, but we do note that there are clear reasons to believe that a person-in-situation

perspective would have added value here too. Research in entrepreneurship has a tradition in the study of personality—either as a success factor for entrepreneurs or to distinguish entrepreneurs from non-entrepreneurs. Zhao and Seibert (2006) conducted a meta-analysis to compare entrepreneurs and managers in terms of Big Five personality traits. They found that entrepreneurs scored higher on conscientiousness, openness to experience, and emotional stability and lower on agreeableness, whereas no difference was found for extraversion. However, for all traits except agreeableness, substantial heterogeneity of effect sizes was observed, suggesting the need to investigate moderators. In a related vein, Rauch and Frese (2007) conducted a meta-analysis of personality traits as predictors of the decision to start a business and entrepreneurial success. Their analysis identified need for achievement, generalized self-efficacy, innovativeness, stress tolerance, need for autonomy, and proactive personality as predictors in these respects. Here, too, substantial heterogeneity of effect sizes was observed, pointing to the need to investigate moderating influences. The state of the science in research in entrepreneurship and personality thus seems to clearly point to the potential of a person-in-situation perspective.

Innovation is typically studied at a higher level of analysis, such as the level of the team or organization (e.g., Leifer, McDermott, O'Connor, Peters, Rice, & Veryzer, 2000), and individual-level studies raising questions about personality thus seem less central to the field. Even so, there have been individual-level studies of innovation (e.g., Jansen & Van Yperen, 2004; Nederveen Pieterse, van Knippenberg, Schippers, & Stam, 2010), and the concept of cognitive style that has been related to creativity (as we have reviewed) can as easily be understood to capture the disposition to innovate (e.g., West & Anderson, 1996). The evidence for person × situation interactions for cognitive style in creativity, as well as the linkage with person-in-situation evidence for creativity provided by a study like the one by Janssen and van Yperen focused on goal orientations and innovation, suggest that a person-in-situation perspective would readily apply to individual innovative behavior. Indeed, given that a common understanding of innovation is that it includes creativity (as well as its implementation), this would not seem an overly bold conclusion.

We thus conclude that a focus on person × situation interactions, as compared with a focus on trait or situational influences alone or in additive models, is the more promising way forward, not only for research in creativity but also for research in innovation and entrepreneurship. For all three areas of investigation, it would also stand to reason that major situational influences of interest would be shared by different individuals within the same environment, and accordingly this would put a premium on the cross-level study of such influences.

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CHAPTER

14 Ethics and Creativity

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Abstract

This chapter discusses the relationship between ethics and creativity. After introducing some common working definitions of ethics, the discussion focuses on how creativity, both as a product and as a process, relates to several ethical issues in a variety of ethical domains, with a particular focus on four types of behavior: uncreative and unethical, uncreative and ethical, creative but unethical, and creative and ethical. It is suggested that inadequate and ambiguous attention to creativity's usefulness or appropriateness, along with an overemphasis on its novelty, leads to an oversimplified understanding of the relationship between creativity and ethics. The chapter concludes by proposing three possible means for promoting ethical creativity and reducing unethical creativity and briefly discusses some potential research directions on the relationship between these two complex concepts.

Key Words: creativity, ethics, novelty, usefulness, appropriateness, divergent thinking, convergent thinking process, entrepreneurship

Introduction

For six consecutive years, *Fortune* magazine chose Enron as America's Most Innovative Company. Then, in 2001, this company of "the smartest guys" underwent the then-largest bankruptcy in American history (McLean & Elkind, 2003). Although Enron's culture has often been blamed as the most important cause of its demise, a close examination of its business practices suggests that they were both creative and corrupt (Salter, 2008). In sharp contrast, Google has also been consistently ranked as one of the most innovative firms in the United States. In 2004, Google's founders established Google.org to make Google "an institution that makes the world a better place" (Rana, 2008, p. 87). Like the hybrid entities created by social entrepreneurs, Google.org was creatively constructed as a for-profit, instead of a traditional nonprofit, philanthropic organization, to increase its flexibility and permissible range of activities and allow it to more directly pursue its social goals. In its pursuit of innovation and profits, the company insists that "You can make money without doing evil" (Rana, 2008).

These two examples show how creativity can be used for markedly different purposes. Although creativity has long been regarded as a necessary and critically valuable part of organizational life (Amabile, 1996), recent research (Cropley, Kaufman, & Cropley, 2008) suggests that creativity is not always inherently benevolent. Instead, people can use creativity to pursue unethical goals and objectives and to create undesirable social effects. Cropley and colleagues (D. Cropley, 2011; Cropley et al., 2008), for example, have suggested that individuals often employ malevolent creativity to create harmful rather than benign outcomes.

Because creativity is tremendously beneficial and critical to organizations and society, its negative side has not received much research attention in the organizational literature (Baucus, Norton, Baucus, & Human, 2008). Also, because creativity can potentially go astray—highly successful

and impressive criminal behavior often includes a strong creative component—the ethical dimension of creativity clearly deserves more research attention (Cropley, 1999; Hilton, 2010; Kampylis & Valtanen, 2010; Sternberg, 2010). Therefore, we have focused this chapter on the relationship between creativity and ethics.

We start with a brief discussion of several working definitions of ethics. Because the fundamental problem of defining ethical decision making remains unsolved (Tenbrunsel & Smith-Crowe, 2008), we do not dwell on these definitional issues; instead, we focus our analyses on ethics' relationship with creativity. Therefore, our second major section discusses creativity as an outcome, creativity as a process, and how creativity relates to ethics in a variety of ethical contexts. After challenging some common beliefs about the inherent tension between creativity and ethics, we suggest that the relationship between the two is best understood by looking at the full range of possibilities of each of these variables. Specifically, we analyze four creativity–ethics relationships (Runco, 2009): high creativity with high ethics, high creativity with low ethics, low creativity with high ethics, and low creativity with low ethics. Then we discuss how people might encourage ethical creativity and curb unethical creativity. We conclude by briefly outlining several potent research directions that could illuminate the key dynamics behind ethics and creativity.

What Is Ethics?

Ethics and morality are philosophical concepts that, because they have both descriptive and normative aspects, have generated a variety of definitions in the organizational literature (Tenbrunsel & Smith-Crowe, 2008). The debates that swirl around the different definitions of ethics or the differences between ethics and morality are not critical to our current analyses. Thus, we acknowledge their existence without dwelling on them here. Instead, we use some common definitions and define ethics as moral standards and principles concerning questions of right and wrong (Beauchamp & Bowie, 2004), duty and obligation, and moral responsibility (Shaw, 2013). Although this working definition focuses on the normative ethics of creativity (e.g., good vs. bad, right vs. wrong, ethical vs. unethical), creativity also can play a role in complicated right–right ethical dilemmas, in which two or more "right" choices conflict (Kidder, 1995). In the end, we have focused this chapter on a straightforward analysis of the relationship between ethics and creativity based on this fairly simple definition.

Ethical issues often address diverging interests, particularly the conflict between self-interest and others' interests. For example, Turiel (1983, p. 3) regarded morality as the set of "prescriptive judgments of justice, rights, and welfare pertaining to how people ought to relate to each other." Kohlberg and Mayer's (1972, p. 129) analysis of moral development also defined morality as "the reciprocity between the individual and others in his social environment." For the most part, ethics and morality restrain individuals' selfish desires as they contribute to a society's normative standards (Shaw, 2013). Our discussion of the relationship between ethics and creativity focuses on how creativity can be useful, appropriate, correct, and valuable and how it can advance relatively narrow self-interests rather than the common good (Hennessey, Amabile, & Mueller, 2011; A. Cropley, 2011; Sternberg, 2010). The next section reviews common definitions of creativity and analyzes how it relates to different ethical issues.

What Is Creativity?

Historically, creativity has been defined both as an outcome and as a process (Shalley & Zhou, 2008). As an outcome, creativity concerns the generation of a novel and useful product, idea, or solution (e.g. Amabile, 1983, 1996; Barron, 1955; George, 2007). Creating such an outcome, however, also requires some special cognitive processes, which typically involve variation and retention (Campbell, 1960; Simonton, 1999). Whereas variation primarily contributes to the novelty of creativity, retention primarily contributes to its usefulness (Amabile, Barsade, Mueller, & Staw., 2005). Although outcome and process are two tightly interrelated and inherently integrative components of creativity (Amabile, 1983; Sternberg, 1988), we analyze them separately in the following sections because outcome and process can have different ethical implications.

Creativity as an Outcome

As an outcome, creativity requires an end product. Although scholars have discussed other indicators of creativity (e.g., Cropley & Cropley, 2005, 2008), this product (which could also be an idea) must typically be considered both novel and useful (Amabile, 1983, 1996; George, 2007). Novelty is the primary aesthetic criterion of creativity: it is often regarded as its most distinguishing and

important feature (Amabile, 1996; Amabile et al., 2005). Even though people have idiosyncratic preferences, they tend to have relatively clear, objective standards about novelty: to be novel, a creative product must be original, unusual, surprising, and unexpectedly different from preceding work (Bruner, 1962; Cropley & Cropley, 2008; Sternberg & Lubart, 1995).

Novelty alone is not sufficient for creativity: Some incredibly novel and unconventional ideas are completely unrealistic, wishful, or unattainable. These kinds of novel ideas are at best considered pseudo-creative (Cattell & Butcher, 1968) or quasi-creative (Heinelt, 1974); at worst, they come across as eccentric and bizarre. Thus, unless a novel product is also useful, it is not creative (George, 2007; Sternberg & Lubart, 1995).

Compared with novelty, usefulness is often seen as creativity's secondary characteristic (Amabile, 1996; Cropley & Cropley, 2005). It is a necessary but not sufficient condition for creativity. Being useful requires that a product serve some function. Although the function of a creative product typically concerns its practical relevance and effectiveness, a broad interpretation of creativity's functionality often includes ethical judgments, especially when a creative product serves a social function. Amabile and Tighe (1993), for example, suggested that to be useful, creativity must be appropriate, correct, and valuable. In their evaluation of traditional creativity assessment tools, Zeng, Proctor, and Salvendy (2011) also concluded that appropriateness, in addition to novelty, should be a predominant criterion of any creative product. These appropriateness and correctness criteria are not value free: When a creative product fits within the constraints of a social problem, its utility naturally includes social and/or ethical judgments of its appropriateness. In other words, a creative product must obtain social approval. As Csíkszentimihályi (1990, p. 198) noted, "Creativity is not an attribute of individuals but of social systems making judgments about individuals."

Previous research, however, has rarely delved into the ethical aspects of creativity's usefulness, possibly because ethical judgments include broad and sometimes subjective criteria about the functions of creativity. Previous research has also used usefulness and appropriateness interchangeably, although, by definition, appropriateness is more relevant to ethical judgments. For the sake of simplicity, we will not distinguish between the two terms in this chapter either.

One major difficulty of investigating usefulness (or appropriateness) is that it is a relatively elusive and subjective concept (Cropley, 1967). To be useful or appropriate, creativity must satisfy a group of people at some time (Stein, 1963); that is, it requires consensual agreement about its appropriateness, satisfaction, and/or usefulness. Yet these criteria prompt some simple questions: To whom is the creative product satisfying and/or useful (Cropley & Cropley, 2008), for what purposes, and with what common standards? Adding ethical values can complicate the assessment of usefulness because ethical issues are not always clear cut. In both practice and theory, for instance, we often take it for granted that creativity is positive and useful (Kampylis & Valtanen, 2010). As long ago as the Enlightenment of the 17th century, however, Francis Bacon (1627/1929) and Rene Descartes (1644/1991) suggested that (scientific) creativity must serve society's common good. The positive connotations of creativity have been well recognized, possibly because of the huge impact of creativity on the advancement of science and technology, but these positive connotations typically ignore ethics.

As the descriptions of Enron and other creative crimes imply, however, creativity can also go astray and produce undesirable social outcomes. D. Cropley (2011) and Cropley et al. (2008) identified this dark side of creativity as *malevolent*. Unlike the norm, with many people typically engaging in benevolent creativity, some people deliberately use malevolent creativity to harm others (D. Cropley, 2011; McLaren, 1993). Creative terrorist attacks are pertinent examples. Other obvious examples include the frauds and schemes of some truly ingenious impostors.

Thus, although many creative products benefit society, creativity can also have unethical consequences. We suggest two general ways to judge and evaluate creativity that creates negative social outcomes. The first is to simply distinguish the positive and negative utility of a creative product using common ethical rules and principles. This is similar to the distinction between benevolent and malevolent creative products (D. Cropley, 2011; Cropley et al., 2008). This approach suggests that people's motives or intentions primarily determine whether a creative product is judged to be positive or negative.

Ethical social entrepreneurs and unethical thieves may engage in creativity in similar ways, albeit for completely different purposes. A team of student social entrepreneurs in Hong Kong, for

example, developed a fashionable and quirky animal fiber, Chiengora, which is waterproof and 80% warmer than wool. The major material of this fiber primarily comes from grooming dogs, and the students hoped, by getting people's attention to the product, they could also, indirectly, increase the public's care of dogs and other animals. Similarly, ingenious thieves are also well known for their attempts to direct attention in one direction while using that attentional focus to engage in crimes in another direction. For example, successful thieves have been known to convince strangers to accompany them to buy expensive jewelry. They then pocket some valuable jewelry and leave, saying that they will "be right back." Of course, they never come back. The unsuspecting stranger is then left behind to take the heat. In both cases, creative misdirection allows the creators to achieve their goals, and it is easy to judge the former creativity as benevolent and the latter as malevolent.

These distinctions are much like the distinctions between good and bad innovation. A creative product or idea, in this view, can and should be evaluated, like any other product or idea, in terms of its ethics and morality. In other words, the ethical criteria we use to judge creativity should not differ from the common ethical criteria we use to judge other social or ethical behaviors.

The second way to judge and evaluate potentially negative creativity focuses on its creative elements——that is, whether malevolent acts or products are novel and useful (Kampylis & Valtanen, 2010). People usually agree that outlandishly wild ideas are bizarre and irrelevant rather than being creative (e.g., Gorge, 2007; Sternberg & Lubart, 1995). A student in New Zealand, for example, stole a dead dog from the school's veterinary clinic and used it for a sculpture assignment. Although his idea was unconventional and his intent was to pay tribute to the dead animal, his exhibition appalled faculty and students and was described as morbid and inappropriate rather than creative. Similarly, a highly controversial Chinese artist created his extremely unconventional conceptual art by grafting a piece of his skin onto a pig carcass and even eating a stillborn fetus. His eccentric ideas have never been called creative; instead, they have sparked anger, shock, disgust, and protest. Despite their novelty and unconventionality, ideas like these, that are neither useful nor appropriate, rarely create any benefit for organizations. Thus, they are simply new or novel for the sake of being new or novel (George, 2007; Runco, 2011)—and they may also be inappropriate or unethical. Solely because they are not useful or do not fit the problem at hand, they do not qualify as being truly creative. Their inappropriateness adds to this kind of negative judgment.

These criteria can also be used to judge the creativity of a malevolent or negative act or product (Amabile & Tighe, 1993; Hennessey et al., 2011). When a potentially creative but malevolent product is inappropriate, incorrect, and unacceptable, even though it is novel and original, it should no longer qualify as being creative because its usefulness does not fulfill society's ethical standards. Stein (1993) made this case very clearly with a simple but potent example: The editors of the *New England Journal of Medicine* refused to publish Nazi research on hypothermia on moral grounds, even though the research met the journal's scientific standards. This example makes it clear that creative endeavors can and should be evaluated by common moral standards. Thus, as Kamplylis and Valtanen (2010) contended, creativity should also be guided by conscience and a common sense of right and wrong.

These two approaches to judging the ethics or morality of a creative product also have several additional, similar assumptions about the usefulness of creativity. First, they both assume that the individuals who will be using a creative product should be part of the evaluation process with respect to its usefulness but not necessarily its ethics (Cropley et al., 2008). Individuals who are engaging in malevolent action, for instance, may not only judge a creative product to be useful; they may also see it as beneficial and appropriate for their nefarious purposes. The individuals who suffer from their malevolence, in contrast, are likely to judge the creative product as both useless and harmful. Thus, an independent, social evaluation of malevolent creativity is likely to be negative, regardless of its ingenuity. Also, because social assessments of creativity are typically normative (Amabile, 1996; Csíkszentimihályi, 1996), creativity's usefulness must be evaluated against social and moral norms. Although strict definitions of usefulness in the ethical domain will sometimes remain challenging because the ethics literature lacks a common, well-accepted definition (Tenbrunsel & Smith, 2008), there is still sufficient social consensus to make many consensual judgments on a case-by-case basis.

Therefore, to judge the appropriateness or ethics of a creative product, we suggest that its usefulness should not only create beneficial outcomes for the common good of the society (A. Cropley, 2011) but

should also be complemented by its users' positive intentions (Cropley et al., 2008). Thus, both consequential and deontological standards should contribute to the evaluation of the social and ethical usefulness of a creative product. Truly useful creative products should include both benevolent intent and beneficial outcomes for more than their creators. If either the intent or the outcome is not beneficial, creative products should not be deemed ethically useful.

We suggest that, in many situations, creativity's ethical usefulness can be reasonably assessed. In doing so, we might disagree with judgments made in previous eras by people who were unduly influenced by their own self-interests. For instance, by thinking of examples like the controversial scientific discoveries of Galileo or Copernicus and the negative ethical judgments that were rendered about them, we focus not only on the moral norms of the time but also on the morality of the judges over time.

Who, then, should make ethical judgments about creative products? Two kinds of judges seem obvious here: independent raters and people who are familiar with the product's domain (Hennessey et al., 2011). The former group of gatekeepers may suffer from a lack of expertise; the latter group may suffer from their own predilections, biases, and interests. Because the ethics of a creative product often require consensual assessments, independence and expertise may both be required. If these reside in two separate groups of people, their agreement is also needed——and they may have very different judgments of a product's usefulness.

In addition, although many ethical issues concern right–wrong judgments, not all ethical issues involve clear-cut ethical judgments. Some particularly nettlesome ethical dilemmas—right–right dilemmas—involve a clash of at least two competing moral values, such as justice versus mercy (Kidder, 1995). The changing nature of moral standards over time and across different societies can also lead to more difficult and less consistent ethical judgments. When creativity involves drastic departures from traditions or conventions, ethical judgments of its usefulness may need to be based on fundamental ethical standards and moral values that transcend religious, philosophical, and cultural beliefs (De George, 1993; Donaldson & Dunfee, 1994; Mikhail, 2007). This suggests that, in ethically debatable situations, reaching consensus may depend on shared social or moral norms—and these kinds of social consensus do not always include ethical judgments. Giordano Bruno and Galileo Galilei, for example, were both morally persecuted for their exceptionally ingenious and pioneering thinking. Thus, when we judge creativity's moral usefulness, the consensual agreements that creativity often must rely on may make it particularly vulnerable to social or moral norms that are strongly resistant to unconventional ideas, even when those ideas are correct.

In sum, even when creativity is viewed as a product, its usefulness has received relatively less research attention and has garnered less acclaim than its novelty has. As a result, products that are particularly novel have often been classified as creative, sometimes even when they include negative, unethical, or malicious intent and consequences. In their review of the validity of creativity assessment measures, Zeng et al. (2011) indicated that appropriateness should be as important as novelty in assessing the creativity of a product and that failing to include it in measurement tools results in inadequate construct validity. We suggest that, similarly, incorporating ethical measures into the criteria of appropriateness would be an important step in evaluating creative products.

Creativity as a Process

Although creativity typically focuses on the novelty and usefulness of a product, many scholars have also focused on the creative process that results in development of these creative products. As a process, creativity requires the search and selection of novel ideas and solutions (Shalley & Zhou, 2008) to resolve open-ended problems (Amabile, 1996). The major components of these creative processes typically include cognitive variation, selection, and retention (Amabile et al., 2005; Campbell, 1960; Simonton, 1999), as well as, or in addition to, divergent and convergent thinking (Runco, 1991; Cropley, 2006).

Several classic creative process models emphasize the variety of cognitions that people use to generate new and novel ideas or solutions. Guilford's structure-of-intellect model (1956) proposed that creativity is deeply rooted in divergent thinking (i.e., generating many ideas and solutions that are often unconventional). Guilford's model examined several aspects of divergent thinking but focused primarily on three key aspects: originality, ideational fluency, and flexibility. Torrance (1964) expanded Guilford's theory to develop the Torrance test of Creative Thinking, which measures these three key aspects of divergent thinking.

Similarly, Koestler's (1964) bisociative model focuses on the creative process as combining previously independent elements to produce new ideas or solutions beyond conventional frames of reference (Koestler, 1985). Mednick's (1962) Remote Associates Test (RAT) also emphasizes connecting distantly related information to discover novel and insightful solutions. A common thread in these and other process models is a focus on open-minded, unconventional thinking (e.g., brainstorming and idea generation techniques; see Shalley & Zhou, 2008, for a review).

Intuitively, these models seem to suggest an inherent conflict between creativity and ethics. On the one hand, divergent thinking is inherently contrarian, emphasizing action that is unusual, novel, and original (Runco, 2011; Sternberg & Lubart, 1995). It is supposed to push people toward nonconformity, unconventionality, thinking out of the box, breaking rules, and ignoring or violating taken-for-granted assumptions (Goldenberg, Mazursky, & Solomon, 1999). Thus, by definition, this approach flies in the face of tradition and traditional practice.

Ethical action, in contrast, involves conformity to moral rules and normatively approved codes of conduct that restrict and constrain people's behaviors (Kant, 1785/1983; Shaw, 2013). Moral rules are often based on commonly recognized, well-established traditions and practices. To be ethical, individuals must often comply, staying within the bounds of these rules and traditions and acting in socially permissible ways (e.g., Jones, 1991; Trevino, Weaver, & Reynolds, 2006).

Ethical action, then, often requires conformity and conventionality, in direct contradistinction to novelty and originality. When people free themselves from traditional boundaries of thinking; engage in divergent, creative thinking (Runco, 1991); and act deviantly (Plucker, Long, & Runco, 2011), they are likely to be breaking rules and violating norms. This suggests that the cognitive processes that are necessary for the discovery of novel, creative ideas can readily lead people to violate moral, ethical, and social norms (A. Cropley, 2011; Wang, 2011). Preliminary empirical evidence lends some mixed support to this argument (Gino & Ariely, 2012; Wang, 2011). For example, Gino and Ariely's studies suggest that creativity or creative personality can increase cheating. Wang showed that priming creativity increased creative cheating but not blatant cheating when the rules were loose enough to allow loopholes. Priming creativity, however, had no effect on cheating in an experimental economics cheating game that Gneezy (2005) developed and many other studies have used.

This discussion of the creative process has focused on the novelty side of creativity; none of it has focused on usefulness. It is also important to recognize that despite its dominance, novelty cannot guarantee creativity: It is a necessary but not sufficient requirement for creativity. In addition, some scholars (e.g., Gardner, 1988; Plucker, 1999) have questioned the value of divergent thinking as a criterion for creative thinking. Baer (1993, 2010), for example, suggested that, although divergent thinking is an important creative thinking skill, it cannot account for creativity in a variety of different domains. Also, Zeng et al. (2011) suggested that traditional divergent thinking tests often lack construct validity and overlook both domain expertise and integrated creativity processes, which should include tests of both novelty and appropriateness.

Runco (1991, 2008) argued that divergent thinking is related to a person's creative potential and that, as a cognitive process, it leads to divergent but not necessarily creative ideas. In addition, because the literature has focused so much on novelty and divergent thinking, other cognitive aspects of creativity have often been overlooked. For example, although the RAT requires unconventional answers, the test creators, in creating the test's items, have already achieved most of the divergent thinking that is part of the test. Respondents, in contrast, must use convergent thinking to identify the single, creative correct answer (Chermahini & Hommel, 2010). More recently, Nusbaum and Silvia (2011) also suggested that divergent thinking depends on convergent thinking, because people who successfully generate creative ideas must also use convergent cognitive processes, such as identifying useful strategies and managing interference.

Therefore, it seems clear that thinking of creativity as a process encourages a focus on novelty rather than on usefulness; it may also, at least implicitly, lay the groundwork for immoral or unethical action. The creative process itself, however, is neither immoral nor unethical. Only the strictest moral philosophers would condemn people for engaging in immoral thought, and contemporary psychology (e.g., Wegner, 1989) has shown that people's thoughts and cognitions can and do range across many domains without necessarily resulting in behavior that is consistent with those

domains. Thus, the primary connection between ethics and creativity seems to reside in evaluations of creative products rather than in the creative process, although, as we have noted, process and product are intimately connected.

Convergent and Divergent Thinking and Ethics

Although divergent thinking may catch more attention than convergent thinking does, many scholars have suggested that both are essential for creativity. In his article praising the role of convergent thinking in fostering creativity, for example, Cropley (2006) suggested that creativity requires both divergent thinking, to generate new and novel ideas, and convergent thinking, to evaluate the novelty and creativity of new ideas. The convergent thinking that is required in this process depends on having a knowledge base that makes evaluations of the effectiveness and usefulness of any new ideas possible. Other process models of creativity also emphasize convergent thinking. For example, Campbell's (1960) and Simonton's (1999) evolutionary models of creative processes suggest that people not only engage in cognitive variation to create new ideas but also selectively retain useful or effective ideas and eliminate less useful ones. Similarly, Wallas' (1926) and Amabile's (1996) models of creativity propose particular stages (verification versus idea validation and outcome assessment) to illustrate how individuals choose the most appropriate and/or useful ideas after they have engaged in open-minded thinking to produce multiple ideas. These evaluation processes clearly depend on convergent thinking: People use a variety of criteria (such as relevance, significance, promise, simplicity, clarity, and accuracy) to identify the most creative and practical solutions.

Runco (2010) suggested that evaluative thinking could judge creativity by also looking for what is right as opposed to what is wrong. Following this suggestion would make creativity and ethics less contradictory; novelty and creative processes could proceed, unencumbered by moral or ethical constraints, until the evaluation part of the creative process begins. Then, judgments of acceptability, appropriateness, and collective value could be incorporated into evaluations of an idea's usefulness and appropriateness. Therefore, in addition to focusing on novelty, we suggest that evaluation and selection processes may be the most appropriate time in the creative process for incorporating ethical and moral considerations.

We have already noted that the creativity literature has focused more on novelty than on usefulness. Similarly, we would suggest that it also focuses more on the divergent part and less on the convergent, evaluative part of the creative process—even though this latter part is also essential and necessary to create a novel and creative product. Cropley (2006) also suggested that an overemphasis on divergent thinking without considering convergent thinking can cause a variety of problems. For example, individuals can engage in reckless or blind creativity, which may lead to disastrous results because of their lack of consideration of the effectiveness of creativity.

In addition, although the argument that creativity will implicitly or explicitly encourage people to break traditional moral rules and act unethically seems intuitively appealing, it may be logically incomplete and even misleading. One major assumption behind this argument is that people are so self-interested that they will behave unethically unless otherwise constrained. Although moral development and socialization has pushed people to learn and adapt to moral rules, local norms, and social conventions, the desire to be creative can push them, explicitly or implicitly, to break these rules, norms, and conventions because these constraints are traditional and lack novelty.

Although this argument is reasonable, it is logically subject to criticism on the following grounds. First, the well-established traditions or practices that creativity attacks are not limited to moral rules, norms, or conventions. Instead, self-interest, a fundamental reason behind unethical action (Shaw, 2013), is also an inseparable part of traditions and conventions. If individuals are as self-interested and rational, as many rational models suggest, actively promoting or maximizing self-interest will also become conventional and normative (cf. Murnighan, Cantelon, & Elyashiv, 2001), with self-interested traditions and practices commonly guiding many daily activities (Miller, 1999). For example, agency theory and transaction cost economics suggest that people are and expect other people to be opportunistic, possibly with guile, by engaging in "the full set of *ex ante* and *ex post* efforts to lie, cheat, steal, mislead, disguise, obfuscate, feign, distort and confuse" (Williamson, 1984, p. 198).

Although self-interest as a norm may be deeply ingrained in Western society, research has shown that people are actually not as selfish as these approaches suggest; instead, people care about

other people—even strangers—and often act selflessly and altruistically (Batson, Ahmad, Lishner, & Tsang, 2002; Miller, 1999). When self-interest dominates and unethical behaviors, such as cheating and lying, are the easiest, most available, and tempting thoughts, creative processes might actually push people to discover moral alternatives. In short, if creativity encourages people to think outside the box and break old norms and traditions, then it should also motivate them to violate self-interested norms, resulting in an expansion rather than a contraction of ethical action. Therefore, behaving in novel and unconventional ways should not be confined to breaking moral norms; it should include breaking self-interested or selfish norms as well. Theoretically, then, what might seem like an inherent tension between creativity and ethics cannot be fully explained by arguments focusing on deviant actions and motivations in the creative process.

In sum, people's creative thinking seems to involve both divergent and convergent thinking. Because divergent thinking requires thinking outside the box, unethical behaviors sometimes follow as an unintended byproduct of creativity: Being too creative can lead to breaking the rules or even violating the law (Cropley et al., 2008). But deviating from the conventional should also include departures from self-interested norms and traditions. In addition, creativity is not all about divergent thinking. People must also use convergent thinking to evaluate and judge the appropriateness of their creative ideas. Moreover, rather than being a systematic process which can be partitioned into separate, divergent and convergent segments, the creative process tends to involve holistic, global thinking (Sternberg & Lubart, 1992) that incorporates a variety of self-oriented and social factors in both moral and non-moral contexts.

Thus, understanding the interaction between creativity as a process and ethics requires understanding of a host of interactions that include both contextual and individual factors. In particular, this kind of analysis can benefit from asking the basic questions of when, how, and why creativity leads people to break what kinds of norms or traditions, and for what purposes.

The Relationship Between Creativity and Ethics

Our previous discussion suggests that creativity and ethics do not always inherently contradict each other. Runco (2010) argued that creativity has no dark side because its sometimes malevolent outcome is neither an inherent quality of creativity nor the necessary outcome of a creative personality. Runco's (2009) two-continuum theory suggests that the relationship between creativity and ethics is far from simple. Rather than pitting them against each other, he depicts creativity and ethics as two intersecting continua, with one continuum ranging from low to high ethics and the other ranging from low to high creativity. This approach creates four possibilities: creative/ethical behavior, creative/unethical behavior, uncreative/ethical behavior, and uncreative/unethical behavior. We analyze these four different types of behaviors in the following section. Two of them—creative/unethical behavior and creative/ethical behavior—seem to provide the greatest insights into the relationship between creativity and ethics.

Uncreative/Ethical and Uncreative/ Unethical Behavior

The first two kinds of behavior, uncreative/ethical and uncreative/unethical behavior, commonly occur in daily life. Because creativity is valuable and often rare, many if not most behaviors are not particularly creative; instead, they tend to be routine and mundane, and many of these everyday, ordinary behaviors are neither ethical nor unethical. Thus, individuals routinely drive on the correct side of the street, show up for work on time (or close to it), use proper etiquette, and stay respectful. Within organizations, following or adhering to society's norms and rules is sometimes considered a mild form of organizational citizenship behavior, particularly when some people choose to do otherwise (Podsakoff, Mackenzie, Paine, & Bachrach, 2000). In addition, many commendable altruistic endeavors, such as making charitable donations or volunteering, are also well-established, traditional behaviors that require little or no creativity. These are all good examples of uncreative/ethical behaviors.

Similarly, many unethical and/or illegal behaviors require little or no creativity. Many simple acts of rule-breaking, such as exceeding the speed limit while driving, and simple unethical acts such as lying, cheating, and stealing all qualify as fairly mundane. Individuals often do not need creativity to think of or engage in any of these unethical behaviors. Even frauds and scams that have had significant consequences are not necessarily the result of creative ideas; instead, they often reflect simple patterns of behavior that continue to

recur. Although creative crimes certainly do occur (Eisenman, 2008), and ingenious criminals often get considerable media attention, Eisenman (1992, 1999) found that jailed criminals tend to be fairly uncreative, both cognitively and socially; they also seem to be relatively rigid in terms of their social and thinking patterns. Because creativity is often a valuable and relatively rare resource, unethical or illegal behaviors, like many other behaviors, tend to include little or no creativity.

Creativity may encourage unethical behavior and the placement of an individual's self-interest before that of others (A. Cropley, 2011). Also, creative ideas may help individuals rationalize their self-interested intentions or behaviors. However, Buchholz and Rosenthal (2005) argued that creativity and other qualities of entrepreneurs are actually crucial to ethical decision making. Indeed, a small number of studies on ethics and entrepreneurship (see Hannafey, 2003; Harris, Sapienza, & Bowie, 2009, for reviews) showed that entrepreneurs displayed high levels of moral reasoning and were disposed to ethical decision making. Collectively, these findings suggest that although creativity may sometimes open the door to being unethical, the incongruence between creativity and ethics is far from universal. Future research might investigate how individual motivation at the moment of being creative (e.g., to promote self-interest vs. to help others) affects people's actions and what contextualized factors (traditions or norms of rule-obeying vs. rule-breaking) may make creativity uncreatively selfish or malevolent.

Creative but Unethical Versus Creative and Ethical Behaviors

The other two types of relationships proposed by Runco's (2009) model focus on creative behaviors, which we have suggested are likely to be less common than uncreative behaviors. We have also argued that creative behaviors can be ethical or unethical, and that creativity is not always likely to push behavior toward being more unethical.

Cropley et al. (2008) suggested that individuals' pre-creativity motivations are a primary determinant of whether their creativity is benevolent or malevolent. On the positive side, people often use creativity as they fulfill their ethical and social obligations. Many organizations, for example, engage in a variety of creative endeavors to make their operations environmentally friendly and sustainable. Many social entrepreneurs also develop novel ideas to push positive social change as they tackle a variety of social problems (Zahra, Gedajlovic, Neubaum, & Shulman, 2009). As one example, the inventor of a foot-driven water well pump—which could be utilized very effectively on poor, small farms in Africa—was unsuccessful in distributing the pumps even though he was giving them away for free. Only after he took the totally counterintuitive strategy of selling them for $100 each—a substantial amount for an African farmer but far less than their cost—was he able to succeed in getting them into farmers' hands. Moreover, after they had paid so much for them, the farmers made sure to use them religiously.

On the negative side, creativity is a particularly useful tool for criminals and fraudsters. For example, although many fraudsters simply mimic well-known scams and schemes, truly original con artists often come up with impressively ingenious ideas. Similarly, even though scandals often have many features in common (Anand, Ashforth, & Joshi, 2004), they frequently display considerable creativity. Although, as observers, we may suffer from availability bias and remember only truly vivid instances of criminal creativity, we cannot help but marvel at stories that are decidedly creative. One example is the original story of ATM skimmers. A group of criminals installed disguised equipment ("skimmers") on legitimate ATM machines to capture victims' ATM card numbers and PIN numbers. When a victim used one of these ATMs, the criminals sat in a nearby car and recorded the personal information wirelessly. They then duplicated the card and used the PIN number to withdraw large amounts of money quickly. From our point of view, this was a creative crime.

With different ethical constraints in place, organizational examples of creative but unethical behaviors often enter the gray area of moral and legal transgressions. For example, professional espionage agents creatively hired a network of flight attendants to eavesdrop on pieces of critical business information in the first-class compartments of international flights. They then managed to sell the information for more than a million dollars a year (Crawford & Di Benedetto, 2011). In another example, for years Thomson Reuters paid more than $1 million a year to be able to distribute the results of a market-moving consumer sentiment survey conducted by the University of Michigan. The university released its results to the public at 10 a.m. every other Friday. However, Thomson Reuters was able to release the results to its premium subscribers 5 minutes earlier, at 9:55 a.m.

The 5-minute advantage meant nothing for most people, but hedge funds specializing in high-speed trading could make hundreds of thousands of trades in 5 minutes. Later, Thomson Reuters even released the results 2 seconds earlier, at 9:54:58 a.m., to a group of super-premium subscribers who paid an additional charge of $6,000 per month simply because this 2-second window gave them a major trading advantage. While denying any wrongdoing, Thomson Reuters suspended this service after New York's attorney general started investigating (Parloff, 2013).

Thus, creativity can be a double-edged sword: People can either misuse it or appropriately apply it depending on their individual motivations. This suggests that the nature of these individuals' goals may also influence whether their creativity is malevolent or benevolent, because ethical means may be more obviously useful for some goals rather than others. The benevolent-malevolent paradigm of creativity suggests that ethical issues begin with the decision maker. The individuals' inherent tendencies toward ethics may predispose them to either ethical or unethical behavior, and they will then use creativity to achieve their goals (Cropley et al., 2008). The appropriateness or usefulness of their own creativity merely acts to support their predetermined motivations. This logic opens up tremendous opportunities for new research by asking how different kinds of goals influence creativity.

Our primary focus on ethical and unethical creative behaviors, in contrast, concerns how individuals overcome external constraints to achieve either ethical or unethical goals. We suggest, for instance, that people often generate creative ideas when they are unsatisfied with traditional solutions and when creative ideas can help them resolve a problem more effectively, efficiently, and satisfactorily. If the problem they face involves ethical issues, their creativity must (hopefully) address issues of appropriateness and acceptability. In particular, creativity must fit the social constraints of the problem (Sternberg & Lubart, 1996). Our model of ethical, creative choices is displayed in Figure 14.1.

The process starts with the problem that needs to be solved. Normal, traditional solutions are often considered first (because of ease and availability); if these do not satisfactorily solve the problem, individuals will seek new solutions. This is where ethics enters the process. If a new solution is too radical, the individual must make a tough decision: either solve the problem using the extreme solution, go back to the drawing board and creatively search for another (novel but less extreme) solution, or live with a suboptimal, traditional resolution. A variety of factors may determine how individuals judge the ethicality of the new solutions, but generally, the more radical or unconventional the proposition, the less likely it is that it will be acceptable, primarily because of ethical limits and boundaries that individuals typically abide by.

Although we acknowledge that individuals often have predetermined ethical or unethical goals or motives, we also suggest that social and contextual forces create potentially formidable constraints (e.g., formal punishments and less formal but certainly stinging social reactions that follow the violation of moral norms). If creativity only inspired deviation from the conventional, without any moral or normative constraints, individuals would quickly and simply find ways to circumvent traditions and conventions. This is less likely because

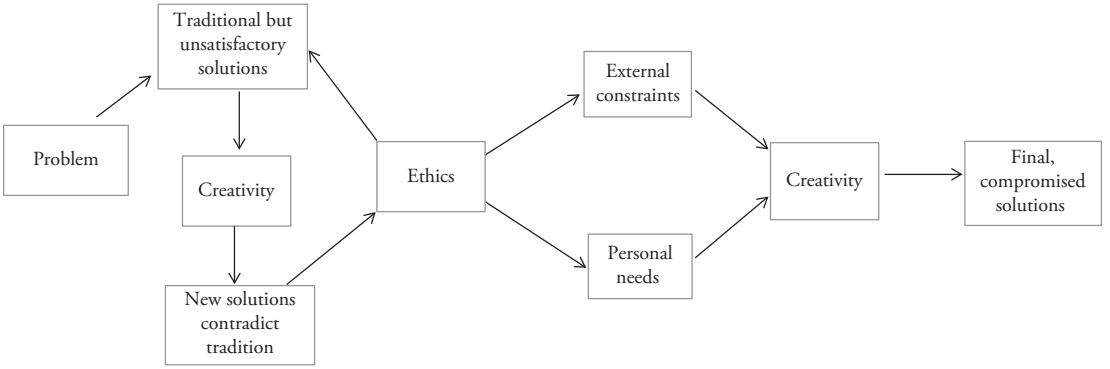

Fig. 14.1 A Model of Ethical, Creative Choices.

Note. Personal needs may also be related to personality characteristics. Because our discussion on creativity has focused on creative products and processes instead of creative personalities, other personality effects are not part of our discussion of the model.

people are aware of and are clearly affected by moral and normative constraints. In addition, they often have a desire to find solutions that are both self-satisfactory and socially acceptable (Aquino & Reed, 2002). Therefore, they tend to think, search, and select creative solutions that satisfy their own needs and at least partially conform to socially acceptable standards.

This suggests that, when individuals address external constraints, they may need to temper or revise some of their novel ideas or solutions. Depending on the relevance and strength of social constraints, individuals will be likely to adjust their creative ideas accordingly and often must abandon their more radical options. For example, Wang (2011) found that creatively primed individuals were more likely to circumvent rather than directly violate rules and regulations. Similarly, Mainemelis (2010) proposed that, as employees face stronger structural constraints, they are increasingly inclined to engage in creative deviance to secretly rather than openly defy their managers' orders. Even then, however, we suggest that their actions are likely to be problem focused. Thus, people's creative solutions are likely to seek a middle ground that avoids the violation of ethical standards, if that middle ground exists. This suggests that they may be likely to move into ethically gray areas in which their choices are less offensive to external stakeholders (whose interests may conflict with their own).

Finally, another major distinction between ethically and unethically creative behaviors is likely to depend on the nature of the ethical issues that are involved in the problem solution process. Ethical issues span both right–wrong and right–right dilemmas (Kidder, 1995): Right–wrong ethical issues involve the direct violation of moral rules and values, and right–right issues tend to reside in the struggle between at least two conflicting moral values. Whereas right–wrong ethical issues are often related to creative but unethical behaviors (creative criminals are a simple example), right–right issues often lead to attempts at creative and ethical behaviors. For both right–right and right–wrong issues, creativity can help people find an ethical middle ground, albeit for different ethical purposes. When people discover creative but unethical ideas, they often explore ethically gray areas to satisfy their selfish desires without being too objectionably aberrant to the public's view. For example, individuals often explore legal loopholes or apply creative accounting to evade taxes. In contrast, when people discover creative but ethical solutions, typically in right–right situations, they may be able to promote one moral value over the other, thereby reducing the severity of ethical confrontations by making them less threatening and less unpleasant. For instance, when a famous artist was politically persecuted, one of his loyal students secretly protected his teacher's paintings by hiding them behind the portraits of a tyrant that no one dared to touch.

In short, an analysis of the four possible combinations of ethics and creativity seems particularly fruitful. Although individuals' motivations often determine the positivity or negativity of their creativity, we focus on the impact of the problem's context and how it stimulates creativity and ethicality to conform to external constraints. Regardless of how many barriers the creative process might break, it often incorporates a desire to remain within some normative boundaries, and these are often ethical in nature. Thus, successful resolution of the difficulties of a problem and the realistic constraints of the situation can often result in creatively seeking the moral middle ground, particularly for right–right ethical issues.

Improving the Ethicality of Creativity

Last but not least, a final question on the relationship between ethics and creativity deserves serious attention: What can be done to guide creativity toward greater ethicality in organizations? Given that the ethical aspects of creativity have not received extensive research attention, this is also an important question for future research. We suggest a few potential research directions in the following paragraphs.

Redefine the Usefulness and Appropriateness of Creativity

One of our major arguments about creativity and ethics concerns the usefulness or appropriateness of creativity. Although creativity's novelty requires that it deviate from norms and traditions, its usefulness or appropriateness should also be evaluated by normative criteria (Amaible, 1996). Novel and original ideas are approved, selected, and/or rejected not only by the individuals who create them but also by many external judges. Therefore, as we have noted, social values and norms can and should become important criteria for the evaluation of a creative product (Csíkszentimihályi, 1999). As Csíkszentimihályi (1996) and Simonton (1999) have also noted, creativity requires social validation. We suggest that this social validation process

should include an evaluation based on ethical criteria. Incorporating well-accepted moral values and principles is probably the first step in this process. However, finding values and principles that have achieved a broad consensus of support to serve as criteria for evaluating creativity in different contextual contexts is actually a difficult task, especially when the issues have created a right–right ethical dilemma. Incorporating these important moral values and principles into a valid, reliable, and consistent scoring system to accommodate creativity is similarly challenging.

Gatekeepers

One approach might be to use ethical gatekeepers to reject novel but inappropriate and unethical ideas. Almost every field includes people who might willingly serve as gatekeepers. Kasof (1995) observed, however, that a field's gatekeepers tend to be people who have had long experience within their field; whether they might also be open to approving the appropriateness of a new, unique, creative idea is an open question. Gatekeepers typically are experts in their fields, but they should also, ideally, have social wisdom (Hilton, 2010). Sternberg (2010) has suggested that wisdom, which requires both intelligence and creativity, is essential to pushing creativity to serve the common good by balancing various interests from different stakeholders and espousing universal moral values.

A difficulty with this approach might be that gatekeepers' roots may be stuck in tradition rather than innovation. In addition, the normative expectations of both gatekeepers and the majority that they serve might not always be ethical and moral. For example, employees often engage in creative deviance to defy their managers' instructions or secretly violate their orders so that they can continue to pursue ideas that they have been asked to abandon (Mainemelis, 2010). This kind of creative deviance has ultimately led to some tremendously successful, well-known products (e.g., LED bright lighting technology at Nichia, the tape slitter at 3M, and the movie *The Godfather*), suggesting that gatekeepers' initial assessments of these ideas may have been both arbitrary and wrong. When it comes to ethical judgments and evaluations, gatekeepers' standards may not be lofty, especially when dominant social or moral norms are misguided. Some well-known examples in history include the jailing and persecution of Bruno, Martin Luther King, Jr., Gandhi, and Galileo (Brower, 1999; Brower & Stahl, 2011).

Intrinsic and Prosocial Motivations

Another potential approach is related to intrinsic and prosocial motivations. People who are intrinsically motivated have a natural inclination to explore novel and original ideas (Deci & Ryan, 1985), and Grant and Berry (2011) found that prosocial motivation reinforces the relationship between intrinsic motivation and creativity, with perspective-taking mediating this effect. They suggested that people who focus their attention on others' needs also see how useful creativity can be, and these insights boost the positive effects of intrinsic motivation on novelty.

Research also suggests that intrinsic and extrinsic motivation have different effects on people's prosocial motivations (Deci & Ryan, 1985). Because monetary incentives can crowd out and undermine social motives (Frey & Jegen, 2001), people must often rely on their intrinsic motivation to sustain and reinforce their social motivation. These findings provide some useful insights into improving the ethicality of creativity: Organizational leaders who can track and tap into their members' intrinsic motivation may be able to more frequently avoid unethical creativity.

Also, because ethically problematic creativity often involves inappropriate behavior, people would do well to attend to creativity's ethical utility. Hilton (2010), for example, proposed a multiperspective community approach emphasizing the importance of valuing creativity in its social contexts. Prosocial motivation that includes taking the perspectives of others, for instance, may be able to effectively channel people's attention. Adding intrinsic motivation could foster even stronger social motivations. Thus, it seems that a combination of intrinsic and prosocial motivations could have a potent, positive impact on moral creativity, making it more focused on benefits for the common good.

In brief, it seems possible to mold situations and to personally promote ethical creativity in at least three ways: (1) redefine and standardize the (ethical) usefulness of creativity; (2) employ field gatekeepers who will wisely reject unethical creativity and promote truly creative ideas that are beneficial to the common good; and (3) activate people's tendencies toward intrinsic and prosocial motivation.

Entrepreneurship, Creativity, and Ethics

Although the major focus of this chapter has been the relationship between creativity and ethics, it is also important to address the intersection

of entrepreneurship, creativity, and ethics because of the crucial role of creativity in entrepreneurship. Entrepreneurs are often creative innovators and change-makers. In the *Homeric Hymn to Hermes* (c. 520 B. C. E.), Hermes, the mythical entrepreneur, was described as a skilled inventor and merchant as well as an "unethical trickster and thief" (Hannafey, 2003). This image suggests a love–hate relationship between entrepreneurs' creative, societal contributions and their compromised ethical standards (Fisscher, Frenkel, Lurie, & Nijhof, 2005). Stereotypes often suggest that entrepreneurs break both moral and non-moral rules in their innovative pursuits. The connection between entrepreneurs and rule-breaking may have been the impetus behind Brenkert's (2009) critique of the use of rule-based morality to analyze the ethics of entrepreneurship.

Creativity is crucial to entrepreneurs: By creating new, novel, and useful products and services, they contribute to the greater good (Buchholz & Rosenthal, 2005). Adding ethically questionable values or behaviors to their enterprises, however, is clearly in conflict with collective, societal value. Our search of the literature (see Hannafey, 2003; and Harris et al., 2009, for reviews), however, suggests that an unethical connection is not a common view of entrepreneurship, and several empirical studies suggest the opposite. For example, Teal and Carroll (1999) found that entrepreneurs displayed higher levels of moral reasoning skills than either professional managers or the general public. Bucar and Hisrich (2001) found that, although entrepreneurs and managers responded similarly to many ethical issues, entrepreneurs sometimes exhibited higher ethical standards than managers did, particularly for intraorganizational issues. Similarly, Payne and Joyner (2006) found that entrepreneurs explicitly or implicitly acknowledged socially recognized values. Finally, Welsh and Birch (1997) showed that small business owners perceived themselves as relatively unlikely to use exploitative power to meet personal or organizational goals.

Collectively, these studies suggest that, although entrepreneurs may often face ethical dilemmas, they are not as ethically compromised as they have often been portrayed. For example, Sergey Brin, Google cofounder, once noted in an interview, "Obviously everyone wants to be successful, but I want to be looked back on as being very innovative, very trusted and ethical and ultimately making a big difference in the world" (Jennings, 2004). At the same time, like research on creativity and ethics, the research on ethics and entrepreneurship is relatively sparse (Harris et al., 2009). Therefore, additional research on creativity, entrepreneurship, and ethics would be particularly fruitful. We would expect that the relationship between entrepreneurship and ethics, like that between creativity and ethics (Runco, 2009), is not simple.

Entrepreneurship is a particularly important context for creativity, business, and society. Entrepreneurs must often face a unique set of elusive and difficult ethical problems. As mentioned earlier, Buchholz and Rosenthal (2005) argued that creativity and other entrepreneurial qualities are critical to the ethical decision making of entrepreneurs. How do they use creative strategies that are potentially lucrative but provoke ethical issues? Do other entrepreneurial spirits affect the role of creativity in their ethical decision making? How might creativity interact with a variety of personal and contextual factors to influence entrepreneurs' final ethical decisions? Both social and commercial entrepreneurship seem to be promising areas in which to address these questions and investigate additional aspects of the relationship between creativity and ethics.

Conclusion

Creativity is a critical and valuable resource for organizations of all kinds, especially entrepreneurial ventures. In this chapter, we discuss a previously under-researched topic: the relationship between creativity and ethics. Although creativity is typically beneficial to organizations, it can also be misused and thereby create undesirable social outcomes. In short, creativity can, but need not, have a malevolent or dark side. Runco (2010) also argued that neither the quality nor traits of creativity are inherently connected with the malevolent outcomes that it can cause. If creativity is just like any other potentially valuable product, its benevolence or malevolence may then depend on when and how individuals use it, and for what purposes.

Our discussions suggest that the consideration and evaluation of creativity does not often include ethical issues, possibly because its usefulness and appropriateness lack unambiguous and consistent standards. In addition, an overemphasis on the inherent tension between creativity and conventions or traditions seems to lead to common misbeliefs that creativity is always contrary to ethics. Many examples of ethically creative behaviors invalidate this position, and it is clear that people can often benefit from moral creativity.

Ethics is a complex concept, and its relationship with creativity is clearly worthy of additional research. At a minimum, we still need to understand the relationship between other relevant actors' and creators' intensions and motivations, what social contexts encourage benevolent as opposed malevolent creativity, and how to promote the former and discourage the latter. Other research efforts might also investigate the cognitive and affective aspects of creativity and ethics, especially their relationship in terms of people's ethical awareness, motivation, judgment, and behavior. In the end, we can't help thinking that creativity's many positive aspects might even be able to help people overcome temptation and increase the likelihood of unique, novel, and effective ethical action.

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CHAPTER

15 A Cross-Cultural Analysis of Creativity

Kwok Leung *and* Jie Wang

Abstract

This chapter provides a review and analysis of the literature on societal culture and organizational creativity. Cultural differences in the conceptualization of creativity are first reviewed, and the cross-cultural literature on the creativity of individuals is analyzed with reference to cultural values. Cultural differences at the individual level are contrasted with cultural differences at the firm and nation levels, followed by a discussion of cultural differences in the antecedents of creativity. The influence of cultural diversity on the creativity of teams and the relationship between biculturalism and creativity are explored. Several fruitful areas for future research on creativity and innovation from a cultural perspective are proposed.

Key Words: creativity, societal culture, cultural values, cultural diversity, biculturalism

Introduction

What do iPhone of Apple, Prius of Toyota, and capsule coffee of Nespresso have in common? These products represent radical innovations that have raked in huge profit for their firms. Few would doubt the importance of creativity and innovation for the competitiveness of firms (e.g., Kanter, 1983) and even nations (e.g., Porter, 1990). Firms cannot be innovative without creative employees, and this is perhaps the main reason why creativity has become a major research topic. A wide range of antecedents of employee creativity, from individual differences, to team processes, to organizational characteristics, have been examined (Zhou & Shalley, 2011).

Despite the vibrant research on organizational creativity, most studies have been conducted in a small number of national contexts and have ignored the influence of societal culture. To illustrate this point, we have surveyed the papers on creativity in two leading journals during the period 2011–2012: *Journal of Applied Psychology* and *Academy of Management Journal*. As expected, 45% of the studies were conducted in the United States and 25% in other Western countries. China was the only sizeable non-Western culture studied, accounting for 20% of the papers. However, among the twenty papers conducted in China, nine adopted a universalist theoretical perspective, paying no attention to the influence of culture. Song, Wu, and Zhou (2012) provided a comprehensive review of research on organizational creativity conducted with Chinese samples. Again, the vast majority of the studies were guided by concepts and theories from the West, without any concern for the influence of Chinese culture. As in other research areas, virtually all theories guiding these studies were formulated by researchers based in the West, especially the United States.

The lack of research on cultural influences on organizational creativity and the heavy reliance of American theoretical perspectives present two limitations. First, current theories are tested in a small set of countries, and it is not clear whether they are generalizable to diverse cultural contexts. Theories formulated in the US context may be suboptimal in other cultural contexts because they may ignore important constructs

and processes salient in these contexts (Hofstede, 1993). The flip side of this argument is that research on organizational creativity in diverse cultures may uncover novel constructs and theories and contribute to more comprehensive theorizing of organizational creativity.

Second, in a globalizing, highly competitive market, firms from different countries may excel in different domains. American firms dominate in Internet-related industries, German and Japanese firms excel in the auto industry, French and Italian firms set the trends in high fashion, and Swiss firms lead the market in high-end watches. The focus on a small number of countries creates knowledge gaps about the processes associated with outstanding creativity in some industries. We need to study Italian and French fashion houses if we want to explore whether innovative processes differ between fashion design and information technologies. Comparing the creative processes across leading firms in different industries may yield important insight for development of more nuanced theories of creativity.

The objective of this chapter is to provide a cross-cultural analysis of creativity in the organizational context. Because of the dearth of relevant research, the coverage of our review is broad, including research in social and educational settings. We first discuss the construct of creativity from a cross-cultural perspective and then review cultural differences in creativity and the antecedents of creativity in diverse cultural contexts. Next, we discuss the influence of cultural diversity on the creativity of teams and the relationship between biculturalism and creativity. We end the chapter with fruitful directions for future research.

The Meaning of Creativity Across Cultures

Creativity is typically defined as the generation of ideas that are both novel and appropriate or useful (e.g., Amabile, 1996; Oldham & Cummings, 1996). Creativity is concerned with idea generation, whereas innovation is concerned with the implementation of creative ideas (Janssen, 2000; Kanter, 1983; Scott & Bruce, 1994). At the individual and team levels of analysis, creativity is often examined (for reviews, see George, 2007; Shalley, Zhou, & Oldham, 2004; Zhou & Shalley, 2011), whereas at the firm and national levels of analysis, innovation is the focus, and products of creativity, such as patents, are studied (e.g., Garcia & Calantone, 2002).

The current definition of creativity is widely accepted, and there is hardly any controversy surrounding it. Viewed from a cross-cultural perspective, however, this definition is more ambiguous than the literature would suggest. Even within a culture, there are well-known cases that illustrate the subjectivity in the evaluation of creativity. Bach is now widely recognized as a major composer, but "his reputation in his life time was restricted to a fairly limited circle and his music was regarded as old-fashioned" (Kennedy & Bourne, 1994, p. 43). van Gogh's ascendance from an obscure painter with no market value to immense posthumous fame is even more dramatic. In science, the pioneering research of Mendel, the father of genetics, was not recognized until long after his death (Henig, 2000). These examples point to the relativity of creativity, which contrasts starkly with the view that creativity represents an individual trait that can be objectively assessed (e.g., Guilford, 1950).

Csikszentmihalyi (1990, 1999) provided perhaps the more systematic account of creativity as an intersubjective phenomenon. He argued that creativity cannot be evaluated outside its social context because "creativity is not an attribute of individuals but of social systems making judgments about individuals" (Csikszentmihalyi, 1990, p. 198). Three interrelated subsystems are postulated in his dynamic model of creativity. The domain involves a set of rules and criteria for defining creativity; the field consists of experts or people who evaluate creativity; and the last subsystem involves individuals. Creative works are generated by individuals in a particular domain, which are then judged by the field. These three subsystems are dynamic and context bound, which explains why judgment of creativity fluctuates with changes in the field and the domain. Runco and Bahleda (1986) found that lay conceptions (implicit theories) of creativity varied across domains. Respondents with an artistic background regarded "humorous" as a characteristic of artistic creativity, but respondents with no artistic background did not. Judges with an artistic background may differ from those without such a background in the evaluation of a piece of art work because of the use of different criteria.

The intersubjective approach to creativity suggests that creativity may be defined and evaluated differently across different cultural contexts, because domains and fields can vary across different cultures. An example was given by Chan and Chan (1999), who found that Hong Kong Chinese teachers, but not American teachers, regarded "quick in responding" as a creative attribute, whereas American teachers but not Hong Kong

Chinese teachers mentioned "self-centered" as a creative attribute. Teachers from these two cultures may differ in their assessment of the creativity of students because of the use of different criteria.

Criteria for Evaluating Creativity across Cultures

The framework of individualism–collectivism is particularly useful in explicating cultural differences in the conceptualization of creativity. Individualism refers to an emphasis on the self as independent and agentic, whereas collectivism refers to an emphasis on a group and the willingness to sacrifice for it (Hofstede, 1980; Triandis, 1996). This framework has guided the exploration and explication of cultural differences in diverse behavioral domains (e.g., Kirkman, Lowe, & Gibson, 2006).

The individualism–collectivism framework provides a coherent account of East–West differences in the importance accorded to novelty and appropriateness/usefulness in defining creativity and in the pursuit of creative endeavors. In general, people in individualist cultures are motivated to see the self as distinctive and hence to pursue uniqueness and novelty as a way to differentiate themselves from others. On the contrary, people in collectivist cultures are motivated to contribute to their in-groups and hence to target the generation of appropriate and useful ideas in their creative endeavors (e.g., Hempel & Sue-Chan, 2010; Morris & Leung, 2010).

Considerable evidence supports the association of individualism with the emphasis on novelty, and collectivism with the emphasis on appropriateness/usefulness. Rudowicz and Yue (2000) found that Chinese undergraduates regarded characteristics associated with creative individuals, such as "have original ideas" and "innovative," as relatively unimportant. They also reported (Yue & Rudowicz, 2002) that Chinese undergraduates, when asked to nominate creative individuals, included primarily politicians and scientists. They interpreted this finding as reflecting a utilitarian view of creativity, because in modern Chinese history, politicians and scientists are often associated with social changes. Yue, Bender, and Cheung (2011) showed that Chinese undergraduates were more likely to nominate politicians, scientists, and inventors as creative individuals, whereas German undergraduates nominated mostly philosophers, artists, and writers. Yue et al. concluded that meritorious salience was emphasized in the evaluation of creativity in China, whereas aesthetic salience was emphasized in Germany.

Paletz, Peng, and Li (2011) proposed that the implicit theories of creativity of East Asians emphasize external themes such as social significance and leadership because of their attention to the social context, whereas the implicit theories of Americans emphasize internal aspects of creativity such as intuition and mental capacities because of their orientation toward individualism and dispositionalism. Indeed, Japanese university students were more likely to mention visible and interactive activities in their implicit theories of creativity than were their Caucasian-American counterparts, who were more likely to mention internal activities and traits. In a second study, Chinese and Japanese university students were more likely to see professions that expressed creativity externally, such as scientist and team manager, as more creative than their American counterparts. By contrast, American university students were more likely to see professions that expressed creativity internally, such as artist and philosopher, as more creative than Chinese and Japanese.

Whereas previous studies were concerned with East–West differences, Rubera, Ordanini, and Griffith (2011) studied the importance of novelty and meaningfulness (i.e., the term used in the marketing literature to refer to appropriateness/usefulness) in influencing the intention to buy a product in Italy and in the United States. Based on the value framework of Schwartz (1994), Rubera et al. argued that novelty should show stronger influence on intention to buy in a culture that endorses low resultant conservatism (emphasizing autonomy, hedonism, and stimulation) and high resultant self-enhancement (emphasizing independence, ambition, successfulness, daring, and authority). In contrast, meaningfulness should show stronger influence on intention to buy in a culture that endorses high resultant conservatism and low resultant self-enhancement. The United States represents a low resultant conservatism/high resultant self-enhancement culture, and Italy represents a high resultant conservatism/low resultant self-enhancement culture. Because low resultant conservatism and high resultant self-enhancement overlap with individualism, whereas high resultant conservatism and low resultant self-enhancement overlap with collectivism (Schwartz, 1992), this formulation is consistent with the argument that novelty is more emphasized in individualist cultures and appropriateness/usefulness in collectivist

cultures. Based on the responses given by consumers who were intercepted at the exit of a shopping mall, their findings confirmed that that novelty had a larger effect on intention to buy in the United States than in Italy, whereas meaningfulness showed a larger effect in Italy than in the United States.

Bechtoldt, De Dreu, Nijstad, and Choi (2010) argued that group creativity is driven by a combination of epistemic motivation (motivation to acquire understanding and knowledge) and prosocial motivation. In an individualist culture, the combination of epistemic motivation and prosocial motivation should promote the pursuit of novelty because this dimension is prized in individualist cultures. In contrast, the combination of epistemic motivation and prosocial motivation should lead to the pursuit of appropriateness in collectivist cultures. In an experiment with university students, Bechtoldt et al. found that when both epistemic motivation and prosocial motivation were high, Dutch participants showed a higher level of originality in a brainstorming task, whereas Korean participants showed a higher level of appropriateness. This pattern of results supports the argument that novelty is emphasized in the Dutch culture and appropriateness in the Korean culture.

We conclude that ample evidence supports the argument that individualism is associated with an emphasis on novelty in conceptualizing creativity, whereas collectivism is associated with an emphasis on appropriateness/usefulness. Ideas high in novelty are seen as more creative in individualist than in collectivist cultures, whereas ideas high in usefulness/appropriateness are seen as more creative in collectivist than in individualist cultures. An important consequence of this difference is that in individualist cultures, social norms and values promote uniqueness and distinctiveness in creative endeavors, and individuals are more motivated to pursue radical creativity, which tends to maximally distinguish them from other people (Lan & Kaufman, 2012). The creative pursuit in collectivist cultures tends to be incremental because of the lower emphasis on novelty and uniqueness.

Cultural Differences in Creativity

Individual Level of Analysis

A stream of research has examined cultural differences in the level of creativity, primarily focusing on East–West differences based on creativity tests administered to students. In a review of this literature, Leung, Au, and Leung (2004) concluded that Western students generally showed higher scores in creativity tests than Asian students, although quite a number of studies showed no pattern or a reverse pattern of cultural difference. For instance, based on the Test for Creative Thinking–Drawing Production, Jellen and Urban (1989) found that children from Western countries, including England, Germany, and the United States, scored higher than their counterparts from such Asian countries as China, India, and Indonesia. Niu and Sternberg (2001) found that artworks produced by American university students were judged by both American and Chinese judges to be more creative than artworks produced by Chinese students. However, Japanese students scored higher than their American counterparts based on the Torrance Creativity Test (Torrance & Sato, 1979). Chen, Kasof, Himsel, Greenberger, Dong, and Xue (2002) found no difference in the creativity of the drawings of geometric shapes produced by European-American and Chinese university students based on the evaluation of judges from both cultures.

The mixed pattern of cultural difference in creativity has also been reported in more recent research. For instance, Yi, Hu, Scheithauer, and Niu (2013) asked Chinese and German university students to make a collage depicting an emotion and to draw an extraterrestrial alien. The creativity of the artworks was assessed by both German and Chinese judges, and German students obtained higher creativity scores than Chinese students for both tasks. Wong and Niu (2013) asked Caucasian-American, Asian-American, and Chinese university students to draw a deep-sea creature and to create a collage depicting an emotion. Caucasian-American and Chinese-American judges evaluated the creativity of the collages and drawings, and both Caucasian-American and Asian-American students obtained higher scores on both tests than Chinese students did.

However, there are also studies showing no cultural difference. Nouri, Erez, Rockstuhl, Ang, Leshem-Calif, and Rafaeli (2013) conducted a study in which Singaporean and Israeli dyads were presented with two symbols and asked to generate as many interpretations as possible. No cultural difference in creativity was found. Van Harpen and Sriraman (2013) studied creativity in the posing of mathematical problems by Chinese high school students in two cities (Jiaozhou and Shanghai) and by American high school students. This creativity test involved posing diverse mathematical

problems based on the information given; it was scored in terms of fluency (number), flexibility (types of problems posed), and originality (uniqueness). Generally, the Jiaozhou sample was more creative than the American sample, which was more creative than the Shanghai sample. Van Harpen and Sriraman concluded that contextual factors such as curricula have significant influence on the performance in this creativity test.

We conclude that the majority of the studies show that Western students score higher than Asian students in various creative tests, but that this difference is unstable because creativity is affected by a wide range of contextual factors. Three caveats need to be addressed in future research. First, many creativity tests do not capture the appropriateness/usefulness of creativity. Although Western students tend to score higher than Asian students in divergent thinking tests such as the Torrance Test of Creativity, these results may not represent a cultural difference in overall creativity. Given their emphasis on appropriateness/usefulness, Asian students should show higher levels of overall creativity if this dimension is included. It is not clear whether Western students are still higher in overall creativity than Asian students when usefulness is taken into account. Second, most of the creativity tests have been developed in the West, especially in the United States, and hence Western students may be more familiar with them than Asian students, accounting for their higher scores. Finally, cross-cultural comparison of the creativity of employees virtually does not exist, and it is not clear whether the findings based on students can be generalized to employees and managers.

Country Level of Analysis

Creativity can be compared at the culture level, with the comparison based on creative output in well-defined domains. Some creative outputs can be attributed to a culture (e.g., overall innovativeness), whereas some others can be attributed to firms (e.g., patents obtained) and then aggregated to represent a culture. Although this line of research has significant implications for the economic development of nations, Hennessey and Amabile (2010) concluded that nation-level research on creativity is less active than research at the firm and individual levels.

An obvious difference in cross-cultural comparison of creativity at the individual and at the societal levels is the importance of wealth. Based on the innovation dimension of the 2012–2013 Global Competitiveness Index (Schwab & Sala-i-Martín, 2012), all the cultures ranked within the top twenty positions are economically developed, with only four non-Western cultures (Japan, ranked fifth; Singapore, eighth; Taiwan, fourteenth; and South Korea, sixteenth). Innovation in specific domains is also related to societal affluence. In the postal section, Felisberto (2013) found that in a sample of seventeen European countries, gross domestic product (GDP) per capita was positively related to innovation. To study the development of new drugs, Keyhani, Wang, Hebert, Carpenter, and Anderson (2010) focused on new molecular entities (i.e., molecules not previously approved) for human therapeutic purposes introduced by firms from different countries in the period 1992–2004. Countries in the top ten positions were all economically developed, with Japan in the fourth position as the only non-Western country. Japan was ranked as the most innovative country in a sample of 40 countries in terms of the amount of time needed for adopting new products (Chandrasekaran & Tellis, 2008), and all the countries in the top ten positions were affluent nations. The strong salutary effect of wealth on innovation is not surprising because creativity and innovation depend on access to resources (Camisón-Zornoza, Lapiedra-Alcamí, Segarra-Ciprés, & Boronat-Navarro, 2004; Damanpour, 1991), which disadvantages low-income countries.

The criticality of wealth for high-impact innovation may be an important reason why Western Europeans and North Americans are generally perceived as more creative than people from non-Western countries, most of which are in the low-income category. Wong and Niu (2013) found that both Chinese and American university students perceived Americans as more creative than Chinese. This stereotype is consistent with the observation that Chinese firms trail significantly behind American firms in technological advancement. Although there are Nobel laureates of Chinese descent, no Chinese person has won a Nobel Prize in science based on research conducted in China. The importance of wealth is underscored by the fact that many Japanese scientists have won Nobel Prizes based on research conducted in Japan, whose per capita GDP was about seven times of that of China in 2012 (International Monetary Fund, 2013).

The influence of culture on nation-level innovation is demonstrated by the relationships between several cultural dimensions and the innovativeness of cultures. The association of individualism with creativity is also supported by culture-level studies,

with culture as the unit of analysis. Individualism at the national level correlated positively with the per capita number of patents issued to a nation after controlling for GNP per capita (Shane, 1992); the per capita number of trademarks in a nation after controlling for per capita income (Shane, 1993); a nation's score on the Global Innovation Index without control for wealth (Rinne, Steel, & Fairweather, 2012); and the Global Creativity Index and Design and Creativity Index scores of a nation after controlling for GDP per capita (Rinne, Steel, & Fairweather, 2013).

Other cultural dimensions have also been found to relate to the innovativeness of cultures. High power distance, which refers to acceptance of social hierarchy and deference to authority figures (Hofstede, 1980), should be negatively related to innovation, because high power distance discourages participation in and contribution to the innovative process by those lower in a social hierarchy. Indeed, power distance at the national level correlated negatively with the number of inventions per capita after controlling for GNP per capita (Shane, 1992), the per capita number of trademarks in a nation after controlling for per capita income (Shane, 1993), a nation's score on the Global Innovation Index without any control variables (Rinne et al., 2012), and managers' creativity-promoting values after controlling for some individual and organizational characteristics (Hoegl, Parboteeah, & Muethel, 2012).

Mixed results were found with respect to uncertainty avoidance, which refers to the compliance with well-defined rules and regulations and the avoidance of uncertainty (Hofstede, 1980). In theory, high uncertainty avoidance is detrimental to innovation because creative ideas typically involve uncertainty about their feasibility and usefulness. Indeed, societies characterized by low uncertainty avoidance are associated with stronger promotion of innovative activities (Shane, 1995) and higher entrepreneurial orientation (internal locus of control combined with innovativeness; Mueller & Thomas, 2001); however, although these two studies did not control for wealth. Controlling for per capita income, Shane (1993) found that lower uncertainty avoidance was associated with a higher number of trademarks. However, no significant relationship was found between uncertainty avoidance and innovation as measured by the per capita number of patents after controlling for GNP per capita (Shane, 1992), the Global Innovation Index score without any control variables (Rinne et al., 2012), or the Global Creativity Index and Design and Creativity Index scores after controlling for GDP per capita (Rinne et al., 2013).

Hoegl et al. (2012) approached the influence of culture from the perspective of national climate of creativity. Drawing on the framework of Amabile (1996), they proposed five dimensions of the national climate that promote creative values, four of which are distinct from the dimensions of Hofstede (1980). One dimension is nation-level material supportiveness, which is related to national wealth. The three remaining dimensions are nation-level freedom, nation-level positive pressure (dependence on innovation) and negative pressure (performance orientation), and regulatory impediments (government regulatory requirements). Only one dimension, nation-level ideological supportiveness, was captured by inverse power distance and assertiveness from previous frameworks of cultural dimensions. Hoegl et al. were interested in whether these nation-level dimensions affected the creativity-promoting values of individual managers. A multilevel analysis of a sample of managers from nineteen European nations showed that perceived freedom and positive pressure were positively related, and negative pressure was negatively related, to individual creative values. These results suggest that creativity-promoting values are influenced by social institutional factors in addition to cultural dimensions.

To conclude, country-level comparisons show that both institutional and cultural factors matter. Societal wealth is critical for innovation, and cultural dimensions and ideologies that promote values and norms in support of creativity are beneficial to innovation. What is less clear is how institutional and cultural factors interact in shaping the creative output of nations.

Antecedents of Creativity

A major direction of creativity research is to identify the antecedents of creativity and the factors that shape the processes involved (for reviews, see George, 2007; Shalley et al., 2004; Zhou & Shalley, 2011). Because most studies are conducted in the West, especially in the United States, it is important to evaluate whether the findings are generalizable to other societies. Two broad types of cross-cultural differences may be identified: difference in the direction of a relationship and difference in its strength. Unfortunately, comparative research contrasting antecedents of organizational creativity in different societies is very limited (Phan,

Zhou, & Abrahamson, 2010). One exception is Chen, Sharma, Edinger, Shapiro, and Farh (2011), who explored whether nationality (US vs. China) and collectivism affected the impacts of empowering leadership and relationship conflict on innovative behavior via their influence on psychological empowerment and affective commitment. In two studies, although there were cultural differences in psychological empowerment, the relationships were found to be similar across the two cultures.

The argument that the antecedents of organizational creativity are universal has also been supported in other settings. Following a group of fifth- and seventh-graders from China and Germany for 3 years, Shi, Xu, Zhou, and Zha (1999) did not find any gender difference in creativity for either cultural groups. In a cross-cultural comparison of overexcitability, "an innate supersensitivity to stimuli in any of five different areas: Psychomotor, Sensual, Imaginational, Intellectual, and Emotional" (Bouchard, 2004, p. 339), Falk, Manzanero, and Miller (1997) found that both Venezuelan and American artists showed a high degree of animistic, intuitive, and emotional thinking—and these are the traits leading to creativity, although they did not measure creativity directly.

We can assess whether antecedents of creativity vary across cultures by considering the results of monocultural studies conducted in diverse cultural contexts. Studies on the antecedents of creativity conducted outside the United States typically adopt a universalist perspective. For instance, based on the reciprocity norm in social exchange theory (Blau, 1964; Gouldner, 1960), Mueller and Kamdar (2011) demonstrated that help giving mediated and moderated the effects of help seeking on individual creativity among 55 teams of Indian engineers. Drawing on conservation of resources theory (Hobfoll, 1988, 1989), Shin, Taylor, and Seo (2012) investigated how organizational inducements and psychological resilience enhanced employees' creative support for change (the provision of creative insights and ideas to promote a change) through commitment to change in South Korea. On the basis of self-determination theory (Gagné & Deci, 2005), Liu, Chen, and Yao (2011) developed a model for the multilevel effects of autonomy support and autonomy orientation on creativity through harmonious passion and obtained support for their model with data from China. In general, these monocultural studies with non-US data have yielded findings that are consistent with predictions of creativity theories that do not consider the influence of culture. These research findings suggest that the antecedents of organizational creativity are similar across cultures and that theories of creativity formulated in the Western context perform reasonably well in non-Western cultural contexts.

Prior research has documented few cultural differences in the antecedents of organizational creativity, but this does not mean that they do not exist. Perhaps an important reason is that past research has not been designed to reveal cultural differences. We now review some research that is indicative of such cultural differences. An inductive study was conducted by Jawecki, Füller, and Gebauer (2011), who explored the creative processes in Chinese-language and English-language online communities. Some participants in the Chinese online communities expressed their pride in China and the Chinese culture, and this patriotic tendency was less noticeable among participants in the English-language communications. Patriotism may be a more salient antecedent of creativity in China than in the West.

Simonton and Ting (2010) reviewed some macro factors that influence individual creativity with historiometrics, a method that relies on historical and biographical data for hypothesis testing. Some interesting cultural differences concerning the antecedents of creativity were found. Political fragmentation showed a positive influence on creativity in the West, but complex relationships were found in China and India. Civil disturbances were related positively to creativity in the West, but not in China. One explanation is that political fragmentation enhanced cultural heterogeneity in the West, which tends to increase creativity, but political fragmentation did not have this effect in China.

To promote research on how culture may shape the relationship between antecedent variables and individual creativity, we propose three possibilities. First, the cultural dimension of individualism–collectivism may predict cultural variation in the antecedents of creativity. A conjecture based on this framework is concerned with the influences of self-efficacy and collective efficacy. It is well established that self-efficacy promotes individual creativity, and collective efficacy promotes team creativity. Given that the self is more salient in individualist cultures, and the group is more salient in collectivist cultures, self-efficacy may be more predictive of individual creativity in individualist than in collectivist cultures; and, likewise, collective efficacy may be more

predictive of team creativity in collectivist than in individualist cultures. Consistent with this conjecture, Schaubroeck, Lam, and Xie (2000) found in a cross-cultural study of job stress that for the American sample, self-efficacy, but not collective efficacy, was significantly and negatively correlated with anxiety, depression, and turnover intention. For the Hong Kong sample, however, collective efficacy, but not self-efficacy, was significantly and negatively correlated with these outcome variables. Another conjecture is based on the finding that individualists are more influenced by affect, and less influenced by norms, than collectivists (Triandis, 1995). Antecedents of creativity that are related to affect, such as mood, may be more predictive of creativity in individualist than in collectivist cultures. Antecedents that are related to norms, such as innovative climate, may be more predictive of creativity in collectivist than in individualist cultures.

Second, theorizing about the influence of culture may point to relatively unexplored antecedents of organizational creativity. Leung, Chen, Zhou, and Lim (2014) examined the implication of the relational orientation of Chinese as measured by face and *renqing* (the tendency to receive favors from and offer favors to others) for innovative behavior. Innovative attempts often fail and result in loss of face and favors from others, so individuals with a relational orientation should be wary of innovative attempts. This prediction was supported by a negative relationship between relational orientation and innovative behavior among a sample of Chinese employees. Leung et al. also reported an interesting interaction effect between innovative climate and autocratic leadership, such that innovative behavior was highest when both innovative climate and autocratic leadership were high. One explanation is that autocratic leadership, in the presence of a strong innovative climate, may motivate subordinates to strive for innovation. Consistent with this argument, although collectivism is generally related to low creativity, collectivism was related to higher creativity among Chinese undergraduate students in a classroom context when perceived creative climate as well as self-reported demand for creativity and creative ability were high (Du & Wang, 2009). Collectivists may be more responsive to creative climate and demand for creativity because they are sensitive to the social environment and the possession of creative ability allows them to show high creativity. The assertion that autocratic leadership and collectivism are detrimental to creativity may be too simplistic because their effects are contingent on some contextual factors (Zhou & Su, 2010).

Benevolent leadership is a dimension of paternalistic leadership, which is concerned with individualized care in both work and non-work domains (Cheng, Chou, Wu, Huang, & Farh, 2004). Wang and Cheng (2010) found that benevolent leadership was positively related to creativity among Chinese employees, especially when creative role identity or job autonomy was high. They suggested that leader benevolence builds trust and provides resources to subordinates, both of which benefit creativity. There is considerable research on the relationship between leadership and creativity, but research on benevolent leadership, an indigenous leadership style in Chinese culture, may offer new insight and broaden our understanding of the impact of leadership on creativity.

Another novel antecedent of creativity is *guanxi*, which refers to a long-term, affect-based social tie prevalent in Chinese culture (Yang, 1994). *Guanxi* is a Chinese form of strong tie, but it is different from strong ties because *guanxi* networks are not necessarily redundant in terms of the kinds of information and resources provided (Bian & Ang, 1997). Research has shown that *guanxi* is positively related to knowledge sharing between employees (Huang, Davison, & Gu, 2008) and firms (Ramasamy, Goh, & Yeung, 2006). *Guanxi* may promote innovative behavior through knowledge sharing, because knowledge sharing is related to innovative behavior (e.g., Lu, Lin, & Leung, 2012). By contrast, research in the West has shown that ties with weaker strength are more related to creativity due to the diversity of information and perspectives they provide (e.g., Baer, 2010). It is interesting to contrast the effects of strong and weak ties and *guanxi* on creativity, and we speculate that weak ties may be more predictive of creativity in the West, whereas *guanxi* may be more predictive of creativity in China.

Research on culture and creativity may also point to novel constructs that moderate the influence of antecedent variables on creativity. A good example is provided by Yao, Yang, Dong, and Wang (2010), who found that self-rated creativity was positively related to supervisor-rated innovative behavior among Chinese employees only when *zhong yong*, the preference for moderation and the avoidance of extreme positions, was low. The conformist pressure associated with collectivism in the Chinese culture discourages extreme and unique

behaviors, which is encapsulated in the concept of *zhong yong.* Chinese who do not subscribe to *zhong yong* are willing to be different and unique and hence are more likely to put their creative ideas into innovative actions. *Zhong yong* as a moderating variable has obviously not been considered in Western research and may shed new light on how conformity pressure may shape the display of innovative behavior.

The final possibility is concerned with the effect of reward on creativity, which has been the focus of a long-standing debate. Researchers with a social cognitive orientation argue that reward reduces creativity through lowering intrinsic motivation (e.g., Amabile, 1996; Deci, Koestner, & Ryan, 1999), whereas researchers with a behaviorist perspective argue for the positive effect of reward on creativity (e.g., Eisenberger, Pierce, & Cameron, 1999). Cultures differ in affluence, and materialism, the emphasis on wealth and materialist success, is stronger in less wealthy cultures (Inglehart, 1997). We speculate that the role of intrinsic motivation may be less important in cultures with high materialism (cf. Deckop, Jurkiewicz, & Giacalone, 2010; Kashdan & Breen, 2007) and that reward may be more effective in promoting creativity in cultures endorsing materialism.

In sum, cross-cultural research on the antecedents of creativity is limited, and few cultural differences have been documented. However, our analysis shows that many interesting research questions can be raised, and this line of enquiry may yield important insights for expanding and enriching theories of organizational creativity.

Creativity of Culturally Diverse Teams

Globalization has resulted in cultural heterogeneity in the workplace, and employees of different ethnicities and nationalities often work under the same roof. Culturally diverse teams are common in many organizations. The information/decision-making approach to the influence of cultural diversity suggests that diverse knowledge, skills, and abilities of members in culturally diverse teams enhance team performance (e.g., Adler, 1986; Van Knippenberg, De Dreu, & Homan, 2004). In an experimental study that compared creativity on a brainstorming task between groups composed of all Anglo-Americans and groups composed of Anglo-, Asian-, African-, and Hispanic-Americans, McLeod, Lobel, and Cox (1996) found that the ideas produced by the ethnically diverse groups were judged as significantly more feasible and more effective than the ideas produced by the all-Anglo groups. A meta-analysis has indeed shown that cultural diversity is significantly related to creativity, but the effect size was small, with an average r of .16, ranging from –.14 to .48 (Stahl, Maznevski, Voigt, & Jonsen, 2009).

The relationship between cultural diversity and team creativity is actually not entirely consistent. In a field experiment with employees from a division of a high-tech, Fortune 500 company, Cady and Valentine (1999) found that racial diversity in temporary teams participating in a technical contest had a positive impact on the quantity of creative ideas generated by the teams but had no impact on their quality. Findings showing no significant relationship between cultural diversity and team creativity have also been reported. For example, in an experiment involving eleven groups of undergraduate students in the United States, the percentage of non-White US citizens and foreign citizens in a group was not significantly related to the group's creativity (Rodriguez, 1998). Paletz, Peng, Erez, and Maslach (2004) compared the effects of two types of ethnically diverse groups in which the majority of the members were either ethnic minorities or Caucasians on their performance on an interactive creative task. This experimental study with undergraduates in the United States found no significant difference in creativity as a function of ethnic composition.

One account for such null findings is based on social categorization theory (Tajfel, 1978; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987), which suggests that cultural diversity hinders team performance because categorization of team members into in-groups and out-groups hampers team processes. The negative social dynamics in culturally diverse teams may weaken the beneficial effects of diverse knowledge and perspectives associated with cultural diversity on team creativity.

Factors Influencing the Relationship between Cultural Diversity and Creativity

A stream of research has considered the possibility that contextual variables may qualify the relationship between cultural diversity and team creativity. O'Reilly, Williams, and Barsade (1998) argued that status differences associated with different ethnic groups would influence the effects of social categorization processes on creativity in teams with different ethnicities and called attention to the ethnic composition of such groups. Based on data from employees of a US company,

they found ethnic diversity was positively related to team creativity mainly in groups composed of Whites and Asians, but not in groups composed of Asians, Hispanics, and African-Americans.

Other factors that are closely related to group processes in culturally diverse teams have been investigated. Giambatista and Bhappu (2010) proposed that computer-mediated communication should interact with ethnic diversity to increase creativity because this form of communication enables multiple individuals to share ideas in parallel and lowers social categorization. Nominal group techniques can enhance the effects of ethnic diversity on creativity because these techniques also reduce social categorization processes. Nominal idea generation should be more effective, followed by "round robin" listing of ideas, discussion of ideas, and nominal voting, because these techniques vary in their degree of anonymity and hence in their effectiveness in suppressing social categorization processes. In study 1, university students in the United States who had been working together as groups for approximately 3 months were asked to work on a creative decision-making task. No significant main effect of ethnic diversity on creativity was obtained, but, as predicted, computer-mediated communication interacted with ethnic diversity to increase group creativity. In study 2, Giambatista and Bhappu followed an experimental design and asked newly formed groups comprised of university students to develop a 30-second radio commercial for a major airline company. Ethnic diversity was negatively associated with creativity, but this relationship was moderated by computer-mediated communication and nominal group technique. As predicted, both computer-mediated communication and nominal group technique interacted with ethnic diversity to increase group creativity.

The studies reviewed earlier were mainly conducted in the United States, but more recent research has investigated cultural diversity in an international context. Gibson and Gibbs (2006) theorized that establishing effective internal communication and a shared vision for innovation is difficult in international virtual teams, because national diversity is associated with different communication practices and low team identification. Findings from a qualitative study and a quantitative survey of members of international teams located in different nations showed that national diversity was negatively related to team innovation. However, this negative relationship was mitigated by a psychologically safe communication climate in which team members were more likely to adjust their communication styles to match those of others.

Nouri et al. (2013) suggested a negative relationship between cultural diversity and team creativity because members from different cultures need time and effort to learn how to work together and therefore tend to focus on common ideas rather than unique ideas. Integrating insights from situational strength theory and task type theory, Nouri et al. further proposed that low task specificity is conducive to the creativity of culturally diverse teams because this type of task imposes less constraint in terms of team interdependence and team coordination. In comparing the performance of culturally diverse dyads (Israeli–Singaporean) and culturally homogeneous dyads (Israeli–Israeli and Singaporean–Singaporean) on a creative task based on synchronous computer communication, they found that cultural diversity reduced team creativity in terms of both fluency and originality. Although originality (but not fluency) was higher for low task specificity than for high task specificity, no significant interaction effect of cultural diversity and task specificity on creativity was found. Both culturally homogeneous and diverse dyads were more creative under the low task specificity condition.

Some recent research has shown that intercultural competence can overcome the negative interpersonal dynamics in culturally diverse teams that hinder team creativity. Chua, Morris, and Mor (2012) demonstrated in three studies that managers who were skillful in thinking about and reflecting on their own culture and others' cultures (i.e., high metacognitive cultural intelligence [CQ]), were more likely to develop affect-based trust in their relationships with people from different cultures, which in turn promoted cross-cultural creative collaboration. Metacognitive CQ was related to better intercultural collaboration in creativity-related work and to the development of affective trust with people from other cultures by sharing ideas with them. In an experiment with undergraduate students who were asked to work in dyads with a member from a different culture, Chua et al. further showed that high metacognitive CQ promoted idea sharing and creativity, but only in a condition in which a personal conversation prior to the task was allowed, because affect-based trust was more likely to develop when conversation was allowed. As predicted, affect-based trust

mediated the effect of metacognitive CQ on idea sharing and creativity.

The importance of affective trust for creativity in a culturally diverse team context is consistent with the findings of Chua (2013) on ambient cultural disharmony, the experience of cultural conflict in the immediate social environment. Chua found that the experience of ambient cultural disharmony hindered the connection of ideas from different cultures, and that the negative relationship between ambient cultural disharmony and creativity was mediated by belief in the low compatibility of ideas from different cultures.

Tadmor, Satterstrom, Jang, and Polzer (2012) found in an experiment with undergraduate students that a culturally diverse dyad consisting of members with multicultural experiences showed higher creativity after controlling for the effects of the multicultural experience and creativity of each individual member. Their interpretation was that multicultural experiences of the two members of a culturally diverse dyad provided diversity in knowledge and perspectives and thereby enhanced the creativity of the dyad. The multicultural experiences of the members were also able to reduce the negative interpersonal dynamics characteristic of culturally diverse teams and allow the diverse knowledge and perspectives associated with cultural diversity to be productively utilized.

To conclude, the relationship between cultural diversity and team creativity is not as straightforward as previously assumed, and the positive relationship exists only in some specific conditions, such as low salience of the cultural identity of members and the presence of members with high intercultural competence. In general, when contextual factors suppress the negative group dynamics in culturally diverse teams, culturally diversity is more likely to spur team creativity.

Multicultural Experience and Creativity

Culturally diverse teams involve diversity across members, and a different line of work has examined cultural diversity within an individual—that is, multiculturalism. In a seminal paper, Leung, Maddux, Galinsky, and Chiu (2008) argued and presented evidence that multicultural experiences are beneficial to creativity and that creativity-supporting processes, including retrieval of unconventional knowledge and recruitment of ideas from foreign cultures. Their thesis was supported by subsequent research. Lee, Therriault, and Linderholm (2012) showed that undergraduate students in the United States who had studied abroad outperformed those who had not in both general and culture-specific creativity regardless of their ethnicity.

Leung and Morris (2011) proposed the notion of *creative versatility,* to describe the wider range of creative capability in individuals with multicultural experiences, and the notion of *creative virtuosity,* to describe their higher quality of creativity. Multiculturals have access to at least two cultures and the knowledge and perspectives associated with them (Leung et al., 2008). They are able to look at a problem from different cultural perspectives, resulting in higher *creative versatility*. Multiculturals are also higher in *creativity virtuosity* because their multicultural experiences facilitate access to diverse ideas, unconventional associations, and novel conceptual combinations (Leung et al., 2008).

As with cultural diversity and team creativity, the relationship between multicultural experience and creativity is not straightforward. Maddux and Galinsky (2009) found in a study of undergraduate and MBA students in the United States and France that multicultural experience alone was not sufficient to boost creativity. Living abroad was related to higher creativity, but traveling overseas was not, because the latter did not require adaptation and problem solving in a foreign culture. Consistent with this argument, Maddux, Adam, and Galinsky (2010) found that learning about a foreign culture facilitated creativity among undergraduate and MBA students in the United States and France who had lived abroad. Leung and Chiu (2008, 2010) found that the positive effect of multicultural experience on creativity was more pronounced for people high in openness but less pronounced when time pressure was high. The interpretation is that openness promotes absorption and learning from multicultural experiences, whereas time pressure leads to reliance on one's home culture in problem solving because of its higher accessibility.

Cheng and Leung (2013), based on the perspective of motivated cognition, argued and found that exposure to stimuli from two cultures increased the creativity of bicultural undergraduate students (Singaporean Chinese who had sufficient knowledge about Chinese, American, and Indian cultures) only when the cultural stimuli presented were sufficiently different from each other and were processed with a mindset that emphasized cultural differences. Extrapolating from their findings, multicultural experience may benefit creativity to

the extent that the cultures involved are substantially different and the foreign cultures are experienced and understood in terms of differences rather than similarities.

A different stream of research has probed the circumstances under which multicultural experience is beneficial to creativity from the perspective of cultural identity. Previous research on immigrants and sojourners has identified the importance of their identification with their home culture and with the host culture (Berry, 1990). Individuals may identify with both cultures (integration), with their home culture only (separation), with the host culture only (assimilation), or with neither of them (marginalization). The integration strategy gives rise to better adjustment and effective functioning in the host culture (e.g., Ward & Kennedy, 1994), and this benefit is also demonstrated in creativity. Tadmor, Galinsky, and Maddux (2012) found that bicultural MBA students who identified with two cultures showed higher performance in a creative task and in previous innovations in a work context than individuals who identified with only one culture. Integrity complexity, the ability to consider and combine diverse perspectives, was found to mediate the positive effect of cultural integration on creativity.

More recent work has shown that people who adopt the integration strategy, namely biculturals, may vary in the extent to which they perceive their two cultural identities as compatible, a construct known as bicultural identity integration, or BII (Benet-Martínez, Leu, Lee, & Morris, 2002). Individuals with high BII see the two identities as compatible and integrate them in their social and cognitive functioning, whereas individuals with low BII see the two cultural identities as incompatible and separate them in their social cognitive functioning.

Some research has shown a positive relationship between BII and creativity. Cheng, Sanchez-Burks, and Lee (2008) found that Asian-Americans with high BII showed higher creativity when a task drew on knowledge systems tied to both Asian and American identities. The task involved the development of new culinary dishes, and Asian-Americans with high BII were more creative only when both Asian and American ingredients were available. High BII was not helpful in the condition in which only one type of ingredients was available, suggesting that the diverse knowledge available to high-BII individuals only helped them prepare new dishes that drew from both cultures. Whereas Cheng et al. focused on a culture-specific creative task, Saad, Damian, Benet-Martínez, Moons, and Robins (2013) studied the relationship between the blendedness subscale of the BII scale, which is concerned with the perceived overlap and compatibility between two cultural identities, and performance on a general creative task (the unusual uses test) among Chinese-American undergraduates. High blendedness was related to high originality via the positive effect on the number of independent and useful ideas generated. These two studies taken together, show that the salutary effect of BII on creativity can be demonstrated in culture-specific as well as culture-general creative tasks.

Finally, a stream of research has examined how the creativity of biculturals with different degrees of BII is shaped by cultural cues. In general, low-BII Asian-American biculturals react to cultural cues in a direction opposite to those cues, whereas high-BII Asian-American biculturals react in a direction consistent with those cues (e.g., Benet-Martínez et al., 2002). This tendency is also observed in creativity. Mok and Morris (2010) found that high-BII East Asian–Americans generated more novel ideas when presented with American rather than Asian cues, whereas low-BII Asian-Americans generated fewer novel ideas under the same condition. As discussed earlier, novelty is more emphasized in individualistic than in collectivistic cultures, and the generation of novel ideas is more consistent with American rather than Asian cultures. The interpretation of this pattern of findings is based on identity-related motivation. East Asian–Americans with high BII see the two cultural identities as compatible: Expressing one does not mean dropping the other. In contrast, those low in BII tend to see the expression of one cultural identity as abandoning the nonexpressed cultural identity. To avoid the experience of identity loss, low-BII individuals are motivated to resist salient cultural cues, which explains why they react in a direction opposite to the cultural cues presented.

To conclude, multicultural experience is beneficial to creativity, but its effect is contingent on dispositional and contextual factors that promote learning from the different cultures experienced and creativity-supporting cognitive processes, such as need for adaptation, openness, low time pressure, large cultural distance between the cultures involved, a focus on cultural differences rather than similarities, high BII, and the interaction of BII and the cultural cues present. The

benefit of multiculturalism may be stronger for culture-specific compared with culture-general creative tasks.

Directions for Future Research and Conclusion

This review of research on culture and organizational creativity shows that considerable progress has been made in several areas. However, major gaps have been identified, and we discuss several directions for future research below.

First and foremost, an important contribution of cross-cultural research is to advance new constructs and perspectives for developing more precise and comprehensive theories because of the diversity in societal culture and institutional environment (Chen, Leung, & Chen, 2009). However, previous research on culture and creativity has been quite limited in this type of contribution. A notable exception is the work of Nonaka, who argued that tacit knowledge can account for the top-notch innovation of some Japanese firms (Nonaka, 1994; Nonaka & Takeuchi, 1995). Nonaka's framework of tacit knowledge has been highly influential, showcasing the use of a specific cultural context to identify new constructs and theories. However, no other highly influential concepts and theories have emerged from research in the non-Western context since Nonaka's work.

The increase in the number of papers based on Chinese data has not been helpful in this regard, because most of them apply constructs and theories developed in the West and do not contribute to theoretical innovation from a cultural perspective. A few studies have suggested that some Chinese indigenous concepts play a role in the creative processes, including relational orientation (Leung et al., 2014), *zhong yong* (Yao et al., 2010), *guanxi* (Huang et al., 2008), and benevolent leadership (Wang & Cheng, 2010). These concepts are obviously novel in the Western literature, and research based on them may extend current theories on organizational creativity.

Second, cross-cultural research suggests that the conceptualization of creativity is subjected to cultural influence. Perhaps the most robust finding is that the dimension of novelty is emphasized in individualist cultures, whereas the dimension of usefulness is emphasized in collectivist cultures. This cultural difference may explain why students from individualist cultures often score higher in creativity tests, which primarily target the novelty dimension, and why the innovation of many firms from affluent collectivist cultures is world class. Services and products are popular not only because they are new; they must also be useful, and the emphasis on the usefulness dimension should elevate the overall innovation of firms from collectivist cultures. An interesting direction is to examine how such cultural differences in the conceptualization of creativity shape the innovation process. One interesting question is whether the emphasis on usefulness prompts firms in collectivist cultures to focus more on incremental innovation and the emphasis on novelty prompts firms in individualist cultures to focus more on radical innovation.

Third, it is important to explore cultural differences in creativity and innovation processes for the development of general theories of creativity and innovation (De Dreu, 2010). Cultural differences may occur in the generation of creative ideas; in the selection, editing, and marketing of those ideas; and in their acceptance and implementation. Prior cross-cultural research has focused on idea generation, and future research needs to identify and account for cultural differences in other stages (Chiu & Kwan, 2010).

Fourth, our review suggests a number of cross-level issues for future research to address. Research on organizational creativity is typically conducted at the individual level, with individual-, team-, and firm-level variables as antecedents. Cross-cultural research has extended the antecedents of individual creativity to macro variables, because research at the nation level shows that both individual creativity and firm innovation are shaped by such variables. Cross-cultural research provides the impetus for developing comprehensive multilevel models that take into account the influence of macro-level factors on individual creativity, including such variables as socioeconomic factors and cultural dimensions. Cross-level relationships between individual creativity and team-, firm-, and nation-level innovation should be explored.

There has been research on the influence of cultural dimensions on individual creativity (e.g., Erez & Nouri, 2010), and cultural dimensions may also moderate the effects of antecedent variables on individual creativity (Zhou & Su, 2010). The possibility that cultural dimensions may exert both cross-level main effects on individual creativity and cross-level moderating effects on the effects of antecedent variables on individual creativity is a major topic for future research. In addition, little research has examined the interplay of socioeconomic factors and cultural dimensions in influencing

individual creativity and innovation of firms and nations. Many interesting cross-level research questions can be raised based on this full-fledged multilevel conceptualization of the influence of culture on creativity and innovation in the work context.

We note that cultural differences in individual creativity only moderately correspond to cultural differences in innovation at the firm and national levels. In particular, affluence is a critical determinant of innovation at the firm and nation levels but not at the individual level. It is important to probe the discrepancy between cultural differences in individual creativity and in the innovation of firms. For instance, if the collectivist culture of Japan is not conducive to the generation of novel ideas, why are some Japanese firms among the most innovative firms in certain sectors? It is also important to examine the contribution of individual creativity to the innovation of firms from a cultural perspective. For instance, how can Chinese firms, being from a developing economy, leverage their creative employees to develop highly innovative products and services?

Finally, globalization is a key feature of contemporary business, and we have reviewed two major areas associated with this trend. It is widely accepted that cultural diversity is beneficial to team creativity (e.g., Adler, 1986; Van Knippenberg et al., 2004). More recent work reviewed in this chapter suggests that the relationship between cultural diversity and team creativity is not as straightforward as previously assumed and that the negative interpersonal dynamics triggered by cultural diversity may hinder team creativity. This is a fertile area for future research because culturally diverse teams are commonplace and are frequently adopted for innovation purposes. We need to know when cultural diversity is beneficial to team creativity and the processes involved.

A more recent area of research is concerned with how cultural diversity within individuals (i.e., multiculturalism) is related to creativity. The number of employees with multicultural experiences is rising because of globalization, and it is important to know whether and how this type of employee is able to contribute to innovation in their firms. Many interesting research questions can be raised, such as probing the circumstances under which biculturals show higher creativity and facilitate the innovation process. A point to note is that many studies in this area are based on experiments with students, and the external validity of the results needs to be evaluated in real-life work contexts.

To conclude, this chapter has provided a review and analysis of the cross-cultural literature on organizational creativity. We discussed cultural differences in the conceptualization of creativity, the level of creativity, and the antecedents of creativity. We also probed the influence of cultural diversity on team creativity and how multicultural experiences are related to individual creativity. Based on the review, we presented several fruitful areas for future research on creativity and innovation from a cultural perspective. We hope that this chapter provides the impetus to stimulate ground-breaking cross-cultural research on creativity and innovation in the work context.

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CHAPTER

16

Is All Creativity Created Equal? Exploring Differences in the Creativity Processes Across the Creativity Types

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Abstract

This chapter develops an updated theory of creativity types based on Unsworth's conceptualization of responsive, expected, contributory, and proactive creativity. Viewing creativity as a process, it discusses how different factors influence each building block of the creative process across the four creativity types: namely, factors affecting perception of situational drivers, engagement in creativity, and how well people complete the creative process across each creativity type. The complexity and dynamic nature of the creativity process are emphasized by specifying the degree of radicalness in the outcome across each creativity type and the feedback loops that are likely to occur depending on the responses people have received to their previous creativity attempts.

Key Words: creativity types, responsive creativity, expected creativity, contributory creativity, proactive creativity, incremental creativity, radical creativity, creativity process, outcomes of creativity

Introduction

In 2001, a theory explaining that there were different types of creativity based on different initial drivers and problems was proposed (Unsworth, 2001). Since that time, many have cited the theory and used it in definitions of creativity. However, as we will show, few have empirically tested the implications of this theory. In this chapter, we review the literature that has used the concept of "types of creativity" and investigate the ways in which this concept has been used. In the bulk of the chapter, we build on this initial theory and extend it by considering the different outcomes inherent in the creativity process and some of the factors that affect these various outcomes across the different creativity types. In essence, we will reflect on the question, Are all creativity types created equal?

First, though, we start with a reminder of the initial theory proposed by Unsworth (2001). She suggested that different types of creativity emerge depending on the nature of the problem and the driver for engagement in creativity, leading to four types of creativity. Throughout this chapter, we consider these four types of creativity as comprising different creativity pathways or processes rather than only different creativity outcomes. Although all are concerned with creativity, the four creativity types may be substantially different in antecedents, processes, and outcomes—just as carrot cake is different to chocolate cake, and as in-role or task performance is different to extra-role or contextual performance (e.g., Borman & Motowidlo, 1997; Motowidlo & Van Scotter, 1994).

The first creativity type is responsive creativity, which is based on an external requirement and a closed problem—the type of creativity often seen in creativity experiments in laboratories or in reaction to problems in the workplace. The second is expected creativity, which necessitates an external requirement but has a more open problem as the starting point; this is the type that is seen in creative

jobs such as advertising. The third type of creativity is entered into voluntarily (i.e., an internal driver) and is based on a closed problem; this contributory creativity can be seen most often as a response and/or initiative to helping others with work-related issues and concerns. Finally, proactive creativity is suggested to evolve from an internal driver and an open problem—the typical "blue sky" creativity or unprompted suggestion that occurs when a person voluntarily chooses to engage in creativity and search for complex problems to solve. In thinking about the other chapters in this book, one could consider entrepreneurship to evolve from either contributory creativity or proactive creativity, because they both involve a self-starting trigger. Whether a particular entrepreneurship activity is based on one or the other would depend on the degree to which the entrepreneur is filling a clear market need (i.e., closed problem, contributory creativity) or opening up a new market (i.e., open problem, proactive creativity). Unsworth (2001) identified some predictors and processes that might differ across these four types of creativity and urged researchers to empirically test the four types separately.

Another conceptualization of types of creativity has recently been suggested, one that is based on the level of creativity found in the outcome (Gilson & Madjar, 2011; Madjar, Greenberg, & Chen, 2011). This conceptualization outlines two levels of creativity—radical (or significant breakthroughs) and incremental (or modifications to existing processes)—and builds on a foundation within the innovation literature, which has long recognized the difference between incremental improvements and radical paradigmatic changes (e.g., Ettlie, Bridges, & O'Keefe, 1984). We believe that differentiating radical and incremental creative outcomes is an important step in our understanding of creativity because it more clearly specifies the construct. In this chapter, however, we focus on the whole process of creativity and suggest that radical and/or incremental creative outcomes could emerge from any of the four creativity types (responsive, expected, contributory, and proactive). As we will discuss later, the likelihood of a radical or incremental outcome may change across the four types, but the possibility always exists. Therefore, we believe it is important that we conceptualize the four types of creativity as theoretically distinct from the two levels of creative outcome. We believe that integrating these four types (Unsworth, 2001) with the two levels of creative outcomes (Madjar et al., 2011) provides a more fine-grained discussion of the creativity process.

Research Differentiating Proactive, Expected, Contributory, and Responsive Creativity

In an attempt to explore empirical evidence and theoretical extensions of Unsworth's (2001) theory, we reviewed articles that cited this research using two databases: Google (resulting in 222 citations) and Scopus (resulting in 87). We organized our review based on the process model of creativity, examining empirical and theoretical evidence regarding the predictors, mediators, moderators, and outcomes of each type of creativity. A detailed review of all the articles is beyond the scope of this chapter; therefore, we discuss general themes and summarize the most relevant research (Table 16.1).

Despite a relatively large number of citations of Unsworth's (2001) article, there has been a lack of empirical testing of the different types of creativity. Notably, many empirical studies have cited Unsworth's research to emphasize the importance of differentiating between the types of creativity and their unique antecedents without embarking on this endeavor themselves (e.g., Suh, Bae, Zhao, Kim, & Arnold, 2010). For example, Perry-Smith (2006) explored the role of networks in regard to creativity and, in an attempt to explain some of the nonsignificant findings, suggested that network centrality may be important for responsive creativity. Others have used Unsworth's framework to discuss the generalizability of their findings for a certain type of creativity, usually based on post hoc conceptualizations. For example, Daniels, Wimalasiri, Cheyne, and Story (2011) suggested that personal initiative both predicts and strengthens the engagement in proactive creativity. Others have built on Unsworth's typology of creativity to extend it to cognate areas. For example, researchers have applied it to the organization level of analysis by proposing various types of organizational creativity (Wise, 2003) and to the person-level by looking at idea management types (incrementalists, consensus builders, searchers, debaters, assessors) based on how people generate, organize, manage, and evaluate their ideas.

To our knowledge, only one study has explicitly examined specific predictors of each type of creativity (Cheng, Wang, Horng, & Huang, 2007). These authors explored the roles of thinking style (adaptor vs. innovator; Kirton, 1976) and of personality (as measured by the Myers-Briggs Type Indicator

Table 16.1 Summary of Reviewed Articles Based on Type of Creativity Investigated[a]

Responsive	Expected	Contributory	Proactive	Undetermined
R&D; specific problem—Cheng, Wang, Horng, & Huang (2007)	*Interior architects/ designers; unspecified problem*—Binnewies & Wörnlein (2011)	*Nurses; specific problem*—Binnewies, Ohly, & Niessen (2008)	*R&D; unspecified problem*—Cheng, Wang, Horng, & Huang (2007)	Azadegan, Bush, & Dooley (2008)
Laboratory study; specific problem—Dane, Baer, Pratt, & Oldham (2011)	*Architects; unspecified problem*—Beeftink, van Eerde, Rutte, & Bertrand (2012)	*R&D; specific problem*—Cheng, Wang, Horng, & Huang (2007)	*Categorized post hoc by authors as proactive*—Daniels, Wimalasiri, Cheyne, & Story (2011)	Backman, Börjesson, & Setterberg (2007)
Engineers; specific problem—Unsworth & Clegg (2010)	*R&D; unspecified problem*—Cheng, Wang, Horng, & Huang (2007)	*Hospital personnel; specific problem*—Coelho, Augusto, & Lages (2011)	*Volvo car engineers/ designers; unspecified problem*—Styhre, Backman, & Börjesson (2005)	Carmeli & Spreitzer (2009)
R&D; specific problem—Young (2011)	*Manufacturing (production planning); unspecified problem*—Ohly & Fritz (2010)	*Service technicians; specific problem ("maintain equipment at customer site")*—Gilson & Shalley (2004)	*Engineers; unspecified problem*—Unsworth & Clegg (2010)	Driver (2008)
	Applied research institution; unspecified problem—Perry-Smith (2006)	*Insurance agents; specific problem*—Sung & Choi (2012)	*Manufacturing branch of a high-tech firm; unspecified problems*—Volmer, Spurk, & Niessen (2012)	Gilson, Mathieu, Shalley, & Ruddy (2005)
	Engineers; unspecific problem—Unsworth & Clegg (2010)	*Engineers; specific problem*—Unsworth & Clegg (2010)	*"Work context where creativity is not explicitly required"; unspecified problem*—Zhou, Hirst, & Shipton (2012)	Kim, Han, & Yoon (2010)
	R&D; unspecified problem—Young (2011)	*Hospital personnel; specific problem (changing services, facilities, etc.)*—Unsworth, Wall, & Carter (2005)		Kim, Hon, & Lee (2010)

(*continued*)

Table 16.1 Continued

Responsive	Expected	Contributory	Proactive	Undetermined
		Supplying application software to industry; specific problem—Zhou, Shin, Brass, Choi, & Zhang (2009)		Kratzer, Leenders, & Van Engelen (2008)
				Litchfield (2008)
				Murphy (2006)
				Prabhu, Sutton, & Sauser (2008)
				Rank, Pace, & Frese (2004)
				West, Kover, & Caruana (2008)

Note. The articles summarized here cited Unsworth's (2001) article; they do not all appear in the reference list of this chapter.

[a] The preliminary categorization of each creativity type is based on (1) the type of industry, in which a driver is either internal or external, and (2) the type of problem, open or closed.

[MBTI]; Myers & McCaulley, 1985) as distinct predictors of each type of creativity. Their predictions were based on differences underlying the ways in which innovators and adaptors approach problems. Innovators tend to generate new ideas and implement novel processes that disrupt the status quo and challenge the existing processes and norms (Kirton, 1976). Conversely, adaptors usually create and bring about changes that fit into the existing system without drastically changing it (Kirton, 1976).

Cheng et al. (2007) found that adaptor-type thinking, which focuses on modifying the existing processes, was important for responsive and contributory creativity, whereas expected and proactive creativity required innovator-type thinking with an unconventional approach to problems. They also demonstrated that different types of creativity were associated with a distinct MBTI profile. In particular, intuition was integral for proactive creativity, sensing was paramount for expected creativity, and judgment and feeling played a role in responsive creativity. Interestingly, the researchers reported the responsive and contributory types of creativity were most frequent: 50% and 30%, respectively, and expected creativity was least frequent (6%). They argued that the findings could be attributed to the nature of their sample: research and development (R&D) project leaders from the Industrial Technology Research Institute (ITRI) of Taiwan. In particular, a lack of adequate funding might explain why researchers were somewhat constrained in initiating responses to "open-ended problems" or why the ITRI was not able to "assign these problems to researchers" (Cheng et al., 2007, p. 218). Despite the uniqueness of the context in which responsive, contributory, expected, and proactive creativity types were examined, this research provides some initial support for the distinctiveness of the four types of creativity.

Categorization of Creativity Types: What Have We Learned?

Although most of the articles that cited Unsworth's (2001) research did not directly measure the four types of creativity, we attempted to categorize their creativity based on Unsworth's proposed dimensions: the nature of the problem and the driver of engagement in creativity. We aimed to identify whether a preliminary "meta-approach" could clarify differences across the various types of creativity. In doing so, we emphasize that our current meta-approach is the first step in trying to categorize creativity types based on the limited information provided by the researchers studying creativity.

We focused only on empirical studies because we categorized each creativity type based on the description of the sample characteristics. In particular, we categorized industries in which research was conducted as (1) those that generally do not require creativity (e.g., nurses, service technicians, insurance clerks), for which employees likely have an internal drive to engage in creativity, and (2) those in which being creative is integral for job success (e.g., interior architects, designers, production planner, R&D employees), for which employees have an external driver (job requirement) to engage in creativity.

Based on the descriptions of the jobs of participants, we categorized problems as *closed* if the required solutions were within the limits of the existing systems and processes (e.g., maintain service equipment at customers' sites; Gilson & Shalley, 2004). We categorized problems as *open* if they required a discovery or if they challenged the system (e.g., engineers were encouraged to discover innovative ideas for new tools and machinery; Ohly & Fritz, 2010). Some research articles confirmed our categorization by explicitly mentioning the type of creativity, usually as the post hoc explanation (e.g., Daniels et al., 2011). Unfortunately, the creativity involved in many studies could not be categorized because of a lack of information regarding the problems and context of the participants. Future research could benefit from collecting more information about the type of creativity to allow for this kind of meta-approach and, in the future, meta-analyses.

Of those that could be categorized, the process revealed that since the publication of Unsworth's (2001) research, all four types of creativity have been explored empirically, with responsive creativity having received somewhat limited attention. Such a scant attention to responsive creativity may be explained by the increasing complexity of the modern workplace, where problems are more open and/or people are expected to take initiative across a variety of work behaviors. Notably, although it appears that responsive creativity may be diminishing in the modern marketplace, the context plays an important role in explaining the prevalence of each type of creativity. Specifically, responsive creativity is predominantly seen in laboratory studies (Unsworth, 2001) and in work environments that are constrained by external

forces (e.g., funding; Cheng et al., 2007). Further, most of the studies examined predictors of creativity and boundary conditions that facilitate or inhibit creative processes. Less empirical attention has been paid to mechanisms underlying each type of creativity, and little or nothing is known about consequences of engaging in a certain type of creativity.

Predictors. When we examined the preliminarily categorized research, we found that different predictors were examined for different types of creativity. A time-lag study showed that a high-quality relationship between leaders and employees (leader–member exchange) was positively related to proactive creativity (Volmer, Spurk, & Niessen, 2012). Personal initiative also proved effective in facilitating proactive creativity (Daniels et al., 2011). Experience-sampling studies demonstrated that positive affect in the morning predicted expected creativity in the afternoon (Binnewies & Wornlein, 2011) and that daily time pressure and daily job control facilitated expected creativity (Ohly & Fritz, 2010). For contributory creativity in teams, it was important to have moderate levels of organizational tenure and frequent interactions with coworkers (Gilson & Shalley, 2004) as well as team knowledge stock and utilization (Sung & Choi, 2012). The social context proved important for contributory creativity, particularly positive customer relationships (Coelho, Augusto, & Lages, 2011) and leader support (Unsworth, Wall, & Carter, 2005). It was shown experimentally that an ability to engage in rational thinking style appeared an important factor for responsive creativity (Dane, Baer, Pratt, & Oldham, 2011).

Moderators.

Similar to the predictors of creativity types, the boundary conditions that either facilitate or inhibit the examined creative processes were different across the types. Specifically, job autonomy strengthened the positive impact of leader–member exchange on proactive creativity (Volmer et al., 2012). The characteristics of one's network (e.g., centrality, number of peripheral ties) amplified the positive impact of networks on expected creativity (Perry-Smith, 2006). Job control proved to be a useful strategy for both expected and contributory creativity, and expected creativity was highest for medium levels of time pressure and high levels of job control (Binnewies & Wornlein, 2011). For contributory creativity, high levels of job control appeared to be particularly important for older employees (Binnewies, Ohly, & Niessen, 2008). A moderate number of weak ties (not too many, not too few) was positively related to contributory creativity; it was stronger for people with low levels of conformity values (Zhou, Shin, Brass, Choi, & Zhang, 2009).

Mediators. Only a handful of studies explored the mechanisms underlying each type of creativity. In particular, creative requirement fully mediated the links between leader support and contributory creativity and between role requirements and contributory creativity (Unsworth et al., 2005). Perceived organizational support explained why organizational justice was related positively to expected and responsive creativity (Young, 2012). Daily time pressure and job control were related to expected creativity because these job demands were appraised as challenge stressors (Ohly & Fritz, 2010). The reason why certain weak ties were important for expected creativity was because these types of networks provided non-redundant information and background heterogeneity, which are critical for solving open problems (Perry-Smith, 2006). Creative self-efficacy explained the relationship between problem solving demand and proactive creativity (Zhou, Hirst, & Shipton, 2012).

Despite the informative nature of these studies, a notable limitation is that they do not explicitly measure each type of creativity: We needed to preliminarily categorize them in a post hoc fashion, and, given the lack of information provided, there might be some errors in our categorization. Further, these findings are somewhat disjointed in that they do not offer theoretical explanations as to why certain personal and situational factors play a key role for each type of creativity. Is it that these particular factors are more theoretically plausible for only one particular type of creativity, and that is why they have only been looked at separately? Or is the need for new theoretical contributions that is inherent in our publishing system driving us to continually look for different factors such that we do not explore the generalizability of the findings of one type to other types of creativity?

In this chapter, we attempt to address this gap by further developing a theory of creativity types. We draw on the original theory by Unsworth (2001) and integrate it with recent empirical findings as well as recent conceptualizations of creativity outcome types such as radical and incremental creativity (Gilson & Madjar, 2011; Madjar et al., 2011).

Updated Theory of Creativity Types

In extending the theory concerning types of creativity, we first delineate what we mean by types of creativity and where there might be differences. In the original Unsworth (2001) article, creativity types were differentiated on the basis of the starting point at which the person engaged in creative action. There were internal or external drivers and either open or closed problems; factors were identified that were proposed to affect the creativity types differentially. However, a more nuanced consideration of this starting point and the entire creative process would be one that differentiates between the actual situation, the perception of the situation, the engagement in creativity, and the outcome of the creative process.

For example, depending on personal and contextual differences, a task may be perceived as a closed problem or an open problem by different people. An employee may identify an open problem to solve, and that employee's supervisor may expect creative solutions, but the employee might decide not to engage in the creative process and instead generate a routine solution. One employee might continue through the creative process successfully, whereas another might give up in the middle of the process. Finally, regardless of initial creativity type, one employee might generate a radical creative outcome, whereas another might generate an incremental creative outcome. Thus, we propose that a theory of creativity types needs to consider factors that, for each of the four creativity types, affect (1) the perception of the situation; (2) the engagement in the creative process; (3) the completion of the creative process; and (4) the level of creativity of the outcome of the entire process. Throughout this chapter, we draw on a person × situation interaction (see Woodman, Sawyer, & Griffin, 1993) in an attempt to describe this creativity process.

We also propose that the theory of creativity should take into consideration the dynamic nature of creative processes. In particular, the four types of creativity may be associated with either positive consequences (e.g., praise, recognition, public acceptance of creative suggestions and improvements) or negative consequences (e.g., resistance to creative changes, hostile attitudes toward creators that challenge the status quo). Further, across the types of creativity, the extent to which these consequences are positive or negative will depend on the characteristics of creators such as gender, because being creative is more stereotype-inconsistent behavior for women than for men (Luksyte, Unsworth, & Avery, 2012). We argue that these differential outcomes can be amplified depending on the creativity type, with proactive creativity receiving the most negative consequences for women. As discussed later, initiators of creative processes are likely to appraise the consequences of their creative actions before embarking on new creative endeavors; for this reason, the creative process is likely to evolve in cyclical loops, wherein the consequences affect perceptions and engagement for future creativity.

We will now discuss these different stages of the creativity process and develop models of factors that influence the stages for each of the four creativity types. Our discussion unfolds sequentially, starting from the perception of the situation as the creativity driver and ending with arguments about the consequences of creativity. Throughout the discussion of the creativity process for the four creativity types, we will elaborate on the dynamic and cyclical nature of each building block of the creativity process.

Perceiving the Situation as Drivers of Creativity Types

It is well understood in psychology and organizational behavior that the situation must be interpreted by employees before they act on it, and that these perceptions are different for different people (e.g., Banks & Krajicek, 1991). Similar to Ford's (1996) conceptualization of sensemaking in creativity, we propose that a situation that presents a problem may be interpreted as either a closed or an open problem by people with different traits in various situations. For example, a supervisor who comments that "It would be great if you could fix this website" might be interpreted by one subordinate (who is, for example, high on prevention orientation) as an order to fix the specific problem that the supervisor is referring to (leading to responsive creativity) but by another (who is, for example, highly proactive) as an order to fix the entire back end of the website (resulting in expected creativity). Similarly, the level of perceived external requirement may differ. For one subordinate (who is, for example, high on learning orientation), the supervisor's comment may be seen as a wish list and not a direct order (leading to contributory creativity), whereas for another (who is, for example, high on conscientiousness) it might be perceived as something that needs to be done (resulting in responsive creativity).

What brings about different perceptions of drivers, and does it matter? Theoretically, these

factors are important to identify because they direct the type of creativity that will be engaged in. Researchers often identify traits, mental schemata (e.g., Banks & Krajicek, 1991; Button, Mathieu, & Zajac, 1996; Prentice, 1958), and social factors such as others' views (Salancik & Pfeffer, 1978) as factors affecting perception. We suggest that these will also affect whether a person sees a particular situation as an open or a closed problem and whether he or she perceives an external requirement to address the problem creatively.

Importantly, and consistent with our notion of the creativity process as dynamic and cyclical, we propose that reinforcement from the outcome of a previous engagement in a particular creativity type is likely to affect the perception of a situation. This may lead to perceiving the current situation as the same as in past attempts or perceiving it as a different situation from that perceived in previous efforts. For the first scenario, if a previous creativity attempt had positive outcomes and was viewed favorably by the affected parties (e.g., coworkers), the perception of the situation will be reinforced and is likely to be repeated. For the second scenario, if engagement in a previous creativity attempt received a negative response from a supervisor or colleagues, then it is likely that the individual would perceive the currently situation differently (e.g., as a closed rather than an open problem) and engage in a different type of creativity (e.g., responsive rather than expected creativity).

In summary, we propose that traits, cognitive schemata, social pressures, and reinforcement of previous perceptions through outcomes and normative responses will affect the degree to which a particular situation is perceived to include creative requirements and the openness of the problem.

Engaging in Different Creativity Types

The previous discussion suggests that employees personally determine the degree to which they are required (or not required) to generate a creative response to a potential problem and the degree to which the problem is open or closed. Now, they need to actually start being creative. Although they did not differentiate across types, Unsworth and Clegg (2010) found that engagement in creativity was separate from the creative outcome. We build on their findings to explore when an employee might engage in responsive, proactive, expected, or contributory creativity.

Unsworth and Clegg (2010) identified expectancy and instrumentality as the key constructs underlying engagement in creativity. Expectancy was defined as the amount of imagined effort required to get a creative outcome; if the imagined task was very difficult, then a person would be less likely to engage in creativity. Instrumentality was defined as the imagined consequences that would emerge from the future outcome; people would not engage in creativity if they anticipated negative or non-positive consequences. Unsworth and Clegg found that five general factors led to engagement in creative action: general work motivation, creative requirement (both internal and external), cultural support, time and resources, and imagined positive or negative consequences. We will now explore the degree to which each of these factors (i.e., expectancy and instrumentality) is relevant to the four creativity types. (Table 16.2 summarizes these influences.) In this discussion, we will look not only at the mean differences (e.g., whether one creativity type requires higher or lower levels of expectancy and instrumentality) but also at the differences in variation (e.g., whether one creativity type is always related to a high or low level of expectancy and instrumentality or whether the relationship varies).

The Role of Expectancy for Creativity Types

Based on the definition of expectancy, responsive creativity is likely to have a relatively high level of expectancy: The effort is required, and the problem is contained and therefore, most likely, will be more easily resourced. This high level of perceived expectancy is unlikely to change much across people and will remain relatively constant due to the situational pressures (Mischel, 1977). As such, we propose that expectancy will be high but will have only a weak relationship with engagement in the responsive creative process due to low variance.

Similar to responsive creativity, expected creativity will have high levels of expectancy because being creative is considered a core job requirement. Contrary to responsive creativity, there will be more variance in engagement in expected creativity due to the open nature of the problem. Although employees are expected to be creative, the extent of their creativity is not specified—for example, they can take either an adaption approach (incremental) or an innovation approach (radical). The resources and cultural support for creatively solving an open problem may be more variable than for a closed problem (as in responsive creativity) because of the greater uncertainty and risk associated with solving

Table 16.2 Summary of Mechanisms and Factors Affecting the Types of Creativity

	Responsive	Expected	Contributory	Proactive
1. Engagement				
Expectancy	High level; weak relationship (constant support, resources, work motivation)	High level; moderate relationship (variable support)	Variable level; moderate-to-strong relationship (constant support, variable resources)	Low level; strong relationship (variable resources, motivation, support)
Instrumentality	High level; weak relationship (constant support)	High level; moderate relationship (variable support)	Variable level; moderate-to-weak relationship (constant support)	Low level; strong relationship (variable support)
2. Successful Completion of Processes				
Role	In-role, so task motivation may substitute for creative motivation	In-role, so task motivation may substitute for creative motivation	Extra-role, so creative motivation	Extra-role, so creative motivation
Focus	Narrow, so negative affect, time pressure, and rewards are positive	Broad, so positive affect is positive, time pressure and rewards are negative	Narrow, so negative affect, time pressure, and rewards are positive	Broad, so positive affect is positive, time pressure and rewards are negative
Challenge or hindrance orientation	Hindrance orientation	Depends on person × situation	Depends on person × situation	Challenge orientation
3. Level of Creativity in Outcome				
Risk	Low (limited alternatives and expected)	Moderate (lots of alternatives but expected)	Moderate (limited alternatives but unexpected)	High (lots of alternatives and unexpected)
Radical or incremental	Dependent on radicalness required by problem	Dependent on radicalness required by problem	Dependent on support for creativity	Dependent on support for creativity and creative self-efficacy

open problems. Thus, we propose that expectancy will be relatively high for expected creativity and will have a moderate relationship with engagement in the expected creativity depending on resources and cultural support.

Contributory and proactive creativity, on the other hand, are likely to have a much more variable level of expectancy. Generally, we expect that the mean level of expectancy will be lower for these types than for responsive creativity; however, there likely will sometimes be situations of high and sometimes situations of low expectancy. We suggest, though, that the factors creating this variance in expectancy are different for contributory and proactive creativity types. Contributory creativity is often engaged in to help other people solve a particular problem; given that the problem is clearly stated and the scope is generally small, there will likely be high support for engaging in the contributory creative process. However, the level of general work motivation will differ across people, and the time and resources they have available to engage in creatively solving a problem outside their own task requirements will differ. Thus, we propose that expectancy will have a moderate to strong relationship with engagement in the contributory creative process depending on work motivation and personal resources.

Proactive creativity is similar to contributory creativity; most notably, there is likely to be a high level of variation in general work motivation and in available time and resources. A person who is not motivated and who is under time pressure is much less likely to engage in proactive creativity than a person who is motivated and/or has time. In addition, however, engaging in proactive creativity may or may not affect other people. A problem that will impact others is more likely to have a low level of expectancy, because it will be more difficult to get to an outcome (Oreg, Vakola, & Armenakis, 2011); therefore, there will be less likelihood of engagement. Proactive creativity for a problem that does not affect anybody other than the employee will probably require less "selling" and less evaluation and therefore will have higher levels of engagement. In addition, the perceived expectancy for proactive creativity will depend highly on a personal level of creative self-efficacy. Specifically, employees who believe they can be creative are more likely to engage in proactive creativity than employees who do not believe in their creative potential (e.g., Zhou et al., 2012). Thus, in addition to the five general factors identified by Unsworth and Clegg (2010), creative self-efficacy may be useful in increasing expectancy for proactive creativity. Given this high level of variation of expectancy both from external and internal sources for proactive creativity, we suggest that expectancy will have a strong relationship with engagement in proactive creativity and will depend not only on work motivation and personal resources but also on the degree to which the problem affects others and the degree of creative self-efficacy.

The Role of Instrumentality for Creativity Types

Instrumentality, as discussed by Unsworth and Clegg (2010), is a perception of the potential consequences of the action. These are consequences that are imagined by the employee when he or she is deciding (consciously or unconsciously) whether to engage in the creative process. Consistent with our notion about the cyclical nature of creative processes, these imagined consequences are likely to be informed by actual consequences that occurred to the or to his or her colleagues in previous creativity experiences, as well as forward projections of the current cultural support for creativity.

Similar to perceptions of expectancy, it is likely that there will be low levels of variance of instrumentality in responsive creativity: The outcome is anticipated, the uncertainty is small due to the closed nature of the problem, and therefore the employee is unlikely to imagine that any negative outcomes would emerge. There might be some variation in perceived positive outcomes; however, given that this creativity type is akin to task performance, instrumentality will likely be positive. We therefore propose that instrumentality is unlikely to be strongly related to engagement in responsive creativity processes due to low variance. Most responsive creativity attempts will lead to generally positive outcomes for the employee.

For expected creativity, there may be some variation (either positive or negative) in outcomes depending on the level of the creative outcome. Specifically, if the problem is solved radically (not just by incrementally adapting existing procedures), the imagined outcomes may be negative (or not uniquely positive) because of jealousy or competition for scarce resources (presumably, those who generate radical creativity receive more and better resources). Further, expected creativity likely affects others in the organization because of the high situational demands to be creative. Given that people often resist such changes (Oreg, 2003; Oreg et al., 2011), we argue that the imagined outcomes for expected creativity with an intended radical outcome will most often be negative. Overall, therefore, we suggest that instrumentality will be lower than that of responsive creativity, and that variation in instrumentality will depend mostly on the level of creativity of the intended outcome.

For contributory creativity, the outcomes may be imagined as either positive or negative for the employee. We suggest that the valence of these imagined outcomes depends on who engages in this type of creativity. Contributory creativity is voluntary, and research shows that there are differences in how volitional work behaviors (e.g., organizational citizenship behaviors; Heilman & Chen, 2005) are viewed and appraised for men and women. Thus, we suggest that gender may play a role in instrumentality for contributory creativity. In particular, women who in the past have engaged in this type of creativity would likely have been ignored or not appraised positively because being helpful is stereotypically a female type of behavior (Allen, 2006; Heilman & Chen, 2005). Notably, some helping behaviors (e.g., civic virtue, sportsmanship) are considered to be stereotypically masculine because they require agentic characteristics such as assertiveness (Allen, 2006; Heilman & Chen, 2005).

Accordingly, we argue that helping employees to perform creatively may be viewed as stereotypically masculine behavior (Luksyte et al., 2012). Thus, in addition to being ignored for being helpful (stereotypically feminine behavior), women who engage in contributory creativity may be appraised negatively as they violate gender stereotypes by assisting with creativity-required solutions.

Based on such unfavorable responses to contributory creativity displayed by women, women will be less likely to engage in contributory creativity than men, who are not stereotypically expected to be helpful and thus are likely to have been celebrated when they engaged in contributory creativity in the past (Heilman & Chen, 2005). Furthermore, the organizational culture may play a role in the imagined consequences of contributory creativity: If the culture emphasizes compliance, then contributory creativity may violate these cultural norms and incur negative outcomes. Thus, we propose that if employees believe that their attempts to help another person by being creative (i.e., contributory creativity) will be viewed negatively, either because of their gender or because of the culture, then they will not engage in that form of creativity.

Finally, previous proactive creativity attempts could lead to extremes of both positive and negative outcomes. Proactive creativity will usually produce unexpected outcomes, and these might be lauded or denigrated. We suggest that, as with contributory creativity, the extent to which these outcomes are viewed positively or negatively may depend on the gender of the person who engages in proactive creativity (Heilman & Chen, 2005). In contrast to contributory creativity, women who engaged in proactive creativity in the past may have violated stereotypical norms about how they should behave (e.g., being warm and nice, not challenging the status quo; Eagly, 2004). Thus, they may have experienced negative consequences (Luksyte, Unsworth, & Avery, 2012) and may be unlikely to engage in another proactive creativity attempt. Moreover, following our reasoning for contributory creativity, the level of cultural support for creativity, as well as awareness of differential appraisal and treatment of actors of proactive creativity, will also be imperative for engagement in the proactive creativity processes. Therefore, given the potential for such a wide variation of possible outcomes, we propose that perceived instrumentality will play a strong role in engagement in proactive creativity.

Successfully Completing the Creative Processes of Different Creativity Types

Once an employee is engaged in a particular creativity type, she or he needs to successfully negotiate the various processes involved in generating and implementing a creative idea (Zhang & Bartol, 2010). These processes include preparation, response generation, response validation, and communication (Amabile, 1983, 1996). If an employee does not complete one of these processes, then a creative outcome will not occur. At this point, we are not discussing the level of the creative outcome (i.e., whether a radical or an incremental idea was generated); instead, we focus on the factors that lead to an employee's getting through the process. This is the fundamental prerequisite for any creative outcome. Moreover, we suggest that the factors that affect the successful completion of these processes will differ depending on the type of creativity underway.

In particular, we highlight mechanisms that we believe will influence the successful completion of the creative process types in different ways. These mechanisms and their levels for the different creativity types are outlined in Table 16.2. The first mechanism is whether the creativity in question is viewed as an in-role or an extra-role behavior, with responsive and expected creativity representing in-role behaviors and contributory and proactive creativity representing extra-role behaviors. The second mechanism pertains to the breadth of focus required for successful completion of the creative processes. The third mechanism relates to the degree to which the context of the creativity type induces a challenge orientation or a hindrance orientation that affects the perception of wider stressors in the job. We will now explore each of these mechanisms and how it affects the successful completion of the creative processes involved in the various creativity types.

Conceptualizing Creativity Types as In-Role or Extra-Role Behaviors

Responsive and expected creativity are akin to in-role performance because they are an expected and required part of the job role of employees (Griffin, Neal, & Parker, 2007) or, in the case of experimental design, part of the experiment role of participants. However, this differentiation between in-role and extra-role behaviors also leads to an interesting differentiation in the motivation of employees. Intrinsic task motivation has

generally been considered the key to creativity (Amabile, 1983, 1996), but in many cases, this has been examined using creative tasks such as painting, creative writing, or R&D (e.g., Amabile, 1985; Amabile & Gryskiewicz, 1987; Koestner, Ryan, Bernieri, & Holt, 1984). Thus, is it motivation for the task (regardless of whether the task is creative) or motivation for a creative task that is important? Indeed, the items used to measure intrinsic motivation appear to focus on motivation to be creative: "I enjoy finding solutions to complex problems"; "I enjoy creating new procedures for work tasks"; "I enjoy improving existing processes or products" (Tierney, Farmer, & Graen, 1999; Zhang & Bartol, 2010). Thus, we propose that in order to more fully understand the differential predictors of creativity types, we also need to differentiate between motivation for the task and motivation to be creative.

Given the in-role nature of responsive and expected creativity, we believe that motivation for the task will be important for successful completion. Indeed, we suggest that it may not only supplement motivation to be creative but also act as a substitute for it if such creative motivation does not exist within the employee. When employees have high task motivation, they will move through the processes that represent the task, even if they do not have creative motivation. Therefore, factors that are related to job motivation, such as job design, leadership, and self-efficacy (e.g., Porter, Bigley, & Steers, 2003), are likely to affect successful completion of responsive and expected creativity processes.

In contrast to responsive and expected creativity, contributory and proactive creativity may be viewed as extra-role behaviors. We therefore suggest that the nature of motivation that is required for completion of these types of creativity is different from that of responsive and expected creativity processes. Given the discretionary and internally driven nature of contributory and proactive creativity, we argue that motivation to be creative is the main force, rather than general work motivation. Unlike responsive and expected creativity, there is no external requirement to complete these processes, and in some cases, the creativity may be only tangentially related to the job. Thus, intrinsic motivation to be creative will hold for contributory and proactive creativity, and motivation for the task will have a much weaker effect on successful completion of contributory and proactive creativity.

The Role of Broad and Narrow Focus in Completion of Creativity Types

Second, a narrow focus on only one or two particular aspects of one's working memory will produce greater attention and concentration on the task (Oberauer & Hein, 2012); as such, it will be useful for closed problems. Given this, we propose that a narrow focus will be more helpful for completing the responsive and contributory creativity processes than a broad focus. Alternatively, we argue that a broad focus is required to generate a wide range of ideas and evaluate them honestly (Fredrickson, 1998, 2001, 2004). Accordingly, factors related to a broad focus will lead to more successful completion of expected and proactive creativity, and processes and factors linked to narrowing that focus will have a negative effect. Indeed, Cheng et al. (2007) supported this premise by showing that adaptive, narrow thinking was related to responsive and contributory creativity (closed problems) but that innovator-oriented and broad thinking was related to expected and proactive creativity (open problems).

Negative moods have been shown to help an individual to converge and have a narrow focus (e.g., Derryberry & Reed, 1998; Schwarz & Bless, 1991), and dual-pathway models of creativity suggest that negative moods help to signal the existence of a problem (De Dreu, Baas, & Nijstad, 2008; George & Zhou, 2002). Therefore, negative moods should aid in the successful completion of creativity processes concerning closed problems (i.e., responsive and contributory creativity). Alternatively, positive emotions broaden people's attention, thinking, and focus (De Dreu et al., 2008; Fredricksen & Branigan, 2005; George & Zhou, 2002) and have been linked to creativity outcomes (e.g., Isen, Daubman, & Nowicki, 1987), particularly expected creativity (Binnewies & Wornlein, 2011). Thus, we propose that positive affect will aid the completion of processes involving open problems (i.e., expected and proactive creativity).[1]

Two other factors that help to narrow focus and attention are rewards and time pressure. First, even though the role of rewards in creativity is somewhat controversial, we believe that in the case of responsive and contributory creativity, rewards will narrow the focus to achieve the goal/reward and will signal competence (Eisenberger, Pierce, & Cameron, 1999; Eisenberger & Shanock, 2003), which has been shown to have positive effects (Deci, Koestner, & Ryan, 1999). On the other hand, for

expected and proactive creativity, which require a broad focus, rewards should have the traditionally negative relationship with successful completion because the employee is more likely to be focused on achieving the goal rather than necessarily being open to other ideas (e.g., Amabile, Hennessey, & Grossman, 1986). Second, time pressure has been found to have both positive and negative effects on creativity, and a number of reasons have been proposed to explain this result (Baer & Oldham, 2006; Byron, Khazanchi, & Nazarian, 2010; Janssen, 2000). We argue that another cause for the mixed findings could be that the studies have not differentiated across creativity types. Specifically, we suggest that time pressure will have a positive effect on responsive and contributory creativity processes because of the narrowing of attention and concentration of focus on the task at hand that comes from time pressure, but time pressure will have a negative effect on expected and proactive creativity because of their need for a broad focus.

The Role of Challenge and Hindrance Orientation for Completion of Creativity Types

Finally, we expect that the drivers of the creativity themselves will alter the extent to which particular aspects of the work environment are interpreted and, thus, how they affect the successful completion of the creativity process and other outcomes. For example, daily hassles can be viewed as either a challenge or a hindrance (LePine, Podsakoff, & LePine, 2005), with the former referring to appraising factors as motivating, invigorating, and promoting goal achievement and the latter describing the same factors as detracting from goal achievement and interfering with completion of one's performance (LePine et al., 2005). We propose that, when an employee is engaged in the process of responsive and contributory creativity, the narrow mindset associated with a closed problem will cause the employee to view daily hassles as a hindrance because they interfere with task completion—integral components of closed problems. Conversely, daily work hassles and the characteristics of one's job are more likely to be viewed as challenging for expected and proactive creativity because the employee is dealing with an open problem and thus adopts a more open mindset toward the issue at hand (Fredrickson, 1998, 2001, 2004).

Yet, the internally or externally driven nature of the creativity type will also affect the perception of daily hassles. When employees are externally driven (i.e., responsive or expected creativity), daily hassles that prevent them from completing a task or achieving a goal will be viewed as hindrances rather than challenges. But when employees are internally driven (i.e., proactive and contributory creativity), daily hassles are likely to be perceived as a challenging situation (LePine et al., 2005). Overall, therefore, a person engaged in responsive creativity processes, with a closed problem and externally driven, will likely have a hindrance orientation. Alternatively, a person engaged in proactive creativity processes, with an open problem and internally driven, will have a challenge orientation toward daily hassles.

Interestingly, when considering hindrance and challenge orientations for expected and contributory creativity, we have two opposing propositions. On the one hand, expected creativity will create a challenge orientation because of the open nature of the problem. On the other hand, it may also invoke a hindrance orientation because of the externality of the driver. Similarly, contributory creativity will create a challenge orientation because it is internally driven but may create a hindrance orientation through the closed nature of the problem. Drawing on the interactionist approach, we propose that situational and personal factors will interact when a person is engaged in expected or contributory creativity, so that one or the other of these factors (problem versus driver) will become more salient than the other. Whichever factor is salient will become the predominant proposition. For example, a learning goal orientation or a transformational leader may make the open problem salient within expected creativity, whereas a performance orientation or a transactional leader may make the closed problem salient within contributory creativity. Or, a high level of openness to experience, job autonomy (as found by Ohly & Fritz, 2010) and positive relationships (as demonstrated by Coelho et al., 2011; Unsworth & Clegg, 2010) may emphasize the internal driver in contributory creativity, whereas the opposite combination of factors may highlight the importance of the external driver in expected creativity.

These challenge and hindrance appraisals will then likely affect the potential stressfulness of the creativity process and the overall likelihood of completing the creativity process. Those who have a challenge orientation will be more persistent in overcoming possible obstacles along the way and may take a broader view of these obstacles as factors that are integral for creative solutions, but a

hindrance orientation will lead to increased stress and decreased persistence during the process (LePine et al., 2005).

To summarize, we identified and explored three key mechanisms underlying the successful completion of each type of creativity: (1) whether each type is akin to in-role or extra-role behaviors, (2) whether people adopt a broad or narrow focus when engaging in each type of creativity, and (3) whether daily hassles that accompany any creativity processes are viewed as a challenge or a hindrance. This undoubtedly creates a complexity to studying each type; yet, it also adds a fine-grained discussion of the creativity processes depending on how people are driven to solve what type of problems.

Being Radically or Incrementally Creative Across Different Creativity Types

So far we have looked at three sets of factors: (1) those affecting perception of the situation, (2) those influencing engagement in the creative processes, and (3) those critical for successful completion of the creative process. But anybody who has ever engaged in a creative endeavor knows that getting a creative outcome does not necessarily indicate the degree of creativity inherent in that outcome. Successful completion of the creative process is a necessary condition of high creativity but may also result in moderate to low levels of creativity. In this section, we discuss some of the factors that generate either a radical outcome (high creativity or total revamping of the processes) or an incremental outcome (low creativity or improvements to the existing systems) within each creativity type.

We suggest that the four creativity types do not directly lead to differences in levels of creative outcome. However, we argue that there may be different levels of variation in the creativity types regarding the degree of spread of outcome and that there may be different factors for each of these types that affect the level of creative outcome. In particular, we argue that there are different levels of risk involved for radical versus incremental creativity, but those risks are not evenly spread across the four creativity types. In particular, responsive creativity has much less risk associated with it than the other three types do, because it is based on a well-defined problem and the outcome is expected by others. Contributory creativity has slightly more risk due to the voluntary, extra-role nature of the contribution, but it is also based on a well-defined problem. Expected creativity is anticipated by others, but the openness of the problem means that the outcome may be risky because it may not fit the others' expectations. Finally, proactive creativity leads to the riskiest outcome because it is neither expected by others nor well defined. We will now discuss the factors that we believe might influence or be affected by these differing risk levels across the four creativity types.

Throughout the discussions of responsive creativity we have focused on its core task performance-oriented aspect. Given this, we propose that the key factor involved in the level of creative outcome for responsive creativity is the problem that was originally set. An employee who generates a radically creative idea for a problem that required only an incremental solution would not be performing well. Alternatively, if the problem required a radical solution, then good performance would indicate generation of a radical idea rather than an incremental improvement. The variation that occurs in the level of creativity in the creative outcome will come predominantly from the original intention of the set problem. Once the issue of the problem requirements has been addressed, the factor leading to the level of creative outcome becomes a simple one involving aspects leading to good performance. As long as the employee is solving the required problem at the requested level, there is low risk; therefore, the level of creative outcome depends on performance issues such as general work motivation and leadership.

Likewise, the level of radicalness in the contributory creativity outcome is likely to be driven by the problem at hand, given its closed nature. However, the voluntary nature of contributory creativity means that deviations from the problem may not be perceived negatively because they do not indicate poor performance. Alternatively, there is some risk involved: The contribution may not be welcomed or may be resisted by others because this type of creativity is driven by employees' internal desire and personal aspirations rather than situational demands. Thus, factors leading to more radical contributory creativity outcomes may be related to the degree to which the employee strives to be radically creative, the support provided, and the organization culture.

The other two types of creativity, expected and proactive, are much less likely to be driven directly by the problem because of their open nature; therefore, a wider variation in creativity levels will be seen. Moreover, both expected and proactive creativity potentially contain a high level of

risk because of this openness. Consequently, both expected and proactive creativity have a greater likelihood than responsive or contributory creativity of resulting in radical breakthroughs because they are not restricted by the problem itself. Yet, the level of radicalness may be either amplified or inhibited by the extent to which being radical is an external demand (expected) or an internal desire (proactive). This prediction is consistent with Madjar et al.'s (2011) research about the importance of willingness to take risks for radical creativity. For expected creativity, this willingness stems from external drivers, whereas people engage in proactive creativity because they are internally motivated to do so. Thus, for expected creativity, the degree to which the outcome is radical may be strongly influenced by others' desires and support for a radical outcome. For proactive creativity, the degree to which the outcome is radical may be substantially affected by an intrinsic motivation to be creative.

This creates an interesting paradox for initiators and recipients of creativity. From the observers' (e.g., supervisors, peers) perspective, radical breakthroughs created by expected creativity are more likely to be viewed positively because they are, to some extent, anticipated. Conversely, radical outcomes generated by proactive creativity are not expected and, as such, are likely to create a wider range of responses (not necessarily positive) than radical breakthroughs created by expected creativity. For the actors producing radical breakthroughs, though, it may be more stressful and taxing when they are expected to be radically innovative (expected) than when these outcomes are personally sought and driven (proactive). Thus, creative self-efficacy, risk-taking, and cultural support for radical outcomes will all be important predictors of the level of outcome of proactive creativity but, though still relevant, will be less critical for expected creativity.

Finally, we propose that the drivers of the creativity (internal or external) will also affect the outcome through an attribution process (Nisbett, Caputo, Legant, & Maracek, 1973). We suggest that when employees engage in contributory or proactive creativity, they are more likely to produce radical outcomes because of cognitive dissonance: Because they freely chose to engage in creativity, they will want to produce a highly creative outcome. Conversely, employees who engage in responsive or expected creativity can attribute their engagement in creativity to external forces, and the subsequent extrinsic motivation may reduce the ultimate level of creativity in the produced outcome (see Deci, Egharri, Patrick, & Leone, 1994; Gagne & Deci, 2005; Ryan & Deci, 2000).

To sum up, integrating the recent conceptualizations of creativity as radical breakthroughs and incremental improvements with the four types of creativity, we propose that the extent to which creativity is either radical or incremental likely varies across each type. In particular, for both responsive and contributory creativity, the degree of radicalness is likely to be driven by the closed problem itself, which can call for either radical or incremental solutions. For expected creativity, the broader support for creativity will influence whether a creative solution is radical or incremental. The situation is somewhat different for proactive creativity, wherein the radicalness is driven by employees' individual difference factors such as their intrinsic motivation, personality, and needs. In this regard, proactive creativity has the potential to generate the most radical outcomes because it is a discretionary behavior directed at solving open problems. Because radical and incremental creativity likely generate various responses from recipients of the creativity, we now turn into examining those potential consequences and exploring how they differ or are similar across the four creativity types.

Consequences of Outcomes of Different Creativity Types and Feedback Loops

What happens after the creative outcome has been produced? Surprisingly, most theories and empirical tests of creativity have not examined the consequences of creativity (with some notable exceptions, including Janssen, 2003, 2004; Luksyte et al., 2012; Post, DiTomaso, Lowe, Farris, & Clordero, 2009). Further, the research has paid virtually no attention to the consequences of various types of creativity in a systematic way, wherein the consequences of each type of creativity are explored in the same study. As noted earlier, based on the work of Luksyte et al. (2012), we propose that these consequences will differ depending on the type of creativity and the gender of the creator. Because responsive and expected creativity are required, they may be viewed positively as long as they fit the criteria of the initial requirements, regardless of whether the creator is a man or a woman. However, a woman producing a contributory creative outcome may be seen as fitting gender stereotype by helping a colleague (which may not be recognized), and a woman engaging in proactive creativity may

be proactively violating gender stereotype (Eagly, 2004; Heilman & Chen, 2005). We suggest that the reaction to contributory and proactive creativity will further depend on the level of radicalness of the outcome: Radical consequences will produce negative reactions for women, but radical outcomes from proactive creativity may be rewarded for men as being indicative of the gender stereotype (Luksyte et al., 2012).

We discussed earlier the notion that engaging in different types of creativity depends on the employee's perception of instrumentality, which is partly based on the consequences of previous engagement in that creativity type. We therefore highlight this feedback loop emerging from the consequences of creativity. Given the dearth of research in this area, it appears to be a fruitful and necessary domain of study.

Discussion

In this chapter, we developed an updated theory of creativity types based on Unsworth's (2001) conceptualization of types of creativity according to the nature of the problem and the engagement in creativity driver. Viewing creativity as a process, we discussed the uniqueness of each creativity type based on the importance of each building block of the creativity process for responsive, contributory, expected, and proactive creativity. Although there are some similarities across the different types, we also made opposing hypotheses for different types of creativity (see Table 16.2). We believe that these differences may underlie some of the confusion in creativity research and the prevalence of mixed findings. Unfortunately, the publishing culture in our field means that we often do not see nonsignificant findings or results that do not "fit" existing theory. We hope that this updated theory will encourage publishing of more contrasting or nonsignificant findings, which will enrich our understanding of creativity types.

As we noted in our review of the existing literature, we urge researchers to explore the different types of creativity within a single study. This will allow us to understand specifically the differences between the types. If this is not possible, we at least encourage authors to provide more information about the creativity type they are studying. If enough of such information is published, it would be possible to develop a meta-analysis that would allow us to draw more definite conclusions about the different types.

Of course, we do not believe that this is the end of the theorizing about creativity types. For example, Unsworth and Clegg (2010) found that engagement in creativity could result from both intrinsic and extrinsic motivation at the same time. This raises an interesting question for creativity types in terms of the distinctness of the drivers and the categories: Could there be a combination of drivers, and would that mean that there are further distinctions and subtypes within the four types? Self-determination theory has recently identified not only linear combinations of intrinsic and extrinsic motivation (e.g., introjected, identified, and integrated; Ryan & Deci, 2000) but also profiles that include both intrinsic and extrinsic motivation (e.g., Hayenga & Corpus, 2010), which may help us to explore similar creativity profiles. For example, an internally driven creativity such as proactive or contributory creativity may have elements of external drivers if it is lauded and reinforced externally (e.g., praise, recognition, acquiring expert status). Alternatively, could there be a primary internal or external driver that creates the type of creativity and then secondary drivers that affect the motivation, perceptions, appraisals, and processes of the creativity type? Or, consistent with our arguments about the dynamic nature of creativity, could it be that the type of creativity can metamorphose depending on the interplay of internal and external drivers? For example, creativity may be initiated externally (as in cases of responsive and expected creativity), but over time, given positive feedback from others and/or personal preferences (e.g., learning orientation), this type of creativity may be internalized and continued as either contributory or proactive creativity. Many more such questions exist for creativity types, and we hope that the theorizing and research in this area continues.

Furthermore, it would be interesting to examine whether these differences in creativity types extend to their implementation, so as to result in "innovation types" and "entrepreneurial types." We propose that there would be differences across innovation and entrepreneurial types and that the implementation of the creativity types would be different. For example, responsive creativity would be much easier to implement and turn into an innovation than proactive creativity, because there would be less resistance and greater resources. The proactive entrepreneurial type may require more selling but may attract more funding than a more traditional contributory entrepreneurial type, given the openness of the original problem. Much more research is required to determine whether such innovation types do truly exist.

Measurement Challenges

This updated theory of creativity types not only poses further theoretical intricacies; it also calls for further measurement challenges for researchers striving to empirically test the theoretical propositions put forth in this chapter. How can we explore the uniqueness of responsive, contributory, expected, and proactive creativity processes in one study? How can we discover different antecedents and boundary factors for each of these creativity types? Considering the complexity underlying each creativity type along the creativity process, we propose two ways forward.

Similar to Cheng et al.'s (2007) approach, scholars could avail themselves of archival data of creativity outcomes and categorize those outcomes in terms of their starting points. By the same token, critical incidents interviews, diaries, or surveys could be used in which employees are asked about a particular creativity incident; then that incident could be then categorized, investigated, and compared with other categorized incidents. The notable limitation with these designs is that there is a selection bias toward those creativity processes that were successful, making it difficult to study unsuccessful creativity attempts.

An alternative approach could lie in using an experimental design, which may prove useful in unpacking creativity types. Different situations with varying levels of external constraints and problem openness could be presented to individuals. Studies could then be made of the perceptions of requirements and problem openness, the processes used, the degree to which the creativity process was completed, and the level of creativity of the outcome. Factors such as those identified in this chapter could be correlated with these outcomes across the different creativity types. We are confident that the resourcefulness of creativity researchers is such that there are many other potential approaches to the study of creativity types.

Conclusion

In this chapter we reviewed the creativity literature that cites Unsworth's (2001) original article on creativity types. We found that very little empirical work exists on these types, so instead we attempted to preliminarily categorize the work ourselves. On finding another dead end, this one due to a lack of information presented about the creativity being investigated, we theoretically explored different predictors for the different creativity types. In answer to the question of whether all creativity is created equal, we say "no." Instead, we demonstrated a complex, dynamic, and cyclical process with multiple factors differentially affecting each of the different creativity types. Given such diversity across the different creativity types, we can but urge researchers one more time to embark on the complex but intellectually stimulating endeavor of empirically examining responsive, expected, contributory, and proactive creativity. The updated theory presented in this chapter could be a useful blueprint for such a journey.

Note

1. There may be other influences of affect on different stages of creativity, such as engagement or level of outcome. Here, we are focused on the successful completion of the creativity process.

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PART 2

Innovation

CHAPTER

17 Organizing Creativity: Lessons From the *Eureka! Ranch* Experience

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Abstract

This chapter presents a research model of organizing creativity that extends to the organizational level an individual-level general model of superior performance based on expertise theory. Extant creativity research is used to specify a deliberate-practice-based model of organizational creativity. This theoretical framework is then confronted with a case study that chronicles the development and growth of the *Eureka! Ranch* (Cincinnati, OH), a leading organizational creativity consulting firm. The *Eureka! Ranch* experience suggests that organizing creativity, to consistently achieve superior creative outcomes, is possible. Central elements of this approach are captured in the propositions developed in this chapter. These propositions suggest direction for the future research needed to establish their external validity.

Key Words: organized creativity, creativity expertise, deliberate-practice, *Eureka! Ranch* case study

There is growing interest in organizational creativity as a continuing source of new products and services with superior economic, social, and environmental outcomes (Cohen, Smith, & Mitchell, 2008). Among the many descriptions of creativity (Table 17.1), one representative definition of organizational creativity is "the creation of a valuable, useful new product, service, idea, procedure, or process by individuals working together in a complex social system" (Woodman, Sawyer, & Griffin, 1993, p. 293). Subsequent to the appearance of this definition, Drazin, Glynn, and Kazanjian (1999) suggested that creativity is a process, rather than an outcome, and they cited Amabile (1983) and Mohr (1982) in support. More recently, however, Amabile, Barsade, Mueller, and Staw (2005, p. 368), in closer agreement with the definition of organizational creativity cited earlier, asserts that creativity "refers to both the process of idea generation or problem solving, and the actual idea or solution (Amabile, 1983; Sternberg, 1988a; Weisberg, 1988)." But how does organizational creativity, both as complex social process and as idea-solution, emerge? In this chapter, we explore two research questions: (1) What is the organizing process that leads a group (compared with an individual) to a creative outcome? and (2) To what extent are idea-solutions "created"—in the sense that creativity is viewed as dependently volitional (i.e., it does not exist until it is developed) rather than independently emergent (i.e., it exists and must simply be recognized).[1]

Creativity has been conceptualized as a cognitive process, both at the individual level (e.g., Bower & Hilgard, 1981; Cohen & Levinthal, 1990) and in general (e.g., Shalley, Zhou, & Oldham, 2004; Woodman et al., 1993). Consequently, we adopt cognitive theory, and in particular expertise theory, to begin to address our research questions. We extend this individual-level theory to the organizational level by applying cognitive

Table 17.1 Analysis of Representative Descriptions of Creativity by Level of Focus

Section A1: Individual Level—Outcome Focused
• "We consider employee creativity to be the production of ideas, products, or procedures that are (1) novel or original and (2) potentially useful to the employing organization (Amabile, 1996)" (Madjar, Oldham & Pratt, 2002, p. 767).
Section A2: Individual Level—Process Focused
• "To Torrance (1988), individual creativity is a process of sensing problems, making guesses, formulating hypotheses, communicating ideas to others, and contradicting conformity or "what is expected"" (Drazin, Glynn, & Kazanjain, 1999, p. 290).
• "At the individual level, we define creativity as the engagement of an individual in a creative act (Ford, 1996; Torrance, 1988). Creative engagement is a process in which an individual behaviorally, cognitively, and emotionally attempts to produce creative outcomes (Kahn, 1990)" (Drazin et al., 1999, p. 290).
Section B2: Organizational Level—Process Focused
• "Organizational creativity is the creation of a valuable, useful new product, service, idea, procedure, or process by individuals working together in a complex social system" (Woodman, Sawyer, & Griffin, 1993, p. 293).
Section C1: Level Neutral—Outcome Focused
• "Researchers and laypersons seem to agree that creativity refers to something that is both novel and in some sense valuable" (Ford, 1996, p. 1114).
• "Definitions that focus on the attributes of creative products have become widely acknowledged as the most useful approach for empirical study and theory development (Amabile, 1983b; Busse & Mansfield, 1980; Mumford & Gustafson, 1988). If researchers focus on creative products, they designate attributes of people, processes, and places as contributors to these acts and recognize that, ultimately, assessments of creativity are subjective (Amabile, 1982)" (Ford, 1996, p. 1114).
• "I define creativity as a domain-specific, subjective judgment of the novelty and value of an outcome of a particular action" (Ford, 1996, p. 1115).
• "The study of creativity has generated a wide-ranging variety of definitions of the concept, some of which define it as a characteristic of a person and others as a process (Amabile, 1988). However, most contemporary researchers and theorists have adopted a definition that focuses on the product or outcome of a product development process (Amabile, 1983, 1988; Shalley, 1991; Woodman et al., 1993; Zaltman, Duncan, & Holbek, 1973). Following this earlier work, in the current study we defined creative performance as products, ideas, or procedures that satisfy two conditions: (1) they are novel or original and (2) they are potentially relevant for, or useful to, an organization" (Oldham & Cummings, 1996, p. 608).
• "… creativity refers to publicly visible attributes of a product presented by an actor to a field" (Ford & Gioia, 2000, p. 707).
• "… creativity is not an inherent quality of an object, but rather is a subjective judgment made by members of a field of the novelty and value of an outcome of an act (cf. Amabile, 1982)" (Ford & Gioia, 2000, p. 707).
• "Throughout most of these perspectives, creativity usually has been defined as the production of novel ideas that are useful and appropriate to the situation (e.g., Amabile, 1983; Mumford & Gustafson, 1988)" (Unsworth, 2001, p. 289).
• "… Li and Gardner offered a Chinese definition of creativity as 'the solution of problems and products in a way that is initially original but is ultimately accepted in one or more cultural settings' (1993: 94)" (Farmer, Tierney, and Kung-McIntyre, 2003, p. 619).
• "Creativity is generally defined as the production of novel, useful ideas or problem solutions. It refers to both the process of idea generation or problem solving and the actual idea or solution (Amabile, 1983; Sternberg, 1988a, Weisberg, 1988)" (Amabile et al., 2005, p. 368).

(*continued*)

Table 17.1 Continued

• "Drawing on the assumption that novelty is that distinguishing feature of creative work over and above work that is solely useful or well done (Amabile, 1996)" (Amabile et al., 2005, p. 368).
Section C2: Level Neutral—Process Focused
• "We define creativity as a process, rather than an outcome. This distinction is not unique to us (Mohr, 1982); Amabile has modeled creativity as an individual-level cognitive process consisting of multiple stages" (Drazin et al., 1999, p. 290).
• "… in effect creativity is a process necessary, but not sufficient, condition for creative outcomes" (Drazin et al., 1999, p. 290).
• "… an approach to work that leads to the generation of novel and appropriate ideas, processes, or solutions" (Perry-Smith & Shalley, 2003, p. 90).
• "Considerable theoretical work (e.g., Amabile, 1996; Stein, 1967) has suggested that the creative process involves several stages, including (1) identifying a problem/opportunity, (2) gathering information or resources, (3) generating ideas and (4) evaluating, modifying, and communicating ideas" (Shalley, Zhou, & Oldham, 2004, p. 947).
• "Creativity can be viewed as a means of identifying problems, using guesswork, developing hypotheses, communicating ideas to others, and contradicting what would normally be expected (Torrance, 1988)" (Gilson, Mathieu, Shalley, & Ruddy, 2005, p. 522).

process composition arguments utilized in other cross-level entrepreneurial cognition research (e.g., Smith, Mitchell, & Mitchell, 2009). We then draw on extant creativity research to delineate a more refined expertise development–based model of organizational creativity that suggests organizational creativity to be a kind of expertise that can be invoked through deliberate practice. Next, we confront this theoretical framework with a case study that chronicles the experience of one of the coauthors of this chapter, Jeffrey A. Stamp, who was a participant-observer (1996–2002) in the development and growth of the *Eureka! Ranch* (Cincinnati, OH), one of the leading organizational creativity consulting firms in the United States. In exploring the implications of this case study, we interrogate our model through comparison of theory with expert practice, to ascertain what aspects of the model are more and less pertinent to the development of organizational creativity, at least from the perspective of this highly successful firm. Insights gained suggest how organizational creativity can be organized through deliberate practice (Charness, Krampe, & Mayr, 1996).

Deliberate practice has previously been suggested to generate expert performance in the study of individuals in a variety of disciplines, such as chess (Chase & Simon, 1973; Simon & Chase, 1973), computer programming (McKeithen, Reitman, Rueter, & Hirtle, 1981), physics (Chi, Glaser, & Rees, 1982), and law enforcement (probation officer; Lurigio & Carroll, 1985), as well as in entrepreneurship (Baron & Henry, 2010; Mitchell, Smith, Seawright, & Morse, 2000; Sarasvathy, Simon, & Lave, 1998). Expert theory (e.g., Chi et al., 1982) suggests that deliberate practice should also build capabilities to develop organizational creativity.

We use this theory to develop a framework and interpretive model to understand how organizations develop creativity expertise to create idea-solutions. To begin to establish the validity of this framework and model, we draw on the *Eureka!-Ranch* experience to provide an initial case-based calibration of the framework. We therefore: (1) outline the general theory of deliberate practice from the expert information processing theory literature with special attention to its application beyond the individual level (i.e., to groups/organizations); (2) present the *Eureka! Ranch* case; (3) apply observations from the *Eureka!-Ranch* experience to elaborate the theory at the organizational level; and (4) offer an organizational-level model of organizing creativity with testable propositions. We conclude with implications of the theory for further research and for use within organizations desiring to better organize creativity within their economic sphere.

Deliberate Practice
An Individual-Level Model

Charness et al. (1996, p. 51) argued that the long legacy of "apprenticeship" in human history,

which relies on significant input from tutors or more-experienced guild members to produce expert performance, is one of the primary reasons that coaching in a variety of individual-focused skill domains is so effective in producing desired outcomes by individuals. But in their study of individual skill in chess, for example, the stand-alone role of coaching was found to be nonsignificant. These researchers found instead that only coaching that invoked deliberate practice—that is, serious study that allowed maximal control over the amount and duration of that study—provided the explanation for noticeable positive effects on skill acquisition (pp. 77–78). Their summary taxonomy (model) of the factors that are important to expertise/skill acquisition by individuals (p. 53) provides a helpful theoretical point of departure for our analysis of organizational creativity.

Following the left-to-right flow shown in Figure 17.1, a general theory of deliberate practice for individuals suggests that the three categories of antecedents of deliberate practice (selected for their applicability to individual skill acquisition) are (1) external social factors, (2) internal motivation/personality factors, and (3) external information factors. These three sets of factors are thought to influence the intensity, duration, and content of deliberate-practice activity. Deliberate-practice activity, in turn, is suggested to influence the cognitive system of an individual such that an improved knowledge base and improved problem-solving processes result, which are then thought to lead to expert performance.

Deliberate Practice Beyond the Individual Level

Although it might also be interesting to apply the deliberate-practice model to individual creativity, this is not the focus of our theorizing. Instead, we move next toward extension of this individual-level model across levels to the group/organization level, because this is the focus of both our participant observations and the task of organizing creativity.

However, before taking this leap, we must recognize that the development of constructs at levels beyond their original conceptualization has additional requirements.[2] Specifically, Chan (1998) suggested that a rationale for cross-level conceptualizing is essential, in particular where concepts "from a lower level are used to establish [a] higher level construct" (p. 235), and that the following types of models are serviceable: additive, direct consensus, referent-shift consensus, dispersion, and process models (p. 236). As we previously noted, the organizational creativity literature

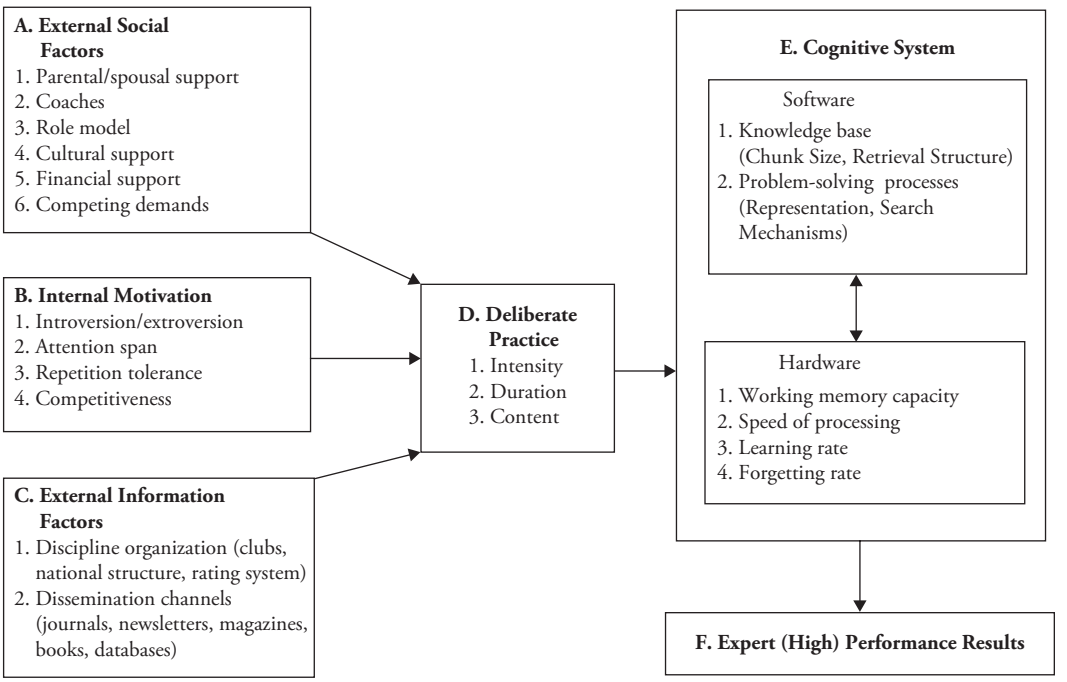

Fig. 17.1 Factors Important to Expertise/Skill Acquisition (adapted from Charness et al., 1996).

has its definition rooted in process (Amabile et al., 2005). We therefore utilize a compositional process model for the task of extending the individual-level deliberate-practice constructs to the organizational level.

A compositional process model enables structure found at one level of analysis (e.g., the level of the individual) to be useful in understanding structure at another level of analysis (e.g., the level of the organization). This model is defined to be "a model which specifies the process relationships among phenomena or constructs at different levels of analysis that reference essentially the same content, but which are qualitatively different at different levels" (Chan, 1998, p. 234; see also Rousseau, 1985). Using this idea, the lower-level process we see in the individual-level deliberate-practice model may be "composed to the higher level by identifying critical higher-level parameters, which are higher-level analogues of the lower-level parameters, and describing interrelationships among higher level parameters, which are homologous (having the same relative position, value, or structure) to the lower level parameter relationships" (Chan, 1998, p. 241).

Herein, we develop a process-composition model that explains how structural linkages among deliberate-practice constructs at the individual level of analysis apply to specifically-constructed homologous variables at the organization level of analysis. The *Eureka!-Ranch* experience is then used as substantive evidence to support the validity of this organization-level model. In the paragraphs that follow, we therefore present the constructs and proposed relationships underlying an organization-level conceptual model of creativity deliberate-practice. We envision this process as one which underlies the process of "organizing creativity."

In Figure 17.2, once again following a left-to-right flow, we suggest a specialized theory of deliberate-practice expertise development for organizations, paralleling the constructs in the individual model in the manner suggested by Chan (1998). The "organized creativity" model of deliberate creativity organization shown in Figure 17.2 also indicates that its three categories of antecedents (selected in this case for their general applicability to organizational creative skill acquisition) are (1) social factors, (2) motivational factors, and (3) informational factors.

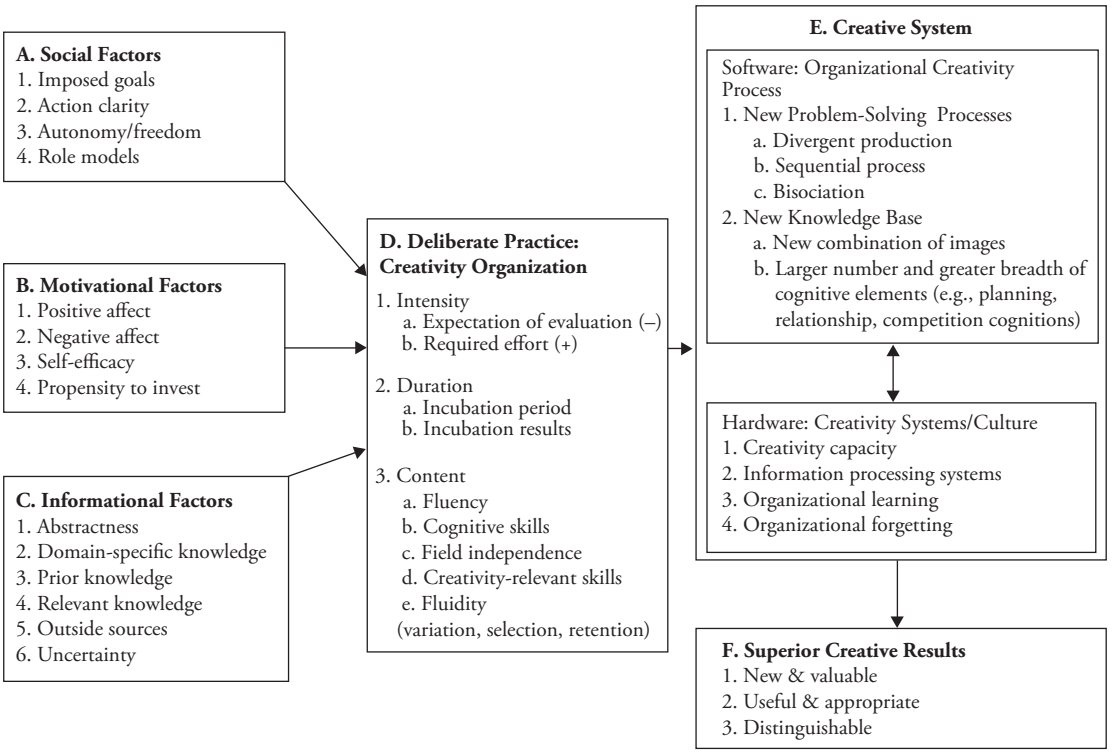

Fig. 17.2 Organizing Creativity: Possible Constructs in an Organization-Level Model of Deliberate-Practice–Based Creativity (see Table 17.3 for references) (cross-level adaptation based on Charness et al., 1996).

The composition of each of these factors in the specialized model arises from our review of the level-neutral antecedents of creativity (items labeled "N" in Table 17.2) to identify the model elements—recomposed to represent at the organizational level the elements in the individual-level figure—that may be asserted to comprise the organizational-level deliberate-practice model of creativity expertise (see Table 17.2). This was accomplished by conducting a broad review of the creativity literature, using electronic data bases such as Business Source Complete, EBSCO, and ProQuest; combinations of the keyword creativity in combination with the other keywords: management, organization, and entrepreneurship; and the restriction "academic (scholarly peer reviewed) journals."

Table 17.2 Antecedents of Creativity

Antecedent	Level	Relationship
Abstractness	N	"…accessing information at more abstract, principled levels leads to greater originality in forming new ideas (e.g. Ward et al., 2002)" (Baron & Ward, 2004, p. 567).
Access to Outside Sources of Knowledge	N	"Outside sources of knowledge are often critical to the innovation processes.… At the organizational level, March and Simon (1958:188) suggested most innovations result from borrowing rather than invention" (Cohen & Levinthal, 1990, p. 128).
Acquisition Effort	N	"To develop effective absorptive capacity… it is insufficient merely to expose an individual briefly to the relevant prior knowledge. Intensity of effort is critical" (Cohen & Levinthal, 1990, p. 131).
Basic Elements of Creativity	N	"…based upon Csikszentmihalyi's (1996) basic elements of creativity—preparation, incubation, insight, evaluation, and elaboration" (Corbett, 2005, p. 477).
Basic Elements of Creativity	I	"Creative behavior often is modeled as the result of… cognitive skills, such as linguistic ability, expressive fluency, convergent and divergent thinking and intelligence (Barron & Harrington, 1981; Basadur & Finkbeiner, 1985; Basadur, Graen & Green, 1982; Gardner, 1993; Glynn, 1996; Helson, Roberts, & Agronick, 1995; Sternberg, 1988)" (Drazin, Glynn, & Kazanjain, 1999, p. 287).
Basic Elements of Creativity	I	"Scholars have found individual creativity to be highest when individuals are motivated by intrinsic engagement; challenge; task satisfaction; and goal-oriented, self-regulatory mechanisms (Amabile, 1988; Amabile, Hill, Hennessey, & Tighe, 1994; Glynn & Webster, 1993; Kanfer, 1990; Kanfer & Ackerman, 1989)" (Drazin et al., 1999, p. 287).
Cognitive Factors	N	"Researchers have identified a number of cognitive abilities that relate to creativity. Carrol (1985) found eight first-order factors that all loaded highly on a second order factor of idea production: associative fluency, fluency of expression, figural fluency, ideational fluency, speech fluency, word fluency, practical ideational fluency, and originality" (Woodman, Sawyer, & Griffin, 1993, p. 298).
Cognitive Skills/ Processes	N	"A number of studies have specifically focused on examining various cognitive processes or skills involved in creative problem solving (see Reiter-Palmon & Illies, 2004, for a review). Some of the skills examined in these studies include problem finding, problem construction, combination, generation of alternatives, and idea evaluation, that are part of the creative process (e.g. Mumford, Baughman, Maher, Costanza & Supinski, 1997; Reiter, Palmon, Mumford, Boes, & Runco, 1997; Vincent, Decker & Mumford, 2002)" (Shalley, Zhou, & Goldman, 2004, p. 947).

(*continued*)

Table 17.2 Continued

Antecedent	Level	Relationship
Cognitive Structures	I	"Research on memory development suggests that accumulated prior knowledge increases both the ability to put new knowledge into memory…and the ability to recall and use it… Bower and Hilgard (1981: 424) suggested that memory development is self-reinforcing in that the more objects, patterns and concepts that are stored in memory, the more readily is new information about these constructs acquired and the more facile is the individual in using them in new settings" (Cohen & Levinthal, 1990, p. 129).
Cognitive Style	I	"A number of investigations have examined the relation between individuals' cognitive style and creative outcomes (see Kirton, 1994; Masten & Caldwell-Colbert, 1987). Results suggest that individuals with an innovative style tend to be more creative than those with an adaptive style (e.g., Keller, 1986; Lowe & Taylor, 1986)" (Shalley et al., 2004, p. 937).
Computational Theory	I	"Amabile's (1983, 1996) computational theory of individual creativity predicts that task motivation, domain relevant skills, and creativity-relevant processes are important components for individual creativity and that there are individual differences in levels of the three components. Mounting empirical evidence demonstrates that individuals are more creative when they possess higher levels of these components (Conti, Coon, & Amabile, 1996; Ruscio, Whitney, & Amabile, 1998)" (Taggar, 2002, p. 315).
Creative Education	I	"We found that students who were identified as creative and who were taught and assessed in their course performance in a way that permitted the students to be creative and rewarded them for their creativity performed better, than did creative students who were not so recognized" (Sternberg, 1997, pp. 490–491).
Creative Role Identity	I	"… with the highest creativity occurring when employees had a strong creative role identity and perceived that their organization valued creative work" (Shalley et al., 2004, p. 946).
Creative Role Models	N	"… Shalley and Perry-Smith (2001) hypothesized and found that observing creative models allows individuals to acquire relevant strategies and approaches that enables them to exhibit higher creativity in their own work" (Shalley et al., 2004, p. 947).
Creative Self-efficacy	I	"… results showed that creative self-efficacy was positively related to creativity, above and beyond contributions of general job self-efficacy" (Shalley et al., 2004, p. 946).
Creativity Goals	N	"The results of three studies suggest that creativity goals enhance creativity" (Ambrose & Kulik, 1999, p. 266).
Divergent Production	N	"Divergent production has long been considered the cognitive key to creativity and has continued to be a major consideration in creativity research. Basadur, Graen, & Green (1982) postulated a sequential application of ideation (divergent thinking) and convergent thinking through the stages of problem finding, solution generation, and solution implementation. Thus, for a creative person to produce socially useful products, his or her divergent thinking must come hand in hand with convergent thinking" (Woodman et al., 1993, pp. 298–299).
Domain-Specific Knowledge	N	"… creativity appears to be relatively domain-specific" (Sternberg, 1997, p. 490).
Evolutionary Processes	N	"Evolutionary metaphors that emphasize variation, selection, and retention processes also have been effectively employed by other creativity researchers, most notably Campbell (1960), Simonton (1988), and Staw (1999)" (Ford, 1996, p. 1114).

(*continued*)

Table 17.2 Continued

Antecedent	Level	Relationship
Expectation of Evaluation	N	"Previous studies provide results that are generally consistent with the argument that creativity is lower when individuals expect their work to be critically judged" (Shalley et al., 2004, p. 940).
Field Dependence	N	"In addition, field dependence also has been related to creativity. People with high field independence are able to analyze the relevant aspects of the situation without being distracted by the irrelevant aspects, whereas field-dependent people have difficulty separating less important aspects (Witkin, Dyk, Paterson, Goodenough, & Karp, 1962)" (Woodman et al., 1993, p. 298).
Freedom or Autonomy	N	"Studies of creativity have revealed that individuals produce more creative work when they perceive themselves to have choice in how to go about accomplishing the tasks that they are given (e.g., Amabile & Gitomer, 1984)" (Amabile et al., 1996, p. 1161).
Good Investments	N	"According to our investment theory of creativity (Sternberg & Lubart, 1991, 1992, 1995, 1996), creative people are individuals who are willing and able to 'buy low and sell high' in the realm of ideas. Buying low means pursuing ideas that are unknown or out of favor, but that have growth potential. Often, when these ideas are first presented, they encounter resistance. The creative individual persists in the face of this resistance and eventually sells high, moving on the next new or unpopular idea. Sometimes creativity is thwarted because a person puts forth an idea prematurely or holds an idea so long that it becomes common or obsolete" (Sternberg, 1997, p. 488).
Good Investments	I	"According to the investment theory, creativity requires a confluence of six distinct but interrelated resources: intellectual ability, knowledge, styles of thinking, personality, motivation, and environment" (Sternberg, 1997, p. 488).
Heuristics	I	"… Busenitz and Barney (1997) found that entrepreneurs relied more heavily on heuristics to speed up the decision making process than did managers. Without such mechanisms, windows of opportunity would often close before an opportunity could be identified" (Shepherd & DeTienne, 2005, p. 93).
Incubation	N	"Recent neuroscience studies have demonstrated that learning can be improved, and creative insight fostered, by incubation periods ranging from one night to considerably longer—in the absence of any additional training (Stickgold, James, and Hobson, 2000; Walker et al., 2003; Stickgold and Walker, 2004; Wagner et al., 2004)" (Amabile, Barsade, Mueller, & Staw, 2005, pp. 392–393).
Inexperience	I	"… exposure to examples of previous ideas or work can greatly restrict creative thought" (Baron & Ward, 2004, p. 564).
Intelligence	I	"In its essence, innovation involves intelligence; to put it simply, 'An innovation is a new idea' (Van de Ven, 1986: 591)" (Glynn, 1996, p. 1081).
Intensity	N	"According to May, creativity cannot be understood only as a function of talent nor as an instrumental phenomenon where a final product or goal completely guides one's actions. Rather creativity depends on the intensity of the direct encounter of people with their work: their experience of unity with and complete absorption in their work, which makes them 'become oblivious to the things around them as well as to the passage of time' (1994: 44)" (Mainemelis, 2001, 552).
Intrinsic Motivation	I	"An intrinsic motivational orientation has been postulated by many researchers as a key element in creativity (Amabile, 1990; Barron & Harrington, 1981). Simon (1967) postulated that the primary function of motivation was the control of attention" (Woodman et al., 1993, p. 300).

(*continued*)

Table 17.2 Continued

Antecedent	Level	Relationship
Knowledge and Skills	N	"Amabile (1988) identified both 'domain-relevant skills' and 'creativity-relevant skills' as being important for creativity" (Woodman et al., 1993, p. 301).
Negative Affect	N	"Some laboratory experiments have found a facilitative effect of negative affect on creativity" (Amabile et al., 2005, p. 371).
Number and Breadth of Cognitive Elements	N	"The importance of the number and breadth of cognitive elements is highlighted by other creativity theorists as well (Langley and Jones, 1988; Sternberg, 1988b)" (Amabile et al., 2005, pp. 368–369).
Positive Affect	N	"… positive affect leads to the sort of cognitive variation that stimulates creativity (Clore, Schwarz, and Conway, 1994) (Amabile et al, 2005, p. 369).
Positive Affect	N	"… experiences of certain positive emotions prompt individuals to discard time-trusted or automatic (everyday) behavioral scripts and to pursue novel, creative, and often unscripted paths of thought and action (Fredrickson, 1998: 304)" (Amabile et al., 2005, p. 369).
Positive Affect	N	"… these empirical results [by Isen's and other's experiments] provide substantial evidence that positive affect can induce changes in cognitive processing that facilitate creative activity" (Amabile et al., 2005, p. 370).
Positive Affect	N	"For example, Isen (1999a, 1999b) proposes that positive affect has three primary effects on cognitive activity. First, positive affect makes additional cognitive material available for processing.… Second, it leads to defocused attention and a more complex cognitive context.… Third, it increases cognitive flexibility…" (Amabile et al., 2005, p. 371).
Positive Affect	N	"The results indicate that positive affect relates positively to creativity in organizations and that the relationship is a simple linear one" (Amabile et al., 2005, p. 367).
Positive Affect	N	"Qualitative analyses identify positive affect as a consequence of creative thought events as well as a concomitant of the creative process" (Amabile et al., 2005, p. 367).
Prior Knowledge	N	"Some psychologists suggest that prior knowledge enhances learning because memory—or the storage of knowledge—is developed by associative learning in which events are recorded into memory by establishing linkages with pre-existing concepts" (Cohen & Levinthal, 1990, p. 129).
Prior Knowledge	N	"Invention is little more than a new combination of those images which have been previously gathered and deposited in the memory. Nothing can be made of nothing. He who has laid up no material can produce no combination" (Sir Joshua Reynolds, 1732–1792; quoted in Offer, 1990)" (Woodman et al., 1993, p. 301).
Prior Knowledge	N	"Scholars of Austrian economics argue that people have different prior knowledge and this allows some individuals to identify certain opportunities (Hayek, 1945; Venkatraman, 1997)" (Shepherd & DeTienne, 2005, p. 93).
Reasoning	I	"Hogarth (1987) suggested that much of creativity involves generating explanations or determining causes. Hogarth (1987) discussed four components of causal reasoning that are relevant to creativity: (a) a causal field which provides the context in which judgments are made, (b) cues-to-causality, which are imperfect indicators of the presence or absence of causal relations, (c) judgmental strategies for combining the field and cues in the assessment of cause, and (d) the role of alternative explanations" (Woodman et al., 1993, p. 299).

(*continued*)

Table 17.2 Continued

Antecedent	Level	Relationship
Relevant Knowledge	N	"The prior possession of relevant knowledge and skill is what gives rise to creativity, permitting the sorts of associations and linkages that may have never been considered before" (Cohen & Levinthal, 1990, p. 130).
Self-efficacy	I	"For example, Redmond, Mumford and Teach (1993) demonstrated that individual's self-efficacy (i.e., the extent that individuals believe they have the ability to accomplish task specific goals and objectives) (Bandura, 1977) was positively related to their creativity. Recently Tierney and Farmer (2002, 2004) extended this work and developed the construct of "creative self-efficacy" (Shalley et al., 2004, p. 946).
Self-efficacy	N	"In fact, Ford (1996) placed self-efficacy beliefs as a key motivational component in his model of individual creative action" (Tierney & Farmer, 2002, p. 1137).
Working Memory Capacity	I	"Research findings indicate that the higher individuals' working memory capacity, the better their performance on complex cognitive tasks . . . (Engle, 2002). In other words, the ability to focus one's attention on what's important is related to an important aspect of human intelligence—the abilities to think and reason (known as fluid intelligence)" (Baron & Ward, 2004, p. 564).

Note. Antecedents are listed alphabetically. I = individual level; N = level neutral.

We started by limiting the search to articles with the term "creativity" in the title, published within the last 10 years, and then we expanded the search using reference snowballing to seek creativity antecedents not previously identified. We sought to identify, within the published research on creativity, those constructs that have been asserted to serve as antecedents to creativity in general. A theoretical antecedent is considered to be something (e.g., a preceding construct in a theoretical model) that came before something else (e.g., the consequent construct in that theoretical model) and that may have influenced or caused it (Antecedent, 2014; Bagozzi & Phillips, 1982; Suddaby, 2010).

We reviewed more than 89 articles and identified 47 creativity antecedents. We organized these general creativity antecedents alphabetically by likely construct name/ terminology. Additionally, we attempted to indicate (as specified in a given article, or as we have interpreted assertions in that article) the likely level of analysis to which these antecedents have been asserted to apply: individual level (I) or level neutral (N). This was done through the use of rater judgment of key passages from the cited article establishing the antecedent–creativity relationship. The results of this analysis appear in Table 17.2.

The three sets of factors shown in Figure 17.2 (social, motivational, and informational) are thus suggested to influence the intensity, duration, and content of the deliberate-practice activity proposed at the organizational level: deliberate creativity organization. Deliberate creativity organization, in turn, is suggested to influence the creative system of an organization such that improved problem-solving processes and an improved knowledge base result, leading to expert creative results. In the following paragraphs, we utilize this theoretical framing as a means to interpret the *Eureka!-Ranch* experience; and then we also utilize this framing to generate several theoretical propositions for organizing creativity.

Interpreting The *Eureka! Ranch* Experience: A Deliberate-Practice–Based Model

In this section, we utilize the organization-level model as an organizing theoretical means to interpret the creativity process used so successfully at the *Eureka! Ranch.* Hence, the next step in the report of our analysis is to present the case in chronological order, using the words of Jeffrey A. Stamp as participant-observer. We then proceed to develop an organization-level research model of organizing creativity.

The Case: Participant-Observations of the Eureka! Ranch Experience

During interviews with Jeffery A. Stamp held in Lubbock, Texas, on April 9, 2013, the following

chronology of the *Eureka!-Ranch* experience emerged. Stamp's words have been paraphrased in parts (indicated by square brackets) for flow; and the bracketed number indicators are used in Table 17.3 to map these data to the organizational-level deliberate-practice model (see Figure 17.2).

> The story of the *Eureka! Ranch* was in many ways an expert exercise in marketplace opportunity recognition. Doug Hall, who is the founder of the *Eureka! Ranch*, has a degree in chemical engineering from the University of Maine. His father worked with the quality guru, Dr. W. Edwards Deming, at the Nashua Corporation. So Doug always had a key awareness of the concept of quality engineering, and of course, quality engineering in itself has now become the major focus of the *Eureka! Ranch* that drives everything they do. So Doug has a natural attraction for this process [of engineering creativity].
>
> Rarely does anyone ever effectively teach the concept of how to create. There are creativity theory classes and psychology theory classes on what it means to be creative, but how do you practice creativity? [That was Doug's genius, figuring out a way to organize creativity and make it a process that could be quality-engineered.]
>
> When Doug graduated from the University of Maine with his Bachelor's degree in chemical engineering, he found that he really wasn't enthralled with the production side but wanted to go into the marketing side. So he went to Procter & Gamble in Cincinnati, Ohio, and he got a job in advertising. Doug became a wonder boy of creativity. When everyone else is going zig, Doug goes zag, and everybody thinks it's great.... So he began to be involved in a number of large brands... from such brands as *Spic and Span* to wherever needed a creative spark. He developed a reputation as being the wild and wacky creative genius when he and his team set a P&G record for nine innovations in 12 months. But the life of a creative genius also creates organizational friction—they are often viewed as being high maintenance, and the staff always turns over because you can't keep political favor and creative intensity. They're mutually exclusive. [1]
>
> So Doug decides to leave [Procter & Gamble]. This is about 1986.
>
> So what's he going to do? He's a chemical engineer who worked in advertising who basically created ideas and didn't really have a product to his name other than P&G projects. So he says, well, I'm going to be entrepreneurial.... I'm going to go back to what I know best [creativity]. So in his basement he starts the [creativity firm] Richard Saunders International (inspired by the pen named used by Ben Franklin). He went to *The Wall Street Journal* and pitched an idea for an article on a new way to develop creativity—which he got in 1989 and business takes off. Then he went after some large Procter & Gamble–sized clients such as PepsiCo, Coca-Cola, and American Express and sold them on his new way to do creativity. The entrepreneurial strategy worked. By 1992, he moves from his basement to a very cool renovated 1779-era Eureka! Mansion and then later right next door into the custom-built *Eureka! Ranch* in 1997, where the firm still exists today as a creativity laboratory and think tank.
>
> There are four generations of creative methodology, in particular, that I think are relevant for this treatise, three of which are innovations of the *Eureka! Ranch*. Now, Doug would disavow that this is what they do today, as the *Eureka! Ranch* is continually evolving. They don't do simple new product or service concept creative sessions anymore because in many ways, the creative process at the *Eureka! Ranch* has run its course, but I still use it today in every creative session I do for a corporate client, and the methodologies still work wonderfully if done right. Doug has done it for so long that he basically has now gone on to his next generation of creative processes, called innovation engineering. He does an adaptation of Six Sigma process in a creative context now. Thus, you could say, he's taken his Deming background and he's basically doing private, lean—what they call agile—development in innovation or concept development, which is the new big thing now.
>
> In the early days of Richard Saunders International, the first generation, creativity started with everybody around the room. You brought in very bright people for a brainstorming session. You brought them into the room and you used the standard Osborn rules. No idea's a bad idea. Let everybody talk. You try to get more ideas than fewer ideas. Everything is valid. You put white flipcharts on the wall, and everybody just starts throwing out ideas. That was the way in which creativity worked. Experts were the source of your knowledge content that the group drew from in the brainstorming session. Well, that was because at that time, we didn't have the Internet. So you didn't have knowledge networks in a concentrated place like you find online today. You had experts in geographically dispersed areas, and you had to bring them together. So the key thing was bring them to

a room and explore what happens in a collaborative thinking environment.

An original brainstorming group really was the first attempt in knowledge network development—and it worked. So you brought great people into a room. You started with some provocative ideas, and people just bounced off the ideas. There is a concept called "bridging" that is especially useful here. If you throw out an idea and I like it, I bridge onto it and add some of my knowledge to yours to make a synthesized improvement. For example, I have an idea for a new water bottle. You say, well, let's put some fruit juice in it. I go, well, why simple fruit juice? Let's, in addition to fruit juice, we also put other flavors in it to create provocative blends that have unexpected taste combinations. Then a third person suggests the added flavors must be natural flavors. Then people bounce around other additions that are different. So we have multiple ideas and combinations from the single starting water concept. We have an idea for water with fruit juice, and an idea for water with natural flavors in it, and so on. We keep all those ideas and then, later on, someone looks at them and turns them into proper written product concepts, and then later they are evaluated through consumer testing. The innovation of brainstorming was just to bring the knowledge network together and harvest the low-hanging fruit. So with all due respect to Alex Osborn, brainstorming was really an effective process of low-hanging fruit harvesting in an efficient way by bringing people together in the same room rather than calling people up from all of the different places where they worked. [2]

So the standard creative process, you read in the literature the Osborn process and rules; which is funny, because they wrote the rules of creativity . . . which just seems ironic. You have methods like the SCAMPER method, and then you've got these various ways in which basically the creative process starts with incubation. Then you wait for magic. Then there's contemplation. Then you create ideas. It's this sort of a linearized process. Doug decided that this was not only inefficient, it was unreliable, and you didn't necessarily create new ideas. Brainstorming historically has always been like a statistical method—in order to get good ideas, you need more ideas. If you had generated 1,000 really good ideas, and then after you whittle them down, maybe one will work—and it was always this bad funnel of you've got to start with 1,000 ideas and then after you throw most of them out, you might find one that will make it. Doug didn't like leaving things to chance. He thought about what was needed to get better ideas, and he concluded we needed to create a better process. [3]

I think Doug's great contribution to creativity, if I had to limit it to one, was that creativity is a process, a process that can be managed, and a process that can be optimized, and a process that can be sold. I think he was the first to realize that the output of creativity is a "written consumer-centric concept." A "concept" is in effect a commercial asset to a company, because we believed that before you can market in dollars, you market in words. And it was important to Doug to get insight from the consumer as early in the creative process as possible. So the concept we produced at the *Eureka! Ranch* for clients was literally a 100-word—plus or minus, whatever is necessary—description of your idea as if it's written through the eyes of the customer. [4]

For example, "Introducing, New from Dasani, Fruit Waters"—and then we describe what it is, and this description addresses the key elements of an effective concept: the overt consumer benefit, the reason to believe you can produce those benefits, and how the product is dramatically different from other products. Well, Doug's team became very good at writing consumer-centric concepts for testing. Marketing companies thought, "We go to you, you charge us, and together we create some new product concepts that we fully own. You don't ask anything other than your six-figure fee and in return give us a folder full of innovative, fully written concepts? Done, where do we sign up?' This was a great business model because brand managers couldn't often do this themselves. They couldn't write with great skill, in a way that was effective in consumer testing. It's not uncommon for people to struggle with articulating their ideas, and people especially struggle to communicate new-to-the-world ideas. So Doug's genius business model was selling the promise of creating great concepts from the view of the creative through the eyes of the customer, and then figuring out how to deliver on that in every single creative session. [5]

So in the second generation, around 1989, and the first Richard Saunders International Eureka! Mansion innovation (it wasn't yet called the *Eureka! Ranch* at this point), is orchestrated immersion with a specialized creative known as a "Trained Brain." Doug would have a session, and then he and his team would create 40 ideas in 40 days (40 days and 40 nights, in reference to the Bible). [6] Doug's point of difference was that he and his team are so fluid in their creative juices that they

will create more ideas than anybody else and can accomplish this task in a very short time compared to the many months and years normal new product development takes in corporate life. You create concepts, you write concepts. So he had on his staff writers, journalists, comedians, English majors, a couple of marketing people, a couple of salespeople, and Doug. That's life and it's grand. The Gen 2 innovation was separating creation from evaluation and then seeding the process with these Trained Brains. [7]

Trained Brains are people trained in creativity and in managing the process of working with content experts in order to ensure innovative product concepts were developed. The development of the master creative practitioner, the Trained Brain [and I was one of them], to me was a true innovation because we have validated proof that they actually help the creative process and have the ability to help a brainstorming session produce more innovative ideas. The Trained Brains at the Eureka! Mansion during this time were a highly trained group that had to demonstrate and maintain a high degree of creative production ability.

Traditionally, a creative session was bringing in a bunch of subject matter experts, people who understood the topic. So let's say we're going to create new digital recording devices and we're the Sony Corporation. So let's go within the Sony organization and get engineers, software writers, logistics people. We'll get people who really understand what this product category is. We're going to get them in a room and we're going to say, "Hey, what's the next generation of digital recorders?" Doug viewed this as biasing the creative output, because you are already judging before you even start creating because you've got the experts and they're going to come from a position of cognition that says, "I know what needs to be done." [8]

Doug decides to mix it up in the creative process. Let's do something really clever. First, let's shorten the creative cycle down from 40 days to 3 days. In order to dramatically speed up this process, we have to change how we get ideas out of the collected team during the creative session. To do this, let's bring from the corporate side all the experts but let's equalize that [with Trained Brains, who really understand the creative process]. So in the creative session we're going to bring five people from Sony and we're going to bring five Trained Brains from Eureka! who know nothing about digital recorders as a profession. [9] Now these five Trained Brains are really creative people, and they are also consumers, so they fill an important space in the session. We're going to have a comedian. We're going to have a writer. We're going to have a branding and naming expert. We're going to have a journalist. We're going to have a mathematician. We're going to have bright, very bright thinking people who are trained and proven to be creative. They're also very expressive. They have high energy and great, fun personalities. The kind of people you want to hang out with. Most corporate teams are composed of the technical, quiet introverts. We have these technical experts which are typically thought of as left-brain thinkers balanced with the extrovert Trained Brains which tended to operate as right-brain thinkers. Doug's philosophy was let's use a whole brain in the session. Let's at least have one whole brain to balance out the perceptual bias or conformational bias, which we know exists in internal brainstorming groups of people from the same team or orientation. For example, if you have an argument with someone, you tend to bring up the things that validate your argument because that's the position from which you're viewing the construct of the question you are at odds with. [10]

It's hilarious, because what you get are serious people and fun people and what happens is a very unique, creative dissonance. Creative dissonance is very important. For example, one of the things that we always did was to designate someone in the role we endearingly called "the hockey puck." The hockey puck is a Trained Brain whose job it is to say early on in the creative session the most outlandish idea they can think of. That way anything else anyone else in the session would say really, actually now, seems more possible. [11]

For example, he or she suggests, "Let's create the gravity-levitating digital recorder that seems to follow you around wherever you are so you never have to wonder where your recorder is. It just seems to follow you. We'll use robotic technology to give it intelligence. This recorder will be great." This completely out-of-the-box—and then some—idea fulfills its purpose, and the people from Sony would look at that Trained Brain and think, like, "Okay, that's ridiculous, let's get back to reality." The Trained Brain would be okay with the suggestion, but we would make an effort to write the concept down anyway—it follows you, it floats on air, levitating antigravity magnets. People would laugh and they would go okay. It served the purpose of loosening the team up to hearing new ideas. And after that all ideas were seemingly more legitimate.

The lesson here was no evaluation; it kills the creative process. [12]

We also found that the music and other creative session environmental comforts had a minor impact on the creative output. Usually conventional wisdom says to have music, have Nerf balls to throw around, have lots of candy and caffeine, make it a fun and lively environment—as if you need permission to create ideas. One of the reasons why creativity is generally done offsite is because just the site of a normal corporate office means the team shouldn't be having fun here. We need to be working. So they didn't understand the concept of fun and the value of play. But we did learn that if you're laughing, you are more likely to say yes to new ideas. [13]

When you're laughing, you go from amygdala thinking, that reactionary flight/fight/fright part of your lower brain to higher-function frontal lobe neocortex thinking. This has now become the great advancement of neuroscience in the last 5 years. Researchers at Dartmouth University and Johns Hopkins have actually taken people, put them in functional MRI units, it's called fMRI units, and they give them creative exercises. They look at which part of the brain lights up. It turns out when you're being creative and you're synthesizing new ideas, the part of your brain in the neocortex that also responds to pleasure and other positive sensory signals lights up, which means that when you're laughing and have a good time, you're more likely to say yes. Your ability to say no decreases, and that kept the creative session moving forward. [14]

We discovered this intuitively without needing functional MRIs because for us the proof was in the output. We just got better ideas. We actually quantified using post–creative session surveys that not only did you get more ideas using Trained Brains but you got better-quality ideas. The Trained Brains were a catalyst to get the experts to not think down their normal, convergent, mental memory tracks. So their job was to push, pull, prod, cajole, kid, peel open in many cases, even be sarcastic and push and push. We had some of the most dynamic and historic creative sessions that you've ever seen. [15] These sessions produced many of the seed idea concepts that you still see in products in the market today.

It was high energy, but it was in many ways taxing, because what we learned was, in order for the Trained Brains to work together, you needed something for everyone to chew on. Now the key to a great creative session is a clearly defined objective. [16] To simply state, "We need to create new digital recorders for Sony," that's not a clear objective. That's a broad objective, because what is a digital recorder? What does it mean to record? What does it mean to be digital? Who is Sony? What does that mean? You want to be able to say, we want to create a portable, less than 4 inch by 5 inch device that costs less than $100. We typically assume that creativity is a blank piece of paper, blue sky, ultimate horizon, and that's not true. You need to have some construct of direction; otherwise in a Trained Brain process where any idea is allowed without judgment, a digital recorder becomes a secretary with a steno pad doing shorthand. [17] That's a digital recorder because it can now go backwards. People would go okay, that is someone who is acting as a recorder but we're in the business of making electronics. You have to have some constraints. The question is, What resource constraints should we view this creative challenge from, so we know where we're going in the creative session? [18]

You see, the challenge with a clearly defined objective is it's conditional on the incoming proposition of what they think the business is about. Often when you have the creative session, what would tend to happen is the objective would start to slide, because it's something the client would become aware of during the session. So we as the creative team would have to always check against what we call reality drift.... If, all of a sudden, a concept had a piece of manufacturing equipment capitalization that was required in order to use that line in their current production plant, they'd kill it. So we needed to know the conditional arguments, these other components or environmental factors unknown to us at the point of creativity. [19]

So in the creative sessions, the Trained Brains would go away after day 1 because their job was done. They're the catalyzing agent to make this whole brain. Then in day 2 and 3, we sit with the core team and evaluate the concepts for application and commercializability. A lot of the client side experts go away too, but usually the brand manager and a couple of their assistants remain with our smaller writing and art team, with Doug to hone in against the major objective, with the outcome to polish the concepts into a portfolio balanced for both low and high risk around the objective. [20]

So Doug is starting to organize the process of creativity in order to get better results. The standard problem with many creativity sessions is that the person in charge states, "Thank you all for coming here, we're going to create some ideas today, and

I'll know it when I see it." This is an impossible position to put a creative team. Again, it's about how to manage the process. In an organizational context, you've got to know how to manage creative people and the creative process. Doug has great skill of getting output from a creative session. [21] Our concept was first we have an immersion process, where we work with the client before the session to understand what it was they wanted to do. We would do a site visit. We would look at their factories. We would look at their R&D. We'd interview people. We'd get a sense of their being. [22] Then we'd go back and before the creative session would start, we would have an internal procreative session. You see, the Trained Brains appear to be naïve; appear is the key word here. It appears to be chaos. It appears to be an unmanageable, nonlinear set of things. But it's a highly orchestrated dance. [23]

What Doug did at the beginning, which was also very smart, was to keep a copy of every concept they ever wrote. The *Eureka! Ranch* was a concept writing machine with a highly prolific team of concept writers and artists. So by the time I met Doug, he probably had 5,000 or 6,000 concepts under his belt. I used to write about 250 concepts a year for the 6 years I worked with Doug. I've probably written another 3,000 since. So my guess is that Doug's total database in the company is now greater than 20,000 concepts and growing. [24]

Then Doug has another brilliant idea. He goes, huh, I've got all these concepts. The next thing clients are going to want to know is how do consumers like them? So within the Eureka! Mansion phase, he starts to develop a consumer research arm, testing all these concepts with consumers. This effort is set up as a sister company called AcuPOLL Research, which becomes one of the top new concept-developing, consumer-testing companies. [25] Doug then does a successful spin-off of AcuPOLL in a sale to a group of employees.

So after starting in his basement, Doug buys the Edwards 1779-era mansion, the mini-mansion in Newtown, Ohio, and creates a new home for Richard Saunders International he names the Eureka! Mansion. Eventually, he would actually build on the property right next door a ranch house, on a lake, right beside the mansion that he converted into his home. So in the middle of Cincinnati sits a ranch house. It looks like a ranch house. It's got wooden rails in the front like the Wild West. He went and bought an old saloon bar and installs it in the front lobby of the *Eureka! Ranch*. It's gorgeous. He created a convincing ranch environment so when clients visited the *Eureka! Ranch* they actually got to go to a ranch. [26]

Time goes by, big huge companies like American Express and Disney start to come to him, and it's an amazing gig. It was during this time in 1994 between the Mansion and Ranch phases that I met Doug. I was new product development Section Manager at Frito-Lay, a division of PepsiCo. Frito-Lay hired Doug to do a creative session for our new low-fat snack development team. I meet Doug during his immersion walk through. He literally walked in my office one day to ask how snack products were made. Of that first meeting, I was struck by his incredible energy and thorough preparation in his immersion questions. One of the most important aspects of creativity is incubation and immersion, and we'll talk about the steps of what creativity is a little bit later, but the key thing is at this point, Doug always went onsite with the big huge clients, like a PepsiCo, huge because an average session is $140,000 for 3 days, and so they're very pricy. [27] A couple of years later I leave Frito-Lay, start a venture, work with Doug as a Trained Brain, then eventually join him full time for 6 years.

So Doug had started developing generation 2. Instead of 40 ideas in 40 days, he moved to a 3-day workshop, and a portfolio of 10 to 20 ideas, and you get full art, full-concept writing. You come on Tuesday. By Friday, you leave, you get the folder. People were like how the heck do you pull this off? [28] So basically he had an around-the-clock operation. So workshop starts on Tuesday. We have creativity session from 8 in the morning until 4 in the afternoon. Then we break for a bit before dinner, and then Doug has dinner with the client until about 7. [During the break before dinner,] Doug briefs his writers and they write concepts overnight. Wednesday morning, [the client] walks in at 9 o'clock, and magically, there's a portfolio of finished concepts. [29]

We learned how to write concepts better and better and gave some thought to what makes them better. At this time, Doug has this database of 12,000 to 13,000 concepts and they have been tested with consumers. So we used this data to create an algorithm to predict concept success or deficiency. Doug called it Merwyn. [30] We applied for a patent for the method, but it is described in Doug's book, *Jump Start Your Business Brain*. Merwyn is the heart of generation 4, and

it was another key *Eureka!-Ranch* innovation. We discovered that there are three key drivers of a great product concept: overt benefit, real reason to believe, and dramatic difference. [31]

Overt benefit is what is in it for the customer. What specific promise can you make to motivate them to buy? What makes it valuable? [32] The real reason to believe is why should customers believe your promise? Why should they trust that this is possible and that you can do it better than others? [33] Dramatic difference is about differentiation and relative value, how is this product better than alternatives, and what makes it not just great but a great deal? [34]

That was the magic of the Merwyn algorithm: the ability to predict success. So you have a core objective set out by the client, and then you have levels from zero to 10 on a Likert scale of how much overt benefit [*value creation promises*] to the core objective it has. What are the reasons to believe [*why customers should trust your promises*]? And what makes it differentiated, really special relative to alternatives? And we understood that the language used to construct the concept literally brings it to awareness and tenability. So we could score concepts, weed out the deficient ones, and focus on quality. We had, like, an intentions index—how likely it is that a customer and the client are going to accept this idea. What we really had to learn how to do was define the science of writing a consumer-winning concept and then that's where we invented Merwyn and the algorithms. [35]

So bringing it back, in generation 2 we have Trained Brains to create a whole brain in the room, a system to use these Trained Brains to generate more ideas and better ideas, a system to take these ideas and develop them into fully developed concepts, and a system to evaluate which concepts would gain the most traction. So now we focused on increasing the quality of the concepts that we generated. This is where generation 3 was evolving at the same time. [36] This next innovation was a big breakthrough around stimulus and in seeding informed intent in our clients. [37]

We had Trained Brains that understood creativity and they helped orchestrate the process, but we needed the clients to get up to speed so our time together could be more effective. [36] Informed intent was about giving the client an understanding of our creative process, instilling in them a belief that we know what we are doing and that, together, we will be successful. [38] We gave them a sense of opportunity, generating perceived feasibility and perceived desirability for what can we create. It was really pre-selling them on our own concept framework: the overt benefit, reasons to believe, and dramatic difference of the *Eureka! Ranch*. [39] So one of the things we did on Monday night was we'd have a little training session with the client team on what does it mean to be creative, the point of creativity, what is the creative goal as opposed to their brand goals, and we established a clearly defined objective. We primed the pump because most people aren't loaded for opportunity. Most people are loaded for preservation. [40]

Informed intention gave them a sense of possibility around creating ideas, that they could do more. We used to measure a corporate index of how creative the client organization was coming into the creative session. How successful are they at innovation? How many ideas did they have that went to market? Trying to get past those hurdles of the team's internal statement of "Oh, my God, we're not a very creative company. [41] We've not done a whole lot." This observation opened up for Doug a training opportunity with his clients on the *Eureka! Ranch* framework, so we started doing some training. We actually created a training business, which became its own highly successful and profitable piece of business. Training the companies on how to be more creative made the creative sessions more productive. [42]

We also learned during this generation 3 phase how to develop client creativity to significantly increase mental fluidity—a lot more ideas, better ideas, leading to better concepts. We increased mental fluidity significantly higher because, again, we needed to jump their tracks of linear thinking. Now, there are creative gurus like Edward De Bono and other folks who talk about lateral thinking and a lot of people think that the *Eureka! Ranch* is nothing more than fancy lateral thinking engine. For example, how do I take this white Styrofoam coffee cup and relate it to new possible organizational structure ideas in a business school? That's lateral thinking. What Doug did to extend and bend this method was a nifty technique he called "stimulus response," and stimulus response was what I would define as a nonlinear method of lateral thinking. [43] In other words, I would call it lateral thinking squared, and this technique would work very effectively when used in a group. [44]

A very simple example of how this stimulus response works to extend the power of the stimulus dramatically compared to lateral thinking starts with the same stimulus I mentioned before: How

is a cup like a university business school? So what you would do is go around the participants in the creative session and ask them to connect the elements of the cup to build ideas for new ideas for the business school. You might start with, well, let's take the elements of the cup. Cup's half full, or half empty. It holds volume. It's Styrofoam so it's disposable. We have somebody on the manufacturing line that had to make sure that that cup was the right form and is always perfectly made to the same dimensions. Then someone else builds from that and recalls that same dimensions in a business schools are called AACSB standardizations, and so on. We can have a 1-ounce cup, a 6-ounce cup. We can have a whole sleeve. So we can relate directly these characteristics of a coffee cup and apply them to the business school objective. But these leaps are obvious and descriptive, anyone can do that. You don't end up with dramatically different ideas because the stimulus is still close in. Creativity is creating a concept that is both innovative and valuable. [45] To get there, you needed serendipitous thinking or divergent thinking to produce more idea options, not reordered conventional thinking. [46]

So what we would do is instead of using the cup as a direct source of ideas to figure out a business school ideation challenge, we use the cup as a starting *stimulus.* What we do is we'd say, "When you think of cup; what do you think of?" So we would write an extended mind mapping of things that they think about the cup. For example, maybe when I think about the cup, I think of an athletic supporter, which is a cup for baseball players. This is somewhat conventional thinking, drinking cup, cup, athletic cup, athletic supporter. Lots of people would make that connection, so it's not very innovative. We wanted original thinking, divergent, serendipitous thinking where we are thinking about ideas and connections that no one else is thinking about. And to do this we use indirect association. [47] View a stimulus, respond to it and think of something, take that thought and associate it with something else, take that something else and associate it with yet another something else. Three, four, five levels of indirect association where the path between the original stimulus and the thinking end point are not obvious and can be only explained by the connections of meaning provided by the individual, the end point uniquely influenced by individual experiences and cognitive processes.

For example, using the white Styrofoam coffee cup as a stimulus as before, but now we extend it, you see a coffee cup, someone else thinks of pencil holder, another person thinks to put dirt in the cup and make it a seedling planter, the next person sees tipping the cup on its side and using it as a golf ball putting target, then someone thinks of tearing up the cup into little pieces, someone sees these pieces and thinks of communion wafers. You think of these small Styrofoam wafers: they could be used in religious ceremony as sacrament. Sacrament makes you think of affirmation or self-selection. And now we take these words which have been related here in a secondary nonlinear effect and apply them to the original problem context, for example, linking a coffee cup to sacrament, affirmation, or self-selection to the business school context. So you might think about self-selection, affirmation, and MBA and come up with the concept idea of a real-world executive MBA program for expert entrepreneurs where the degree is conferred based solely on an assessment of prior learning experience coupled with a real-market laboratory, as documented (self-selected) by the entrepreneur and affirmed (or blessed, to use the sacrament language) by their stakeholder peer network rather than an academic board. The cup was just a stimulus, but you might have got to sacrament because of your unique life and perspective of the world. Somebody could say, well, that's just really wrong and suggest something else, and the process starts again. In this way, from the same piece of stimulus many concept ideas begin to emerge. So we always say that it can be whatever it is, but now it jumps the tracks and gives us a starting point from which we think from a different second-order place, and it amplifies the ideas generated. This was the huge, big A-ha! [48]

Then we learned how to use the stimulus more effectively. So now what we would do is, we would select a physical stimulus to foster greater jumping-off points, more creative response from the participants, and we would customize the stimulus to the people in the room. We learned very quickly it was about personality matching, and that's where we started to make relationships with a group called the HBDI, Herrmann Brain Dominance Instrument. Ned Herrmann was an engineer for General Electric, and he began to realize that people had various kinds of thinking-style personalities. It's not like Myers-Briggs. It's not like a number of others, but basically it's a way in which people think about ideas, not their personality per se but their personality when thinking about new ideas.

So we measured our clients' thinking styles, and we would match with our Trained Brains an opposite set, so that we had a complementary whole brain. So we created this concept of whole brain creativity. That became our secret R&D. That's never really been clearly codified in the academic literature. I can better set up a creative session because I know how you're going to accept the stimulus, and I can choose a stimulus that fits your thinking style, which helps you be more fluid in the creative process. [49]

And we called this the nonlinearity of stimulus. It was a two-step stimulus process. So you take a base stimulus, unrelated to your industry context, and you cross it up by doing free association around that base stimulus. This approach results in nonlinear super-stimulus that creates an exponential increase in the number of ideas generated. Then you add the industry context—also represented by stimulus, but this time related stimulus, like a CPU to represent the computer industry, or a graduation hat to represent a University. It is just a clever extension of some standardized brainstorming methodology. Alex Osborn used stimulus. They did it all the time, and so did De Bono and other people. But this was a clever reassembly of that basic idea—using unrelated and related stimulus, and free association to get innovative thinking. Once we figured that out, the quantity, breadth, and depth of the ideas generated was just off the hook. We always got lots of ideas, but we got better ideas, and inherently you get more ideas, but the key thing is you want better ideas. No one cares whether you create more ideas. [50]

So it's this process of managing the stimulus and then using people's own life experience to get them thinking divergently. [51] This means that the Trained Brains became more than just thinkers. They became facilitators, or mini-facilitators, if you will. So you'd have a group of two or three people and out would come a piece of stimulus. The Trained Brain's job is to go wide, just to start throwing things in and letting the corporate people add on, until they figured it out or we trained them how to be starters. So, literally, the Trained Brain's interaction to fire became kindling, gasoline, and match. That's how we generated the heat. [52]

We literally could have creative sessions where we did enough preparation that Doug and I would create pre-concepts ahead of the customers even coming in, and literally in the twenty concepts generated during the Tuesday creative session, five of them contained these seed ideas that were written before the clients ever got there because we had practiced with the stimulus beforehand. We'd introduce those on the Wednesday, after spending the Tuesday working with the client generating innovative ideas. Wednesday morning we'd say, hey, while we were putting these ideas together, we had some new thoughts. We always presold it that way because the stimulus response process can diverge along many directions. We'd always have some great concepts in the bank, that way we knew we could always deliver on our promise. [53]

Another big masterful thing was in understanding how to pitch or communicate the ideas that you create in a portfolio. The key observation was there are two kinds of biases that people always operate from. Overconfidence bias, because the client comes in with the attitude of the experts while discounting the expertise of the Trained Brains, thinking the experts will know the correct ideas. Then they have their confirmational biases, which literally confirm what they think they already know. We used to get a lot of language, for example, like "so what you're saying is. . ."—and you can tell they're leading you down this path of trying to confirm what they already think. So we had to know how to intersperse the concepts, and we used to call it the Three Bears Method. So you always stack concepts in groups of three, knowing that they're more likely going to pick the middle of the three. The first one's not enough, the last one's too much, and the middle one's just right. It works. It's always the Mama Bear. So what you do, if you have twenty concepts, you say, okay, well, we're going to show these concepts, and we're going to show you three which are name ideas, three that are manufacturing ideas, and three that are—so you parcel them into groups. You don't say we have twenty, or people just go crazy. [54]

So, yes, creative magic does happen, and we do have unique combinations that occur more often using these four generations of techniques, but we set them up to happen. The client is going to think this is just random from their perspective, but in reality it was highly orchestrated. There's no blind randomness allowed in creativity. That's a common misconception of brainstorming that the whole thing can be rigged so that at the center of a great creative session is a guide to get participants to make cognitive selections that they might never have thought were possible until someone led them to it. In this context of the creative session, it doesn't happen by itself, which is the power of the group. The reality is that the facilitator or guide

can't, on their own, determine the output; they can only organize and guide its flow. Creativity has changed, from the nexus of bringing important people to one location, to using brains in a serial processor. It's distributed thinking. It's literally cloud based—remember, a creative group could be interpreted as the first cloud computing system ever. Cloud computing is not a new invention. It just happens to be done now by computers. Cloud-based in that here's a bunch of people, we'll hook up their brains and a great facilitator can get the maximum out of it. The *Eureka! Ranch* can arguably claim to have created more and better ideas than anybody else in the country. The magical creativity of *Eureka! Ranch* is the orchestrated emergence of a concept. Organizational creativity is a misnomer, because it's what you do to organize creativity that makes it happen. [55]

I have never believed that at the *Eureka! Ranch* we ever created anything that did not already exist somewhere deep in someone's mind. We simply brought to awareness and perceptual conditioning that these things were possible. So we went and put them together. [56]

Interpretation

An analysis of this chronology with respect to the deliberate-practice model appears in Table 17.3, which is organized to follow the left-to-right flow represented within Figure 17.2. The table provides a homologous definitional basis for each antecedent construct used as an element in the figure. Additionally, Table 17.3 contains the participant-observations from the *Eureka!-Ranch* experience which both enable the interpretation of this experience in terms of the theoretical model and support generalizations on this experience that comprise the research model we suggest for organizing creativity (Figure 17.3). The matching between the literature-based constructs and the *Eureka!-Ranch* experience was accomplished with the use of multiple rater assessments. Independently, the lead authors reviewed the transcript of the *Eureka!-Ranch* experience, coding this text for deliberate practice expertise constructs. The lead authors then compared their coding, discussed the few areas where there was a difference of opinion, and used consensus to determine the final coding. If more than one transcript element illustrated a construct, the most demonstrative passage was included in Table 17.3.

Based on the analysis made possible by an examination of Table 17.3, a research model emerges that can enable researchers to examine the theoretical propositions for organizing creativity that flow from the analysis. Specifically, we are enabled through this analysis to (1) identify the constructs in the organizational-level deliberate-practice model (see Figure 17.2) that are generalizable beyond the *Eureka!-Ranch* experience, and (2) specify the definitions of key constructs in a model of organizing creativity, as illustrated in Figure 17.3.

A Research Model

As illustrated in Figure 17.3, the research model that we have abstracted from our analysis of the *Eureka!-Ranch* experience is similar in form to both the individual-level and organizational-level models of deliberate practice, but they are not identical. In this section, we use Figure 17.3 as our means to communicate both the constructs suggested to further the understanding of organizational creativity and the logic for the relationships, presented in the form of propositions (described later and labeled P1 through P7 on the figure). We review the constructs and research logic presented in Figure 17.3 from right to left, beginning with the outcome: superior creativity outcomes.

Superior Creativity Outcomes

As previously suggested, superior creativity outcomes are defined to be *new product introduction results with economic, social, and/or environmental outcomes* (Cohen et al., 2008) *that either exceed past results for similar products of a given organization or exceed results for comparable products of competitors*. Economic outcomes include such performance results as sales, market share, or profits. Social outcomes include brand equity, reputation, customer satisfaction, and so on. Environmental outcomes include pollution levels, energy footprint, quality of life, and many others.

Superior Product Concepts

From our analysis of the *Eureka!-Ranch* experience, we suggest that the notion of the "product concept," as a monetizable outcome of organizational creativity, is a highly useful one to contribute to the creativity literature. The process of organizing creativity that is chronicled in the case introduces a subtle but important distinction by suggesting that an explicit-form written product concept is a critical result of the creativity process. As suggested in the case, superior explicit-form product concepts are defined to be *the written depiction of new products* that reflect clear: "overt benefits," "real reasons

Table 17.3 Possible Constructs for Research in Organizing Creativity: Support for an Organization-Level Theoretical Model (see Figure 17.2)

Constructs	Supporting Quote	Participant Observations
A. Social Factors		
1. Imposed goals	"The results of three studies suggest that creativity goals enhance creativity" (Ambrose & Kulik, 1999, p. 266).	So one of the things we did on Monday night was we'd have a little training session with the client team on what does it mean to be creative, the point of creativity, what is the creative goal as opposed to their brand goals, and we established a clearly defined objective. We primed the pump because most people aren't loaded for opportunity. Most people are loaded for preservation. [40]
2. Action clarity (teleological stance)	"… interpreting another's' actions relies on an inferential process that considers the target goal and the environmental constraints that limit or facilitate goal achievement" (Hauser & Wood, 2010, p. 305).	It was high energy, but it was in many ways taxing, because what we learned was, in order for the Trained Brains to work together, you needed something for everyone to chew on. Now the key to a great creative session is a clearly defined objective. [16] … The question is: What resource constraints should we view this from so we know where we're going? [18]
3. Autonomy/Freedom (in the creation environment)	"Studies of creativity have revealed that [people] produce more creative work when they perceive themselves to have choice in how to go about accomplishing the tasks that they are given (e.g., Amabile & Gitomer, 1984)" (Amabile et al., 1996, p. 1161).	"Not evident in the case"
4. Role models (in the creation environment)	"… Shalley and Perry-Smith (2001) hypothesized and found that observing creative models allows [people] to acquire relevant strategies and approaches that enables them to exhibit higher creativity in their own work" (Shalley, Zhou, & Oldham, 2004, p. 947).	So the trained brains would go away after day 1 because their job was done. They're the catalyzing agent to make this whole brain. Then day 2 and 3, we sit with the core team.… A lot of the client side experts go away too, but usually the brand manager and a couple of their assistants remain [and we] hone in against the major objective, with the outcome to polish the concepts into a portfolio [of] risk around the objective. [20] The Trained Brain, to me, was a true innovation because we have validated proof that they actually help the creative process. [8]

B. Motivational Factors		
1. Positive affect	"… positive affect leads to the sort of cognitive variation that stimulates creativity (Clore, Schwarz, and Conway, 1994) (Amabile et al., 2005, p. 369)… through additional cognitive material being available for processing, defocused attention and a more complex cognitive context, and increased cognitive flexibility (Isen 1999a, 1999b in Amabile et al., 2005, p. 371), that lead to the pursuit of novel, creative, and often unscripted paths of thought and action (Fredrickson, 1998: 304)" (Amabile, Barsade, Mueller, & Staw, 2005, p. 369).	We found that [it wasn't the music.] Usually conventional wisdom says to have music, have Nerf balls to throw around, have lots of candy and caffeine, make it a fun and lively environment—as if you need permission to create ideas. One of the reasons why creativity is always done offsite is because just the site of our normal corporate office means the team shouldn't be having fun here. We need to be working. So they didn't understand the concept of fun.… But we did learn that if you're laughing, you are more likely to say yes to new ideas. [13] When you're laughing, you go from amygdala thinking, that reactionary fight/fight/fright part of your lower brain, to higher-function frontal lobe neocortex thinking. This has now become the great advancement of neuroscience in the last 5 years.… [They've] actually taken people, put them in functional MRI units, it's called fMRI units, and they give them creative exercises. They look at which part of the brain lights up. It turns out when you're being creative and you're synthesizing new ideas, the part of your brain [for pleasure] lights up, which means that when you're laughing and have a good time, you're more likely to say yes. Your ability to say no decreases, and that kept the creative session moving forward. [14]
2. Negative affect	"Some laboratory experiments have found a facilitative effect of negative affect on creativity" (Amabile et al., 2005, p. 371).	[Bringing in Trained Brains] is hilarious, because what you get are serious people and fun people and what happens is a very unique, creative dissonance. Creative dissonance is very important. For example, one of the things that we always did was to designate someone [as what we called] "the hockey puck." The hockey puck is a Trained Brain whose job it is to say… the most outlandish thing they can think of. That way anything else you say really, actually now, seems more possible. [11]

(*continued*)

Table 17.3 Continued

Constructs	Supporting Quote	Participant Observations
3. Self-efficacy	"… results showed that creative self-efficacy was positively related to creativity, above and beyond contributions of general job self-efficacy" (Shalley et al., 2004, p. 946). "In fact, Ford (1996) placed self-efficacy beliefs as a key motivational component in his model of individual creative action" (Tierney & Farmer, 2002, p. 1137).	We had Trained Brains that understood creativity and they helped orchestrate the process, but we needed the clients to get up to speed so our time together could be more effective. [36] Informed intent was about giving the client an understanding of our creative process, instilling in them a belief that we know what we are doing and that, together, we will be successful. [38] Informed intention gave them a sense of possibility around creating ideas, that they could do more. We used to measure a corporate index of how creative you're the client organization was.… How successful are they at innovation? How many ideas did they have that went to market? Trying to get past those hurdles of the team's internal statement of "Oh, my God, we're not a very creative company." [41]
4. Propensity to invest	"According to our investment theory of creativity (Sternberg & Lubart, 1991, 1992, 1995, 1996), creative people are individuals who are willing and able to "buy low and sell high" in the realm of ideas.… Sometimes creativity is thwarted because a person puts forth an idea prematurely or holds an idea so long that it becomes common or obsolete" (Sternberg, 1997, p. 488).	"Not evident in the case"
C. Informational Factors		
1. Abstractness	"… accessing information at more abstract, principled levels leads to greater originality in forming new ideas (e.g., Ward et al., 2002)" (Baron & Ward, 2004, p. 567).	"Not evident in the case"
2. Domain-specific knowledge	"… creativity appears to be relatively domain-specific" (Sternberg, 1997, p. 490).	Traditionally, a creative session was bringing in a bunch of subject matter experts, people who understood the topic. So let's say we're going to create new digital recording devices and we're the Sony Company. So let's go within the Sony organization and get engineers, software writers, logistics people. We'll get people who really understand what this product category is. We're going to get them in a room and we're going to say, "Hey, what's the next generation of digital recorders?" Doug viewed this as biasing the creative output, because you are already judging before you even start creating because you've got the experts and they're going to come from a position of cognition that says, "I know what needs to be done." [8]

3. Prior knowledge	"Some psychologists suggest that prior knowledge enhances learning because memory—or the storage of knowledge—is developed by associative learning in which events are recorded into memory by establishing linkages with pre-existing concepts" (Cohen & Levinthal, 1990, p. 129). "Scholars of Austrian economics argue that people have different prior knowledge and this allows some individuals to identify certain opportunities (Hayek, 1945; Venkatraman, 1997)" (Shepherd & DeTienne, 2005, p. 93).	We typically assume that creativity is a blank piece of paper, blue sky, ultimate horizon, and that's not true. You need to have some construct of direction, otherwise in a Trained Brain process, … a digital recorder becomes a secretary with a steno pad doing shorthand. [17] So it's this process of managing the stimulus and then using people's own life experience to get them thinking divergently. [51]
4. Relevant knowledge	"The prior possession of relevant knowledge and skill is what gives rise to creativity, permitting the sorts of associations and linkages that may have never been considered before" (Cohen & Levinthal, 1990, p. 130).	You see, the challenge with a clearly defined objective is it's conditional on the incoming proposition of what they think the business is about. Often when you have the creative session, what would tend to happen is the objective would start to slide, because it's something the client would become aware of during the session. So we… have to always check against what we call reality drift.… If, all of a sudden, a concept had a piece of manufacturing equipment capitalization that was required in order to use that line in their current production plant, they'd kill it. So we needed to know the conditional arguments, these other components or environmental factors unknown to us at the point of creativity. [19]
5. Outside sources	"Outside sources of knowledge are often critical to the innovation processes.… At the organizational level, March and Simon (1958: 188) suggested most innovations result from borrowing rather than invention" (Cohen & Levinthal, 1990, p. 128).	Doug decides to mix it up.… Let's do something really clever.… Let's bring from the corporate side all the experts but let's equalize that.… So in the creative session we're going to bring five people from Sony and we're going to bring five Trained Brains from Eureka! who know nothing about digital recorders as a profession. [9]
6. Uncertainty	"… uncertainty is a perceptual phenomenon derived from an inability to assign probabilities to future events, largely because of a lack of information about cause/effect relationships (Hoskisson & Busenitz, 2002)" (Ireland, Hitt, & Sirmon, 2003, p. 968).	"Not evident in the case"

(*continued*)

Table 17.3 Continued

Constructs	Supporting Quote	Participant Observations
D. Deliberate Practice: Creativity Organization		
1. Intensity:		
a. Expectation of evaluation (–)	a. "Previous studies provide results that are generally consistent with the argument that creativity is lower when individuals expect their work to be critically judged" (Shalley et al., 2004, p. 940).	a. The people from Sony would look at that Trained Brain and think, like, "Okay, that's ridiculous."… The Trained Brain would be okay with the suggestion, but we would make an effort to write the concept down anyway—it follows you, it floats on air, levitating antigravity magnets. People would laugh and they would go okay.… And after that all ideas were seemingly more legitimate. The lesson here was no evaluation; it kills the creative process. [12]
b. Required effort (+)	b. "… it is insufficient merely to expose an individual briefly to the relevant prior knowledge. Intensity of effort is critical" (Cohen & Levinthal, 1990, p. 131).	b. So basically he had an around-the-clock operation.… So the workshop starts on Tuesday. We have creativity session from 8 in the morning until 4 in the afternoon. Then we break for a bit before dinner, and then … Doug briefs his writers and they write concepts overnight. Wednesday morning, [the client] walks in at 9 o'clock, and magically, there's a portfolio of finished concepts. [29], also [1], [15], [22]
2. Duration:		
a. Incubation period	a. "Recent neuroscience studies have demonstrated that learning can be improved, and creative insight fostered, by incubation periods ranging from one night to considerably longer—in the absence of any additional training (Stickgold, James, and Hobson, 2000; Walker et al., 2003; Stickgold and Walker, 2004; Wagner et al., 2004)" (Amabile et al., 2005, pp. 392–393).	a. One of the most important aspects of creativity is incubation and immersion, and we'll talk about the steps of what creativity is a little bit later, but the key thing is at this point, Doug always went onsite with the big huge clients, like a PepsiCo. [27] [Doug] would have a session, and then he and his team would create 40 ideas in 40 days (40 days and 40 nights, in reference to the Bible). [6]
b. Incubation results	b. "Incubation is a process of unconscious recombination of thought elements that were stimulated through conscious work at one point in time, resulting in novel and useful ideas at some later point in time" (Amabile et al., 2005, p. 371	b. Instead of 40 ideas in 40 days, he moved to a 3-day workshop, and a portfolio of 10 to 20 ideas, and you get full art, full-concept writing. You come on Tuesday. By Friday, you leave, you get the folder. People were like how the heck do you pull this off? [28]

3. Content:		
a. Fluency	a. "Carrol (1985) found eight first-order factors that all loaded highly on a second order factor of idea production: [8 types of fluency]" (Woodman et al., 1993, p. 298).	a. "Not directly evident in the case."
b. Cognitive skills	b. "A number of studies have specifically focused on examining various cognitive processes or skills involved in creative problem solving (Shalley et al., 2004, p. 947).	b. "Not directly evident in the case."
c. Field independence	c. "Field dependence also has been related to creativity. People with high field independence are able to analyze the relevant aspects of the situation without being distracted by the irrelevant aspects (Woodman et al., 1993, p. 298).	c. We learned how to write concepts better and gave some thought to what makes them better. [We have] this database of 12,000 to 13,000 concepts and they are tested with consumers. So we used this data to create an algorithm to predict concept success or deficiency. [30]
d. Domain- and creativity-relevant skills (concepts)	d. "Amabile (1988) identified both 'domain-relevant skills' and 'creativity-relevant skills' as being important for creativity" (Woodman et al., 1993, p. 301).	d. We actually quantified [that] not only did you get more ideas using Trained Brains but you got better-quality ideas. The Trained Brains were a catalyst to get the experts to not think down their normal, convergent, mental memory tracks. So their job was to push, pull, prod, cajole, kid, peel open in many cases, even be sarcastic and push and push. [15] also [35]
e. Fluidity (idea variation, selection, retention)	e. "Evolutionary metaphors that emphasize variation, selection, and retention processes also have been effectively employed by other creativity researchers, most notably Campbell (1960), Simonton (1988), and Staw (1999)" (Ford, 1996, p. 1114).	e. We also learned… how to develop client creativity to significantly increase mental fluidity—a lot more ideas, better ideas, leading to better concepts. We increased fluidity significantly higher because, again, we needed to jump their tracks of linear thinking.… What Doug did [was] called "stimulus response," and stimulus response was … a nonlinear method of lateral thinking. [43], also [7]
E. Creative System		
1. New problem-solving processes:		So, yes, creative magic does happen, and we do have unique combinations that occur… but we set them up to happen. The client is going to think this is just random.… There's no blind randomness allowed in creativity. That's a common misconception.… The magical creativity of *Eureka! Ranch* is the orchestrated emergence of a concept. Organizational creativity is a misnomer, because it's what you do to organize creativity that makes it happen. [55]

(*continued*)

Table 17.3 Continued

Constructs	Supporting Quote	Participant Observations
a. Divergent production	a. "Divergent production has long been considered the cognitive key to creativity and has continued to be a major consideration in creativity research. Basadur, Graen, & Green (1982) postulated a sequential application of ideation (divergent thinking) and convergent thinking through the stages of problem finding, solution generation, and solution implementation. Thus, for a creative person to produce socially useful products, his or her divergent thinking must come hand in hand with convergent thinking" (Woodman, Sawyer, & Griffin., 1993, pp. 298–299).	a. Creativity is creating a concept that is both innovative and valuable. [45] To get there, you needed serendipitous thinking or divergent thinking, … not conventional thinking. [46]
b. Sequential process	b. "Based upon Csikszentmihalyi's (1996) basic elements of creativity—preparation, incubation, insight, evaluation, and elaboration" (Corbett, 2005, p. 477).	b. In the early days,… the first generation, creativity started with everybody around the room.… That was the way in which creativity worked. [2] Doug decided that that was not only inefficient, it was unreliable, and you didn't necessarily create new ideas. Brainstorming historically has always been like a statistical method—in order to get good ideas, you need more ideas. If you had generated 1,000 really good ideas,… maybe one will work—and it was always this bad funnel of you've got to start with 1,000 ideas, and… then you whittle them down.… Doug didn't like leaving things to chance. He said was needed to get better ideas, and he concluded we needed a better process. [3]
c. Bisociation	c. "Bisociation occurs when a person combines two or more previously unrelated matrices of skills or information" (Ireland et al., 2003, p. 981).	c. But this [two-step stimulus process] was a clever reassembly of that basic idea—using unrelated and related stimulus, and free association to get innovative thinking. Once we figured that out, the quantity, breadth, and depth of the ideas generated was just off the hook. We always got lots of ideas, but we got better ideas, and inherently, you get more ideas, but the key thing is you want better ideas. No one cares whether you create more ideas. [50] also [56]

2. New knowledge base:		
a. New combination of images	a. "Invention is little more than a new combination of those images which have been previously gathered and deposited in the memory. Nothing can be made of nothing. He who has laid up no material can produce no combination" (Sir Joshua Reynolds, 1732–1792; quoted in Offer, 1990)" (Woodman et al., 1993, p. 301).	a. What Doug did… was a nifty technique he called "stimulus response," and stimulus response was… a nonlinear method of lateral thinking. [43] I would call it lateral thinking squared, and this technique would work very effectively when used in a group. [44]
b. Larger number and greater breadth of cognitive elements (e.g., planning, relationship, competition cognitions)	b. "The importance of the number and breadth of cognitive elements is highlighted by other creativity theorists as well (Langley and Jones, 1988; Sternberg, 1988b)" (Amabile et al., 2005, pp. 368–369).	b. [Planning Cognitions:] The standard problem with many creativity sessions is that the person in charge states, "Thank you all for coming here, we're going to create some ideas today, and I'll know it when I see it."… Again, it's about how to manage the process. In an organizational context, you've got to know how to manage creative people and the creative process. [21], also [13], [24], [37]. b. [Relationship Cognitions:] We literally could have creative sessions where we did enough preparation that Doug and I would create pre-concepts ahead of the customers even coming in, and literally in the twenty concepts generated … five of them contained these seed ideas that were written before the clients ever got there because we had practiced.… We'd introduce those on the Wednesday, after spending the Tuesday working with the client generating innovative ideas. Wednesday morning we'd say, hey, while we were putting these ideas together, we had some new thoughts. We always presold it that way.… We'd always have some great concepts in the bank, that way we knew we could always deliver on our promise. [53], also [26], [39], [46]. b. [Competition Cognitions:] Then Doug has another brilliant idea. He goes, huh, I've got all these concepts.… He starts to develop a consumer research arm, testing all these concepts with consumers.… AcuPOLL Research, which becomes one of the top new concept-developing, consumer-testing companies. [25], also [10], [16], [29]

(*continued*)

Table 17.3 Continued

Constructs	Supporting Quote	Participant Observations
3. Hardware: *Eureka! Ranch* Creativity Systems/Culture Creative Capacity	Inherently unsystematic	
a) Orchestrated engagement		a) Our concept was first we had an immersion process. [22] Then we'd go back and before the creative session would start, we would have an internal procreative session. You see, the Trained Brains appear to be naïve; appear is the key word here. It appears to be chaos. It appears to be an unmanageable, nonlinear set of things. But it's a highly orchestrated dance. [23]
b) Marginalizing "deal killer" thinking		b) The people from Sony would look at that Trained Brain and think, like, "Okay, that's ridiculous."… The Trained Brain would be okay with the suggestion, but we would make an effort to write the concept down anyway—it follows you, it floats on air, levitating antigravity magnets. People would laugh and they would go okay.… And after that all ideas were seemingly more legitimate. The lesson here was no evaluation; it kills the creative process. [12]
c) "Trained Brains" traction		c) We have Trained Brains to create a whole brain in the room, a system to use these Trained Brains to generate more ideas and better ideas, a system to take these ideas and develop them into fully developed concepts, and a system to evaluate which concepts would gain the most traction. So now we focused on increasing the quality of the concepts that we generated. [36], also [7], [8]
d) Support staff idea processing		d) So basically he had an around the clock operation.… Doug briefs his writers and they write concepts overnight. Wednesday morning, [the client] walks in at 9 o'clock, and magically, there's a portfolio of finished concepts. [29]

e) Stimulus based divergent thinking	e) The next innovation was a big breakthrough around stimulus and in seeding informed intent in our clients. [37] We wanted original thinking, divergent, serendipitous thinking where we are thinking about ideas and connections that no one else is thinking about. And to do this we use indirect association. [47] The cup was just a stimulus . . . a starting point from which we think from a different second-order place. [48] It was a two-step stimulus process. So you take a base stimulus, unrelated to your industry context, and you cross it up by doing free association around that base stimulus . . . Then you add the industry context—also represented by stimulus, but this time related stimulus . . . Once we figured that out, the quantity, breadth, and depth of the ideas generated was just off the hook. [50]
f) Personality matching stimulus	f) Then we learned how to use the stimulus more effectively. . . . We would customize the stimulus to the people in the room. [49]
g) Validated concept assessment	g) What Doug did at the beginning, which was also very smart, was to keep a copy of every concept they ever wrote. [24] We learned how to write concepts better and gave some thought to what makes them better. . . . So we used this data to create an algorithm to predict concept success or deficiency. Doug called it Merwyn. [30] Merwyn is the heart of generation 4, and it was another key *Eureka! Ranch* innovation. [31]
h) Framed concept pitching	h) Another big masterful thing was in understanding how to pitch or communicate the ideas that you create in a portfolio. . . . So you always stack concepts in groups of three, knowing that they're always going to pick the middle of the three. [54]

(*continued*)

Table 17.3 Continued

Constructs	Supporting Quote	Participant Observations
F. Superior Creative Results		
(Note on Product Concepts as Expert Results)		**[Product Concepts Note:]** I think Doug's great contribution to creativity, if I had to limit it to one—was that creativity is a process, a process that can be managed, and a process that can be optimized, and a process that can be sold. I think he was the first to realize that the output of creativity is a "written consumer-centric concept." A "concept" is in effect a commercial asset, because we believed that before you can market in dollars, you market in words.… So the concept … was literally a 100-word—plus or minus, whatever is necessary—description of your idea as if it were written through the eyes of the customer. [4] We discovered that there are three key drivers of a great product concept: overt benefit, real reason to believe, and dramatic difference. [31]
1. New & valuable	"Researchers and laypersons seem to agree that creativity refers to something that is both novel and in some sense valuable" (Ford, 1996, p. 1114). "I define creativity as a domain-specific, subjective judgment of the novelty and value of an outcome of a particular action" (Ford, 1996, p. 1115).	Creativity is creating a concept that is both innovative and valuable. [45] Overt benefit is what is in it for the customer. What specific promise can you make to motivate them to buy? What makes it valuable? [32]
2. Useful & appropriate	"Throughout most of these perspectives, creativity usually has been defined as the production of novel ideas that are useful and appropriate to the situation (e.g., Amabile, 1983; Mumford & Gustafson, 1988)" (Unsworth, 2001, p. 289).	The real reason to believe is why should customers believe your promise? Why should they trust that this is possible and that you can do it better than others? [33]
3. Distinguishing feature	"Drawing on the assumption that novelty is that distinguishing feature of creative work over and above work that is solely useful or well done (Amabile, 1996)" (Amabile et al., 2005, p. 368).	Dramatic difference is about differentiation and relative value, how is this product better than alternatives, and what makes it not just great, but a great deal? [34]

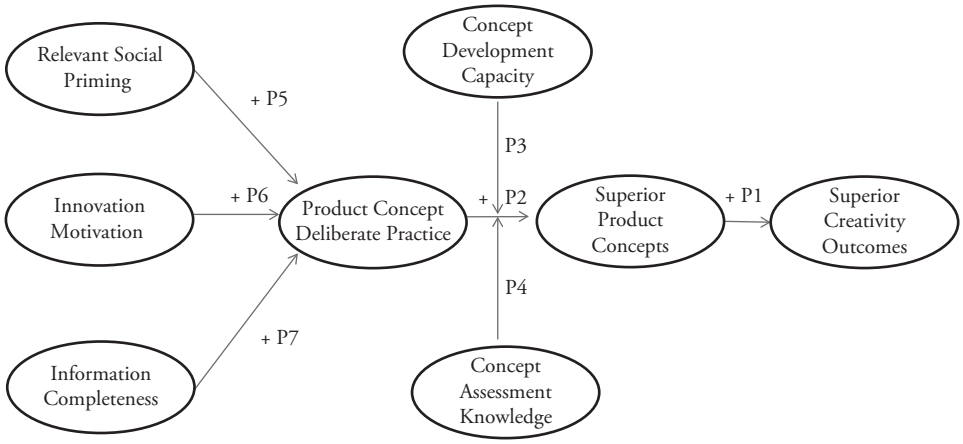

Fig. 17.3 A Research Model of Organizing Creativity.

to believe," and "dramatic differences." These elements reflect three key aspects of creativity. Overt benefits reflect the value (appropriateness) aspects of creativity (Ford, 1996; Hennessey & Amabile, 2010). Dramatic differences reflect the novelty or differentiation aspect of creativity (Amabile et al., 2005). Real reasons to believe reflect the difference between invention and innovation; at least in the business context, this necessitates creative outcomes that are both feasible to commercialize and accepted by customers (Jones, Knotts, & Udell, 2011; Schoen et al., 2005).

There is anecdotal evidence from the case (in which thousands of written product concepts were analyzed in the Merwyn database against consumer preferences) that there is a connection between superior explicit-form written product concepts and superior outcomes. Although the literature does not address the notion of the explicit-form written product concept, superior products (valued and differentiated) have been found to be the most important differentiator between winners and losers in new product development (Cooper, 2011). Consequently we expect:

Proposition 1: Superior explicit-form written product concept development leads to superior creativity outcomes.

Product Concept Deliberate Practice

Product concept deliberate practice is defined to be *the orchestrated activities that involve intensity* (Cohen & Levinthal, 1990), *duration* (Amabile et al., 2005), *and content central to the development of a new product concept* (Hall, 2001). As previously noted, the expertise-development theory that underlies the deliberate-practice model of superior performance suggests that intensity, duration, and content are the key elements comprising deliberate practice, and also that deliberate practice drives exceptional performance. The *Eureka! Ranch* experience suggests that (1) a key facet of intensity is immersion—devoting dedicated time to the creative process (see Table 17.3); (2) a key facet of duration is accelerated incubation, which we note from the case can be interpreted as "working around the clock"; and (3) a key facet of content is written explicit-form product concepts, which exhibit strong overt benefits, real reasons to believe, and dramatic differences. Accordingly, we suggest:

Proposition 2: Product concept deliberate practice leads to superior product concepts.

Concept Development Capacity

Concept development capacity is defined to be *the level of competence (e.g., ability for bisociation, divergent production, insight) available to refine the quality of new product concepts* (e.g., Corbett, 2005; Ireland, Hitt, & Sirmon, 2003; Woodman et al., 1993). We suggest concept development capacity to be a construct that is homologous in nature to the problem-solving process capability that is part of a cognitive system. In the organization-level model, we suggest that as part of the organizational creative system, changes in the creativity process are a key outcome of deliberate practice. However, in the case we analyzed here, we have not seen as directly, this linkage implicating deliberate practice and the superiority of the product concept. Rather, our experience indicates that it is the ability to refine product concepts that were developed through product concept deliberate practice that enables them to become superior.

As previously noted, the literature suggests that the dimensions of deliberate practice that influence its effectiveness are intensity, duration, and content (see Figures 17.1 & 17.2). Whereas intensity and duration are primarily thought to arise endogenously, content (the "what to practice" and "how to practice it") must come from expert external sources *and* must be utilized by those who are actually doing the practicing (Charness et al., 1996). To the extent such input is not available, then the "content" portion of deliberate practice can be compromised (practice is flawed), and the effectiveness of deliberate practice is reduced. Consequently, we suggest that concept development capacity (such as input from the Trained Brains in the case presented) has a moderating effect on the relationship between product concept deliberate practice and the quality of the product concepts produced.

This observation is borne out in the literature, which suggests that the refinement of creative output is enabled or disabled to the extent that divergent production, sequential process, and bisociation (see Table 17.3) are available from those who possess the new problem solving processes (see Figure 17.3 E1) for application to influence the quality of the practice of those they coach. As we have previously noted, this "coaching" role is also suggested to combine well with deliberate practice to produce expert performance (Charness et al., 1996). Hence, we suggest the following:

Proposition 3: Concept development capacity moderates the association of product concept deliberate practice and superior product concepts.

Concept Assessment Knowledge

Concept assessment knowledge is defined to be *the extent of relevant techniques and tools available* (cf. Woodman et al., 1993) *for validating possibilities generated in the product concept generation process*. We interpret concept assessment knowledge as a construct that is homologous in function to the knowledge base that is part of a cognitive system. Similar to concept development capacity, the ability to draw upon previously developed expert evaluation cognitions enables coaches to help organizations select "winning" product concepts. This effect was evident in the *Eureka! Ranch*'s use of the Merwyn database to assess the veracity of product concepts against consumer preferences. Consequently, we conclude that the level of concept assessment knowledge has a moderating effect on the relationship between product concept deliberate practice and the quality of the product concepts produced, and accordingly we suggest:

Proposition 4: Concept assessment knowledge moderates the association of product concept deliberate practice and superior product concepts.

Relevant Social Priming

Relevant social priming is defined to be *the cognitive readiness* (*such as, the preparedness invoked by such factors as imposed goals* (Ambrose and Kulik, 1999), *task clarity* (Hauser and Wood, 2010), *response to role modeling* (Shalley et al., 2004), etc.) *that arises from the assertion of expectations within an important/applicable social context*. The case illustrates three social-priming subconstructs that appear to us to be particularly relevant. First, clearly defined creative objectives initiated product concept deliberate practice by "priming the pump." Second, constraint awareness helped to provide direction in the use of related stimulus to assist in the development of concepts that are relevant and implementable. And third, Trained Brain catalysts provided role modeling for task-relevant activity.

Expertise theory suggests that social factors enable or constrain the extent of deliberate practice (Charness et al., 1996). More recently, developments in cognitive psychology suggest that the social situation of cognition creates dynamism in the task environment through action orientation (Mitchell, Randolph-Seng, & Mitchell, 2011). Where cognition is action-oriented, embodied, distributed, and situated within a given context, behavior (such as deliberate practice) is concurrently and jointly affected by: what action is underway, the way a person's body is responding (had your coffee this morning?), the extent of input from a variety of other people, and within some given situation. This "social influence *plus* body/experiential influence" conceptualization moves away from more static models for understanding cognition (such as input–process–output—so-called *boxologies* [Smith & Semin, 2004]) toward a more dynamic model. This logic suggests that relevant social factors prime or prepare the mind for action, in this case, the actions of product concept deliberate practice. Thus, we suggest the following:

Proposition 5: Relevant social priming leads to product concept deliberate practice.

Innovation Motivation

Innovation motivation is defined to be *the desire (e.g. from positive/negative affect* (Amabile et al., 2005)*), and confidence (e.g. self-efficacy* (Shalley

et al., 2004)*), and propensity for action* (Sternberg, 1997) *necessary to generate action toward engagement in creative tasks*. The *Eureka!-Ranch* experience suggests three facets of innovation motivation that we believe are particularly relevant. First is organizational efficacy. The *Eureka! Ranch* found it to be important to develop "informed intent" with their clients, instilling within them a belief in the organization's exceptional skill and methods, thus enabling the creation of an expectation that together they would be successful in generating superior new product concepts. Second is affect orchestration. At the *Eureka! Ranch,* a key role of the Trained Brains was to make it fun, to keep clients engaged and positively disposed toward the deliberate-practice process of product concept development. Third is creative dissonance development, another key role of the Trained Brains that was used at the *Eureka! Ranch* to invoke tension, focus, and motivation.

The expertise literature suggests that motivation in the deliberate-practice process stems from such factors as attention span, repetition tolerance, and competitiveness (see Figure 17.1) (Charness et al., 1996). When informed intent, positive disposition, and dissonance resolution were invoked in organizing creativity, a high level of motivation to innovate occurred (see *Eureka! Ranch* case). Thus, we suggest:

Proposition 6: Innovation motivation leads to product concept deliberate practice.

Information Completeness

Information completeness is defined to be *the quality of the fusion among domain-specific knowledge* (Sternberg, 1997), *prior organizational knowledge* (Shepherd & DeTienne, 2005)*; and relevant creativity knowledge and outside (creativity-expert) sources* (Cohen & Levinthal, 1990). We note from the case that at the *Eureka! Ranch*, it was important to match domain expertise and prior knowledge with process expertise and relevant creativity knowledge. The result of this matching was the formation of a "whole brain," which then enabled the members of the organization to avoid perceptual and conformational biases as they were organized with intensity, duration, and (most importantly, in this instance) specifically relevant content. Accordingly, we offer:

Proposition 7: Information completeness leads to product concept deliberate practice.

Discussion

Evident in Table 17.3 is the fact that in organizing creativity, the *Eureka! Ranch* business model is highly consistent with the organizational-level expertise development model of Figure 17.2. Deliberate creativity organization is clearly the focal activity of the *Eureka! Ranch*. Social factors, motivational factors, and informational factors are tuned to supporting this focal activity, and a creative system (represented by the business model) was developed to drive superior results. This provides support for our framing of the organization of creativity at the organizational level as an expert entrepreneurial cognitive task. With a few exceptions, the *Eureka!-Ranch* experience reflects (and draws upon) most of the key concepts thought in the extant literature on creativity and deliberate-practice expertise to be relevant to the generation of superior creative results. The exceptions (which we noted in our analysis in Table 17.3, are the social factor of autonomy/freedom, the motivational factor, propensity to invest, and the informational factors of abstractness and uncertainty. This does not necessarily imply that these factors are not relevant in any context, but it suggests that they were not relevant to the *Eureka! Ranch* approach, as recounted in participant observations.

The *Eureka! Ranch* case extends our understanding of organizational creativity by providing new insights into organizing creativity, as well as potential applications in related fields. In the following paragraphs, we suggest several implications of our research, related to our model, that we argue is: (1) more complete, (2) more systematic, (3) more integrated with related fields such as corporate entrepreneurship and innovation, and (4) more extendable than previous work.

A More Complete Model

First, the *Eureka! Ranch* approach focuses on the development of explicit-form written product concepts as the focal content of the deliberate practice of creativity organization. The extant literature suggests that fluency, cognitive skills, field independence, creativity-relevant skills, and fluidity are the content to practice. *The Eureka! Ranch* draws on those skills but applies them specifically to the development of product concepts that have three key elements: a strong overt benefit, strong "reasons to believe," and a strong dramatic difference, suggesting that superior creative results are driven by superior product concepts.

A More Systematic Model

Second, the *Eureka! Ranch* approach provides insight into the creative system required to achieve superior creative results. Previous work to be found within the creativity literature has not addressed the "black box" of how to set up a system to deliver superior creative results, implying that the creative process is inherently unsystematic. The *Eureka! Ranch* business model suggests that what was thought to be unsystematic is, in reality, substantially systematic; and it is clear that over a substantial period of time, *Eureka! Ranch* has been able to document an effective system for consistently achieving superior creative outcomes.

Linkage with Related Fields: Corporate Entrepreneurship and Innovation Literatures

Third, our analysis of the *Eureka Ranch!* model for organizing creativity has implications for research in related fields (i.e., those beyond organizational creativity)—in particular, corporate entrepreneurship and innovation. These fields often employ an organization level of analysis for the explanation of innovation and creativity processes and events (e.g., Zahra, 1991, 1993, 1995; Damanpour 1991), which facilitates integration with our treatment of organizational creativity.

Zahra (1995) defined corporate entrepreneurship as the processes that involve "innovation, renewal, and venturing efforts." Sharma and Chrisman (1999) even more explicitly defined corporate entrepreneurship as "the process whereby an individual or a group of individuals, in association with an existing organization, create a new organization or instigate renewal or innovation within that organization." Our model addresses generating new products in a process that involves the creation of explicit-form written product concepts. Given that other aspects of corporate entrepreneurship—creating new organizations and instigating (strategic) renewal—also require creativity, it may be valuable to consider potential construct analogs to the explicit-form written product concept for those processes as well. In this way, the process of developing entire new organizations or new strategies might likewise be explained by a deliberate-practice, expert-cognition approach and related model.

Additionally, Barringer and Bluedorn (1999) observed that the influence of context on a firm's level of entrepreneurial intensity has become a major theme in the corporate entrepreneurship literature. Many of the social factors we have described as being important to the process of organizational creativity could be added to some of the contextual factors suggested by the corporate entrepreneurship literature, such as turbulent versus stable environment (Naman & Slevin, 1993), top-management team support, and political factors (Hitt, Nixon, Hoskisson, & Kochhar, 1999).

Damanpour (1991, p. 556) cited previous research defining innovation as the "adoption of an internally generated or purchased device, system, policy, program, process, product, or service that is new to the adopting organization." Past work on innovation has suggested that international diversification contributes to higher innovation (Hitt, Hoskisson, & Kim, 1997) and that that successful innovation in the context of high international diversification depends on "culturally diverse corporate and divisional management teams" (p. 790). This assertion appears to us to be analogous to the notion of a "whole brain" found throughout the *Eureka! Ranch* case, and it appears to parallel the construct of information completeness we propose. Like assembling a "whole brain" to organize creativity, assembling diverse management teams likely increases the quality of fusion-born innovation from combining domain-specific knowledge, prior organizational knowledge, and relevant creativity knowledge and sources to produce interfunctional integration (Hitt, Hoskisson, & Nixon, 1993). Relatedly, previous research on cross-functional teams has suggested that the foregoing organizational arrangements are necessary but not sufficient for the development of new products within the context of corporate entrepreneurship (Hitt et al., 1999). In these and similar studies, we speculate that perhaps structural considerations are reported as "necessary but not sufficient" because they are speaking to only part of the requirements of organizing creativity. For example, these structures, despite facilitating information completeness, may be neglecting certain elements of deliberate practice.

There are constructs reported to be significant in studies of innovation or corporate entrepreneurship that do not appear in our model. For example, organizational slack—"the pool of resources in an organization that is in excess of the minimum necessary to produce a given level of organizational output" (Nohria & Gulati, 1996, p. 1246)—has been associated positively with innovation (Cyert & March, 1963), yet our model says little about organizational resources. This and other open points may be reconciled, however. Consider the assertion of Nohria

and Gulati (1996) that the relationship between slack and innovation takes an inverted U shape. They argue that too little slack discourages experimentation and attempts at innovation and that too much slack increases complacency and decreases discipline in evaluation. We wonder whether our model of organizing creativity may simply account for these realities in another way. For example, the social factors of autonomy and freedom encourage experimentation and innovation attempts, and the social factor of imposed goals decreases complacency and sets proper boundaries.

There are probably many such similarities in the literature that can stem from our analysis of organizing creativity and that provide an opportunity for further integration and empirical testing. Hence, just as we have identified organizational-level homologs to individual-level counterparts in our additive composition model of organizational creativity, we likewise suggest that application to other literatures may proceed based on drawing analogs to phenomena, models, and definitions in related fields. It is likely that phenomena salient to all fields will be better understood.

Extension of Value Creation Research

Fourth, the expert knowledge base (thinking) that supports the *Eureka! Ranch* process for organizing creativity reflects the three key active knowledge structures required to create any economic exchange: planning cognitions, relationship (promise) cognitions, and competition cognitions (Mitchell, Morse, & Sharma, 2003). Understanding these expert cognitions may allow others to effectively develop a *Eureka! Ranch*–style creative system needed to achieve superior creative results.

Future Research

The key limitation of single-case research is external validity. Although the Eureka Ranch experience maps well to our organizational-level expertise development model (Figure 17.2), further development and investigation of a more generalized research model of creativity organization is needed. We developed Figure 17.3 based on the *Eureka!-Ranch* experience and offer it as starting point for future research on ways to "organize creativity." Such a model might be tested using an experimental method: training new product development managers or other innovators in the *Eureka Ranch!* approach and comparing the inputs, processes, and outcomes of this treatment group with those of control groups that received more traditional creativity training or no training at all.

Notes

1. We note that our analysis of volition in creativity contributes to the more general dialogue on opportunity creation versus discovery (see, e.g. Alvarez & Barney, 2007), although substantive engagement in this dialogue is not the focus of our chapter.
2. Although it is also beyond the scope of this chapter to delve deeply into the mechanics of construct development across levels, the analysis we provide nevertheless draws the applicable outlines (e.g., Chan, 1998; Rousseau, 1985) and provides construct-definition sources that can enable deeper consideration.

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CHAPTER

18 Business Innovation Processes

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Abstract

This chapter examines business innovation processes as an ongoing set of activities comprising *invention, development*, and *implementation*. Invention implies the emergence of novel ideas of potential value. However, to realize this potential, ideas have to be developed, a process that requires both their instantiation in the form of prototypes and the creation of an infrastructure to generate value in use. In addition, the implementation of innovations (i.e., their widespread adoption) requires additional efforts. After the explication of these three elements of innovation processes, the complexities involved are highlighted. In particular, innovation processes do not progress in a neat, linear fashion from invention to development and implementation, but instead are characterized by considerable shifts between these elements. The chapter concludes by highlighting implications for practice.

Key Words: invention, innovation process, entrepreneurship, intrapreneurship, complexity

Introduction

Business innovation is centrally concerned with the creation, development, and implementation of new ideas (Rogers, 2003). An idea may be a novel recombination of old ideas, an invention that challenges the present order, or an unprecedented formula or approach. As long as the idea is perceived as new, it can serve as the basis for a business innovation.

Business innovations can vary widely in novelty, size, complexity, and temporal patterns of development. They may be unplanned, emerging by chance and accident, or as an afterthought. Although most business innovations are of small scope, larger-scale business innovations have attracted greater attention. This chapter examines business innovations that (a) require concentrated efforts to develop and implement, (b) reflect substantial technical, organizational, and market uncertainty, (c) entail a collective effort of considerable duration, and (d) require greater resources than are held by the intrapreneurs[1] undertaking the effort.

Specifically, the chapter focuses on the processes by which business innovations are invented, developed, and implemented—which we label as *innovation journeys*. Understanding these processes is critical for intrapreneurs who seek to increase their odds of innovation success. In practice, a majority of new and seemingly useful inventions fall by the wayside, and are never implemented. Some of these ideas are terminated because they do not work, are not feasible, or fail to solve a problem. However, many good ideas are never implemented because of complexities associated with the innovation process (i.e., the sequence of events and challenges that unfold to initiate, develop, and implement an innovative idea). Therefore, understanding the innovation process provides important insights to practitioners and scholars.

The Minnesota Innovation Research Program (MIRP) and subsequent studies have examined how innovation processes unfold in a variety of settings. In the MIRP program, Van de Ven, Polley, Garud, and Venkataraman (1999) found a

dozen common characteristics that occurred during the invention, development, and implementation stages of the innovation journey (Figure 18.1). They found that a long period of gestation precedes the emergence of novel ideas, which, as they emerge, often shock the system and set planning in motion.

The developmental process is not straightforward but instead is characterized by a proliferation of paths and many setbacks. The development period is also characterized by ongoing and shifting assessments of goals, progress, and fluid participation of different stakeholders, even as an industry infrastructure emerges requiring both cooperation and competition among the various constituents involved. Implementation activities often occur throughout the innovation journey, linking and integrating the "new" with the "old," as opposed to substituting or replacing the old with the new (Van de Ven et al., 1999). These observations are consistent with those offered by Rogers (2003), who noted that it is misleading to assume that an innovation is completed during the development period, because much reinvention occurs as adopters modify an innovation to fit their local implementation setting.

It is useful to systematically review these findings and related studies by examining the subprocesses of invention, development, and implementation. We take a multilevel approach to this task by examining how these processes unfold, not only within firms but also across the larger field within which innovations operate. For each of the three stages of innovation, we first begin by articulating some of the core mechanisms driving the process before explicating how the sub-processes unfold.

Invention

One of the findings from MIRP and other studies (e.g., Irvine & Martin, 1984; Usher, 1954) is that a gestation period precedes the emergence of novelty. This research shows that many events, some intended and others unintended, are required to set the stage for acts of creative insight to occur (Usher, 1954). Such creative insights occur through a recombination of ideas and artifacts across different domains of knowledge and practice (Hargadon, 2003; Van de Ven et al., 1999). Indeed, creativity is often defined as the novel recombination of existing ideas (Van de Ven et al., 1999).

Recombination can be led by individuals who have the capacity to "bisociate," or to associate ideas across two or more distinct domains of knowledge (Koestler, 1964; Usher, 1954). This is one source of creativity, but another is recombination by brokers (Hargadon & Sutton, 1997) who span "structural holes" across a network of communities to connect ideas and artifacts (Burt, 2004). In addition, knowledge that flows through a network (Ahuja, 2000; Podolny, 2001) can be catalyzed by interactions between people with different perspectives (Tsoukas, 2009). The emergence of novelty can

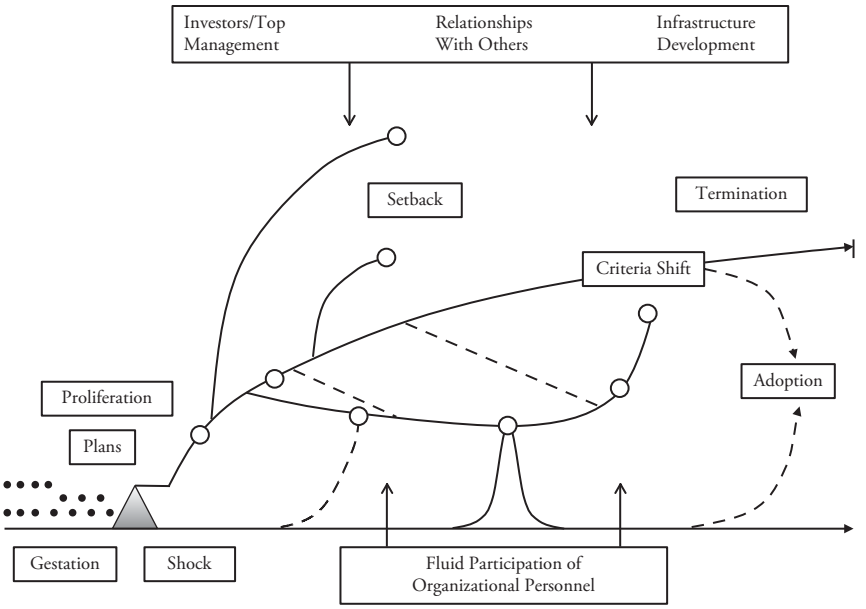

Fig. 18.1 Key Components of an Innovation Journey (from Van de Ven et al., 1999.)

even be routinized (Feldman & Pentland, 2003) through the use of heuristics and simple rules (Davis, Eisenhardt, & Bingham, 2009) that lead people to question and explore alternative ways of doing things.

Invention within firms. It ought to be easy for inventions to occur within firms, given that intellectual property produced within the firm belongs to the corporation, making it possible to recombine different strands of knowledge to foster ongoing inventions. In reality, however, there are roadblocks. Knowledge in many organizations continues to remain in "silos" because of the structural mechanisms in place that lock communities of practice in "thought worlds" (Dougherty, 1992). As a result, members of one community (Brown & Duguid, 1991; Lave & Wenger, 1991) are unable to recognize 'let alone share' ideas and knowledge with one another (Carlile, 2004). New ideas, to the extent that they emerge, can easily be stamped out by top management teams (TMTs) who are unable to fully appreciate the value of the new opportunity, thereby dampening the variations required for novelty to emerge (March, 1991).

What are the solutions to this problem? Process research suggests that individuals are likely to be creative in their work, especially in organizations that both enable and motivate innovation (Amabile, 1996; Angle, 1989). The availability of slack resources is one enabling factor that allows for exploration during work (Garud, Gehman, & Kumaraswamy, 2011; Nohria & Gulati, 1996). To the extent that new ideas emerge from recombinations of ideas across different boundaries, invention typically requires interactive expertise (Collins & Evans, 2007) and the integration of knowledge across boundaries within and between organizations, disciplinary communities, and regional/national cultures (Van de Ven & Zahra, 2015). Ideas that emerge from such bottom-up processes (Burgelman, 1983; Kanter, 1988) can be combined with other ideas through practices such as the rotation of people (Galunic & Rodan, 1998; Garud & Nayyar, 1994), the sponsorship of internal technology fairs (Nayak & Ketteringham, 1986), cross-functional teams, and intermediary organizational arrangements (Van de Ven & Zahra, 2015).

Because routine tasks are more predictable and less challenging than novel tasks, organizations tend to favor exploitation over exploration (Benner & Tushman, 2002). Novel ideas, if not protected, can be selected out even before they have a chance to develop. An approach that has been suggested to deal with this problem is the protection of exploratory ideas in niches such as skunk works (Rich & Janos, 1994), allowing them to escape "innovation killers" such as the use of Net Present Value calculations (see Christensen, Kaufman, & Shih, 2008).

Separating the nurturing of exploration from exploitation, with TMTs overseeing the activities of the two, creates what Tushman and O'Reilly (2006) called an ambidextrous organization. Ambidextrous organizations have the capacity to efficiently manage their current operations even while preserving the capacity to adapt to environmental changes. In this regard, recent research finds that TMT's attention toward an emerging technology (as compared to existing technologies) is associated with faster entry into the new field (Eggers & Kaplan, 2009).

Invention across the field. As noted before, the process of invention does not occur within the confines of a single firm; it is embedded in a much larger community or network that defines the field within which inventions occur. Indeed, a stream of research confirms the importance of the flow of knowledge across networks (Ahuja, 2000; Hansen, 1999). These networks serve not only as "pipes" through which information and knowledge flows but also as "prisms" reflecting these exchanges such that they can be perceived by others in the network (Podolny, 2001). Some of the connections between firms represent "weak ties" (Granovetter, 1973) that facilitate the flow of ideas across distant domains. Relatedly, research that builds on Burt's (2004) notion of structural holes establishes the importance that brokers play in the recombination of ideas (Hargadon, 2003). Recent work also includes critics as network members and highlights the roles they play in evaluating novel ideas (Lakhani & Panetta, 2007).

It should be noted, however, that the friction that exists in the flow of knowledge within firms (e.g., across different communities of practices) also occurs in the flow of ideas across firms constituting a multiparty network. Research has approached this issue from the notion of absorptive capacity (Cohen & Levinthal, 1990). Absorptive capacity is the ability of firms to absorb new knowledge based on prior knowledge. The recombination of ideas is dampened to the extent that absorptive capacity is lacking among the constituents of a knowledge network.

Besides the challenges that arise in the flow of ideas due to lack of absorptive capacity, additional challenges arise because of intellectual property protection (Teece, 1986). For instance, the protection of ideas by one firm for strategic reasons may impede the flow of ideas to another. One solution to the problem is for firms to enter into contractual relationships to share, transfer, and license intellectual property (Dyer & Nobeoka, 2000; Gulati & Singh, 1998). Yet, contractual hazards exist between alliance partners, because there is always the possibility for one firm in a relationship to assimilate and exploit the other firm's knowledge, thereby changing the competitive balance between the two (Hamel, Doz, & Prahalad, 1989; Teece, 1987). Specifically, collaborators may learn from one another such that a one-time collaborator becomes a competitor. Furthermore, even if competitors try to protect their intellectual property, knowledge eventually leaks out (Dyer & Singh, 1998).

All of this contributes to what has been termed competitive "learning races" between firms (Dyer & Singh, 1998; Gulati, Nohria, & Zaheer, 2000; Hamel, 1991). Several issues become salient. First, absorptive capacity (Cohen & Levinthal, 1990) and *relative* absorptive capacity (Lane & Lubatkin, 1998) become important because they will determine the capacity and rate at which companies can learn and apply knowledge from others, thereby impacting their competitive advantage. Second, the location and the strategic orientation of a firm within a network of firms become important (Obstfeld, 2005; Powell, Koput, & Smith-Doerr, 1996). Third, given the possibilities of spillovers, acts of reverse engineering, and even espionage, as well as the need to connect with others to generate more robust ideas, firms must continue to invent if they want to retain their competitive position in the industry (Barnett & Hansen, 1996).

Development

The invention stage usually concludes when an innovation (or entrepreneurial) team is formed and funded to develop the business idea based on a plan and budget approved by resource controllers (top managers or venture capitalists). There are several important milestones that mark innovation development processes. First, developmental activities must provide proof of concept (i.e., demonstration of feasibility). In this regard, many have written about the important role that prototypes, modular designs, and drawings play (Thomke, 2003; Wheelwright & Clark, 1992; Van de Ven & Zahra, 2015), not only to demonstrate proof of concept, but also to serve as "boundary objects" (Star & Griesemer, 1989). Boundary objects are abstract or physical artifacts that have the capacity to bridge perceptual and practical differences among diverse actors to promote cooperation. Boundary objects thus provide a common basis for interaction but are pliable enough to accommodate and retain heterogeneous goals and points of view (Boland & Collopy, 2004; Carlile, 2002).

Second, to become commercially viable, the initial innovation idea must snowball during the development period into a collection of assets, resources, and capabilities that make it possible for the innovation to be manufactured, serviced, and sustained (Cooper, 2001). Of course, driving the process is the emergence of value in use and the ongoing feedback generated through trials by users (Lakhani & von Hippel, 2003; Tyre & von Hippel, 1997). Indeed, users interpret and modify innovations to suit their own contexts (Faulkner & Runde, 2009; Pinch & Bijker, 1987). Eventually, this process results in the commercial launch of an innovation.

Development is a messy process, with actors and artifacts becoming entangled through subprocesses such as bricolage, improvization, and experimentation that defy simple linear explanations (Baker, Miner, & Eesley, 2003; Baker & Nelson, 2005; Garud & Karnoe, 2003). The overall process is transformational, specifically of actors' identities and preferences as they become entangled with the idea (Garud & Karnoe, 2001). Transformed, too, are the material artifacts and institutional resources that come into play. Given the disruptions involved and adjustments required, even the most exciting of new ideas can encounter inertia and resistance (Glasmeier, 1991), thereby making it difficult for development to gather the necessary momentum (Hughes, 1969). More often, there are false starts and dead ends, partial triumphs and victories, as an idea proceeds from conception to commercial development (Van de Ven et al., 1999). In the end, the idea itself is transformed.

Development within firms. Firms are potentially fertile grounds for the elaboration of novel ideas because they are often rich with resources that can be used at the discretion of TMTs if they have the "patient capital" to nurture ideas from conception to commercialization (Penrose, 1959). This is the picture richly detailed by

Burgelman (1991), who offered an evolutionary perspective on innovation within firms, with upper echelons of management selecting and nurturing initiatives that arise from all around the organization.

Besides TMTs, others in the organization can play important roles in the development of ideas. For instance, Burgelman (1994) described how Intel was able to survive because of autonomous bottom-up processes that escaped the organization's internal selection screen. Specifically, some in the company pursued microprocessor chips. When competition for dynamic random-access memory (DRAM) chips intensified with the market entry of Asian manufacturers, Intel was able to shift to microprocessors because of such autonomous innovation.

Many other firms, such as Research In Motion, Nokia, Kodak, and Polaroid, have not been so fortunate, and have felt the sting of Schumpeter's (1942) process of creative destruction. Literature offers cognitive, behavioral, and structural reasons why incumbents fall into such traps. In some cases, the TMT has limited ability to cognitively appreciate the need for change (Tripsas, 2009; Tripsas & Gavetti, 2000) because they seek comfort in the deployment of a rational calculus by which to make decisions (Porac, 1997). Behaviorally, the very "core competencies" (Prahalad & Hamel, 1990) of companies can become "core rigidities" (Leonard-Barton, 1992; Sydow, Schreyogg, & Koch, 2009) as the contexts within which firms operate shift. Structurally, Henderson and Clark (1990) demonstrated how and why firms may be unable to recognize architectural innovations that can destroy the architectural knowledge embedded in firms' structures and information-processing procedures.

Projects are one way to overcome the traps that emerge from such cognitive and behavioral constraints (Martin, 2009). Projects are mezzo-level organizational arrangements that serve as forums for pursuing new opportunities. Moreover, they serve as forums for action and interaction among a diverse set of organizational actors to facilitate the emergence, formation, and transformation of beliefs, routines, and practices (e.g., Nonaka & Takeuchi, 1995; Ravasi & Lojacono, 2005). Projects may be sponsored by TMTs, or they may arise autonomously from bottom-up efforts. Irrespective of their origins, projects compete for top management attention to gain corporate resources (Burgelman, 1991; Kaplan, 2008). However, although TMTs may act as critics or as sponsors, they can also serve as mentors (Van de Ven & Grazman, 1997).

Noting the importance of projects, several scholars have explored project team dynamics. For instance, Wheelwright and Clark (1992) introduced the notion of heavyweight teams, which are teams with the autonomy and resources to take a project from conception to commercialization. Also influential is work by Takeuchi and Nonaka (1986), who used the analogy of the game of rugby to paint a picture of players from different disciplines continually interacting with one another as an idea travels from conception to commercialization.

Development across the field. Just as development does not unfold in a vacuum within a firm, this is also true of the larger field or industry within which novel ideas evolve. A macro-infrastructure for innovation, also known as an ecosystem in today's parlance, is required (Adner & Kapoor, 2010; Iansiti, 1998). In addition to proprietary research and development, manufacturing, marketing, and distribution functions by private entrepreneurial firms to commercialize the innovation for profit, this infrastructure includes collective resources (intellectual, financial, and technological endowments), institutional standards and legitimacy, and educated consumers (Van de Ven & Garud, 1989).

The creation of this infrastructure is well beyond the reach of any individual firm. Typically, it requires the involvement of many public- and private-sector organizations such as universities (as idea sources), training facilities (for human resources), financial institutions (for insurance and funding), industry associations (for standards), and government services (for enabling regulations and legitimacy). It also requires access to co-specialized assets that firms can access by entering into relationships with partner firms (Teece, 1986). These assets can be general-purpose, specialized, or co-specialized, and they can be owned by the firm in which the idea originated or by other firms. In combination, the innovation idea and the assets required to establish value create what has been called a "value net"—a network of firms that together offer value to customers (Brandenburger & Nalebuff, 1996).

Teece (1986) theorized that the appropriation of benefits across a network is contingent on several factors including how lax or stringent intellectual property protection is, who owns the assets, and whether nontrivial resources are required to

generate these assets. In many cases, the firm that owns the idea may not be able to appropriate the benefits of its efforts, especially when the appropriability regime around an idea is weak. When appropriability regimes are weak, it is difficult to stop others from copying the idea. It is very possible that the owners of co-specialized assets are the beneficiaries. This was the case when EMI introduced the computed tomography scanner but General Electric was able to appropriate the benefits because they could introduce their own scanner while possessing co-specialized assets such as a trained pool of medical sales personnel (Gelijns & Rosenberg, 1999; Teece, 1987).

Recent work has introduced the concept of technological platforms that lie at the heart of value nets (Gawer & Cusumano, 2008). Technological platforms serve as a base on which firms may build to offer enhanced products and services. The value of a platform increases when positive network externalities exist on both the supply and the demand side; that is, to the extent that complementors (firms that offer complementary products such as software that operates on specific operating systems; see Brandenburger & Nalebuff, 1996) and users attach to a platform, its value increases (Garud & Kumaraswamy, 1993). In related literature, the growth of a platform is based on the degree to which actors prefer to attach themselves to a network, and this is based on how many others are already connected with the platform as well as the platform's growth potential (Barabasi & Albert, 1999). Using this approach, Venkatraman and Lee (2004) traced the growth of game consoles in the software game industry.

Apple's core technology platform is a case in point (Boudreau & Lakhani, 2009; Suarez & Kirtley, 2012). Apple has continued to innovate around its core technologies even as it has generated value by spawning a value net such as iTunes and the App Store that serve as "killer apps," offering value to the core platform. The characteristics of Apple's digital platform make it possible for digital content and apps to connect different devices such as mobile phones, personal computers, television sets, and many others (Yoo, Boland, Lyytinen, & Majchrzak, 2012). The platform also allows third-party developers an opportunity to create new functionalities by introducing apps and accessories for these devices, resulting in wakes of innovation (Boland, Lyytinen, & Yoo, 2007). As a consequence of such ongoing innovation, the platform itself is never complete at any point in time and is under continuous development (Garud, Jain, & Tuertscher, 2008).

In fast-moving (dynamic) industries, especially those involving systemic products, open innovation (Chesbrough, 2003) allows firms to build on the strengths of others (i.e., "run in packs"; see Van de Ven, 2004), legitimize the technology, create a bandwagon, and establish an industry-wide standard. Yet, opening up a technology implies "transient advantages" (Garud & Kumaraswamy, 1993), requiring firms to innovate for fear that their platforms will lose appeal, an eventuality that transpired with Research In Motion (Hicks, 2012). In other words, open innovation through multiparty interactions and continual change, are coterminous.

Implementation

As noted earlier, MIRP researchers found that implementation activities often overlap with development activities by linking and integrating the "new" with the "old," as opposed to substituting, or replacing the old with the new (Van de Ven et al., 1999). They pointed out that these overlapping development and implementation activities are possible when the innovations are developed within the adopting firm. However, even when organizations adopt or purchase innovations that were developed elsewhere, the innovations are more likely to be implemented when they are integrated into the existing arrangements, rather than being added on or replacing existing arrangements of the adopting organizations. This is the case because existing arrangements are yesterday's innovations, regarding which the organization has made investments and commitments. Integrating new innovations into the existing arrangements of yesterday's innovations facilitates organizational continuity and transition.

Extant literature offers diffusion of creative ideas that have been developed as a key mechanism driving implementation. Most diffusion studies use contagion models and an S-shaped curve to examine the adoption rate of an innovation by members of a target population (Abrahamson, 1991; Rogers, 2003; Suarez, 2005). Several points about diffusion curves are worth noting and are illustrated in Figure 18.2. The diffusion process involves a time lag between when potential adopters become aware of an innovation (the left side of the S curve) and when they decide to adopt it (the right side of the curve). The flatter the curve, the longer it takes to

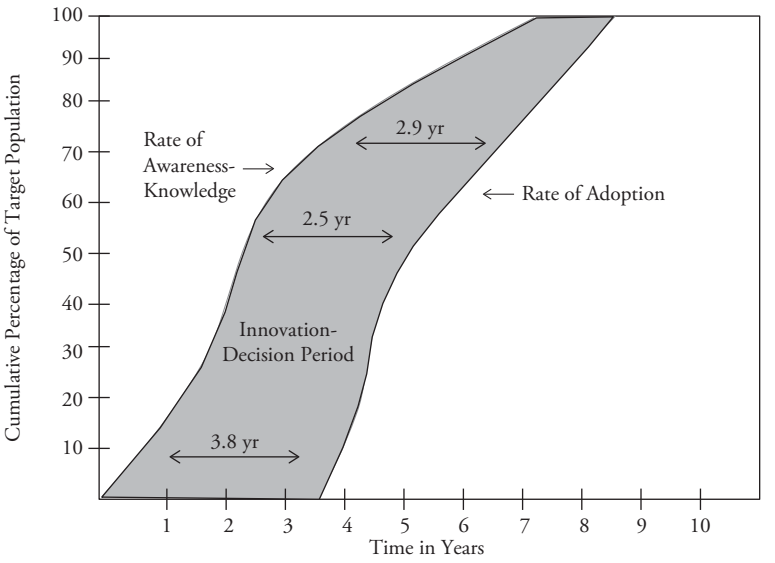

Fig. 18.2 The Innovation Diffusion Curve.

diffuse an innovation into a population. The wider the curve, the longer the time lag between awareness and adoption of an innovation for any group of decision makers. Rogers noted that innovators begin the process, and they represent 2.5% of all adopters. They are followed by another 13%, who are often called opinion leaders, then by an early majority, a late majority, and concluding with 13% adopting laggards. Rogers noted that similar proportions of different adopters in the S-shaped diffusion curve have been found for most innovations studied.

Implementation within firms. Utterback and Abernathy's (1975) research in the automobile industry highlighted how firms shift their attention to making nontrivial investments to develop human skills, manufacturing capabilities, and organizational routines to refine manufacturing processes once a dominant design has emerged. They called this the "specific phase" of the process, one that Tushman and Anderson (1986) labeled an "era of incremental change." It is during this period that production competencies are created and efficiencies are generated through a process of learning-by-doing (Argote & Epple, 1990; Dutton & Thomas, 1984). As Green's (2004) research showed in the context of Total Quality Management, eventually the manufacturing process becomes taken for granted as justifications for instituting new manufacturing processes and administrative arrangements subside and the innovation becomes an ongoing part of the organization.

In addition, the design underlying the new technology is rationalized so that it can be mass-produced, marketed, and serviced on an ongoing basis (Ulrich & Eppinger, 1995). Parts are standardized for interoperability and interchangeability (Kanigel, 1997). These parts rest on an overall platform that serves as the basis for creating a family of related products (Wheelwright & Clark, 1992). Knowledge is codified into the product design as different modules of a system become black-boxed (Rosenberg, 1982)—that is, the internal workings of a module and how it evolved over time become obscure to scrutiny.

The Sony Walkman platform is illustrative in this regard (Sanderson & Uzumeri, 1995). Sony created "generational" platforms on which it would produce "incremental" and "topological" changes. Sanderson and Uzumeri described how Sony was able to steadily release a stream of Walkmans for different market segments. The use of platforms to generate a family of products is readily apparent in many other cases ranging from software (e.g., different versions of the Microsoft Windows operating system) to hardware (e.g., Apple iOS devices).

Implementation across the field. Extant literature has offered several insights on the implementation of innovation at the field level. For instance, the literature on the emergence of technological systems directs attention to the importance of standards after the emergence of a dominant design (Tushman & Anderson, 1986;

Utterback & Abernathy, 1975). Standards make interoperable and interchangeable parts possible, so they are important to stabilize the entire ecosystem (David & Greenstein, 1990; Garud & Kumaraswamy, 1995). Standards also institutionalize the dimensions of worth that become accepted as being important (e.g., the clock speed of chips as a metric; Fine, 1998).

Such institutionalization involves more than simple contagion effects as interdependent actors actively try to manage the adoption of innovations across the field. This is best understood by insights offered by actor network theorists (Callon, 1986; Latour, 1987). Rather than diffusion, they offer "translation" as an active mechanism whereby actors become attached to an emergent platform. There are "trials of strength" across "centers of calculation" (Latour, 1987) as actors within and across multiparty networks try to convince industry members to adopt their innovations.

Whereas studying the emergence of standards is one way of approaching the institutionalization of an innovation, another related approach is to examine how these innovations become legitimate through conformance to emerging regulation (DiMaggio & Powell, 1983) or as meaning is stabilized within different categories and markets through the overall industry-wide discourse (Phillips, Lawrence, & Hardy, 2004; Porac, 1997; Rosa, Porac, Runser-Spanjol, & Saxon, 1999). The stabilization of meaning represents an overall technological frame that holds the different actors of an ecosystem in place (Bijker, 1995; Kaplan & Tripsas, 2008). Besides users and producers, a technological frame involves evaluators, who may provide product certification (such as whether or not a product is organic), and regulators such as the US Food and Drug Administration (FDA), who determine the safety and efficacy of product offerings. Overall, an industry that emerges around an innovation develops a distinct identity and incorporates a particular style or recipe for operation (Spender, 1989; Wry, Lounsbury, & Glynn, 2011).

Complexities Associated with Innovation

Early conceptions of the innovation process viewed it as a linear sequence of stages comprising invention, development, and implementation that could be controlled by managers or entrepreneurs. However, MIRP studies found that the innovation process is considerably more complex than the commonplace view of the invention, development, and implementation of a core novel idea by a stable set of people operating full-time within a stable context. Instead, the process is characterized by a proliferation of ideas, setbacks, and shifts in assessment criteria. Other factors include fluid participation of organizational personnel, conflicting involvements of stakeholders (e.g., investors, top managers), changing relationships with others, and involvements in developing an industrial infrastructure to commercialize or implement the innovation.

As these observations suggest, most innovation processes do not unfold in sequential stages and orderly steps. The process is often highly unpredictable and uncontrollable and is driven by the expenditure of resources—people, time, ideas, money—above and beyond the system's normal sustenance. Over time, though, convergence is triggered by constraints that focus efforts on refining and exploitating a given direction. External constraints include institutional rules and organizational mandates that narrow the boundaries of permissible action. Internal constraints include resource limitations and discovery of a possibility that focuses attention and actions in a chosen direction.

Integrating these observations, Van de Ven et al. (1999) found that the innovation journey consists of repeated cycles of divergent and convergent activities that are enabled by resource investments on the one hand and constrained by external rules and internal discovery of a chosen course of action on the other (Figure 18.3). These dynamics are best understood by providing an example from one of the MIRP studies—the commercial development of cochlear implants. With this innovation, as with others that we studied in the MIRP program, cycles of divergence and convergence were evident both within and across firms. For instance, we found that cochlear implant firms were driven at an early stage by an entrepreneurial logic of "damn the torpedoes, full steam ahead" (Garud & Van de Ven, 1992). At this stage, a proliferation of activities and paths, fluid participation and assessments, and considerable interplay between idea generation, development, and implementation were evident. These are dynamics associated with divergence.

Processes associated with convergence began as the ambiguities associated with the choice of cochlear implants started to subside and as dedicated resources became more difficult to obtain. Innovation program members started pruning the bramble bush that had grown during the divergent stage and initiated a process of trial-and-error learning to resolve residual uncertainty as they fine-tuned their trajectories.

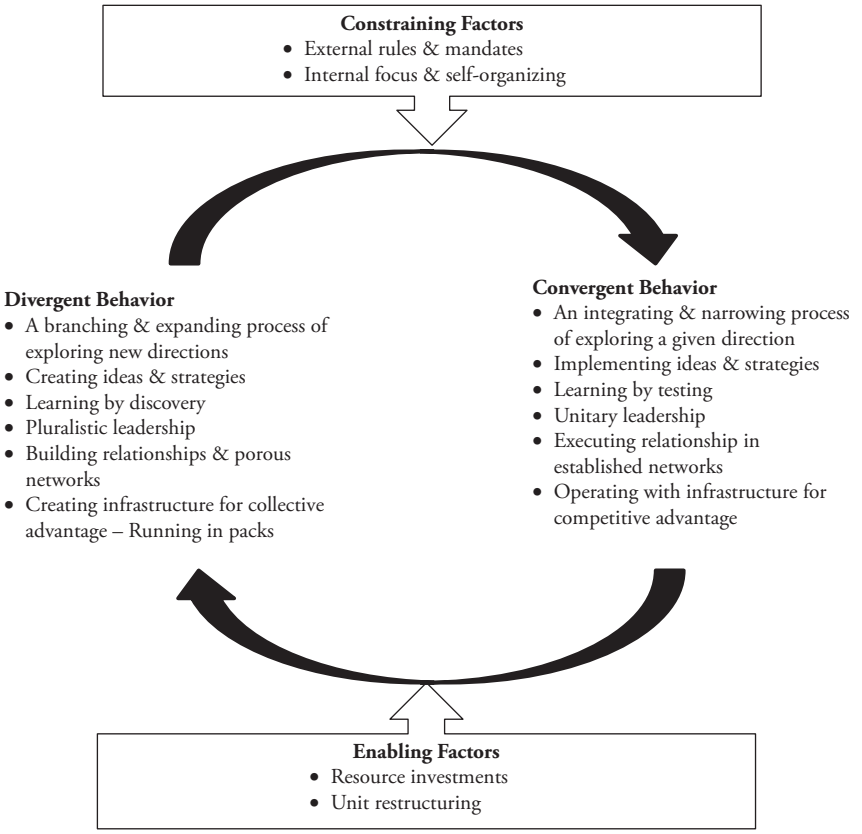

Fig. 18.3 Cyclical Model of the Innovation Journey (from Van de Ven et al., 1999).

Divergent and convergent dynamics were also evident across the larger field. We found that different firms committed to different technological trajectories based on the beliefs they held, the artifacts they developed, and the evaluation routines they created (Garud & Rappa, 1994). In other words, there was a fight for the definition of cochlear implant functionality during an era of ferment (Tushman & Anderson, 1986). Considerable resources were expended to develop and validate cochlear implant devices. However, given that different companies used different evaluation criteria, each consistent with their own technological approach, the evidence that accumulated only served to confuse rather than clarify.

As the field continued to diverge, institutional mechanisms kicked in to try to generate institutional closure. Specifically, the National Institutes of Health and FDA organized a consensus development conference at which independent researchers reviewed the evidence and concluded that one approach was more promising than the others. This was a critical watershed incident in the emergence of cochlear implants, because it served to select a dominant design, which then acted as a constraint around which the field members began to converge.

The dynamics that unfolded within firms and in the wider field were related and were representative of co-evolutionary dynamics. For instance, firms created their specific evaluation routines to validate and legitimize their devices long before field-level evaluation routines emerged. Lacking industry-wide standards, all that firms could do was commit resources to pursue their own trajectories. Such commitments had the perverse effect of increasing the rate at which alternative FDA-approved devices were offered in the market while dampening the adoption of cochlear implants by deaf patients, who continued to wait for the release of promised products (see Rosenberg, 1976, for details of anticipatory retardation).

Implications for Practice

These observations from MIRP and other studies hold several implications for practice. First, managers must develop the necessary orientation to handle these co-evolutionary dynamics.

Specifically, they must pay attention to what is happening, not only within the firm but also across the larger field within which they operate. Within firms, organizations often use stage gate processes (Cooper, 2001) to manage the stages of new product development, including idea screening, concept development, product design, testing and validation, and product launch. Although stage gate processes provide a useful opportunity for reviewing and investing in multiple periods often required to develop innovations, they do not necessarily increase the predictability of the process. Indeed, studies of the nonlinear innovation process suggest that managers cannot control innovation; instead, they can learn to maneuver through the journey by learning and practicing routines for dealing with challenges and setbacks when they arise (Van de Ven et al., 1999).

Across the broader field, if the innovation is created and developed within an organization, implementation processes include introducing the innovation in the market, transferring it to operating sites, and diffusing it to potential adopters. If the innovation is developed elsewhere, the implementation process centers on the activities undertaken by a host organization to introduce and adopt the innovation. In both instances, organizations have to learn to "run in packs" (Van de Ven, 2004), cooperating and competing with one another to build an industry structure that is important for the development and adoption of innovations.

Dealing with processes unfolding within the firm and in the broader field highlights additional facets of ambidexterity (Tushman & O'Reilly, 2006) that have implications for learning and leadership. Learning is critical in pursuing those courses of action that appear successful and avoiding or terminating those actions that do not work or appear to lead to failure. Van de Ven and Polley (1992) and Garud and Van de Ven (1992) found that during the initial period of development, an innovation team must discover what innovation goals, courses of action, and contexts are feasible before it can learn through a trial-and-error process of testing which courses of action achieve desired goals in different contexts.

These processes are guided by four pluralistic leadership roles: sponsor, mentor, critic, and institutional leader (Van de Ven et al., 1999). These four types of leaders often provide checks and balances for each other in directing innovation entrepreneurs. A sponsor is typically a high-level manager, who can command the power and resources to push an innovation idea into good currency and thus procures and advocates for the innovation. A mentor is usually an experienced and successful innovator who assumes the responsibility for coaching and counseling an intrapreneur. In contrast, a critic serves as a "devil's advocate" by challenging innovation investments, goals, and progress. An institutional leader, often an executive who is less involved in the innovation, settles disputes between the pro-innovation leaders (i.e., sponsor, mentor, and entrepreneur) and the critics.

Van de Ven et al. (1999) found that, as an innovation becomes more predictable, the relative balance in exercising these pluralistic leadership roles also changes. During the initial period of innovation development, a pluralistic structure encourages multiple and diverse perspectives needed to manage innovation ambiguity and uncertainty. When this diversity and the conflict between sponsor and critic roles is kept in balance through institutional leadership, such a pluralistic structure increases the probability of technological foresights and reduces the likelihood of oversights. As levels of project ambiguity and uncertainty decrease, a more traditional homogeneous structure of leadership is appropriate to mobilize unity in implementing the innovation.

Conclusion

Business innovation has clearly become important in all walks of life. As we have noted, innovation is not just the emergence of a new idea or a final product but the entire process that takes an idea from conception to implementation. These processes implicate activities not just within firms but also across a broader field. A realization of such considerations leads to an appreciation of the complexities associated with innovation. Employing simple linear models risks dampening the very generative forces that are required to sustain innovations at whatever level of analysis one chooses to study. Instead, we need models that can help firms harness rather than reduce such complexity. Indeed, sustaining ongoing innovation has become all the more important in environments characterized by ongoing and pervasive change.

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Note

1. *Intrapreneur* is a term used by Pinchot (1985) to allude to entrepreneurs within corporations.

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CHAPTER

19

Innovating Without Information Constraints: Organizations, Communities, and Innovation When Information Costs Approach Zero

Elizabeth J. Altman, Frank Nagle, *and* Michael L. Tushman

Abstract

Innovation traditionally takes place within an organization's boundaries and with selected partners. This Chandlerian approach is rooted in transaction costs, organizational boundaries, and information challenges. Information processing, storage, and communication costs have been an important constraint on innovation and a reason why innovation takes place inside the organization. However, exponential technological progress is dramatically decreasing information constraints, and in many contexts, information costs are approaching zero. This chapter discusses how reduced information costs enable organizations to engage communities of developers, professionals, and users for core innovative activities, frequently through platforms, ecosystems, and incorporating user innovation. When information constraints drop dramatically and the locus of innovation shifts to the larger community, there are profound challenges to the received theory of the firm and to theories of organization and innovation. Specifically, this chapter considers how shifts in information costs affect organizational boundaries, business models, interdependence, leadership, identity, search, and intellectual property.

Key Words: managing innovation, information costs, information constraints, communities, organization boundaries, technological progress, platforms and ecosystems, user innovation

Modern business enterprise is easily defined . . . it has two specific characteristics: it contains many distinct operating units and it is managed by a hierarchy of salaried executives.

(Chandler, 1977, p. 1)

What characterizes the networked information economy is that decentralized individual action—specifically, new and important cooperative and coordinate action—plays a much greater role than it did. . . . The declining price of computation, communication, and storage have, as a practical matter, placed the material means of information and cultural production in the hands of a significant fraction of the world's population.

(Benkler, 2006, p. 3)

Introduction

Information is expensive to process, store, and communicate—at least, that has been the prevailing assumption upon which most of our organizational theories rely. Because information has been hard to gather and process, firms have emerged as hierarchical and control-based organizations (Chandler, 1962). Leaders have developed strategies to compensate for the difficulties of obtaining and processing data. Business models have been

built with the underlying assumption that information costs are high (e.g., Tushman & Nadler, 1978). However, with the exponential growth in information processing, storage, and communication abilities, this is all changing. Information costs are rapidly approaching zero, and the constraints associated with information processing are disappearing. Organizations now have the ability to engage with external communities in unprecedented ways. This decrease in information processing costs is having a decentralizing impact on the locus of innovation and, in turn, on how organizations manage their innovation processes.

In this new information context, institutional logics (Friedland & Alford, 1991; Thornton & Ocasio, 1999; Thornton, Ocasio, & Lounsbury, 2012) revolving around Chandler's (1962) hierarchy and control-centric management, which have prevailed in firms such as General Electric (GE), are being challenged by new logics centered on openness, sharing, and external engagement (Benkler, 2006).[1] Recognizing that new doors are opening as information flows more freely than ever before, incumbent organizations are grappling with how and when to address these new logics. For example, in the summer of 2013, GE launched two online three-dimensional (3D) printing contests, which they referred to as quests, inviting entrepreneurs and organizations to submit new designs for aircraft engine brackets and advanced materials production capabilities (General Electric Company, 2013).

Adopting these new logics, and engaging more deeply with communities, has substantive implications for how firms organize and innovate. As we see with GE's call for inputs related to design and production capabilities, the locus of innovation for incumbent firms has begun to move from within the firm to communities beyond its full control. Evidence of this shift and the tension it is creating can also be seen as firms engage with labor/task marketplaces (e.g., oDesk, eLance, TopCoder), developer ecosystems (e.g., Apple's App Store), and user-generated contributions (e.g., open source software, user review websites). All three of these community engagements allow for reductions and blurring of firm boundaries and call into question what the firm does and what resources it owns. As we discuss throughout this chapter, this tension between a Chandlerian logic and a more open and community-centric logic challenges many of the assumptions underlying the strategic and organizational research that has been treated as foundational wisdom in management scholarship.

To explore the implications of these phenomena, we start by discussing information processing, storage, and communication and note dramatic increases in capabilities coupled with substantial decreases in costs. Recognizing that cost reductions have enabled wide engagement with external communities, we present a typology of communities, emphasizing those enabled by information cost reduction: labor marketplaces, developer ecosystems, and user-generated contributions. Engagement with these communities involves parties outside the firm heavily participating in, or influencing, innovative processes and product offerings managed by the firm.

We then consider how information costs approaching zero and engagement with external communities affect firm organization and strategy. We investigate what happens with respect to organization boundaries, business models, interdependence, leadership, identity, search, and intellectual property (IP) when organizations engage with communities for capabilities core to their innovative processes. Before concluding, we explore the impact of these organizational and strategic shifts on innovative processes. Utilizing the classic evolutionary process model of variation, selection, and retention, we identify ways in which engagement with communities shapes the path of innovation at each step of the process. We suggest that when information constraints drop dramatically and the locus of innovation shifts to the larger community, there are profound challenges to the received theory of the firm and to theories of organizations and innovation. We conclude with thoughts for how these changes present opportunities for research on innovation and organizations.

Information Constraints Reduction

Just over 50 years ago, in 1961, the IBM 1301 disk drive, which could store 28 MB of information, cost $115,500 (almost $900,000 in 2013 dollars).[2] In late 2013, Hewlett-Packard's cloud service offered 500 GB (500,000 MB) of storage, almost 18,000 times the capacity, for free.[3] This massive drop in price for information storage costs is representative of the reduction in information costs in general.

Together, information processing, storage, and communication represent the three primary components of information usage. Costs for these three components represent important constraints on how information can be used to drive innovation (Maskell, 2000). As engineers, scientists, and

others involved in technology development continue to push the boundaries of their craft, and thus increase technological efficiency, they generate exponential growth rates and price decreases for all three of these components. Recent assessments estimate that information processing capabilities grow at an annual rate of 58%, information storage capabilities at 23%, and capacity for information communication at 28% (Hilbert & López, 2011).

Although the costs for information usage are dropping, not everyone is able to take full advantage of this reduction. First, use of many free services is predicated on access to computing devices and infrastructure. In many parts of the United States and the world, disadvantaged populations have limited access to such devices and infrastructure due to the so-called digital divide (Greenstein & Prince, 2007; Norris, 2001; Warschauer, 2003). Second, although we present examples in which information costs have dropped to zero, these frequently occur at scales useful only for individuals or very small firms (e.g., Google Drive's free storage is only 15 GB; larger capacities are offered for a fee to larger enterprises). Although costs for larger firms have also dropped dramatically, large-scale information operations can still be expensive.

Third, whereas the costs of the three primary components of information usage may be approaching zero, there are many complementary assets that are required to fully capture the business value of the information. For example, as firms gather more data from their customers, they require more data scientists to manage the data and extract useful insights from it. Likewise, electricity costs for running and cooling massive data warehouses have started to affect firms' bottom lines (Koomey, 2008). We keep these three caveats in mind as we explore how the capacity for information processing, storage, and communication has been increasing exponentially leading to declining prices that are rapidly approaching (and in some cases have already reached) zero.

Information Processing

Information processing refers to the ability of a device to take information and perform calculations using it. In the computerized world, this is frequently measured by the speed of a central processing unit (CPU), which is correlated with the number of transistors that can fit in a given space on a computer chip. Moore's Law (Moore, 1965) predicts that the number of transistors that can be placed on a chip will double every 18 to 24 months. This leads to exponential growth and an associated reduction in cost per calculation, a pattern that has continued from 1971 to the present. Although some have predicted that Moore's Law is not sustainable in the long run due to the size of transistors, which are approaching the molecular level (Latif, 2013; Merritt, 2013), new computing methods including multicore chips, DNA computing, and quantum computing should allow for Moore's Law to hold from the perspective of how many calculations can be done per second.[4]

The impact of such sustained growth is often underestimated because it is exponential. Many estimate that information processing power is passing an inflection point in its exponential growth, described by Ray Kurzweil (1999) as entering "the second half of the chessboard."[5] We are entering a period in which the increases in processing speeds will occur in a manner never imagined before (Brynjolfsson & McAfee, 2011). The effects of this exponential growth can already be seen: A modern cell phone has more processing power than all of NASA had in 1969 when humans landed on the moon (Kaku, 2012). Likewise, the processing power of a multimillion-dollar military supercomputer in 1997 could be found, less than 10 years later, in the Sony PlayStation 3 gaming console, released in 2006 for $500 (Kaku, 2012).

With this exponential growth in processing power has come a dramatic drop in price for a set amount of power (Figure 19.1). For example, in 1996, the best personal computers could obtain about 1 million instructions per second for each US dollar of cost (1 MIPS/$) (Koh & Magee, 2006), whereas today, the best personal computers can obtain about 176 MIPS/$.[6] Further, although these prices reflect the cost for cutting-edge performance, it is possible to obtain lower levels of performance for free when utilizing cloud computing services.[7] For example, Amazon Web Services EC2 provides free processing power for 1 year that runs at approximately 1,933 MIPS and HP Cloud provides free processing power for 90 days that runs at approximately 4,545 MIPS.[8] Although today's cutting-edge processing power is by no means free, the processing power that was cutting-edge for a personal computer approximately 10 years ago is now offered for free via cloud computing.

Information Storage

The costs of information storage have also dropped dramatically. For many years, disk drives have been a common object of study for management

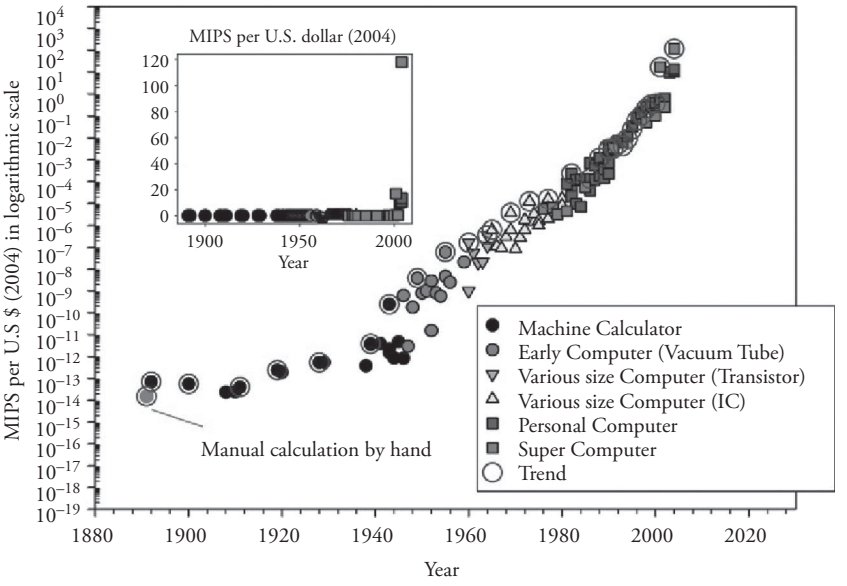

Fig. 19.1 MIPS per US Dollar Over Time (Source: Koh & Magee, 2006. Reprinted with permission.)

scholars due to constant technological disruptions in this industry (e.g., Chesbrough, 2003a; Christensen, 1993, 2006). These disruptions drove an exponential growth pattern similar to that of Moore's Law for transistors. Although each generation of users frequently wonders, "How will I possibly use up all that disk space?," they always do, as technologies evolve and enable people to create increasing amounts of information that needs to be stored. Indeed, industry approximations estimate that by 2010, the amount of information created between the beginning of civilization and 2003 (5 exabytes[9]) was being created every 2 days.[10] This rapid increase of information storage allowed for the progression from text as the only practically digitizable information to pictures and eventually video becoming storable at a reasonable cost. This increased storage has led to websites such as YouTube, to which users upload 100 hours of video per minute.[11]

Not only has information storage space increased, but the portability of this storage has also grown. Magnetic tapes were followed by magnetic disks, optical disks, and flash memory. The latter now allows for up to 1 terabyte[12] of information to be carried on a device the size of a person's thumb. Flash memory was an important innovation that enabled the portable device revolution, which has led to the large-scale production and adoption of smartphones and tablets. Such massive amounts of storage have led to a "save everything" mentality at both individual and firm levels.

Combined with increases in processing power, the ability, and thus the propensity, to save everything has led to the "big data" or data analytics phenomenon that is revolutionizing the way companies do business as they gain the ability to better understand their consumers.[13] Although basic data analytic capabilities have existed for many years, it is only through the emergence of cheap information storage that organizations can now save and analyze enough data to produce deeper and more nuanced analyses of customer behavior for use in prediction, market segmentation, and so on.

As with information processing power, the growth in information storage space has also led to a decline in the cost of storage (Figure 19.2). For example, in 2000, the cost of hard disk storage was about 140 MB/$ (Koh & Magee, 2006); today, storage on an external hard drive costs about 22,073 MB/$.[14] Further, although the largest storage devices are not free, there are a number of storage options that are free. Thumb drives holding 1 GB have become so cheap that they are regularly given out for free.

More impressively, coupling gains in storage capacity with increases in information communication power has allowed for extremely cheap, and even free, storage via the Internet. For example, Google Drive offers 15 GB of free storage, Box offers 50 GB, and HP Cloud offers 500 GB for 90 days. A 500-GB disk drive that cost $150 five years ago is $50 today. Further, the same storage

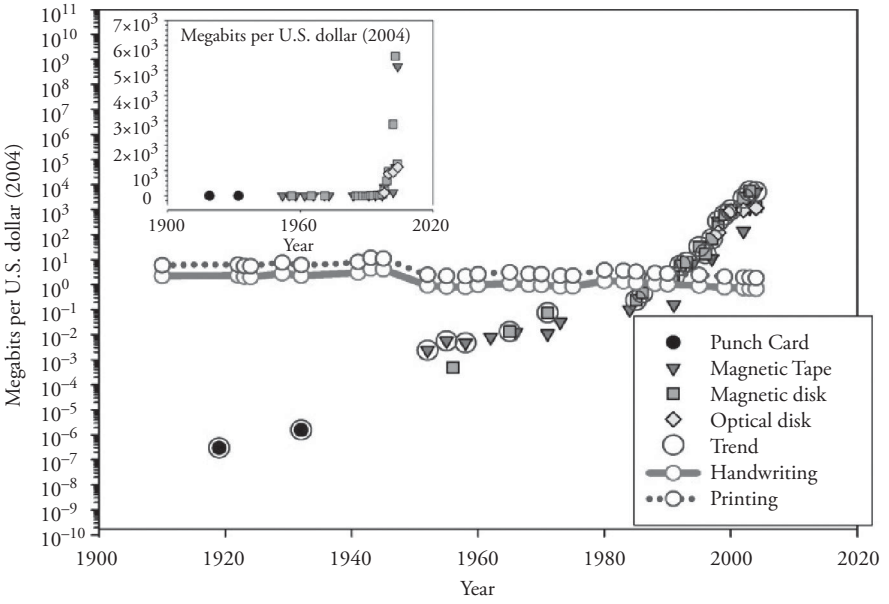

Fig. 19.2 Megabits per US Dollar Over Time (Source: Koh & Magee, 2006. Reprinted with permission.)

space can now be obtained through the cloud for free. These impacts on processing and storage bring down information constraints for large incumbent firms and similarly reduce information costs to essentially zero for new entrants.

Information Communication

Information communication is the ability to move bits of data from one place to another, often from storage to processing and back. We consider this to encompass both machines communicating with each other and people communicating with each other via these machines. Although communication costs within a computer system are certainly one aspect of information communication, we focus primarily on the communication channels that move information from one device to another, namely bandwidth. The ability to move digital bits from one system to another has long relied on existing telecommunications channels, starting with phone lines and moving to cable lines and, more recently, fiber optic lines. Wireless data communication has also relied on existing channels, namely radio and cellular. In both wired and wireless domains, bandwidth has grown exponentially since the invention of the telegraph and radio in the 1800s (Koh & Magee, 2006). This increase in communication capabilities is what allowed for the creation of the Internet and its growth into a communication channel accounting for 8% of all retail products sold in the United States (Anderson, Reitsma, Evans, & Jaddou, 2011). Ever since the invention of the precursors to the Internet in the 1960s, bandwidth has increased rapidly. For example, in 1984, the fastest modem available to a home user had a speed of 300 bits per second (bps), whereas in 2010 it was 31 Mbps, an increase of 100,000 times in just over 25 years (Nielsen, 2010).

As with information processing and storage, the exponential growth of information communication has been accompanied by a rapid decline in price (Figure 19.3). Industry assessments estimate that the price per Mbps for Internet transit dropped from $1,200 in 1998 to $5 in 2010 (Norton, 2010). However, since the mid-1990s when America Online (AOL) mailed floppy discs to consumers providing free access to the Internet for a limited time, there have been avenues for free access to the Internet. Today, Google Fiber, which boasts maximum speeds of 1 Gbps, offers a free connection to the Internet with download speeds limited to 5 Mbps.[15]

It is important to note that while such cheap bandwidth is readily available in many areas of the United States, in many other areas it is very difficult to get access to high-speed Internet service, creating what many have called the "digital divide" (Greenstein & Prince, 2007; Norris, 2001; Warschauer, 2003). However, even in areas where the decreases in cost have not yet produced wider accessibility for broadband service, cheaper communications allow for innovations such as the delivery of agricultural market prices via text message to farmers in developing

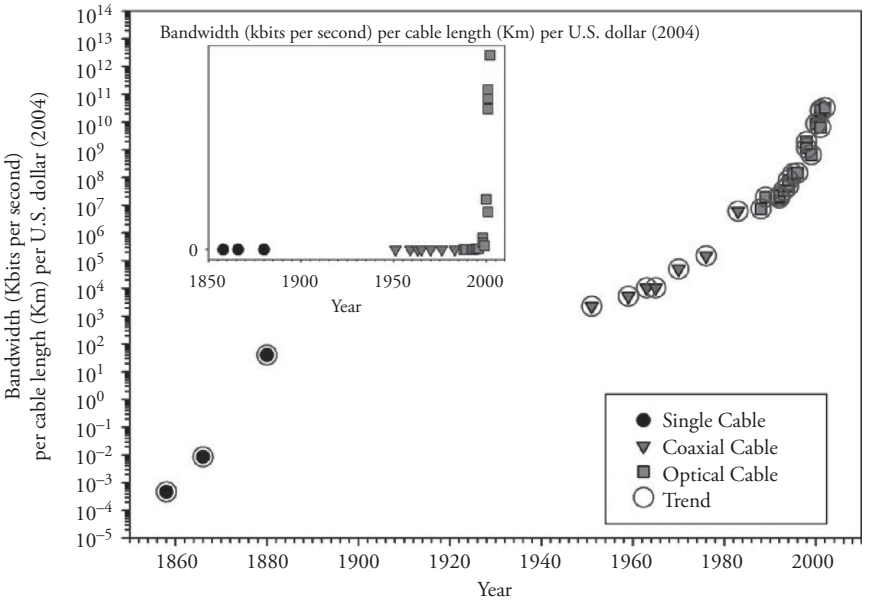

Fig. 19.3 Bandwidth per Cable Length per US Dollar (Source: Koh & Magee 2006. Reprinted with permission.)

nations (Aker, 2010; Jensen, 2007). Around the world, this reduction in information communication costs has had an impact, allowing skilled workers from emerging economies to have access to developed markets via platforms such as oDesk, eLance, and TopCoder. Further, through the rise of massive open online courses (MOOCs), the reduction in information communication costs has allowed anyone with an Internet connection to gain access to high quality education in a vast array of fields. Finally, although some bandwidth may be free, 5 Mbps is not nearly enough to allow a large business to operate effectively, and therefore they must still pay for access, even if the fees are much less than only a few years ago.

Together, the reduction in costs of information processing, storage, and communication have led to more products that leverage modular technologies and standardized interfaces, greater engagement by consumers and other end users, and wide-scale availability of enormous computing power and comprehensive databases. This, coupled with the increased ability to collaborate and coordinate across large distances, has produced wide-ranging effects on the way organizations create and leverage innovations as well as on fundamental organizational processes.

Engaging Communities

Organizations engage with many types of communities including customers, suppliers, partners, and complementors. One way to visualize the scale of these engagements is through the triangle shown in Figure 19.4. At the top are a small number of strategic alliances. For large technology firms, these may be multidimensional technology, service, and licensing relationships with other large firms. This type of alliance is custom-negotiated, and usually involves senior members of the executive team, possibly including the CEO. A firm will likely not have more than ten to twenty relationships of this kind that are strategic in nature. Microsoft's interaction with Intel is one example of this type of relationship (Casadesus-Masanell & Yoffie, 2007).

The next set of relationships is more tactical but still involves custom negotiations on a case-by-case basis. A relationship in this category is one in which a firm licenses a technology that it integrates into a product. A large firm might have tens of these tactical contributors but probably will not have hundreds. These relationships are usually managed by business development professionals trained to work with interfirm relationships (see the alliance literature; e.g., Gulati, 1998, 2007; Rothaermel, 2001). A mobile phone provider's relationship with a speech recognition technology provider such as Nuance is an example of this type of alliance (Nuance Communications, 2013).

Beyond these custom-negotiated relationships are community engagements enabled by reductions in information costs. In this chapter, we focus on the bottom three sections of the triangle because they include the types of engagements that are accelerating as a result of the increase in information processing capabilities and the decrease in

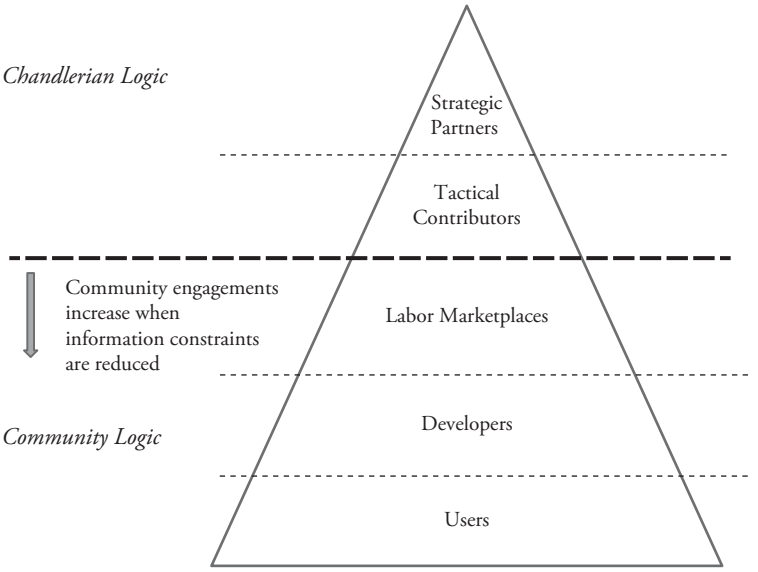

Fig. 19.4 Typology of Communities.

information costs. These categories of engagement are (1) the advent of external labor and task markets, (2) the rise of developer ecosystems, and (3) the growing prevalence of user-generated contributions. Considering labor marketplaces, we examine how firms engage with parties beyond their legal control to accomplish tasks they previously would have performed internally. With developer ecosystems, we look at how complementary firms provide value to end-users. With user-generated contributions, we consider how firms engage users to contribute value. Organizations that use labor marketplaces might have many interactions with individual external workers contributing to a project. Organizations with developer ecosystems may have hundreds, thousands, or potentially more than a million developer relationships. Organizations that interact with users could have millions of contact points. In Table 19.1, we summarize how engaging external labor, developers, and users changes with and without information constraints.

Reductions in information processing, storage, and communication costs make these relationships not only feasible but also attractive, though they need to be managed in an entirely different way from those in the top two sections of the triangle. Institutional logics that revolve around openness and sharing become essential, but they differ from the prevailing logics of hierarchy and control. Firms need to grapple with how to manage these multiple logics as they cope with an array of complex community engagements. These interactions create challenges (e.g., contrasting logics, more user input than a firm can easily process) and opportunities (e.g., introducing benefits from entities beyond those directly controlled by the firm). Studying these phenomena may prompt us to think differently about innovation, organizations, and our classic theories that explain them. Innovation is no longer occurring primarily within a firm; rather, organizations now engage with others who also innovate in ways that improve the organization's products, experiences, and value. These interactions result in new behaviors to create, capture, and select innovations while also introducing fundamentally new managerial challenges.

Labor Marketplaces

Labor marketplaces, also known as task marketplaces, are multisided platform-based businesses that allow firms and individuals that have specific tasks to find people to accomplish those tasks. Tasks posted on the most popular of these platforms (e.g., oDesk, eLance, TopCoder) include everything from website design to language translation and marketing. Sometimes also referred to as "the human cloud" and considered the next generation of outsourcing after information technology (IT) and offshore outsourcing, these marketplaces comprise an ecosystem of platforms linking virtual workers with employers who hire them on an as-needed basis.

The recent rise of these platforms is substantial, with growth in global revenue amounting to

Table 19.1 Engaging With Communities With and Without Information Constraints

	With Information Constraints	Without Information Constraints
Labor	• All internal to the firm, or specialized contracting through temp agencies and contractors	• Labor marketplaces
	• Long-term engagements and large-scale projects	• Micro-jobs enabled
	• Difficult performance quality control and monitoring	• Community rating schemes and digital monitoring
Developers	• Organization-to-developer contracting	• User-to-developer contracting
	• Select few high-maintenance relationships between organizations and developers	• Many arm's length developer relationships governed by simple click-through licenses
	• Significant case-by-case IP considerations and negotiations	• IP licensing tailored for engagement with high volume of organizations (e.g., automated websites for contracts)
	• Embedded applications ("pre-loads") executed by engineering teams	• App store applications ("post-loads") by third-party developers
Users	• Users engage almost exclusively through customer service representatives	• Users provide inputs across functional organizations (e.g., to engineering and marketing) contributing to full design process
	• Inputs are primarily customer complaints or repair requests	• Inputs include product design suggestions, manufacturing ideas, and so on
	• External inputs are avoided	• External inputs are embraced as a valuable part of product design and delivery

53% for 2010 and 74% for 2011 (Kaganer, Carmel, Hirscheim, & Olsen, 2013). Addressing some original concerns about transparency, quality control, and coordination in these labor relationships, these marketplaces now have mechanisms to allow hiring managers to monitor contractors' work as well as standardized contracts and dispute resolution services (Needleman, 2010). Task platforms allow a firm to rely on external parties for much of its labor supply in a way that was previously not possible before information technologies enabled the collaboration and communication feasible today. As we discuss in the next section, this reliance on external labor has important implications for organizational and strategic decisions.

Developer Ecosystems

Technology developments enable firms to deploy goods that are increasingly modular, with open interfaces allowing independent entities to contribute to end-products (Baldwin & Clark, 2000). Although many firms design and develop self-contained products that provide a complete user experience, increasingly more products require after-market applications or accessories to deliver full value (Adner, 2012). In using labor marketplaces, organizations engage external parties directly and hire resources to further their missions. In contrast, when they build developer ecosystems, organizations enable external parties (developers) to create complementary products (apps or accessories) that customers acquire either directly from the external parties or through a marketplace.

Prevalent examples of firms with developer ecosystems are those that offer smartphones, tablets, and other devices that users customize with apps and accessories. Beyond consumer products, this same phenomenon exists in other industries, such as medical diagnostic devices. Welch Allyn traditionally provided integrated systems to doctors' offices and hospitals allowing medical practitioners to measure blood pressure, temperature, and so on. Today, it offers a platform system to which doctors and hospitals can add modules and apps provided by other firms (Welch Allyn, 2011, 2013).

The widespread availability of apps is driven by underlying reductions in information costs. Firms are able to leverage today's ease of processing and communication to open interfaces to their products, providing application programming interfaces

(APIs) and software development kits (SDKs) and encouraging other firms to contribute to their products. Consumers are able to easily download apps to improve products they purchase, and market evidence indicates that they are doing so in large numbers. In May 2013, Apple announced that 50 billion apps had been downloaded from its App Store, which offers more than 850,000 apps in 155 countries for a suite of iPhone, iPad, and iPod Touch products (Apple Inc., 2013). In Facebook's second quarter 2013 earnings release, to benefit its 1.15 billion monthly active users, it announced that more than 100,000 apps had been built (Facebook, 2013). Complementary firms (such as app developers) are able and incentivized to develop these apps because they have easy access to product information through developer websites and ease of distribution through app stores and other means. Enticed by the prospects of serving enormous markets, and equipped with enabling technologies and documentation, developers invest in creating apps and accessories for other firms' products. Firms and their complementary developers and accessory providers need to employ institutional logics consistent with operating in a world that is highly open and decentralized with significant sharing and interdependence.

User-Generated Contributions

As the drastic reduction in information costs has made it easier to engage an ecosystem of developers, it has also made it easier for organizations to connect with the users of their products and services (Von Hippel, 2009). In explaining this phenomenon, Benkler (2006, p. 5) highlights "the rise of effective, large-scale cooperative efforts—peer production of information, knowledge, and culture." Indeed, in some cases, such as open source software, users have become the entirety of the organization developing the product. In these cases, the creative contributors no longer reside inside an organization. Rather, they exist in a loosely affiliated community with its own set of operating procedures and norms that have developed to govern behaviors (O'Mahony & Ferraro, 2007; Shah, 2006).

Many open source software projects started within an organization and then were taken over by a group of users after the code base was opened. For example, Apache began as a federally funded research project and is now a fully open source project that runs more than 50% of websites on the Internet (Greenstein & Nagle, 2014). In a survey of large organizations, 50% of respondents said they use open source software in their business, and another 28% said they are considering using it (Trapasso & Vujanic, 2010).

Although these types of open source software projects exist in an entirely community-based self-governing organizational form (Benkler, 2006), in more traditional firms there are increasing examples in which user-generated contributions provide firms with free inputs. For example, user-generated product and service reviews on Amazon, TripAdvisor, and Yelp help drive sales and profits of reviewed firms and products (Duan, Gu, & Whinston, 2008; Liu, 2006; Luca, 2011). Further, companies such as Threadless rely on users for idea generation and selection (designing products and determining which products are most likely to be successful in the market) (Lakhani & Kanji, 2008). All of these activities (open source software, user-generated reviews, and user idea generation and selection) are enabled by reductions in information costs.

As information costs drop sharply and all three types of community engagement increase, sharply inconsistent logics emerge within incumbent firms. Incumbents need to balance operating in their traditional internally focused mode with an approach that is more externally oriented and inclusive. They need to manage competing logics that will be more pervasive than ever before (Lounsbury, 2007). Table 19.1 summarizes how these three types of communities (labor, developers, and users) change as the environments in which they operate move from a world where information is constrained to one in which information constraints are essentially nonexistent.

Organizational and Strategic Implications

Organizations that flourished during the industrial age focused their energy on managing physical assets. The constraints they battled related to physical goods, production challenges, and employment issues. In contrast, organizations during the information age leverage sophisticated information technologies to manage their resources and pursue product development. Incumbent firms reach beyond traditional organizations and interact with individuals, firms, and communities to create offerings integrating contributions from a variety of sources. They undergo structural transitions to operate in a networked information economy characterized by decentralized action by individuals cooperating and coordinating through distributed nonproprietary, non-market strategies (Benkler, 2006).

The effects of this new economy span organizational and institutional levels. As these firms engage beyond their boundaries, they outgrow the strategies, business models, and organizational processes theorists have been studying for decades and challenge their institutional logics. Whereas previously they managed based on a Chandlerian logic that emphasized hierarchy and control (Chandler, 1977; Thornton & Ocasio, 1999), firms today balance multiple logics that incorporate peer production, information sharing, data access, and free goods. As they modify their institutional logics in response to new strategies and organizational transitions (Gawer & Phillips, 2013), they undergo institutional work, which Lawrence and Suddaby (2006, p. 215) defined as "the purposive action of individuals and organizations aimed at creating, maintaining and disrupting institutions."

Take, for example, research and development (R&D), an institutionalized category with well-understood meaning and value in society beyond the work it encompasses (Meyer & Rowan, 1977). As information constraints decrease, categories of activities change in terms of work processes, symbols, and myths that surround them, creating challenges for institutionalized rules. For example, whereas R&D used to be performed almost entirely by professionals employed within a firm, it can now be a joint activity spanning internal experts and external contributors.

In the context of increased community engagement and enhanced roles for user contributions, institutional entrepreneurs (Battilana, Leca, & Boxenbaum, 2009; Greenwood & Suddaby, 2006; Maguire, Hardy, & Lawrence, 2004) are increasingly found outside traditional boundaries of firms. One example is social networks, which were originally a means for students to connect with each other and now have evolved to become, among other things, a primary venue for sharing photographs as well as a useful setting for firms to garner insights into consumer sentiment (Nagle, 2013). This change was largely driven by user innovators rather than members of existing firms.

Another example is the evolving role of quality assurance (QA) departments. In the days of mainframe computing, a QA department would be responsible for extensive testing of mainframe software before release. Today, users provide immediate feedback to software firms, so the role of QA professionals includes developing and managing mechanisms to collect and manage quality-related feedback from users. At the extreme, in community-centric peer production contexts such as Wikipedia, the QA role has been entirely shifted to the community (Piskorski & Gorbatai, 2013), further challenging institutionalized norms.

These community-based innovation processes affect a range of topics associated with strategy, innovation, and organization theory. These topics include organizational openness (Boudreau, 2010; Chesbrough, 2003b), community engagement (Lakhani, Lifshitz-Assaf, & Tushman, 2013; O'Mahony & Lakhani, 2011), user innovation (Lakhani & Von Hippel, 2003; von Hippel, 2009), networked economies (Benkler, 2006; Castells, 1996), and other related topics such as multisided markets (Hagiu & Spulber, 2013; Parker & Van Alstyne, 2005), and social media (Piskorski, 2013).[16] Regardless of where one falls on the spectrum of views related to these topics, or to which version of openness or community engagement one subscribes, they all clearly have organizational implications. These include the effects on firm boundaries, strategy and new business models, interdependence and community engagement, leadership, identity, search, and IP. Table 19.2 shows how these organizational and strategic characteristics vary as information processing, storage, and communication become virtually free.

Boundaries

The concept of firm boundaries and what is considered inside versus outside the control of a firm (March & Simon, 1958; Pfeffer & Salancik, 1978; Thompson, 1967) is challenged as information constraints decrease and firms become more community-centric (Gulati, Puranam, & Tushman, 2012; Lakhani et al., 2013). Gulati et al. (2012, p. 573) introduced the notion of meta-organizations comprised of "networks of firms or individuals not bound by authority based on employment relationships, but characterized by a system-level goal." They developed a typology based on degrees of stratification and permeability of boundaries. These organization types, all of which bring together autonomous entities into an interconnected system, are largely enabled because information costs are so modest. Researchers have also explored the porosity of boundaries under various circumstances (Santos & Eisenhardt, 2005), and alliance researchers such as Dyer and Singh (1998) have considered the strategic value of relationships between alliance partners and networks. Yet, there remains substantial opportunity for research that considers the effects on organization

Table 19.2 Organizational and Strategic Characteristics With and Without Information Constraints

	With Information Constraints	Without Information Constraints
Boundaries	• More employees inside organization because it is less expensive to include them within the organization than to contract externally	• Fewer employees within organization because it is easy to contract with external employees when organization needs more human resources
	• Difficult to find appropriate person for job	• Easy to find appropriate person in the community, so coordination costs decrease with matching efficiencies
	• Hold-up problems exist because individuals with specific skills have power over the organization	• Hold-up problems reduced because there is efficient marketplace with large supply of highly skilled people
	• Organizations contract with firms providing services, rather than with individuals, thus difficult to fire underperforming individuals outside organization boundaries	• Organization-to-individual contracts are the norm, so it is easy to fire a temporary individual
	• Vertical and horizontal integration attractive strategic alternatives because market costs tend to be expensive	• Vertical and horizontal integration less attractive strategic alternatives because market transactions are less expensive
	• Organizations incur costs and risks associated with internal computing assets for innovation	• Organizations can pool risk and costs associated with computing by using cloud computing
Strategy and New Business Models	• Organizations own or tightly contract for the assets they need	• Assets are free and open; organizations leverage what they need
	• Digital goods (e.g., software) are expensive to produce, and user inputs are virtually impossible to capture	• Free digital goods (e.g., open source software, user reviews, and ideas) are widely available for the organization to leverage
	• Differentiation is straightforward when resources are unique to the organization	• Differentiation is hard when leveraging widely available common public goods
	• Strength of organization resides in owned resources and skills	• Organization strength resides in skills and knowledge processing, not in owned resources
	• Difficult to conduct corporate entrepreneurship because of shared resources	• Corporate entrepreneurs can leverage labor markets, cloud computing, and so on, to create their own space inside the organization
	• Entrepreneurial organizations need to build capabilities internally to compete	• Entrepreneurial organizations, including solopreneurs, can cost effectively engage external resources allowing them to highly specialize
Interdependence and Community Engagement	• Organization owns and controls computing resources for innovation	• Organization does not control, and is reliant upon, cloud computing partner to provide innovation resources
	• Organization internally owns resources critical to accomplishing its mission	• Organization contracts externally for resources critical to accomplishing its mission
	• Outputs created by the organization and/or partners with whom it is tightly contractually bound, so organization controls own destiny	• Outputs created by partners with loose affiliations, so organization has high interdependence with many entities
	• Developers contract case-by-case with individual organizations and engage in strategic relationships	• Developers join ecosystems, must comply with ecosystem rules, and become reliant upon success of the platform
	• Accessories and applications created using resources owned by the organization	• Accessories and applications created by resources residing outside the organization

(*continued*)

Table 19.2 Continued

	With Information Constraints	Without Information Constraints
Leadership	• Hierarchy and control are primary means of managing external parties (agents) through contracts • Organization must incur expenses to monitor all agents (partners) • Administrators must satisfice because they are choosing from bounded options • Leaders operate in a hierarchy • Engagement with outside communities restricted to particular staff members engaging with limited communities (e.g., disgruntled customers)	• Adopt community logic and incorporate behavioral incentives, influence, and persuasion as primary means of managing external parties (agents) • Communities via review mechanisms provide monitoring and quality control role at drastically reduced costs • Administrators satisfice less because they have more and broader options • Leaders must manage in communities • Engagement with outside communities to harness external creativity becomes central element across functions (e.g., R&D, marketing)
Identity	• Dimensions of internal organizational identity focus on internal development (e.g., R&D excellence) • External organizational identity is associated with the organization • Professional identity is associated with internal development and creativity	• Dimensions of internal organizational identity shift to emphasize engaging communities (e.g., developer evangelism) • External organizational identity (image) encompasses both the organization and related communities • Professional identity is associated with engaging external communities, sourcing, and selecting creative outputs
Search	• Local search is predominant • Search is expensive and thus there is limited rational choice in decision making • A challenge for exploitation is that gathering user feedback to incrementally improve products is hard • Exploration is hard because it is difficult to engage in distant search (hard to cast a wide net)	• Distant search, particularly leveraging communities, is predominant • Search is cheap, so decision making can be more rational • Exploitation is easier due to enhanced user feedback (e.g., localization) • Exploration is easier because distant search is cheaper
Intellectual Property (IP)	• Organizations protect IP with various legal mechanisms such as patents, trademarks, copyrights, and trade secrets • When organizations engage in interorganization collaborations, they execute traditional cross-licensing IP contracts • Without access to free digital goods, organizations need to either create or buy resources, both of which have well-defined ownership and IP implications	• IP considerations become very tricky, and organizations need to consider who owns inputs as well as outputs • Licensing involves various types of open source and public goods licenses • Availability of free digital goods provides opportunities for organizations to source resources without cost but introduces challenges related to ownership and IP

boundaries as information constraints approach zero and community engagement becomes more prevalent.

A reliance on external labor leads to a weakening of firm boundaries. Task marketplaces reduce an organization's need to hire internal employees by providing a marketplace with standardized contract terms and efficient matching of tasks to task performers. The matching mechanisms allow task performers to very clearly showcase their skills and portfolios of past projects, while also allowing organizations to concretely define tasks they need

completed (Kaganer et al., 2013). Standardized contracts are designed to let two parties negotiate price, time for completion, and task details while covering issues such as IP and task monitoring in a consistent way. Traditionally, hierarchies are utilized to limit coordination and contracting costs (Coase, 1937; Jensen & Meckling, 1976; Thompson, 1967; Williamson, 1975). However, task platforms allow organizations to limit these costs by using markets instead of hierarchies to execute tasks.

For organizations engaging with task marketplaces, the two primary risks are projects not being completed and IP leaks (Kaganer et al., 2013). However, the scale of these marketplaces makes it possible for organizations to engage in redundant projects, which decreases failure risk. Further, task performer reputations are publicly available, incentivizing performers to complete projects that garner good feedback from their employers. To manage IP concerns, organizations employ multiple strategies such as breaking tasks into small subunits such that any individual contributor does not have enough information to make a leak valuable. Further, the high volume of individual task performers participating in labor marketplaces results in competition, which allows organizations to seek qualified individuals, test their services, and easily contract with a different person if the first is unsatisfactory. This reduces the importance of hold-up problems (Klein, Crawford, & Alchian, 1978) because organizations contract with individual contractor employees rather than hiring an outsourcing organization. Hart and Moore (1990) noted a distinct difference between firms hiring employees directly and those contracting with outsourcing firms. When hiring employees, firms can fire individuals who underperform. In contrast, when outsourcing with third-party contractors, firms cannot address problems with individual workers. Task marketplaces eliminate this problem because individuals are contracted on a discrete basis, and thus contracts can be managed individually.

Activities enabled by reductions in information constraints and broader engagement with communities of complementors and developers also allow for a reduction in the need for vertical and horizontal integration, and thus organization size. Transaction cost economics (TCE) maintains that firms come into existence when the costs of a transaction in the market are higher than the costs of performing the same transaction within a firm (Coase 1937; Williamson 1981). However, when user-generated contributions are freely supplied, the costs of transactions are essentially zero, and therefore it is no longer logical to have these activities located within a firm. For example, because the creative agency Victors and Spoils relies on crowdsourcing to develop advertising campaigns, it does not need to employ as many creative designers as a traditional firm. Although it has long been known that firm boundaries shrink as IT (Malone, Yates, & Benjamin, 1987; Brynjolfsson, Malone, Gurbaxani, & Kambil, 1994; Hitt, 1999) and the Internet (Afuah, 2003) reduce information costs and associated transaction costs, few studies have considered what happens to organizations when information costs, and thus transaction costs, essentially vanish.

Cloud computing similarly leads to potential reductions in firm boundaries by decreasing information costs and allowing organizations to rely on external parties for critical needs (e.g., a powerful set of IT tools for innovation). Traditionally, risk reduction has been an important reason for firms to conduct activities internally (Chandler, 1962). However, by allowing organizations to rapidly scale their computing needs, cloud computing greatly reduces the risks associated with purchasing large and expensive servers. Cloud computing allows an organization to offload the risk of overbuilding computing capacity by contracting with a third party who pools capacity demand with that of other organizations (Simchi-Levi, Kaminsky, & Simchi-Levi, 1999).

Strategy and New Business Models

As organizations leverage more free and open assets (e.g., open source software, user reviews and ideas), it becomes less clear what assets an organization needs to own and how it differentiates itself from competitors. When information constraints were high, these assets were expensive to produce, and user inputs were essentially impossible to capture. Now, these goods are widely available, and organizations can leverage them to accomplish their goals. However, organizations also need to re-think their basis of competitive differentiation. Perhaps the knowledge and strategies for utilizing such free and open assets will become the most important assets of an organization, and perhaps the only assets it truly owns (Teece, 2007). Consequently, an organization's most valuable assets, the knowledge and information within the organization (Arrow, 1975; Teece, 1982) and the mechanisms through which this knowledge is processed (Tushman & Nadler, 1978), will become the largest avenues for sustainable competitive advantage.

Taking advantage of these new assets and modes of competition requires the adoption of new strategies and business models and/or the modification of more traditional ones (Chesbrough & Appleyard, 2007; Dahlander & Gann, 2010). With information costs decreasing, community engagement increasing, and new opportunities related to opening and expanding boundaries, organizations need to supplement existing business models with new approaches that capture the creativity and inventiveness of external innovators, such as those related to developer ecosystems, labor marketplaces, and user contributions. Crowdfunding, in which organizations search for funding by engaging with a wide community of potential investors, is an example of an emerging business practice in which organizations can also capture resources from external parties through taking advantage of dramatically reduced information constraints. Entrepreneurship provides a business approach that by its nature leverages scarce resources and thus thrives as information costs decrease and more resources become available with much less investment. Within large organizations, the entrepreneurial model can be mimicked through corporate entrepreneurship, in which small groups within organizations can enable mature incumbent organizations to explore new and innovative areas while continuing to exploit existing capabilities (Bresnahan, Greenstein, & Henderson, 2011).

Another business model enabled by inexpensive information capabilities is the rise of "solopreneurs," individual entrepreneurs who can build entire companies without ever hiring internal employees. Solopreneurs, such as AllergyEats and SociallyActive, no longer need to acquire large amounts of capital to buy servers and IT support, formerly an important barrier to entry; rather, they rely on cloud computing. Further, solopreneurs can utilize labor marketplaces to perform functions that previously would have required entire departments. Website design, marketing, and even sales can all be contracted out to external parties via task marketplaces. Additionally, these types of organizations can engage their users as sources of content and direction. Although solopreneurs have existed throughout history, drastic reductions in information costs are allowing them to have a broader impact that helps them compete with larger, established organizations by focusing on their core competencies (Prahalad & Hamel, 1990) in highly specialized entrepreneurial ventures.

Interdependence and Community Engagement

The Internet and peer production processes function as effectively as they do because of adoption of new technical and organizational architectures combining contributions from diverse providers (Benkler, 2006). These architectures have as a defining characteristic their ability to deal with interdependencies among modular components. As Internet-based technologies become more pervasive throughout core business processes, incumbent organizations and institutions will continue to adopt new institutional logics consistent with the new processes (Thornton et al., 2012). As these organizations participate more broadly in peer-production processes, contribute to sharing communities, and generally engage in more modern forms of community interaction, they will need to develop organizational processes that embrace interdependence and community engagement.

Coordination and integration are challenges organizations face as a result of this increased interdependence and more complex logics. Okhuysen and Bechky (2009) addressed these topics and considered the creation of integrative conditions for coordination, such as accountability, predictability, and common understanding. In ecosystems incorporating community engagement, the conditions for accountability are sometimes unclear. For example, when a platform owner decides to upgrade technologies it is unclear whether the platform owner is responsible for maintaining backward compatibility to protect all developers and for how long it would need to do so. The extent to which platform owners need to provide predictable technology roadmaps is also debatable. To leverage reduced information constraints and build and maintain a developer ecosystem, an organization needs to focus on the questions associated with these coordination mechanisms (Adner, 2012).

Interdependencies vary depending on the type of entity with which the focal organization is engaging. Organizations have interdependencies with suppliers with whom they contract directly (e.g., cloud computing, IT service providers). They also have interdependencies with complementors. Both types of interdependencies have significant implications for organizations related to how they consider and manage firm boundaries (March & Simon, 1958; Pfeffer & Salancik, 1978; Santos & Eisenhardt, 2005; Thompson, 1967). And, both increase as information constraints decrease and organizations engage with communities more broadly.

Complementor interdependencies are becoming more frequent and complex as product design, development, and deployment are evolving, particularly as more modularized products are introduced into the world with open interfaces ready for additions by other organizations (Baldwin & Clark, 2000). Formerly, product development efforts were primarily internal or occurred through a network of closely affiliated suppliers and strategic alliance partners, but when organizations build and engage with communities, the product experience is developed in conjunction with organizations operating outside the central organization's legal and economic boundaries. The central organization may exert control in terms of regulating distribution of products through app store requirements or branding programs (such as Apple's "Made for iPhone" logo), but complementors act and innovate independently.

An example of complementors' actions influencing a central organization is privacy breaches by Facebook application developers (Steel & Fowler, 2010). Developers disclosed users' personally identifiable information (PII). Users were infuriated with Facebook. In fact, Facebook was not releasing data; app developers were releasing information after users opted in to using the apps. However, the perception was that Facebook was releasing user information. Facebook was harmed by actions of complementors they did not control.

With lower information constraints, organizations are enabled to develop and grow ecosystems and encourage communities, consisting of either organizations or individuals, to invest on their behalf. An example is a smartphone maker that encourages app developers and accessory providers to create products that work with its particular smartphones. This creates interdependencies between the phone maker and the app and accessory providers in which both become dependent on each other for business success. The smartphone provider needs apps and accessories to be available so that its product is attractive to consumers. The app and accessory providers need the smartphone provider to make available sufficient advance information so they can create compelling complementary products. Additionally, app and accessory providers must address the risk that smartphone providers might introduce new models rendering existing apps and accessories obsolete. The app or accessory organization has no control over a situation that could potentially lead to a significant negative impact such as high inventory scrap costs.

Interdependence among various members of an ecosystem also leads to risks being shared. From the perspective of the focal organization, there is a diversification of risk to developers or accessory providers. From the vantage point of an app developer or accessory provider participating in an ecosystem, there is risk associated with decisions the focal organization might make to the detriment of the accessory provider. However, these risks are usually justified by the great benefits that also exist from potential growth of the overall market.

Leadership

As information costs dramatically decrease and organizations engage more actively and comprehensively with communities of all types, leaders are faced with new challenges, and new leadership styles emerge. Roles transition from directing work in a traditional hierarchy (Chandler, 1977) to sourcing and organizing contributions in a more interdependent loose affiliation of communities. This is true for interactions within incumbent organizations (managing employees), outside the organization (managing suppliers and complementors), and in the newer community-based organizational forms. As Benkler (2006, p. 67) explained regarding the large-scale Linux operating system development process, "a certain kind of meritocratic hierarchy is clearly present. However, it is a hierarchy that is very different in style, practical implementation, and organizational role than that of the manager in the firm."

Because of increased access to information, leaders no longer can use asymmetries of information as a significant source of control. Herbert Simon (1945/1997) outlined considerations related to the creation of an administrative organization and highlighted the notion of influencing staff members (beyond just directing them). This is even more relevant when staff members have the same or better access to information and information processing than managers. Similarly, in a context where user-generated contributions play a significant role in product development and brand management, leaders need to influence not only staff members but also those in the community who contribute work, reviews, and other resources to projects.

Leaders also need to manage and orchestrate interactions with ecosystem members, and the form of management cannot be one of traditional hierarchy and control because the members are independent entities outside the organization. Instead, leaders need to use incentives and persuasion,

frequently referred to as "developer evangelism" by practitioners in this arena, to convince developers to invest in their products. Developer conferences, websites, tools, and cross-promotions are all means that leaders can use to influence developers to invest valuable resources on behalf of their organization as they expand their search for innovative solutions beyond their boundaries (Rosenkopf & Nerkar, 2001).

Illustrating the importance of engaging individuals, Samsung has long had a developer program through which developers can obtain product information online and attend local conferences. Expanding this activity, Samsung hosted a worldwide developer conference in October 2013. The conference website invited participants to "Engage with industry leaders; Collaborate with fellow developers; Learn about new Samsung tools and SDKs; Create what's next" (http://samsungdevcon.com/sdc13/). This highlights the importance that Samsung's leadership is placing both on building relationships with ecosystem members worldwide and also on the role they need to play in fostering community interactions among members.

Beyond considering influence and persuasion, Simon's (1945/1997, p. 199) notion of an administrator as one who satisfices, choosing actions that are satisfactory or "good enough," is worth reconsidering when inputs are from large external communities. To what extent do administrators need to satisfice when the solutions from which they are choosing come from external communities widely diverse in functional expertise, geography, motivations, and experiences? No longer are managers bound by inputs from their employees and close partners; rather, they may be able to get closer to the economic model of maximizing decision making when search extends beyond the boundaries of their organization to large-scale communities.

Furthermore, top management team operations and roles (Finkelstein & Hambrick, 1996) may be affected by changes as a result of decreasing information constraints. Just as individuals might be affected by shifts in the relative importance of roles when firm boundaries shift and interdependence increases, so too might dynamics within top management teams change. For example, as developer communities become increasingly important, the roles of team members who create and nurture these communities might also increase in importance. However, in a management team where product development professionals have traditionally held sway, shifting power to business development staff might be a difficult transition for a leadership team. Additionally, the openness associated with more community engagement may introduce top management team challenges related to managing paradoxes and contradictions as leaders aim to protect traditional proprietary advantages while embracing creative innovative inputs from external parties (Smith & Tushman, 2005).

Moreover, across the organization, shifts to broader external community engagement, sharing, and openness may introduce challenges related to roles and functional responsibilities. In the past, primary engagement with external communities was largely restricted to particular staff members, such as customer service personnel. Now, in cases where sharing with external parties becomes important and more pervasive, other functional areas (such as product development) might need to interact directly with external parties and process their inputs (e.g., suggestions from users).

Monitoring costs, a central topic in the TCE discourse (Williamson, 1981), vary in the context of interdependent communities. One might initially think that monitoring costs would increase as the number of developers in an app store increases. In fact, through network effects, the more popular an app store becomes, with an increasing number of apps, the larger the community of users it develops, and that community then contributes reviews to the marketplace, which serve as a form of monitoring. In practice, a conglomeration of developers monitors all the individual developers. Therefore, not only does lack of information constraints allow for production of complementary goods by parties outside the organization, it also allows for monitoring and quality control of these goods for free by users. Leaders may no longer need to manage organizations of individuals monitoring outputs but rather organizations of individuals nurturing and managing the community that monitors outputs.

Identity

Organizational identity research encompasses both an internal perception of organizational identity (Albert & Whetten, 1985) and an external conception, which is sometimes referred to as an organization's image (Dutton & Dukerich, 1991). As information constraints decrease and the locus of innovation moves outside the organization, both internal and external conceptions of organizational identity may be challenged. With respect to internal organizational identity, as an organization

transitions from creating innovations entirely internally to sourcing and selecting innovations externally, it may change from considering itself as primarily a research-based organization to being one that delivers innovative product experiences regardless of where they are sourced. This may lead to changes in which functions have the most power in an organization, potentially shifting the power base from engineers to business development professionals or vice versa, depending on the nature of the organization.

Relative to external identity, an organization may change from presenting itself as primarily a technology-led product organization to a services-based one. It may move from having an organizational identity centered on the organization alone to one that encompasses both the organization and its related communities (e.g., its developer ecosystem). In both cases, the organization's identity may be threatened and undergo a transition as a result of transitions prompted by technological changes (Tripsas, 2009).

Identity spans levels of analysis considering both individuals and organizations (Gioia, 1998). Both of these identity types may shift as organizations transform, and the two may influence each other (Fiol, 2002). How employees identify with their organization and with their professions is likely to be challenged as the locus of innovation moves outside the organization. When much of the innovation included in an organization's product offering is being sourced externally, do employees have the same level of pride in their organization? As engineers transition from considering themselves creators of innovations to evaluators of others' innovations, is there also a potential threat to their professional identities (Ibarra, 1999; Lifshitz-Assaf, 2013)? Must organizations hire people with different profiles when the roles of people within R&D include much greater levels of interaction with external communities? Professional identities are increasingly associated with engaging external communities, sourcing, and selecting creative outputs rather than with internal development and creativity when an organization is more focused on external engagement. Both individual and organizational identities provide powerful lenses through which we can study these changes. Further, organizational identity research could likely benefit from examples that link changes associated with information constraints reduction, such as product-to-platform transitions, with identity transitions (Altman & Tripsas, 2015).

Search

Search and decision making (Cyert & March, 1963) are relevant topics to reconsider with respect to organizations and communities in the context of minimal information constraints. A fundamental underpinning of rational choice theory is that there is a cost associated with gathering better information. In his behavioral model of limited rational choice, Simon (1955, p. 112) tied these costs to aspiration levels of individuals and then built his argument on the idea that a "behaving organism does not in general know these costs" and thus cannot be fully rational in its decision making. In the world of social media, users employ tags, "like" buttons, and hashtags to signify their approval (or disapproval) of content.[17] Through these mechanisms, they self-organize into communities supporting particular ideas. These freely created groups exist and are searchable by entities looking for trends and insights into popular culture. When we have free contributions (e.g., user reviews), costs associated with searching for better information are greatly reduced.[18] This reduction in constraints enables individuals to meaningfully operate in less boundedly rational ways and thereby adopt a classic welfare-maximizing approach to decision making.[19]

At an organizational level, absorptive capacity is understood to characterize an organization's ability to exploit external knowledge as a function of its prior related knowledge and is dependent on the structure of communication between the organization and its environment (Cohen & Levinthal, 1990). In a world of free contributions from individuals and self-organized groups, it is not clear whether the gatekeeper and boundary-spanning roles in traditional R&D organizations (Allen, 1977; Tushman, 1977), which are important for absorptive capacity, maintain the same functions or possibly morph into more of a curatorial or distributor role, managing inputs from the community at large. Although community contributions increase alternatives available to managers and introduce new complexity into the search process, on balance these changes present an enormous opportunity for leaders to make better decisions from better alternatives.

At an organizational level related to search, innovative organizations continually strive to balance the challenges and trade-offs of exploiting existing knowledge while also exploring new opportunities (March, 1991). Within product development particularly, search behavior varies

in terms of both how organizations re-use existing knowledge and how widely they look for new knowledge (Katila & Ahuja, 2002). User-generated contributions can apply in modes of both exploitation and exploration. In the exploitation mode, user-generated contributions can extend the reach of an existing product through localization efforts. A specific example is when organizations enable users to localize products for particular markets and then capture these localizations for the benefits of other users, as Facebook does when it relies on users to translate its site into non-English languages. User-generated contributions and developer interactions offer even greater opportunities in an exploration mode because they dramatically increase the available search area. When an organization casts a wide net for user contributions and developer applications, it dramatically increases its ability to explore new alternatives. If managed properly, these contributions allow the organization to gain important insights into how products are used. Further, engaging with users and developers leads to products that better satisfy the needs of users and are therefore more widely adopted.

Intellectual Property

Decreased information constraints, greater engagement with communities, and a shifting locus of innovation lead to strategic considerations regarding how organizations manage IP. When innovation and the accompanying invention were conducted entirely within the boundaries of an organization, the situation was relatively straightforward. Organizations protected IP through legal mechanisms such as patents, trademarks, copyrights, and trade secrets. When they engaged in interorganization collaboration, they executed appropriate licensing contracts to document ownership and usage rights of the IP created during that relationship.

Organizations, individuals, and groups of users all need to understand IP considerations in a world where organizations regularly solicit inputs and then incorporate these contributions into product offerings (Harhoff, Henkel, & von Hippel, 2003). Beyond determining who owns outputs (which is a challenge in itself), organizations need to be concerned about verifying ownership of inputs. When a user leaves a suggestion on a feedback forum and the organization integrates that suggestion into the next version of a product, does the user have any ownership rights? And, how can the organization be certain that the user did not steal that idea and its implementation from someone else and thus whether the user has the rights to contribute it in the first place? Similarly, when open source software is used to develop proprietary software (e.g., Mac OS X is based on the open source BSD Unix kernel), one must carefully consider how that particular open source license is framed (O'Mahony, 2003). Further, when cloud computing resources are used to develop important innovations, clear ownership agreements with the cloud provider must be in place. The full scope of strategic implications and considerations related to IP in a world of external resources, app developers, and user-generated contributions are well beyond the purview of this chapter. However, it is clear that increases in processing capabilities and reduction in information constraints create novel and complex challenges for IP attorneys and the leaders and individuals with whom they work. They may even call into question the utility of IP laws for spurring innovation (Benkler, 2006; Jaffe & Lerner, 2004).

In summary, while many of the traditional organizational and strategic theories do not necessarily fail as information costs approach zero, several of the assumptions that underlie these theories may no longer apply. Therefore, in all of the areas discussed (boundaries, strategy and new business models, interdependence and community engagement, leadership, identity, search, and IP), research is required to understand how organizations shift strategic visions to account for the reduction in information constraints. However these shifts occur, it is clear that the process of innovation will be significantly altered.

Impact on Innovation

Scholars often use evolutionary process models, incorporating variation, selection, and retention as lenses through which to view innovation (Campbell, 1960; O'Reilly & Tushman, 2008; Staw, 1990; Tushman & O'Reilly, 1996). We employ this framework to help better understand how the reduction of information constraints affects innovation. Variation is the process through which individuals, organizations, communities, and institutions take existing problems and explore potential solutions through a process of experimentation. In a world without information constraints, the locus of this innovative process shifts from being centered within an organization to more broadly encompassing organizations, individuals, and communities. Selection is the process through which competing alternatives are evaluated and

the dominant solution is chosen and brought to market. Finally, although the classic evolutionary view of retention is that of a hereditary process of distributing the selected attributes to the next generation, we instead use the term to mean retention and adoption by the community of users (or potential users). In all three of these stages, dramatic reductions in information processing, storage, and communication costs allow individuals and communities to be more engaged in the innovation process than previously was possible. In Table 19.3, we compare these three innovation stages in contexts with and without information constraints.

Variation

In settings both with and without information constraints, the process of variation is a key driver of innovation. Whereas the first movers create the variation via new innovations, all other organizations must react to the variation. Both must manage the variation as it inevitably affects the status quo. During the variation stage, organizations conduct research and development by searching the existing solution space for a problem, use innovation tools to experiment with possible new solutions, and are open to complementary innovations that add value to the original innovation. However, as we move toward a world without information constraints, all of these activities require more engagement with communities and in some cases may be conducted by communities. Individuals are capable of performing many of these activities on their own when they are armed with the tools enabled by reductions in information constraints.

Previously, most R&D was conducted within an organization that perhaps engaged a few select partners in their innovative efforts. Now, platforms such as TopCoder and InnoCentive allow organizations, and even complex government agencies such as NASA, to focus their efforts on defining problems that are then opened to the community to help generate possible solutions (Lifshitz-Assaf, 2013). This allows organizations to seek inputs from individuals based in diverse disciplines who

Table 19.3 Innovating With and Without Information Constraints

	With Information Constraints	Without Information Constraints
Variation	• R&D conducted internally and with select partners	• Organization defines the problem, uses community to help generate possible solutions
	• Long prototype and pilot cycles	• Faster experimentation (lean)
	• Inputs from internal domain-specific experts	• Inputs from diverse disciplines (e.g., biologists answering physics problems)
	• Reseller models do not encourage complementary innovation	• Multisided platforms (marketplaces) create opportunities for a large variety of offerings from a community of sources
	• Computing tools are expensive and inaccessible	• High-performance tools are available for innovators
Selection	• Management hierarchy decision making	• Community-based decision making (or at least input)
	• Homogenous perspectives during evaluation	• Heterogeneous perspectives during evaluation
	• Traditional market research techniques (e.g., focus groups)	• Online and field-based rapid experimentation
Retention (by Communities)	• Limited and costly communication to potential customers (e.g., traditional advertising)	• Easy and inexpensive communication to potential customers (e.g., social media)
	• Complexity in segmenting and targeting customers	• Big data enables specific customer targeting
	• Organization/customer relationship ends with product purchase (e.g., brick and mortar checkout)	• Organization/customer relationship starts with product purchase (e.g., account signup)
	• Slower diffusion and difficult distribution of product offerings	• Leverage platforms and ecosystems for wide diffusion of new products (e.g., apps)

can engage in out-of-the-box thinking (e.g., a biologist may have the solution to a physics problem).

Powerful new tools, such as cloud computing, allow individual innovators to create solutions that previously could have been developed only within an organization with vast resources. These same tools allow all innovators (organizations, individuals, and communities) to conduct faster experimentation whenever fully detailed prototypes are not necessary to gain accurate measurements of how a product will function or be adopted. Web-based communication tools, including email, mobile phones, and sharing sites (all sometimes gathered under the term "social media"), are also making it much easier for groups to quickly form and grow and for new types of groups to gather. As Shirky (2008, p. 20) explained in his popular book on self-organization, "We are living in the middle of a remarkable increase in our ability to share, to cooperate with one another, and to take collective action, all outside the framework of traditional institutions and organizations," all of which leads to production of knowledge that organizations can employ in their innovation efforts.

With information constraints dramatically reduced, organizations are changing how they leverage creativity of entities outside their organizations and engender ever greater levels of variation. Open and distributed innovation research provides insights into how organizations manage some of these engagements (Baldwin & von Hippel, 2011; von Hippel, 2009). In related work, the burgeoning literature on multisided platform-based businesses and ecosystems provides guidance for how organizations leverage complementors to increase the value of their offerings (Adner & Kapoor, 2010; Eisenmann, Parker, & Van Alstyne, 2011; Zhu & Iansiti, 2012). Although there are numerous types of multisided platform business models, they all enable interactions between two or more types of customers (e.g., buyers and sellers) interacting in a market (Hagiu & Wright, 2013). Transitioning to this business model may enable increased variation and better innovative outcomes, yet may also create new challenges for organizations.

Selection

After going through the variation process, in which firms either create or react to a new innovation, an innovating entity must select which version of an innovative solution it wants to bring to market (Lakhani et al., 2013). However, without information constraints, the organization can engage with external communities to gain important feedback regarding what is most likely to be successful. For example, when a traditional clothing retailer, such as The Gap, must decide which designs to mass manufacture and release to the public, the decision is frequently made by the management hierarchy, with input from consumers, if any exists, filtered via a marketing or market research organization using tools such as focus groups. However, when a firm such as Threadless desires to launch a new product, it has the user community vote directly on competing designs. In this manner, Threadless already has a good sense of a product's potential consumer acceptance and demand before it manufactures the product. Organizations no longer need to rely primarily on traditional market research techniques like focus groups; they can directly engage a large subset of the user community to experiment with reactions to products before making final selections.

Similar to the variation process, engaging communities outside an organization during the selection process allows for heterogeneous perspectives to be sampled before a decision is made. This gives experts in fields outside an organization's core competencies the ability to identify potential challenges the organization might not have considered. These contributors can be professional experts, as when a biologist answers a physics-based problem on a competition website, but they can also be amateurs who have become "experts" with particular products. This often occurs with user-generated reviews: End-user customers contribute to e-commerce websites by posting product reviews, and then other customers vote on the level of helpfulness of the comment. In one recent instance, one of us received a catalog from a mail-order firm highlighting the top ten rated products on the firm's website and offering discounts on those goods. The firm was engaging users to select products on which the firm then offered a promotional discount through its catalog, which blended the traditionally unidirectional world of mail order catalog merchandising with the digital world of customer ranking and ratings.

Retention (By Communities)

For an innovation to survive, the innovator must ensure that it is retained, diffused, and adopted by the community. The reduction of information constraints has important implications for the diffusion of innovations, which has been an important topic of economic inquiry for many years (see Griliches, 1957, and Rogers, 1962, for early examples and

Geroski, 2000, for an overview). The reduction of information constraints speeds communication about new innovations, but this means that organizations have less room for error in early versions of products. Big data and data analytics, enabled by major information cost reductions, allow organizations to mine their existing customers' behaviors to better identify potential early adopters of new products; this can greatly improve the speed with which an innovation diffuses. However, it also causes an organization to increase its engagement with customers after they purchase the product. In many instances with today's online products, the first thing users do when they start to engage with a product is create an account with the organization selling the product. This establishes a link between the organization and the user that represents an ongoing relationship, enabling the user to provide feedback to the organization that can be integrated into the innovation process.

Further, application marketplaces (e.g., Apple's App Store, the Facebook App Center) have large captive audiences that developers want to reach. By using cloud hosting services (e.g., Heroku, Amazon Web Services), which integrate seamlessly with the marketplaces, developers are able to quickly and widely distribute applications to an audience well beyond what they could reach without such services. Additionally, utilizing cloud computing to host innovative applications allows organizations to experiment and update software-based products without requiring users to download a new version to their desktop after every update.

Importantly, the world without information constraints not only allows for more rapid diffusion of information and physical goods but also allows for some physical goods to diffuse as rapidly as information goods via the invention of 3D printing. 3D printing enables individuals to send digital files of goods rather than sending actual physical goods. Receivers can then print their own versions of a physical good from files they have received. Sending digital information that represents a physical good is much easier (and less expensive) than sending actual goods.

Future Directions and Research Opportunities

During the time we were writing this chapter, we frequently encountered situations in which we found ourselves thinking, "This is it! This is what we are writing about! This is innovating in a world without information constraints. This is an organization acting differently because information is essentially free." An example occurred while we were researching incumbent organizations engaging with communities. One of us found GE's open innovation call for participation, thought it was well executed, and tweeted the link with reference to the source.[20] Within 15 minutes, much to our surprise, GE tweeted back. That interchange represents exactly the type of organizational change examined herein. A decade ago, this type of interchange could never have happened. In addition to the technological constraints, there were organizational ones, particularly for large, hierarchical control–centric organizations. Before GE, or any large organization, distributed text publicly, it would need to go through an onerous approval loop. Today, embracing new tools and approaches enabled by reduced information constraints, GE has changed how it engages with the world and is publicly posting multiple tweets per hour, chatting with consumers and potential innovators.

In this chapter, we explored the implications of information processing, storage, and communication costs approaching zero. We showed that the reduction of these costs allows organizations to engage with communities of laborers, developers, and users, and that this engagement leads to shifts in fundamental assumptions of traditional organizational theory. In turn, these organizational shifts lead to new innovation methods. What we see with the simple social media interchange just described, and the phenomena from which it derived, is the instantiation of these shifts.

The changes described herein lead to opportunities for theoretical and empirical research. From a theoretical standpoint, the existing assumptions that many fundamental organizational theories are built upon may no longer be accurate portrayals of a world without information constraints. Although the theories may still be valid, there are open questions as to which of them remain relevant in the modern world. From an empirical standpoint, it is logical to focus on changes to existing business models and development of entirely new ones. Mature organizations are struggling with new levels of interdependency and complexity as they share and engage more broadly and attempt to manage multiple logics simultaneously. Entrepreneurial organizations are emerging with entirely new approaches to managing innovation. These organizations and institutions are undergoing significant transitions, at multiple levels of analysis, which neither practitioners nor scholars fully understand.

Quantitative and qualitative research methods should be employed to improve our knowledge of these phenomena and their theoretical implications. We see a wealth of research questions related to these studies. In particular, the value of free contributions by users also deserves further research. Is this value accounted for in productivity and growth measurements? Do organizations that utilize such free inputs have higher rates of return than their competitors? What drives users to contribute such free labor? Further, when traditionally product-centric organizations transition to platform-based marketplaces leveraging today's environment with de minimis information constraints, what are the organizational and strategic ramifications? To what extent is organizational identity involved in these types of transitions? Can it help with the transition, or is it always a hindrance? How do organizations that participate in another organization's ecosystem balance their need to differentiate with the requirements of compliance when they are part of a community? These questions stem from the observation that we are living in a world where information is no longer expensive to process, store, or communicate, and this opens a world of innovation opportunities for individuals, organizations, and institutions.

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Notes

1. Throughout this chapter, we adopt the definition of institutional logics put forth by Thornton and Ocasio (1999, p. 804) as the "socially constructed, historical pattern of material practices, assumptions, values, beliefs, and rules by which individuals produce and reproduce their material subsistence, organize time and space, and provide meaning to their social reality." This definition embraces both the material and the symbolic and encompasses both formal and informal rules for decision makers.
2. IBM archives. Retrieved from http://www-03.ibm.com/ibm/history/exhibits/storage/storage_1301.html on December 15, 2014.
3. The 500 GB of free storage is valid for 90 days. Retrieved from https://www.hpcloud.com/free-trial on June 5, 2013 .
4. Multicore chips contain two or more CPUs that run in parallel. DNA computing utilizes the self-assembling nature of DNA to craft problems as half-strands of DNA, which are solved by the matching pieces of DNA. Quantum computing takes advantage of qubits, which are bits of information that can exist as both a 0 and a 1 at the same time.
5. East Indian lore tells the story of an Indian king who loved chess so much that he offered the inventor of the game any prize he desired. The inventor asked for one grain of rice on the first square of the board, two on the second, four on the third, and so on, doubling the amount for each of the 64 squares on the board. While the amount of rice on the first half of the chessboard was large, it was within the realm of the feasible. However, the amount of rice on the second half of the board was more than all the rice in the world.
6. The calculation was based on the Intel Core i7-3960X, which runs at 177,730 MIPS and could be purchased from TigerDirect.com for $1,009 in 2013.
7. Although there are many definitions of cloud computing, we use a fairly broad definition and consider cloud computing to be the use of computer servers and services that are hosted by a third party and are accessed via the Internet. One key feature of most commonly used cloud computing platforms, including Amazon Web Services and Google Drive, is the ability for a firm to utilize more computing power, storage, and bandwidth on demand, without needing to buy and install servers within the firm.
8. Amazon Web Services free package information, retrieved from http://aws.amazon.com/free/ on June 5, 2013. HP Cloud free package information retrieved from https://www.hpcloud.com/free-trial on June 5, 2013. MIPS calculations for both were retrieved from http://insights.wired.com/profiles/blogs/all-clouds-are-not-created-equal-2x-cpu-performance-at-nearly-the#axzz3LuAiExLF on June 5, 2013.
9. An exabyte is 10^{18} bytes, or 1 billion gigabytes.
10. Google CEO Eric Schmidt addressing the Techonomy 2010 conference, Lake Tahoe, California, August 6, 2010.
11. YouTube upload statistic. Retrieved from http://www.youtube.com/yt/press/statistics.html on December 15, 2014.
12. A terabyte is 1,000 gigabytes or 10^{12} bytes.
13. Although there are many definitions of big data and data analytics, Gartner (2013) defines big data as "high-volume, high-velocity and high-variety information assets that demand cost-effective, innovative forms of information processing for enhanced insight and decision making."
14. This calculation was based on the Seagate Backup Plus 4TB External Desktop Drive, which could be purchased from TigerDirect.com for $190 in 2013.
15. Although the monthly fee is $0, there is a one-time installation fee of $300. Information retrieved from https://support.google.com/fiber/answer/2476912 on June 6, 2013.
16. For a broad overview of the technology and innovation management literature, see Altman, Nagle, & Tushman, 2013.
17. Tags are keywords included in the metadata of text that make it easier to search. Like buttons are a small button that allows a user to indicate that they approve or agree with an action or statement by another user. Hashtags are the # symbol followed by a keyword or phrase within a block of text to allow for easier searching and grouping.
18. We recognize that these reviews can potentially be manipulated by the organization or individual of focus and thus must be monitored. Nevertheless, these reviews are having sizable impacts across business models and industries and thus are relevant to this discussion.
19. We acknowledge also that we are assuming individuals can easily process information without bias, but we believe this is a reasonable enough assumption to make this point.
20. "Tweeted" in this context refers to posting an update on the twitter.com website to a community of followers.

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CHAPTER

20 Product-to-Platform Transitions: Organizational Identity Implications

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Abstract

Organizations are increasingly recognizing that value they once derived from offering stand-alone products can be significantly enhanced if they transition to platform-based businesses harnessing innovative capabilities of complementors. Whereas the competitive dynamics of platform-based businesses have been studied extensively in the economics and strategy literatures, the organizational implications of shifting from a product- to a platform-based business model remain relatively unexplored. We propose that such a shift is not simply an operational change but may challenge the core of how an organization views itself, calling into question organizational identity. Organizations that define themselves as creative and innovative may have trouble accepting a platform-based context in which outsiders engage in creative activity on their behalf. Organizational identity can also influence whether and how organizations become platform-based. To succeed, organizations must question elements of their existing identity and actively modify it to become consistent with their new business approach.

Key Words: organizational change, organizational identity, multi-sided platforms, ecosystems, complementors, managing innovation

Introduction

The ability of organizations to innovate and adapt to changes in the external environment is a critical component of competitive success. Historically, scholarship has focused on understanding the challenges of technological innovations that require organizations to master new scientific disciplines and develop new competencies (e.g., Henderson & Clark, 1990; Tushman & Anderson, 1986). More recently, scholars have started to explore the role of business model innovation (e.g., Casadesus-Masanell & Ricart, 2010; Zott & Amit, 2008). In particular, organizations in many industries have adopted platform-based business models in which, rather than simply sell a product, organizations manage multi-sided platforms that "get two or more sides on board and enable direct interactions between them" (Hagiu & Wright, forthcoming). Some platforms, such as mobile phone app stores, connect producers of a complementary product (e.g., developers) with consumers, whereas others serve as marketplaces that connect buyers and sellers of goods (e.g., eBay) or match users (e.g., dating platforms). Platforms enable direct interactions between both sides, but each side also typically has a relationship with the platform provider. These relationships range from less formal interactions, such as single people signing up for an account on a dating site, to formal economic contracts such as application software developers registering with a smartphone manufacturer's developer website and then selling software via an app store. Figure 20.1 provides a schematic representation of this type of business.

The traditional yellow pages directory is a classic example of a multi-sided platform-based business enabling buyers and sellers to search for (and then interact with) each other, yet both buyers

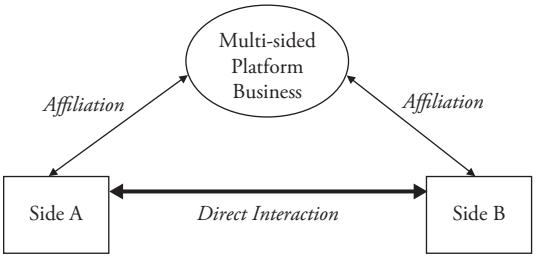

Fig. 20.1 Multi-sided Platform-Based Business Model.

and sellers are also customers of the yellow pages provider (Evans, 2003; Rysman, 2004). eBay is a more modern example of a multisided platform-based business: Buyers and sellers interact directly with each other (i.e., a seller pays a buyer directly when buying an item), yet the interaction is enabled through eBay. Both sellers and buyers are affiliated with eBay; sellers pay eBay a fee, and buyers have a registered account on the site. The videogame industry provides a hardware- and software-centric example. Manufacturers sell videogame consoles to consumers, and game titles are developed by both console manufacturers and independent producers. Consumers can buy games from manufactures or directly from third-party producers through console manufacturers' websites (e.g., www.microsoftstore.com/) and other venues. Thus, the videogame console manufacturers enable interactions between consumers (one side) and game producers (the other side); the game producers offer a complementary product that enhances the value of the game consoles. Multi-sided platform firms are now primary players in a variety of both online and offline industries that include mobile phones, tablets, personal computers, online retailing, credit cards, media, innovation contests, financial services, and shopping malls (Eisenmann, Parker, & Van Alstyne, 2011).

Although some of these markets have existed for a long time, current technological advances are making these industries and organizations increasingly relevant (Gawer, 2009). Leveraging the declining costs of information processing, storage, and communication and the associated increasing penetration of broadband Internet and computing, organizations in many industries are expanding their innovative activities by engaging with external communities, frequently through platform-based business models (Altman, Nagle, & Tushman, 2015). In addition, with the widespread adoption of technologies such as software operating systems that enable external development of applications and other complementary services, industries that were traditionally composed of single-sided, product-based businesses now consist of organizations adopting platform-based business models. Even the automotive industry has recently moved in the direction of multi-sided platforms, with firms like General Motors creating new structures such as their developer ecosystem program. This program facilitates interactions between consumers and external software application developers, such as those building apps that enable drivers to communicate with their cars remotely or that track mileage for business expenses (Trop, 2013).

As multi-sided platform-based businesses have become ever more relevant in the global economy, researchers have increasingly focused attention on topics related to their growth and management. The competitive and strategic implications of multi-sided platforms have been studied extensively in the economics and strategy literatures, including modeling of pricing, competitive dynamics, and growth strategies (Armstrong, 2006; Rochet & Tirole, 2006). However, the organizational implications of shifting from a product-based to a platform-based business model remain relatively unexplored.[1]

In particular, the implications of this transition for organizational identity and the role of organizational identity in guiding the transition are not well understood. Yet, these transitions can affect the essence of how an organization views itself and operates. If an organization attempts to make a product-to-platform transition without taking into account the implications of identity, problems may arise. If organizational identity does not evolve to accommodate the activities and beliefs that accompany a platform-based business, dissonance may result between those involved in building the platform-based business and those historically involved in the product-based business, inhibiting an organization's ability to successfully transition. At the same time, some aspects of organizational identity may influence the type of platform-based strategies a firm utilizes. In this chapter, we explore the relationship between movement to a platform-based business model and organizational identity.

Organizational Identity

We conceptualize organizational identity as a shared understanding on the part of organizational members about "who we are as an organization." It represents what individuals believe is central to and defining about their organization, often in contrast

to other organizations (Albert & Whetten, 1985; Corley, Harquail, Pratt, Glynn, Fiol, & Hatch, 2006). Organizational identity manifests in two ways. First, organizational identity can address the question, "How do we define what business are we in?" This aspect of identity is often expressed by claiming membership in a particular product market or industry category (Glynn & Abzug, 2002). For instance, Koch Industries was defined as an "oil and gas company" (Barney, 1998), and Linco as a "digital photography company" (Tripsas, 2009). Second, organizational identity can consist of a set of attributes that members collectively believe are core. For instance, in their study of the New York Port Authority, Dutton and Dukerich (1991, p. 526) listed a set of six attributes that organizational members identified as distinguishing their organization. These included items such as being "a professional organization . . . , ill-suited to social service activities," and being "ethical, scandal-free, and altruistic." Similarly, in their study of a unit that was spun off from an established firm, Corley and Gioia (2004, pp. 185–186) found that key elements of the unit's identity included being a "younger, more agile competitor than [Bozco,] 'an industry founder,' 'an aggressive competitor,' [and] a ground-breaking marketer."

Because organizational members have a shared understanding of "who we are," there is also an implied agreement about "what we do" (Navis & Glynn, 2011). Organizational identity therefore creates a clear set of expectations about what constitutes appropriate action. These expectations often result in a set of heuristics and routines that guide and coordinate organizational action (Kogut & Zander, 1996). Interpretation of the external environment is filtered through the organization's identity, providing a common ground for decision making (Tripsas, 2009).

Although organizational identity can serve as a guidepost that unifies an organization, it can also create conflict. Actions inconsistent with the organizational identity result in discord and dysfunctional behavior within the organization (Elsbach & Kramer, 1996; Golden-Biddle & Rao, 1997). Kraatz and Zajac (1996) found that when liberal arts colleges adopted vocational and professional programs that were inconsistent with a liberal arts identity, those programs were denounced by key actors. In addition, if a firm violates the norms and expectations that outsiders have for a given product market category, the firm loses legitimacy (Benner, 2007; Zuckerman, 1999, 2004). For instance, Zuckerman (1999) found that securities analysts provided less coverage to firms that did not conform to generally accepted categories, and the share prices of those firms suffered.

Managing identity effectively can help increase an organization's flexibility in response to environmental shifts. For instance, in contrast to Polaroid, which maintained a narrow identity as an instant photography company, Fujifilm redefined itself as an "information and imaging" company, an identity that encompassed digital imaging activities and made those activities legitimate in the eyes of organizational members (Tripsas, 2013). Scholars have also shown that proactive, planned changes in identity are often necessary to effectively accomplish other types of organizational or strategic change. For instance, Gioia and Thomas (1996), in their study of institutions of higher education attempting to become more business-like, found that articulation of a new, desired future identity was important in managing the transition.

Multi-Sided Platforms

With multi-sided platform firms gaining in prominence, there has been a focus on this organizational form in the field of economics, with roots in industrial organization (Armstrong, 2006; Boudreau, 2010; Rochet & Tirole, 2006). Research can be grouped roughly into two segments addressing two broad areas of strategic choice. The first relates primarily to competitive dynamics and examines the implications of network effects on pricing and growth strategies. The second addresses platform governance and covers questions about how open a platform should be, whether standards should be proprietary, and the establishment of criteria for interacting through a platform.

Competitive Dynamics and Network Effects

From an economics perspective, one of the factors that distinguishes a platform-based business from a product-based business is the presence of network effects, also sometimes referred to as network externalities (Hagiu & Yoffie, 2013). Network effects are present when the value of a product or service increases as others utilize that product or service and expand the size of the network (Katz & Shapiro, 1985). Network effects are said to be direct when the source of increased value is direct connections among members. The classic historical example is a public telephone system: Having more people to call increases the value of the system to each individual who has a telephone.

There are also systems that exhibit what are referred to as indirect network effects, in which the source of increased value for customers is the greater number and variety of complementary products and services that are available when more customers use a product. A classic example is the computer hardware/software paradigm: As more users adopt a particular type of hardware, such as a personal computer or videogame console, more software will be developed for that hardware (Katz & Shapiro, 1994). Indirect network effects are also sometimes referred to as "opposite side network effects" because the value to an individual member on one side is affected by the actions of members on the other side of the network.

Multi-sided platforms are most affected by indirect network effects: The larger one side of a platform becomes, the more value is created for actors on the other side of the platform.[2] For instance, the availability of more high-quality applications for a smartphone platform is beneficial to consumers, and the more consumers there are on the platform, the more attractive the platform becomes to application developers (Armstrong, 2006; Hagiu, 2009; Rochet & Tirole, 2006). Empirical research has demonstrated the strength of these network effects in the yellow pages (Rysman, 2004), the personal digital assistant (PDA) industry (Nair, Chintagunta, & Dubé, 2004), the video cassette recorder (VCR) industry (Cusumano, Mylonadis, & Rosenbloom, 1992), and the videogame industry (Clements & Ohashi, 2005). In some cases, network effects are so strong that a "winner take all" phenomenon is at play and the market "tips" in favor of the dominant platform (Arthur, 1989; Cusumano et al., 1992; Shapiro & Varian, 1998).

Given the strength of network effects, much of the research related to platforms has focused on how firms can quickly build critical mass on both sides of the platform to get a feedback loop started (Evans, Hagiu, & Schmalensee, 2006; Gawer & Cusumano, 2002; Parker & Van Alstyne, 2005; Rochet & Tirole, 2003). This is sometimes referred to as the chicken-and-egg problem, or getting the flywheel going, and it addresses the challenges of getting early adoption (Caillaud & Jullien, 2003; Evans, 2009). Scholars have shown the effectiveness of a number of approaches to growing a platform when network effects are in place. These include pricing strategies, potentially including subsidization, and providing free services to some participants on the platform.

To achieve early growth, firms may cut prices to generate demand. In a formal model of two-sided markets, Caillaud and Jullien (2003) focused primarily on e-commerce marketplace platforms and found that effective pricing strategies were in the mode they called "divide-and-conquer," where the firm subsidizes one side and recovers the loss on the other. Parker and Van Alstyne (2005) extended this work by addressing the question of which side of the platform is optimal to subsidize. Using a formal model, they show that in two-sided markets comprised of content producers and consumers, the best approach is to subsidize the side of the market that contributes more to demand for the other side.

Another approach to jump-starting a platform is to provide free technical support to either or both sides. For instance, to encourage adoption of the Postcript standard, Adobe Systems provided laser printer manufacturers with a free boilerplate reference design for a Postcript interpreter and also gave technical support to application developers who wanted to create Postcript output (Tripsas, 2000). Parker and Van Alstyne (2005) illustrated the theoretical justification for this approach in their model; they found that firms can profitably invest in developing products they give away for free (e.g., application development toolkits) because doing so increases the number of providers on one side of the platform (e.g., number of application developers), which drives demand on the other side of the platform (e.g., end-users), and the revenue from the enhanced demand more than covers the cost of development.

While platforms need to obtain the appropriate level of participation to start their growth engines, the dynamics related to gaining a "critical mass" of adoption vary (Evans, 2009). For some markets, such as dating platforms, organizations need to secure critical mass of both sides at launch to succeed. There are yet other cases in which organizations may need to make precommitments to one side to entice them to invest in the platform. For example, in the case of hardware/software products such as console-based videogames, hardware providers (console manufacturers) need to convince software developers to invest in product development (creating videogames) before the console is on the market and proven to be a hit with consumers. Hardware providers must provide enough pre-release confidential information to convince developers to invest or provide financial guarantees to catalyze demand for the console (Evans, 2009).

Multi-sided Platform Governance and Management

Scholars have also addressed questions of platform management, such as to what extent a platform should be open or closed and how to manage the quality of contributors to a platform. The distinction between open and closed is not straightforward, because there are varying degrees of openness (Baldwin & Woodard, 2009; Boudreau, 2010). Although organizations that have decided to provide a platform-based offering have already chosen to be open, at least to some extent, by enabling others to transact through their offering, there are still many choices related to the level of openness they are willing to allow and the means with which they achieve it.

For example, organizations that offer closed, self-contained software products and decide to transition to a multi-sided platform-based business model need to decide to what extent to open their software and how to enable complementors (developers) to interact with their products. One such decision, which is tactical but may have significant strategic consequences, is whether an organization is going to offer application programming interfaces (APIs) and/or a software developer kit (SDK) to developers. Decisions about whether and how to offer APIs and SDKs highlight trade-offs between open and closed access, flexibility for developers, and ease of access for developers, all of which reflect an organization's stance toward moving to a platform-based business model. An API is essentially a set of specifications and rules that explain how to interact with and access software code. The act of "opening an API" means that the organization is providing access to code for developers and is a step toward openness. An SDK is a set of software development tools for designing apps on a particular system; it typically includes one or more APIs (and possibly software code for accessing those APIs). The tools that are part of an SDK may provide structure and guidance for developers but only proscribed access to the code. Thus, although they may deliver significant assistance to developers, this may come at the expense of constraints on access, which may limit creativity and flexibility. Decisions about which APIs to offer, whether or not to include an SDK, and what form the SDK should take are examples of practical decisions that an organization transitioning to a platform model needs to make that set the stage for the level of openness the organization is willing to allow for its complementors.

Organizations must choose between developing their own proprietary standards through which to interact with others and adopting industry standards. West (2003) noted that firms have an incentive to follow closed, proprietary strategies that can provide better barriers to imitation, higher margins, and more control (because they do not necessitate interoperability with other standards). However, there are frequently technical and economic considerations that force organizations to move to either open or hybrid strategies. For example, to balance the creation and capture of value, when Adobe Systems introduced the Postcript "page description language" and font standard that allowed software applications to communicate with laser printers, it was both open and closed. To increase adoption of Postscript and thereby create value, it was open to application developers. As Charles Geschke, one of the founders, explained, "We made a decision early on that the standard itself—the documentation for how you describe the page—would be open, freely available and we would publish it. We would retain the copyright and the trademark, but we would make the interface open to anyone" (Tripsas, 2000). To capture value, however, the standard was closed, in that Adobe did not disclose the technology for interpreting the Postscript language in a laser printer. Laser printer manufacturers had to pay to license the controller technology from Adobe.

Another topic related to multi-sided platform governance is how organizations keep out unauthorized or low-quality contributors through a regulatory role. In the videogame console industry, Atari suffered from allowing too many poor-quality games into their ecosystem. Nintendo later solved the problem through deploying a security chip that enabled only authorized games to work with their systems (Boudreau & Hagiu, 2009). Similarly, Apple addressed this problem when they introduced their App Store by maintaining the ability to remove inappropriate applications such as the "I Am Rich" $999 app that didn't provide any useful functionality (Boudreau & Hagiu, 2009). With the introduction of topics such as the regulatory role that multi-sided platform-based businesses play, this research is starting to address more management-related issues.

Product-To-Platform Transitions

Some organizations are born platform-based. eBay was founded as an online auction and shopping website with the aim of connecting buyers and

sellers; Match.com was initially started as a test site for a newspaper classified advertising system with the explicit goal of connecting individuals. In such cases, from the start of building the business, a management team can take into account that there are multiple sides of the platform to be served. The activities of the organization can be aligned with creating a platform-based business or marketplace. However, in some instances, organizations start as product-based, directly providing complete products to customers, and then transition to multi-sided platforms that enable other entities to transact with each other. As technologies are evolving such that products and services are becoming more receptive to complements, product-based organizations are increasingly finding themselves in situations where they need to transition to being platform-based to remain competitive.

The mobile phone industry exemplifies a historically product-based industry that has become platform-based as mobile phones have become technologically more sophisticated such that consumers add after-market applications (apps) to increase a smartphone's functionality. For many years in the United States, firms in this industry thrived by selling basic mobile phones (called feature phones) to network carrier customers (e.g., AT&T Mobility), who then sold them to consumers. Firms that developed feature phones created most of the innovations and features in their own R&D laboratories or contracted directly with developers to embed new technologies in phones before they were shipped. As microprocessor technology evolved such that programmable operating systems could reside on inexpensive mobile devices, smartphones that could run apps began to substitute for feature phones. With smartphones, consumers could procure their own apps and add them to their devices to increase functionality. With the widespread proliferation of smartphones, most firms in this industry now operate as multi-sided platform-based businesses. They enable consumers and software app developers to interact through an intermediary (e.g., the Apple App Store, Google Play marketplace). Figure 20.2 provides a schematic representation of this transition.

As organizations make this change, they not only need to modify their product or service offerings, but they also need to modify the activities that support these offerings. We next describe the primary activity-related changes that organizations undertake as they transition from being product- to platform-based (Table 20.1).

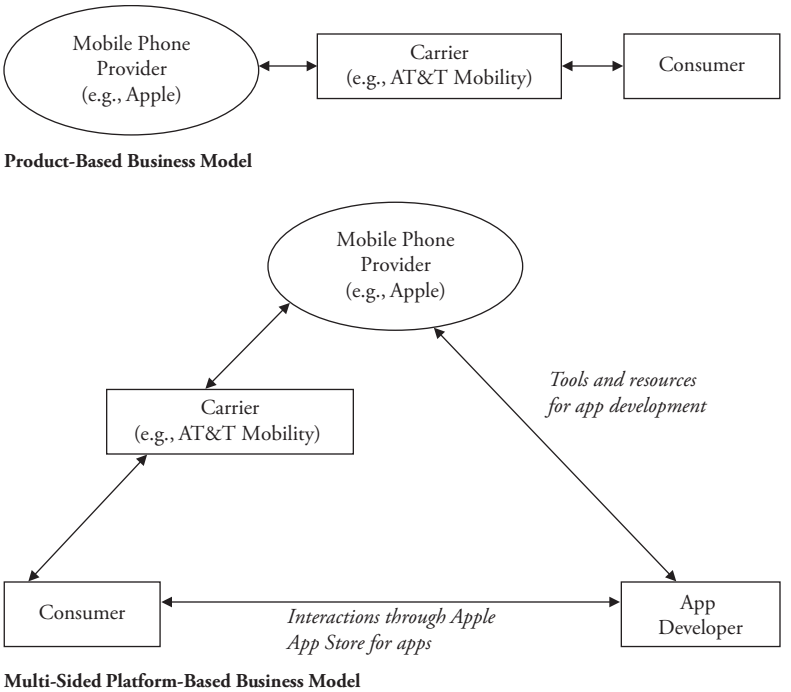

Fig. 20.2 Example of Transition From Product- to Platform-Based Business Model.

Table 20.1 Product-Based Versus Platform-Based Activities

Product-Based Activities	Platform-Based Activities	Example
Provide the best product	Develop the best network of complementors	**Amazon**: From providing best selection of books to providing best selection of vendors offering both new and used books
Maximize product profit	Drive platform adoption	**Adobe Systems:** Offering Acrobat Reader for free to drive adoption of Acrobat software that creates PDF files
Maximize units sold	Maximize transactions enabled	**Amazon**: From books sourced and sold to revenue shares of transactions enabled and hosting fees

From Providing the Best Products to Developing the Best Network of Complementors

In product-based businesses, an organization's goal is to develop products that best meet customers' needs. The organization that offers the most value to customers—the best product given its price—will generally outperform others in the marketplace, all else being equal. Organizations, therefore, focus their efforts on gaining a deep understanding of customer needs and segmenting the market so that they can target products effectively.

In platform-based businesses, the value created for a customer is dependent not only on the quality of a particular product but also on the number and quality of the complementors. What matters is the volume of participation on the platform and the strength of the network effects. Rather than focusing exclusively on developing superior technology to have the best product performance, organizations need to develop structures to identify and attract the best complementors to grow adoption of their platform. In the videogame console industry, for instance, having a blockbuster game such as Electronic Arts Tiburon's "Madden NFL" or Activision's "Call of Duty" available to run on a firm's platform is just as important as including features such as superior graphics capability of a gaming console. Organizationally, in some cases, a separate group may be developed with professionals who are adept at working with this second type of customer (e.g., with developers). Policies for this new group, such as compensation, may also need to be modified to align with and provide proper incentives for serving these complementors.

From Maximizing Product Profit to Driving Platform Adoption

It takes time to build a critical mass of users in a platform-based business. In addition, many of the short-term strategic moves that organizations make to encourage adoption, such as cutting prices or giving products away for free, result in losses. The goal is to maximize the number of customers participating on each side of the platform, even if this means losing money in the short term. This type of behavior is in direct contrast to accepted norms of product-based businesses, in which profits and profitable growth are primary (and usually short term) goals. Shifting this behavior is important, but not without controversy.

After developing Postscript, Adobe Systems started to compete aggressively in the shrink-wrap software business with products such as Photoshop and Illustrator. Then, in 1993, the firm introduced the Acrobat software system, which required two types of software: one product to create PDFs and another to read them. When Adobe introduced the software, the products lost money for about 4 years. Initially, Adobe charged for both types of software: people who just wanted to read PDFs paid between $35 to $50 for Acrobat Reader software, and those who wanted to create PDFs paid $195 for simple Acrobat creation software or $695 for the full-featured Acrobat product. Eventually, to encourage adoption, Adobe changed its approach and offered the Acrobat Reader software for free. Essentially, they needed to incentivize one side of the market to adopt the software, so they subsidized it. As Adobe founder, John Warnock, explained in a recent interview, "The board questioned [the decision.] 'You're going to give the Reader away?' I think it was one of the first instances of giving software away" (Adobe Acrobat at 20, 2013). Other Adobe software packages, such as Photoshop, followed a more traditional product-based model, and the contrast with Acrobat created internal organizational conflict. Warnock noted, "We had meetings where [the managers of] other applications, like Photoshop, [would say], 'Why in the

hell are we spending a dime on Acrobat when we make all the money?" (Adobe Acrobat at 20, 2013). However, providing the Acrobat Reader for free created a large base of users that could consume PDF content and therefore helped increase demand for Acrobat PDF–creation software. Acrobat eventually became one of Adobe's most profitable lines of software, and 20 years after its launch, the PDF format is still a dominant means for exchanging documents.

From Maximizing Units Sold to Maximizing Transactions Enabled

Two conventional measures of success for product organizations are units sold and market share. Employee compensation, bonuses, and award structures are often based on these numbers, and individuals typically make decisions with the goal of maximizing sales profitably. As an organization transitions to becoming platform-based and starts to enable others to transact with its traditional customers, other, nontraditional metrics may become relevant.

In 1995, Amazon began as an online book seller that procured books from publishers and sold them to consumers. In 2000, the Amazon team launched Amazon Marketplace, which allowed other businesses to sell merchandise, in an integrated fashion, on Amazon's website. The shift also meant that a portion of Amazon's traditional sales would likely be cannibalized because buyers could easily purchase from competitors through Amazon's main website. In fact, over time, the volume of sales through Marketplace affiliates grew to the point that it became a significant portion of Amazon's overall business. Although Amazon's profit on individual Marketplace transactions was lower, the overall number of transactions increased. In addition, by simply collecting a royalty payment and not holding inventory or incurring logistical costs associated with physical handling of goods, Marketplace became highly profitable. With the new platform-based model, however, prior metrics for measuring success, such as units sold and market share, might no longer be adequate. Instead, metrics such as number of merchants participating in the program, number of transactions, or aggregate royalties might be more relevant.

Platform Transitions and Organizational Identity

When an organization transitions from being primarily product-based to being platform-based and adopts new activities and behaviors consistent with this transition, there are important implications for organizational identity. Given dramatic changes in "what we do," the answer to the question, "What business are we in?" may change. Similarly, new activities associated with platforms may be inconsistent with existing identity attributes, and this may cause discord if left unresolved. In the following section, we explore how specific aspects of identity may be challenged by the shift to a platform-based business model (Table 20.2).

From One Definition of the Business to Another

As organizations evolve, their identity claims also sometimes shift. For instance, as it extended its product line from memory cards for digital cameras to include flash drives, Linco went from defining itself as a digital photography company to defining itself as a memory company (Tripsas, 2009). After breaking away from AT&T and the Bell System, US West went from being part of a telephone company to "not a telephone company"

Table 20.2 Example Implications of the Shift to Platforms on Organizational Identity

Product-Based Identity	Platform-Based Identity	Example
Merchant bookseller	Marketplace	**Amazon:** Bookseller to marketplace
Technology driven	Business development focused	**RIM/Blackberry**: Early history from internally product driven to third-party application business development focused
End-user service oriented	End-user and complementor service oriented	**Amazon**: From focused on serving consumers only to focusing on consumers along with other merchants
Creative	Disciplined	**Canon:** Impact of display size design changes when there is not a community of complementors versus when there is one
Self-reliant	Team player	**Nokia**: Difficulty transitioning to a platform-based industry

to a "multimedia company" (Sarason, 1998). Similarly, the transition from a product-based to a platform-based business is likely to imply a shift in how an organization defines its business—in other words, what category claims it makes.

When Amazon started operations as a bookseller, Jeff Bezos, the founder, referred to the company as "Earth's Biggest Bookstore" (A Retail Revolution Turns 10, 2005). Consumers visited Amazon's website, searched for a book, and then ordered it from Amazon. Amazon took the payment from the customer, procured the book, and sent it to the customer. Amazon was a straightforward online merchant (Hagiu, 2007). Although the business model was innovative at the time, the sales transaction still occurred simply between the end customer and Amazon. When Amazon launched its Marketplace initiative, allowing third parties to sell goods through Amazon's platform, the business model shifted from a pure merchant model to a combined merchant and platform-based model. Given this major change in "what we do," Amazon broadened its identity claims to encompass being a marketplace for books and many other types of goods. Today, Amazon's website lists as its mission, "To be Earth's most customer-centric company where people can find and discover anything they want to buy online" (Amazon Inc., 2015).

By changing the answer to "what business are we in?" through both modifying its business activities and claiming membership in a different or broader industry category, a firm can alter what is considered legitimate behavior. In Amazon's case, the organization expanded its strategic mission and modified its claims to support that expansion in alignment with its new activities and behaviors. This sort of shift in organizational identity may be particularly important when moving from product- to platform-based businesses given the significant changes in "what we do."

From Technology Driven to Business Development Focused

In many organizations, the prominence of a particular functional area is a key identity attribute. For instance, Fiol (2002, p. 654) discussed the transformation of a large information technology organization from an "engineering-driven data storage company [with] a primarily hardware, engineering mind-set to a mind-set of information management and storage solutions." Similarly, Nag, Corley, and Gioia (2007, p. 822) explored how one telecommunications organization moved "from an engineering-oriented ('technology-push') R&D organization into a business development–oriented ('market-pull') R&D organization." In each of these cases, organizational members had originally considered the firm's technical skills and accomplishments to be defining characteristics; then, through an identity transformation process, they shifted to consider market-based capabilities to be more salient. In the case of the information technology company, developing total solutions required a deeper understanding of customer needs, and in the case of the telecommunications company, once the organization became a separate establishment, business development capabilities became essential.

We propose that when organizations shift from being product-based to platform-based, like those studied by Fiol (2002) and by Nag et al. (2007), these organizations may need to shift their identity to become more focused on business development. In a product-based organization where research and product creation are the most highly valued skills, scientists and engineers may be the most respected, well compensated, and well treated members of the organization. As a result, these organizations are likely to view being "engineering oriented" as a core part of their organizational identity. However, in a platform-based organization that depends on complementors to be successful, business development people may hold more sway. They may be the employees who primarily manage relationships with complementors and ensure that an organization is building solid relationships with external partners. As these external interactions increase in number and importance, so too should the prominence of the people who manage them. In some cases, identity may evolve in an emergent fashion as business development gains importance, such that eventually the organization is no longer engineering driven. In many cases, however, this type of identity shift encounters resistance because it implies a change in the power dynamics among functional areas.

For example, Blackberry, which was formerly known as Research in Motion Limited or RIM, is a highly technology-driven organization that early in its history changed from being primarily internally product-driven to becoming more business development–focused as its products became more platform-based and dependent on applications. At the time of their initial public offering (IPO) in 1996, the focus was on engineering. The paragraph describing the corporation in the IPO prospectus stated, "RIM develops and supplies radios and other

network access devices.... RIM has developed an international reputation in the wireless industry for innovations in radio engineering" (Research in Motion Limited, 1996, p. 2). In 1998, Jim Balsille, RIM Chairman and Co-CEO, noted the importance of externally developed applications in an earnings release, emphasizing "the broad range of industries currently developing applications for our products—such as financial services, field service, health care, public safety, real estate, retail, security, telecommunications, transportation, utilities and the military" (Research in Motion Limited, 1998). By that time, RIM appeared to have moved beyond focusing solely on their own capabilities and recognized the need to highlight the role played by other organizations in developing applications to drive demand for RIM's products.

From End-User Service Oriented to End-User and Complementor Service Oriented

Commitment to customer service is often a salient element of an organization's identity. For instance, Dutton and Dukerich (1991, p. 526) found that being "a provider of superior service" was a key identity element of the New York Port Authority. If an organization's identity is tied to the quality of its customer service, when the nature of the customer changes, such as in a product-to-platform transition, the organization's identity may be challenged. Product organizations are focused on serving customers who use their products; being customer service oriented means that understanding and satisfying end-users is paramount. In contrast, platform-based organizations attempt to serve the needs of not only end-users but also complementors. More specifically, organizations with developer platforms serve customers that purchase end-products (e.g., smartphone buyers) and also the developers that create products that complement those end-products (e.g., application developers). Those with marketplace platforms serve both customers who wish to acquire products (e.g., buyers of used goods) and entities that aim to sell to those customers (e.g., sellers of used goods). So, when an organization shifts to a platform-based offering, members must expand their view of who the customer is and what good customer service means to them. If they fail to do this, deeply held beliefs about being a "service-oriented" organization may be violated as employees make trade-offs that emphasize the welfare of complementors as opposed to prioritizing end-users or vice versa.

When Amazon was simply a bookseller, its focus was entirely on consumers who purchased books and other items the firm offered. After introducing the Marketplace, a large-scale platform initiative integrated into its main consumer website, it also needed to meet the requirements of merchants selling on Amazon's platform. Whereas booksellers may care more about ease of posting items for sale or ease of transaction processing, book buyers might be more concerned with breadth of offerings and competitive pricing. In some cases, the preferences of participants on a platform may be in direct conflict; for instance, Amazon merchants may want more advertising opportunities, whereas Amazon buyers may want fewer (Hagiu & Jullien, 2011). To manage these situations, we propose that an organization must adapt its identity.

Unlike other identity attributes that we have discussed, in this situation, organizations may be able to adapt by broadening the meaning of existing identity labels such as "service driven," to accommodate service to both sides of the platform. This sort of "adaptive instability" (Gioia, Schultz, & Corley, 2000) enables organizations to accommodate the new behaviors associated with a platform-based business without completely shifting their organizational identity. Intuit is in the process of transforming its QuickBooks small business accounting software product family to a platform-based offering. It is working to expand its traditionally end-user customer-focused organization to one that similarly places high value on serving the needs and challenges of developers and other complementors. In the process, it may be undergoing identity work that takes into account the new behaviors while maintaining core elements of the existing organizational identity (Hagiu & Altman, 2013).

From Creativity to Discipline

For many organizations, being creative and being innovative are important identity attributes. For instance, the organization studied by Corley and Gioia (2004) included "an innovative company" as one of its core descriptors, and many of the universities studied by Elsbach and Kramer (1996) also included "innovative" as an important dimension of their identity. Bang and Olufsen, a design-oriented audio/video system manufacturer, included "inventiveness" as one of its seven identity components (Ravasi & Schultz, 2006). When organizations produce stand-alone products, they control the overall architecture, which allows for high

levels of freedom and creativity in making design decisions. They can optimize product designs based purely on aesthetic design and functionality considerations. Firms designing small kitchen appliances and tools, for example, can place aesthetic and ergonomic design considerations high on their list of priorities and not worry about interdependencies with accessory or application providers. Similarly, on an old Sony 8mm camcorder, if the designers decided to move the hand strap from one side to the other, the change influenced only the design of that product and did not affect any other products supplied by members of an ecosystem. On a digital camera, if Canon decides to change the size of a display on the back of a camera, no complementor firms are affected.

For platform-based offerings, designers cannot unilaterally make changes that might affect complementary products; potentially many external firms are relying on a design to remain stable along certain dimensions so that accessory or application products can work with that design. Organizations need to be aware of considerations such as backward compatibility because these affect the complementor firms in their ecosystem. As a result, discipline—following an orderly process to determine which product characteristics to maintain as product generations mature—becomes a valuable and necessary skill. Further, standard interfaces that enable seamless interoperation among products become essential elements and need to be mandated and enforced by the organization. For software products, this is frequently discussed in terms of adopting a service-oriented architecture (SOA), and the extent to which an organization does so may be considered a measure of how committed it is to transitioning to being platform-based.

When design decisions affect complementors, it can cause extreme difficulties for them if they do not have enough lead time to redesign or modify their complementary products (Staudenmayer, Tripsas, & Tucci, 2005). If a smartphone manufacturer decides to change the size of a display, an entire cadre of application developers and accessory providers is affected. This curtails the level of creativity that a platform-based organization's designers can exhibit. They operate under significant constraints imposed by the needs of the complementors and have fewer degrees of freedom within which to operate. If Canon decides to adopt an open operating system that allows independent developers to create apps for cameras, then its designers will have a whole new set of constraints. Display size decisions will become dependent on operating system versions and the needs of application developers. Designing to standards and creating rigidly standardized interfaces to benefit an ecosystem may be perceived as "not nearly as much fun" as designing what looks and works best.

As organizations transition from product-based to platform-based, particularly if they are moving from an entirely closed product to one with open interfaces, they may notice that designers and/or engineers are frustrated by newly instituted requirements to hold elements of designs constant for the benefit of complementary developers or accessory providers. Engineers and designers, who pride themselves on their creativity, may have difficulty with the transition to an organization that has to choose upon which elements to compete and upon which to adopt standardized approaches. They may resist this change by continuing to design products that are not fully compatible with other platform elements or trying to design around platform specifications.

From Self-reliant to Team Player

Organizations accustomed to performing most key activities internally may include self-reliance as a key identity element. For instance, "individuality" was an identity component at Bang and Olufsen, and this was projected using the phrase, "We think differently" (Ravasi and Schultz, 2006). Becoming a platform essentially involves moving into a mode of working more extensively with and enabling an expanded group of partners in one form or another. The transitioning organization needs to change from prioritizing providing solutions through internal development and a select, narrow set of strategic partners to enabling a broader range of complementor partners (e.g., developers, users, other ecosystem members) to serve their customers as well.

This is particularly difficult for organizations that consider independence and self-reliance to be core parts of their identity. Their management's first impulse is generally to consider how they can accomplish tasks themselves and build their own internal capabilities. Even for organizations that have previously entered into many supply or marketing partnerships, if they have not engaged extensively in product development alliances that affect core operations, they may encounter significant challenges. Opening up interfaces and allowing others to contribute to their products, possibly affecting central product propositions, can be a very hard, and thus identity-threatening, shift. If

an organization's general approach to challenges is to work harder internally, or potentially to acquire an outside firm, rather than build relationships with other organizations, moving to a platform orientation can be particularly difficult.

Nokia provides an example of an organization that had trouble changing along this vector. Throughout the 1990s and the early 2000s, part of Nokia's identity was its emphasis on internal technology development. It was also known to be a very difficult firm with which to partner (Vilkamo & Keil, 2003). When the mobile phone industry shifted to being smartphone-centric, which required phone providers to build strong relationships with application developers, Nokia faltered. Although it attempted various platform-based strategies related to mobile software, none of them took hold to the extent of becoming an enduring industry-wide standard, perhaps in part because they were not implemented in a way that was attractive enough to developers and other partners (Selander, Henfridsson, & Svahn, 2010; Steinbock, 2001). Although the reasons for Nokia's troubles are certainly complex, the inconsistency between partnering behaviors and Nokia's historical organizational identity as an internally focused mobile phone developer may have contributed to the situation. The organization's existing identity served as a barrier to change.

Discussion

In this chapter, we have examined the relationship between innovation in the form of platform-based business models and organizational identity. We propose that moving from a product-based to a platform-based business model requires organizations to engage in a broad range of activities that may influence, or be influenced by, an organization's identity. We have primarily discussed cases in which the product-to-platform transition required activities that challenged expectations associated with the organization's existing product-based identity. However, we also recognize that there are cases in which existing organizational identities are supportive and reinforcing of these changes. An organization's strong identity may guide the strategic choices necessary to accomplish these transitions.

For example, when Apple needed to choose a standard to enable its devices to stream media with one another and with other firms' products, it chose to develop its own proprietary system called Airplay instead of adopting the industry standard platform, Bluetooth. Although the literature frames this as a strategic decision (West, 2003), one could argue that it also echoes Apple's identity. Apple has always been a design-focused firm with an emphasis on creating the most customer-friendly experiences. Controlling the user experience by developing Airplay was consistent with Apple's identity. Similarly, while creating the iPhone App Store resulted in Apple's losing some control of the user experience, the manner in which Apple implemented the App Store, with approval required before an app could be offered, was fully consistent with the meticulous approach the firm takes to managing customers' overall experiences with Apple offerings. In the same vein, after introducing the Marketplace, Amazon marketed a branded guarantee program, which provided customers a full refund if they had a problem with a purchase made through an Amazon affiliate. This step was consistent with its identity claim of being "Earth's most customer-centric company" (Amazon Inc., 2015). In each of these cases, although the transition to a platform-based business model likely challenged many aspects of the organization, by incorporating elements that were well aligned with the core, management did not challenge organizational identity.

Still, in many cases, particularly during times of considerable transition, organizational identity may be challenged by substantial strategic change. Organizations must rethink the "who we are" as the "what we do" changes dramatically. To be successful, organizations should question elements of their existing organizational identity and, when there are inconsistencies with new business approaches, actively attempt to adapt their organizational identity to resolve them. Whereas proactively changing identity can be a challenging process frequently accompanied by organizational resistance, as illustrated by prior research (e.g. Dutton and Dukerich, 1991; Ravasi and Schultz, 2006; Tripsas, 2009), ignoring the need to attempt an identity shift may result in dissonance and contribute to dysfunctional behaviors that may hinder innovativeness, creativity, and entrepreneurial behaviors.

In this chapter, we contribute to the literature on platforms in two ways. First, platform-related research generally considers the focal entity to be an existing or emerging platform-based organization rather than an incumbent, more mature, organization transitioning from another business form into a platform-based one. Yet, established organizations with a long history of traditional,

product-based business models make up a significant portion of the organizations starting to compete in platform-based markets. We suggest that understanding how to manage these transitions is as important as comprehending the pure competitive dynamics of platform-based businesses. Second, we link our discussion of organizations making this transition to considerations of organizational identity. Although economics and strategy scholars have done an excellent job of evaluating the optimal strategic moves in platform-based markets, they have for the most part ignored the organizational considerations suggested by a shift from product- to platform-based competition. We propose that success in the implementation of new strategic opportunities created by transitioning to a platform-based business model may require a shift in organizational identity.

Future Research

Although our discussion has encompassed a variety of considerations related to product-to-platform transitions and organizational identity, we believe there are significant opportunities to expand this research in a number of directions. These research avenues include contributions to both the organizational identity literature and the multi-sided platform literature. Additionally, they encompass multiple research methodologies, some of which have yet to be fully leveraged in these arenas.

This chapter has highlighted a variety of dimensions of organizational identity that are relevant to product-to-platform transitions. However, the dimensions discussed here are by no means exhaustive. We believe there are likely to be other identity elements that generally change when an organization makes the type of shift we have discussed. Furthermore, organizations will potentially need to overcome constraints imposed by their current organizational identity. In-depth qualitative field-based research could enable researchers to better understand the change mechanisms associated with transitions to platform-based organizations and determine which dimensions of organizational identity are most salient. Additionally, there may be interdependencies among these dimensions affected by shifts from product to platform that are worth studying further.

As organizations become platform-based, in some instances the dimensions of organizational identity may not shift from state A to state B, but rather move from state A to state A + B (or, A + B + C, and so on). We highlighted such a shift as we discussed Amazon's transition from being end-user focused to being both end-user and complementor focused. We recognize that new dimensions of organizational identity may be added to an organization as it makes this type of shift, and this may lead to potentially interesting implications for the study of organizational identity. What happens if the new additional states are inconsistent with the existing states? For example, if the existing organization has been entirely consumer focused but the platform-based organization must also focus on application developers, what are the implications? Are they the same as when an organization simply expands into new markets, or is something different at play because these new markets consist of complementors and function as part of a platform-based business model? We know that organizational identity can constrain an organization's ability to adapt and implement change. What is the process by which organizations accomplish changes in identity associated with the transition to platforms? Are there instances in which an organizational identity change precedes a strategy change or modifications in activities? Or is it primarily the case that strategies and activities are changed first, followed by a realignment of organizational identity? How does this differ from other contexts in which organizations shift identity? Are some mechanisms more effective than others?

Although we have emphasized changes to organizational identity, some attributes of organizational identity may remain intact as an organization makes a transition to platforms. In general, values dimensions of identity that relate to beliefs, social concerns, or morals are unlikely to be affected. For instance, organizations that are connected to a particular religious doctrine or have political affiliations are likely to maintain those aspects of their identity even if they move from a product-based to a platform-based model. Ironically, having some elements of identity that remain constant may actually make it easier for organizations to change other aspects. In general, changes in identity are difficult to accomplish and are disruptive to the organization (Fiol, 2002; Tripsas, 2009). Individual-level identification with the organization makes changes in organizational identity a highly personal and emotional experience for employees. If organizational members are provided with identity anchors that remain consistent, they may be more willing to accept changes in other aspects of the organizational identity. This connection between individual-level identification

with macro-level organizational change, particularly in association with product-to-platform transitions, remains a fertile area for multilevel research.

Finally, multi-sided platform research has also observed that organizations can operate along a continuum of dimensions ranging from being pure multi-sided platforms to being pure product suppliers or retailers (Hagiu & Wright, 2011). Although we have considered the transitions that organizations make, we need to remember that the transitions are not necessarily binary and may involve moving only partially to a platform-based model (e.g., allowing other entities to offer complementary products, yet retaining strict control on what they can offer and who is authorized to do so). Or only part of an organization may transition (e.g., maintaining a traditional product-focused division alongside a platform-based one). Regardless of the extent and form of the transition, challenges to organizational identity are likely to be present. Research considering different units of analysis beyond more traditional organization-level platform analysis (i.e., considering transitions for product divisions within multidivisional firms) may be particularly interesting.

Notes

1. In this chapter, when we refer to transitions from product-based to platform-based business models, we also include those that might be from merchant-based to platform-based models. We see this in the case of Amazon, which shifted from being entirely merchant-based to including platform-based offerings.
2. Economics scholars disagree about whether, strictly speaking, the existence of network effects is necessary for an entity to be considered a platform. However, because we are studying product-to-platform transitions and the platforms of most interest to us tend to have indirect network effects as a defining characteristic, we center our discussion on platforms that contain network effects (Katz and Shapiro, 1985; Rochet and Tirole, 2003; Gawer, 2009). Additionally, in this chapter, when we use the generic term *network effects*, we are in most cases referring to indirect network effects.

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CHAPTER

21 Business Model Innovation: Toward a Process Perspective

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Abstract

Business model innovation matters to managers, entrepreneurs, and academic researchers because it represents an often underutilized source of value and, as such, could translate into sustainable performance advantage. Yet, despite the importance of the topic and the increasing attention it has received from researchers, relatively little is known about the *process* of business model innovation. To address this gap, this chapter draws on the design literature to derive a generalizable and normative model of the business model innovation process. Our contribution links creativity at the individual and firm levels with innovation at the business model level of analysis and thus acknowledges explicitly the multilevel nature of innovation.

Key Words: innovation, business model, business model innovation, innovation process, design, design process, creativity, activity system, firm boundaries, process model

Introduction

Companies often make substantial efforts to innovate their processes and products to achieve revenue growth and maintain or improve profit margins. However, innovations to improve processes and products are often expensive and time-consuming, and their future returns are uncertain. Hesitant to make such big bets, more companies now are turning toward business model innovation (BMI) as a complement to product or process innovation. A global survey of more than 4,000 senior managers by the Economist Intelligence Unit (EIU) found that the majority (54%) favored new business models over new products and services as a source of future competitive advantage. EIU analysts concluded that "the overall message is clear: how companies do business will often be as, or more, important than what they do" (Economist Intelligence Unit, 2005, p. 9). And in a similar global study conducted by IBM, in which more than 750 corporate and public sector leaders were interviewed on the subject of innovation, researchers found that "competitive pressures have pushed business model innovation much higher than expected on CEOs' priority list" (Pohle & Chapman, 2006, p. 34).

Business model innovation (BMI) can be defined as the design and implementation of an activity system that is new to the focal firm or new to the product–market space in which the focal firm competes (more definitions of key constructs are provided in a later section).[1] It matters to managers, entrepreneurs, and academic researchers for several reasons. First, it represents an often underutilized source of value. As was shown by Amit and Zott (2001), the business model represents an opportunity for value creation through four value drivers: novelty, lock-in, complementarities, and efficiency. Second, competitors might find it more difficult to imitate or replicate an entire novel activity system than a single novel product or process. Because it is relatively easy to undermine and erode the returns of product or process innovation, innovation at the level of the business model could translate more readily into sustainable competitive advantage (Snihur & Zott, 2014a). Third, because

BMI can be such a potentially powerful competitive tool, managers must be attuned to the possibility of competitors' efforts in this area. Competitive threats often come from outside traditional industry boundaries (Johnson et al., 2008).

Yet, despite the importance of the topic and the increasing attention it has received from researchers (e.g., Amit & Zott, 2012; Casadesus-Masanell & Zhu, 2012; Chesbrough, 2010; Markides, 2006; Zott and Amit, 2007), relatively little is known about the *process* of BMI. A small subset of the business model literature has begun to delineate high-level process models (e.g., Bucherer, Eisert, & Gassmann, 2012; Frankenberger, Weiblen, Csik, & Gassmann, 2013), yet without addressing the concrete steps that business model designers could take in order to come up with innovative models. A second subset of this literature has been examining single cases of business model change, which often yield rich insight into the "how-to" although generalizability may be challenging (e.g., Aspara, Lamberg, Laukia, & Tikkanen, 2011; Siggelkow, 2002; Sosna, Trevinyo- Rodríguez, & Velamuri, 2010). What appears to be missing from the received literature is a generalized process model that describes at a high level of abstraction how BMI works and that is also rich and detailed enough to have normative implications for researchers and to give useful guidance to practitioners.

In this chapter, we take a first step toward addressing this gap, which is important for at least two reasons. First, research has shown that the process of innovation interacts with, and influences, other parameters of innovation, such as its magnitude (radical vs. incremental) and its likelihood of success (Tatikonda & Montoya-Weiss, 2001). Hence, researchers need to consider process models that they can examine further regarding their interaction with BMI antecedents, contingency conditions, innovation content, and outcomes. Second, practicing managers who are interested in building innovative business models need guidance on how to accomplish this, in order to better assess the trade-offs involved, as well as the resources and capabilities required. Without such guidance, valuable time, effort, and value-creation potential may be wasted.

To address this gap, we build on the idea that innovation can be achieved through design. That is, we draw on the design literature to derive a detailed model of the BMI process. Our contribution falls squarely within the aims of this *Handbook* by linking creativity at the individual and firm levels with innovation at the business model level of analysis. We thus acknowledge explicitly the multilevel nature of innovation.

Concept Definitions and Literature Review

Rapid advances in information and communication technologies have brought about fundamental changes in the ways in which economic agents interact with each other. According to Weill and Woerner (2013), three trends have been converging that push companies to innovate their business models: digitization of business, increasing numbers of "digital natives" who expect a brilliant digital experience, and the increase of the customer voice via ratings of services and online comments through social media. These developments, among others, have encouraged firms to fundamentally rethink and reshape the ways they "do business"—that is, the ways in which they organize and conduct exchanges and activities with customers, vendors, partners, and other stakeholders across firm and industry boundaries. Because of these technological advances, senior managers of focal firms have an increasing number of combinatorial possibilities in how they structure what used to be called their "value chain" (Porter, 1985). By innovatively designing boundary-spanning exchanges and activities, they create a networked structure of interdependent activities, which we term the business model. Thus, the business model has become a source of innovation (e.g., Zott & Amit, 2007, 2008)—for example, when it connects previously unconnected parties, links transaction participants in new ways, or introduces new transaction mechanisms.

Building on Zott and Amit (2010), we define the business model as an activity system that is designed and enabled by a focal firm in order to meet perceived market needs and thereby create value for all stakeholders involved: customers, strategic partners, suppliers, and, of course, the focal firm. It encompasses interconnected, potentially interdependent activities that are conducted either by the focal firm or by other stakeholders, thus spanning firm and possibly even industry boundaries. An activity involves the engagement of human, physical, information-based, and/or capital resources to serve a specific purpose (e.g., the distribution of the focal firm's products) toward the fulfillment of the overall objective, or core logic, of the business model (Magretta, 2002). Interdependencies exist when the combined effect of activities on an objective function (e.g., performance) is different from the sum of

the effects of each of the activities considered in isolation (Siggelkow, 2001, 2002). They arise when business model designers choose the set of organizational activities (which we call "content"); when they design the links and coordination mechanisms that weave activities together into a system (which we call "structure"); and when they shape the mechanisms that make the system work (which we call "governance").

The business model construct is conceptually distinct from organizational structure (Zott & Amit, 2007) and from product market positioning strategy (Zott & Amit, 2008). However, it must be considered a fundamental aspect of a firm's overall strategy because it defines how the focal firm is embedded in its "ecology" (Adner & Kapoor, 2010; Amit and Zott, 2014)—that is, in the multiple networks of firms, institutions, and customers that surround it—thereby determining not only the possible partners that can help it co-create value but also its likely competitors. In other words, the business model stakes out the focal firm's cooperative and competitive landscape. For instance, the Israeli start-up company FriCSo considered three basic business models for commercializing its revolutionary friction-reduction technology (Loch, Zott, Guttman, Jokela, & Nahminas, 2008): machine manufacturer (which would embed the technology into machines and then sell the machines to original equipment manufacturers [OEMs] and suppliers); research and development company (which would develop technology and license it to machine manufacturers); and service company (which would provide an outsourced service to the OEMs and suppliers). In each of these business model choices, FriCSo faced a distinct set of "friends" and "foes." For example, in the manufacturing model, it would compete against other already established, and therefore powerful, machine manufacturers. By contrast, in the licensing model, it would partner with those manufacturers. Each of the models also had different capital requirements (e.g., in the machine manufacturing model FriCSo would have to invest in a factory) that influenced its ability to create and capture value.

The business model is thus one of the most fundamental strategic choices that entepreneurs, CEOs, and general managers must make, in addition to deciding which market needs to address (i.e., which customer segments to serve), in which (e.g., geographic) markets to compete, how and when to enter these markets, and on which resources and capabilities to anchor a company's competitive advantage.

Product, process, and technology innovations have traditionally been viewed as the source of innovation and value creation. Although BMI can be traced back to Schumpeter (1934), it has received increased attention from managers and scholars in recent years. The "newness" of the business model may refer to any of its design elements—that is, its content, structure, or governance. Because of the systemic, interconnected nature of the business model, a change in any of these elements (compared with existing models) may engender further changes at the system level (e.g., it may lead to changed functionalities and performance prospects). For example, the addition of the iTunes music distribution activity to Apple's business model (a content and structure innovation) enabled the firm to achieve higher value creation through the powerful combination of selling its innovative and sleek electronic devices together with the content that feeds them. We posit that the more wide-ranging the changes at the system level, the more encompassing (and radical) the BMI.

What Business Model Innovation Is Not

To clarify the concept further, we examine what types of changes to a focal firm's activity system do *not* constitute BMI. First, we suggest that modifying an activity without modifying the activity system does not constitute BMI. Any change of an individual activity that results in higher activity performance (such as faster, cheaper, or higher-quality output from the activity) without affecting the overall gestalt of the business model in terms of its content, structure, or governance does not qualify as BMI. Consider, for example, the augmentation of activities through the deployment of new technology, such as the adoption of injection-molding production technology for the manufacturing of candles. This is a technology innovation that results in more efficient manufacturing, but it does not represent BMI.

Second, modifying an exchange without modifying the system does not constitute BMI. Any change in a link between activities that results in higher exchange performance without affecting the overall gestalt of the business model in terms of its content, structure, or governance does not qualify as BMI. To illustrate, a focal firm invests in communication technology that allows its sales force in the field to communicate more effectively with corporate headquarters. This improves the exchange between sales and centralized firm activities, such as production, but it is not BMI.

Furthermore, service innovations are not necessarily associated with BMI. Service innovation can also result from changes not related to the business model, for example, when customer experience is improved through better training of employees, or by changing the incentive system in the company. Or consider Zara's BMI of highly vertically integrated fashion design, production, and delivery, which allows the firm to react rapidly to changes in customer preferences and to implement a fast-follower strategy. However, neither the products nor the services Zara provides are particularly innovative (Pich, van der Heyden, & Harle, 2002).

BMI is thus distinct from innovation in products and services; methods of production, distribution, or marketing; and markets (Schumpeter, 1934). An innovative business model can either create a new market or allow a focal firm to create and exploit new business opportunities in existing markets. Dell, for example, implemented a customer-driven, build-to-order business model that replaced their traditional build-to-stock model of selling computers through retail stores (Brynjolfsson & Hitt, 2004).

Empirical research has established that BMI conceived of as novel transaction architectures (i.e., new to the state-of-the-art) positively influences firm performance, even when the environment switches from resource-rich to resource-poor (Zott & Amit, 2007). Research has also established that BMI and product innovation have a positive interaction effect (i.e., as complements) on firm performance (Zott & Amit, 2008).

BMI provides a path for value creation, complementing new technologies. Chesbrough (2010) identified two barriers to BMI in existing firms. The first is an underlying configuration of assets that hinders change. The second is cognitive issues related to managers' inability to evaluate the value potential of ideas that do not fit with their current business models. These barriers can be addressed through experimentation and leadership (Sosna et al., 2010).

Types of Business Model Innovation

Some of the prior research on BMI has focused more narrowly on the extent to which business models are de novo—that is, *new to the state-of-the-art* and not just new to the firm (Birkinshaw, Hamel, & Mol, 2008). Santos, Spector, and van der Hayden (2009), for example, defined BMI as the "reconfiguration of activities in the existing business model of a firm that is new to the product/service market in which the firm competes." Niduolu, Prahalad, and Rangaswami (2009) viewed the development of new business models as a key step in their five-stage model of corporate transformation to become environmentally sustainable. Their central challenge is "to find novel ways of delivering and capturing value, which will change the basis of competition" (p. 60). According to these authors, opportunities for BMI lie in developing new delivery technologies that change the value chain by combining digital and physical infrastructures or by turning products into services. Similarly, Johnson et al. (2008) focused on de novo business models, based on the belief that there is "no point in instituting a new business model unless it is not only new to the company, but in some way game-changing to the industry or market" (p. 58). In a similar vein, Markides (2006, p. 20) emphasized the need to discover fundamentally different business models in existing businesses: "To qualify as an innovation, the new business model must enlarge the existing economic pie, either by attracting new customers into the market or by encouraging existing customers to consume more." Conceived in this way, business model innovators do not introduce new products or services but redefine an existing product or service and how it is delivered to the customer. Companies such as Amazon, Dell, and Southwest can be considered business model innovators because they enlarged their addressable markets (i.e., enhanced sales to existing and new customers) through BMI.

Changes to business model design, however, can be subtle; they may not have the potential to disrupt an industry but could still yield important benefits to the business model innovator (i.e., the focal firm). Consider Taco Bell, the restaurant chain offering Mexican-style fast food, which in the late 1980s decided to turn the restaurant's kitchen into a heating and assembly unit in a program called "K-minus." The chopping, cooking, and clean-up activities were transferred to corporate headquarters. The food was sent precooked in plastic bags to the restaurants, where it was heated, assembled, and served (Applegate, Schlesinger, & Delong, 2001). This incremental BMI was not game-changing for the fast food industry, but it allowed Taco Bell to realize economies of scale and improvements in efficiency and quality control, as well as increase space for customers within the restaurants (Santos et al., 2009). Other firms might wish to change their business models in similar (incremental) ways or follow a business model innovator in their industry in order to achieve competitive parity.

Performance Consequences of Business Model Innovation

Several authors have related BMI to firm performance. For instance, Zott and Amit (2007) showed that BMI positively affects the market value of entrepreneurial firms, and Pohle and Chapman (2006) found that established companies whose operating margins had grown faster than their competitors' over the previous 5 years were twice as likely as their lower-performing peers to emphasize BMI, as opposed to product or process innovation. Bock, Opsahl, George, and Gann (2012) found that BMI effort in companies positively moderates the relationship between activity reconfiguration and strategic flexibility, enhancing firm performance. Snihur and Zott (2014a) differentiated BMI from product, process, and management innovation and introduced the concept of *robust* BMI design. Robust BMI involves strategically designing the content, governance, and structure of the new business model so that it appears legitimate to stakeholders but at the same time prevents imitation from competitors. Such robust design is likely to be associated with more sustainable performance advantages for business model innovators, compared to other innovators.

Sanchez and Ricart (2010) explored BMI in low-income markets and distinguished between what they called *isolated* and *interactive* new business models introduced by firms in those markets. Isolated business models are defined as business models based on an exploitation strategy, leveraging the firm's existing resources and capabilities and replicating its business model to a low-income country. Interactive business models are defined as those based on an exploration strategy, leveraging external resources to search for new models through partnerships rather than seeking efficiency with an existing business model. By conducting extensive interviews with managers in five successful companies and two companies that experienced BMI failure in low-income markets, Sanchez and Ricart found that interactive business models lead to a more sustainable competitive advantage in this context than isolated business models.

Other authors have explored the impact of BMI on competitive dynamics in an industry. Casadesus-Masanell and Zhu (2013, p. 464) analyzed the impact of BMI imitation by incumbents. They defined BMI as the "search for new logics of the firm, new ways to create and capture value for its stakeholders, and… new ways to generate revenues and to define value propositions for customers, suppliers, and partners." Their main premise was that in addition to implementing a differentiation strategy with new or better products, firms have a strategic option to compete through distinct business models. In their model, the entrant has a choice to introduce BMI or not, and the incumbent then decides to imitate BMI or not. Based on game theoretical analysis, they showed under what conditions a new entrant might prefer not to introduce the new business model and when the incumbent might prefer to imitate the entrant's BMI. Their work provides a dynamic analysis of competition through BMI. Taking new business models into consideration allows for more sophisticated understanding of industry dynamics than merely analyzing the product innovation options available to competitors in an industry.

Drivers and Process of Business Model Innovation

Given the significant performance consequences that BMI can have, it is important to understand how BMI can be generated. Amit and Zott (2014) identified four antecedents of business model design: goals, templates, stakeholder activities, and environmental constraints. They linked these design drivers to various design themes, one of which was novelty (i.e., BMI). They argued that mindful (as opposed to mindless) consideration of incumbents' templates is likely to foster BMI. They also argued that working around *external* constraints is more likely to happen through BMI in new companies rather than in established firms. The latter are *internally* constrained by their extant business models (Chesbrough & Rosenbloom, 2002), by leadership and managerial inertia (Chesbrough, 2010), and by their extant resources and capabilities (Bonaccorsi, Giannangeli, & Rossi, 2006).

Qualitative research focusing on the antecedents of BMI in new firms indeed points to the lead founder as an important driving force. Analyzing data from interviews and other secondary sources in eight firms, Snihur and Zott (2014b) found important individual-level cognitive differences between firm founders who design new business models and those founders who do not undertake BMI. They also found that team-level effects are less noteworthy than usually expected in the innovation literature; indeed, teams are associated with a lack of BMI. Extending these insights from new ventures to the context of established firms, Snihur (2013) found that search breadth (i.e., the quantity of diverse sources firms use to generate innovation) and search

depth (i.e., the intensity with which various sources are exploited to generate innovation) were significant predictors of BMI in a sample of established firms from Europe and the United States.

Based on these insights, Amit and Zott (2012) proposed that top managers ask themselves six key questions as they consider BMI: (1) What perceived needs can be satisfied through the new model design? (2) What novel activities are needed to satisfy these perceived needs? (3) How could the required activities be linked to each other in novel ways? (4) Who should perform each of the activities that are part of the business model? (5) How is value created through the novel business model for each of the participants? and (6) What revenue model fits with the company's business model to appropriate part of the total value it helps create?

In a similar vein, Johnson et al. (2008) viewed the business model as driven by a perceived customer need. They stated that "success starts by not thinking about business models at all. It starts with thinking about the opportunity to satisfy a real customer who needs a job done" (p. 52). Following this step, the business model designer should (1) articulate the current business model and what makes it successful; (2) take into account relevant signals that suggest that the business model needs to be changed; and (3) decide whether reinventing the business model is really worth the effort (i.e., whether it will bring real change to the industry or market in which it is embedded).

Yet, despite the valuable insights emerging from these early empirical and conceptual studies on BMI, we still know very little about the actual process of BMI and how it is (or should be) undertaken by firms. A small subset of the business model literature has begun to delineate high-level process models, yet without addressing the concrete steps that business model designers could take to come up with innovative models. Based on a comparison of process models from the product innovation literature and in-depth case studies of BMI in both established and new firms, Bucherer et al. (2012) identified four phases of BMI: analysis, design (i.e., development of solution alternatives), implementation, and control. They noted that at a high level of analysis, there is little difference between product innovation and BMI, although there are likely to be deviations among the concrete activities performed within each of the phases. The authors also noted a further similarity between product innovation and BMI: The process is rather chaotic early on, characterized by iterations and nonlinear sequencing of activities. Frankenberger et al. (2013) suggested a slightly different set of BMI phases, again based on process models from the innovation management literature and insights from business model case studies. The four phases identified are initiation (understanding the ecosystem), ideation (generating new ideas), integration (aligning the business model internally), and implementation (making investments). In discussing these phases, the authors focused more on the challenges than on the particular activities performed by business model designers.

A second subset of this literature has examined single cases of business model change, which often yield rich insights into "how to" but lack generalizability. Sosna et al. (2010) studied BMI at the Spanish firm Kiluwa, which developed a franchised network of Naturehouse stores selling dietary complements in Spain and abroad. They explained how the firm managed to transform its business model through a process of trial-and-error and subsequently scaled up for international expansion. They differentiated two distinct phases: a 5-year period during which the company experimented and explored the nutrition advice store concept, followed by a high-growth exploitation phase during which the company replicated the stores across Spain and the neighboring countries. Demil and Lecocq (2010), drawing on similar concepts, characterized the development of the London football club Arsenal's business model as a "fine-tuning process." And Aspara et al. (2011) focused on the exchanges between corporate headquarters and business subunits in describing the corporate transformation of Nokia between 1987 and 1995. They point out the importance of corporate mechanisms, such as ranking of business units, management accounting systems, and personnel rotation, in facilitating the transfer of a business model from a subunit to corporation level.

Finally, some authors have presented typologies of business model changes (Cavalcante, Kesting, & Ulhøi, 2011) or focused on the later stages of the BMI process (Chesbrough, 2010; McGrath, 2010). Building on the insights of the received literature, we believe it is important that the development of a comprehensive, generalized process model not only describes at a high level of abstraction how BMI works but also is rich and detailed enough to have normative implications for researchers and give useful guidance to practitioners. For this, we examine the design literature.

Design Process

Given the scarcity of academic studies on the actual process of business model design (let alone on the specific process of generating *innovative* business models), we turn to the broader literature on design in order to generate insights about the BMI process. Design has been defined as the activity of changing existing situations into desired ones; it involves human beings using knowledge to create things that do not yet exist but should (Simon, 1996). The notions of design and innovation are thus closely related. Designers, like innovators, deal with ill-defined problems and attempt to find new and desirable solutions. According to Bánáthy (1996, p. 20), "If solutions could be offered within the existing system, there would be no need to design. Thus, designers have to transcend the existing system. Their task is to create a different system or devise a new one."

Design as a process broadly consists of two phases: an analytical phase of finding and discovery, and a synthetic phase of invention and making (Owen, 1993). These phases allow designers "to generate new products, services, business models, and other designs" (Beckman & Barry, 2007, p. 29). According to Brown (2008, p. 88), design can be broken down into three essential components: (1) deep and holistic understanding of users (analytical); (2) visualization of new possibilities, prototyping, and refining (synthetic); and (3) the "creation of a new activity system to bring the nascent idea to reality and profitable operation" (synthetic). That is, the design process and the notion of business model (i.e., activity system) innovation are inextricably linked.

For the remainder of this chapter, we draw on a model of the design process (e.g., employed by the Californian design company IDEO) that has five phases, two of which are analytical (*observe, synthesize*) and three of which are synthetic and highly creative (*generate, refine, implement*). We will sketch how that process model can be applied to the design of the business model, thus offering arguments that could be useful toward a more process-oriented perspective on BMI. The design process has been described in the academic literature (e.g., Sutton & Hargadon, 1996) and has also received wide coverage in the business press (e.g., Brown, 2009). Although originally used for the design of new products, the model has been deployed more recently to design new services (Bhavani & Sosa, 2008), as well as entirely new businesses (see http://www.ideo.com/expertise/business-design/). Its versatility makes it an attractive framework for BMI. Notice that the arguments we develop on the basis of that model are meant to be relevant to the design of business models of new ventures, as well as for redesign of the business models of established incumbents.

Toward a Process Model of Business Model Innovation

The design process model consists of five stages that are linked iteratively: Although we present the model as linear, in reality designers may jump back and forth between the various stages. The stages are *observe, synthesize, generate, refine,* and *implement*.

Observe

The first stage, *observe*, involves a close examination of how customers use products and services (such as how they use hospital services, take the train, or use their cell phones). It relies on going to the source, not to market research experts (Kelley, Littman, & Peters, 2001). The goal at this stage is for the designer (or more precisely, the design team) to develop a deep understanding of the customer experience, especially of the problems customers face when buying and consuming products and services. This is because "effective design begins with a clear understanding of the problem to be solved" (Boland & Collopy, 2004, p. 189), and for that designers need to be "first-class noticers" (Martins, 2009, p. 30). This also increases the chances of generating truly novel ideas, which are "more likely to be triggered by observing the odd practices of an amateur carpenter or the incongruous detail in a mechanic's shop than by hiring expert consultants or asking 'statistically average' people to respond to a survey or fill out a questionnaire" (Brown, 2009, p. 41).

Specific techniques that could be helpful for achieving this level of understanding include the use of interdisciplinary teams (e.g., anthropologists, economists, psychologists, engineers, sociologists); journey mapping (i.e., the graphic representation of how customers interact with a company in receiving its product or service—see Liedtka & Ogilvie, 2011); "shadowing" customers (i.e., following them closely and observing their real-time use of products and services); or the use of visual techniques such as photographing consumers or asking them to document their own experience with stories, photos, and videos (see Beckman & Barry, 2007; Bhavani & Sosa, 2008).

Observe, in the context of the business model, has to be interpreted more broadly than just with

respect to how end-users interact with a product or service. First, in line with Beckman and Barry (2007), the focus should be on *all* business model stakeholders—not only end-users but also suppliers, partners, and the focal firm itself. Second, observation should be concerned with how stakeholders play their respective roles within a given business model, not (only) on how customers use the products and services delivered as part of it. So the observation stage for the design of new business models is more encompassing and more complex than for the design of new products or services. It requires the designer to gain a deep understanding of the design drivers of the new business model.

Synthesize

The second stage of the design process, *synthesize*, requires that designers take stock, share, and make sense of all they have learned during the observation stage. It involves the ordering of data, search for patterns, and identification of recurring themes and issues that have become salient during the observation stage (Brown, 2009). Beckman and Barry (2007) referred to this step as building "frameworks." They noted that the essence of this step requires the designers to identify "interesting nuggets or stories from all of the data collected, to find patterns of behavior across the many instances of behavior that were observed, and to see what is missing within the system of use, usability, and meaning that forms the innovation or solution" (Beckman & Barry, 2007, p. 36). Extracting meaningful patterns from masses of raw data collected (i.e., synthesis) is a "fundamentally creative act" (Brown, 2009, p. 70), although there are techniques such as mind mapping (see Liedtka & Ogilvie, 2011) to support it. In short, synthesis is "an attempt to move forward and create a response to the problem—the generation of solutions" (Lawson, 2006, p. 37).

Synthesize, in the context of BMI, means to gain a comprehensive, holistic understanding of the design challenges and influences that the focal firm faces (e.g., what customers are we or should we be serving? What are their needs and goals? What are their problems? Where are we currently falling short in helping customers solve their problems? What could we do better? To what extent do we rely on strategic partners to conduct activities for us? The business model designer needs to develop a strong sense of the market gap(s) that the focal firm addresses, the problems that it solves for its various stakeholders, and the forces that will shape the design solution.

Generate

The third stage of the design process, *generate*, involves the creation of potential design solutions, at least on a conceptual level. Beckman and Barry (2007, p. 43) noted that this part of the design process "is, perhaps, the best documented and exercised in practice" because of the wide array of techniques available for concept generation, ranging from logical (e.g., morphological analysis) to intuitive (e.g., brainstorming). Each of these techniques comes in many forms (e.g., group vs. individual brainstorming).

IDEO's use of group brainstorming, for example, relies on a given set of rules, such as "defer judgment," "build on the ideas of others," "one conversation at a time," "stay focused on the topic," and "encourage wild ideas" (see Kelley et al., 2001; Sutton & Hargadon, 1996). "Brainstorming is the goal-oriented cousin of daydreaming.... It is fundamental to how we think about innovation" (Liedtka & Ogilvie, 2011, p. 102). Kelley et al. (2001, p. 55) noted that "you can deliver more value, create more energy, and foster more innovation through better brainstorming." Brown (2009, p. 79), however, cautioned that "brainstorming cannot be built into the structure of every organization."

Generate, in the context of BMI, involves either making modifications to an existing business model that represent novelty (in terms of new business model content and/or structure and/or governance—see Amit & Zott, 2010) or creating an entirely new activity system from scratch. This can be achieved by engaging in a disciplined brainstorming exercise (which represents a structured technique for unleashing creativity), during which ideas for new business models are generated, inspired by the previous synthesis stage, keeping in mind the previously identified design drivers and the resources and capabilities of the focal firm.

Refine

In the fourth stage of the process, *refine*, the designers proceed to an evaluation of the various design solutions that have been generated in the *generate* stage. The purpose is to narrow down the number of design possibilities to a few. Liedtka and Ogilvie (2011) referred to this process as "concept development"—the act of choosing the best ideas, assembling them into detailed solutions, and evaluating them using focal firm and stakeholder criteria. Beckman and Barry (2007, p. 43) observed that although there are a number of formal evaluation techniques, such as scorecards or multivoting, the evaluation of alternative

design solutions is performed "in very informal and ad hoc ways in most organizations." And Liedkta and Ogilvie (2011, p. 113) suggested that "whereas brainstorming is best done by a diverse group that includes people outside the innovation project, concept development requires a dedicated core team."

One critical component of the refinement stage is concept testing. This often is done through "rapid prototyping," which entails the production of "mock-ups" or working models that visualize the design solution, make it tangible, and thus facilitate evaluation and decision making (Ulrich & Eppinger, 2004). For example, in the context of an Internet-enabled business model, rapid prototyping might entail the production of mock-up screenshots that illustrate how the focal firm provides its services in conjunction with its partners. However, "the goal of prototyping is not to create a working model. It is to give form to an idea, to learn about its strengths and weaknesses, and to identify new directions" (Brown, 2009, p. 91). Rapid prototyping, in particular, "is an iterative set of activities, done quickly" and aimed at giving the concepts "detail, form and nuance—you bring them to life" (Liedtka & Ogilvie, 2011, p. 23). It helps "people experience a possible future in tangible ways [and] allows a very low-risk way of quickly exploring multiple directions before committing resources to the best one" (Boland & Collopy, 2004, p. 191).

Stakeholder (especially, customer) involvement at this stage is crucial. Designers present prototypes to customers and other stakeholders and observe their reactions and feedback, in order to "iterate [their] way to an improved offering" (Liedtka & Ogilvie, 2011, p. 159). This feedback from stakeholders "is based in the reality of an experience, rather than in an interpretation of a description of that same experience" (Boland & Collopy, 2004, p. 191). This is what makes prototyping so valuable for refining a design solution.

Refine, in the context of BMI, involves (1) consolidating the various new business models generated in the previous stage into classes of alternatives; (2) evaluating these alternatives according to relevant criteria (e.g., feasibility, viability, and desirability—see Brown, 2009); and (3) prototyping them as far as possible (i.e., experimenting on a small scale and narrow scope). By combining and repeating these steps in an iterative manner, the goal in this phase of the design process is to narrow down the fundamental choices for new business model designs and achieve focus and clarity on the details of the emerging designs.

Implement

In the last stage of the process, *implement*, a specific design is selected, and a new product, service, or business (model) is created. In the context of BMI, once the parameters of the new design have been determined, the focal firm also needs to make the requisite organizational and strategic adaptations. The firm's existing stock of resources and capabilities will have to be modified to fit the requirements of the new design. Some existing resources and capabilities will have to be shed, others redeployed, and new resources and capabilities will have to be created or acquired (Sirmon, Hitt, & Ireland, 2007). In addition, core processes will likely have to be changed. However, before engaging in a full-scale launch, the focal firm may decide to perform what Liedtka and Ogilvie (2011, p. 23) called a "learning launch: creating an affordable experiment that lets customers experience the new solution over an extended period of time, to test key assumptions with market data." For example, before Apple broadly launched its retail stores, it learned about key parameters in its first location (Tysons Corner Center, Virginia) in 2001.

Implement, in the context of BMI, requires putting in place all the elements envisioned by the new design. This includes design elements that refer to the content (i.e., activities), structure (i.e., exchanges), and governance (i.e., partnerships) of the business model. The demarcation with the previous stage (especially the idea of "prototyping") could be rather fleeting, insofar as it may be neither easy nor desirable to say where the trial-and-error phase stops and full-blown implementation begins. This is especially when implementation proceeds in a gradual, trial-and-error manner, such as when it is guided by the learning-based principles of discovery-driven planning (McGrath & Macmillan, 2000) or effectuation (Sarasvathy, 2001). In any case, attention must be paid in this stage to the focal firm's organization and how it fits with the new business model. Organizational redesign may be required as part of implementation in order to make the new business model work.

Conclusion

In this chapter, we have begun to delineate a process perspective on BMI. We have anchored our conceptual development on two observations: (1) the existence of a gap in the literature on business models regarding the question of how new or existing firms actually do (or should) change their

business models, and (2) the idea that innovation can be achieved through design, which follows an effective process.

The core of the model is formed by five stages—observe, synthesize, generate, refine, and implement. These stages are linked in a closed loop, indicating that individual designers, or design teams, may have to cycle through the process multiple times in an iterative manner, sometimes skipping steps, before converging on a new business model design for the focal firm. That design may be novel in terms of its content and/or structure and/or governance. The novelty, in order to qualify as a BMI, needs to be manifest at the system level in terms of business model performance or functionality (i.e., how the system behaves and how it performs *as a whole* and not just in any of its parts). Our model thus links creativity at the individual and firm levels with innovation at the business model level of analysis. The five-stage business model design process that we have outlined in this chapter, once codified (as within the Californian design firm, IDEO), can be considered a firm-level capability. Creative individual designers (e.g., entrepreneurs) often play a strong role in that process. And the outcome is BMI, which can span firm and even industry boundaries (Amit & Zott, 2001). We thereby acknowledge explicitly the multilevel nature of innovation.

Innovation, in turn, lies at the heart of an entrepreneurial process that centers on the discovery, creation, and profitable exploitation of market opportunities (Baker & Nelson, 2005; Drucker, 1985; Kirzner, 1997; Schumpeter, 1934). Innovation-driven entrepreneurs can disrupt the market equilibrium and initiate a "gale of creative destruction" (Schumpeter, 1934). The creative process that leads to BMI involves out-of-the-box thinking about the value-creation opportunities for a focal firm. It thus involves endowing resources with new wealth-producing capacity by enabling new combinations of resources and capabilities that are either controlled by or accessible to the focal firm.

We believe that our model of the business model design process has implications for both practice and academia. For relevant decision makers such as CEOs, entrepreneurs, and general managers of business units, our model holds promise for thinking more proactively about business model design. As Amit and Zott (2014) argued, such "mindfulness" about design is a first, crucial step toward breakthrough BMI. More specifically, by building on the design literature, the model suggested in this chapter attempts to integrate the received knowledge on business model content with the challenges associated with the process of BMI. It yields a concrete, step-by-step approach to developing such innovation, which has been largely absent from the business model literature. For researchers, our model opens new territory by pointing toward the importance of BMI *as a process*. By drawing on the design perspective, we offer a first step in the direction of understanding that process better. But much more research, both conceptually and empirically, is required to fully understand how innovative business models are developed in practice and how they should be developed in order to offer maximum benefit for stakeholders.

Note

1. Some scholars have suggested broader domains for BMI, in line with their corresponding definitions of the business model concept. Mitchell and Coles (2003), for example, propose that BMI involves modifications in the "who," "what," "when," "why," "where," "how," or "how much" involved in providing products and services to customers. Similarly, Johnson, Christensen, and Kagermann's (2008) notion of BMI involves the firm's value proposition, target customers, product and service offering, resources (e.g., people, technology, equipment), revenue model, cost structure, processes, rules, and norms.

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CHAPTER

22 Institutional Innovation: Novel, Useful, and Legitimate

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Abstract

This chapter advances the theoretical construct of *institutional innovation*, which is defined as novel, useful, and legitimate change that disrupts, to varying degrees, the cognitive, normative, or regulative mainstays of an organizational field. Institutional innovation, like all innovation, is both novel and useful, but it differs in that it is also legitimate, credible, and appropriate. Legitimacy is hinged to four characteristics such that institutional innovation is theorized to be (1) normative or value laden, (2) progressing in bursts of change over time, (3) socially constructed and culturally embedded, and (4) associated with logics that shape practices. A framework is developed that outlines the definition, composition, and processual nature of institutional innovation, as well as its generative potency. Finally, implications for theory, practice, and future research are offered.

Key Words: institutional innovation, institutions, institutional change, institutional logics, institutional practice, innovation, legitimacy, novelty, usefulness

Introduction

Institutions—because they structure and make meaningful the behaviors, roles, and relationships among the members of a community—order the activities and interactions of a collective (Scott, 2008). Institutions can accomplish this because they tend to be relatively stable, inert, and generally resistant to change and innovation. As Hughes (1936, p. 180) observed more than 75 years ago, the term "institution" connotes "some sort of establishment of relative permanence of a distinctly social sort," an argument with which most institutionalists concur (Raffaelli, 2013; Raffaelli, Glynn, & Strandgaard Pedersen, 2013).

And yet, in spite of their durability, institutions do change, over time and circumstance, to varying degrees, and with varying degrees of disruption (Leblebici, Salancik, Copay, & King, 1991). The institution of marriage, for instance, has been a site of innovation in the United States over the last few decades as legal, normative, and cognitive sensibilities changed so that persons of different races, religions, and sexual orientations are now legitimately regarded as married (Amato, 2007). Another example is that of the employment contract, which has also been an innovation that organizations have enacted in practice (e.g., Baron, Dobbin, & Jennings, 1986; Weber & Glynn, 2006). Similarly, financial institutions have innovated to serve new or underserved populations with products and structures that include microfinance and other hybrid organizational forms (Battilana & Dorado, 2010). And, in the field of consulting, a new type of innovation has recently been institutionalized, that of "innovation consulting" (i.e., the process of helping clients develop novel capabilities, products, or services), which, when paired with performance-based compensation, "could revolutionize the industry" (Itzenshon, 2013: 27).

Therefore, institutional innovation can occur in existing institutions as they adapt to address new opportunities, changed environments, or new cultural sensibilities. As Hargrave and Van de Ven (2006, p. 866) described it, institutional innovation can be

regarded as "institutional change as a difference in form, quality, or state over time in an institution." Moreover, these authors went on to acknowledge a second and more radical form of institutional innovation, "the generative process of collective action through which institutions are created."

The creation of new institutions is a more extreme form of institutional innovation, but one that is consistent with the notion of institutional entrepreneurship: "New institutions arise… when organized actors with sufficient resources (institutional entrepreneurs) see in them an opportunity to realize interests that they value highly.… [Institutional entrepreneurs] create a whole new system of meaning that ties the functioning of disparate sets of institutions together (DiMaggio, 1988 p. 14). Consistent with Hargrave and Van de Ven (2006), we view institutional innovation as including both the creation of new institutions and change in existing institutions. Accordingly, we posit that institutional innovation can occur along a continuum that ranges from more disruptive or radical innovation (i.e., the creation of new institutions) to less disruptive or incremental innovation (i.e., the modification of existing institutions).

Institutional innovation is challenging and is often met with friction, resistance, and contestation because of the dynamic tension between institutional persistence and innovative change: "When innovations meet institutions, two social forces collide, one accounting for the stability of social systems and the other for change" (Hargadon & Douglas, 2001, p. 476). The stability that is the hallmark of institutions results from the "more-or-less taken-for-granted repetitive social behavior that is underpinned by normative systems and cognitive understandings that give meaning to social exchange and thus enable self-reproducing social order" (Greenwood, Oliver, Suddaby, & Sahlin, 2008b, p. 4). And innovation—of any type—creates disruptions in this established order that can shift institutional arrangements, power structures, relational interactions, and well-honed practices.

In spite of the evident obstacles to institutional innovation, how and why does it occur? Three different types of explanation have been advanced by researchers, none of which has enjoyed widespread approval or broad scholarly acceptance. The first explanation centers on the causes or precipitating factors for institutional change, and especially the impact of exogenous factors. On balance, researchers have emphasized the force of the external environment in fostering institutional change, particularly in terms of environmental shifts (Hoffman, 1999) or environmental jolts (Meyer, 1982). Although this research has advanced our understanding of institutional change, Mahoney and Thelen (2010, p. 3) argued that it is still limited: "If theorizing is going to reach its potential, institutional analysts must go beyond classification to develop causal propositions that locate the sources of institutional change—sources that are not simply exogenous shocks." In the theoretical framework we advance, we address this gap by examining how not only exogenous forces but the endogenous dynamics of fields can give rise to innovations that ultimately create or modify institutions.

Second, although there has been some research into endogenous and agentic explanations of institutional creation and change, it has tended to focus on more extreme cases rather than more incremental ones. Institutional entrepreneurship tends to elevate the hypermuscular, heroic efforts of entrepreneurial actors who overthrow established institutions; it offers a counterpoint to alternative conceptualizations of actors as "passive dopes" who are overwhelmed and constrained by, and thus succumb to, institutional forces without hope of overthrowing or even changing them (Scott, 2010). This line of work tends to focus more on actions taken by individuals during the extraordinary event of new institutional creation, rather than the more frequent (and sometimes more ordinary) instances of institutional change, which are often precipitated by groups of individuals or activists.

A third explanation of institutional change focuses more squarely on our phenomenon of interest, institutional innovation. Although there is some emerging work (notably that of Hargrave & Van de Ven, 2006), to date, the concept seems to have had a limited following among academics; ironically, however, it is gaining traction among practitioners, and our intent is to narrow this gap. Hagel and Brown (2013) described the emergence and importance of institutional innovation to organizations and managers:

> As the pace of change increases, many executives focus on product and service innovations to stay afloat. However, there is a deeper and more fundamental opportunity for institutional innovation—redefining the rationale for institutions and developing new relationship architectures within and across institutions to break existing performance trade-offs and expand the realm of what is possible.
>
> *(Hagel & Brown, 2013, p. 2)*

The result of such institutional innovation, Hagel and Brown (2013, p. 4) argue, is a shift from scalable efficiency to scalable learning, such that organizations "can become more adept at generating richer innovations at other levels, including products, services, business models, and management systems." Building on the foundational work of Hargrave and Van de Ven (2006), we seek to extend their work by developing a theoretical framework that offers a fuller rendering of the definition, composition, and process of institutional innovation.

Our notion of institutional innovation seeks to find a middle ground between existing definitions of institutional persistence and change. Although we aim to account for the creative "art of institution-building" (Selznick, 1957, p. 153) and the rise of new institutional forms, we also apply the notion of institutional innovation to change in existing institutional forms. In this way, we account for changes in the constitutive elements of institutions—normative, regulative, and cognitive factors—that induce change in existing institutions. Institutional innovation in this case refers to change that neither destroys the old institutional order nor brokers a new one, but instead creates interstitial institutional spaces that can serve as a locus for innovation.

In this chapter, we elaborate the concept of *institutional innovation*, which we define as *novel, useful, and legitimate change that disrupts, to varying degrees, the cognitive, normative, or regulative mainstays of an organizational field*. Institutional innovation is similar to other types of innovation in that "an innovation is a new idea" (Van de Ven, 1986, p. 591); it represents novelty that is useful, particularly in terms of solving problems or achieving goals, often in organizations (Amabile, 1988; Drazin, Glynn, & Kazanjian, 1999; Gopalakrishnan & Damanpour, 1997; Kanter, 1984). Both novelty and usefulness are defined in terms of their relevance to the adopting organization: "As long as the idea is perceived as new to the people involved, it is an 'innovation,' even though it may appear to others to be an 'imitation' of something that exists elsewhere" (Van de Ven, 1986, p. 592). However, institutional innovation is different in that it is less localized in its novelty; instead, novelty is perceived in terms of the broader organizational field (or community of organizations) in which the innovation arises. Moreover, the novelty is perceived by relevant audiences—such as employees, consumers, or analysts—as legitimate, credible, and appropriate.

Institutional innovation, as we see it, is not only new and useful, but also legitimate change. Legitimacy is an important factor in institutionalization, because "the creation, transformation, and diffusion of institutions require legitimacy, a condition whereby other alternatives are seen as less appropriate, desirable, or viable" (Dacin, Goodstein, & Scott, 2002, p. 47). Hargadon and Douglas (2001) pointed out that Edison's innovation of electricity succeeded, in part, because he embedded it in familiar and legitimated systems to "shape the outcomes of contests between the innovation and established institutions" (Dacin, 1997). Work in the entrepreneurship literature (e.g., Lounsbury & Glynn, 2001; Navis & Glynn, 2010) has recognized how institutional and cultural contexts have bound entrepreneurial innovation and cast innovations as *legitimately* distinctive and not uniquely distinctive. Such embeddedness can thus constrain innovation, but it can also enable it, by supplying cultural resources and toolkits that can be appropriated in the service of innovation.

Importantly, institutional innovation need not be organizationally bound; instead, it is more oriented to larger-scale change in an existing organizational field. Earlier researchers have touched on this idea (Hargadon & Douglas, 2001; Hargrave & Van De Ven, 2006; Ruttan & Hayami, 1984), but we extend this work to theorize the definition, composition, and processual nature of institutional innovation, as well as its generative potency in effecting disruptive change.

We seek to explore the ideas that have been briefly sketched out here with the objective of developing and advancing a theoretical framework on institutional innovation. Toward this end, we begin by reviewing the relevant literature to better understand innovation in the context of institutions. Our theorization anchors on Scott's (1987) four variants of institutionalization: (1) instilling values, (2) creating reality and social order, (3) embedding cultural elements, and (4) delineating particularistic logics, belief systems, and practices. From this, we develop a theoretical framework that delineates the definitional, compositional, and processual nature of institutional innovation, paying particular attention to how institutional innovation is not only novel and useful but also legitimate. Finally, we offer implications for theory, practice, and future research.

Innovation in the Context of Institutionalism

Ever since DiMaggio and Powell (1983) highlighted the homogenization of organizational fields, institutionalism has had a grip on organizational theory. Over the ensuing 2 decades, "Institutional theory [rose] to prominence as a popular and powerful explanation"; indeed, it was said that institutional theory had "arrived" (Dacin et al., 2002, p. 45). Davis (2006; see also Walsh, Meyer, & Schoonhoven, 2006) supported this assertion in his analysis of author keywords submitted to the Organization and Management Theory (OMT) division for the 2005 national meetings of the Academy of Management, finding that *institutionalism*, the most frequently used keyword, was associated with 25% of the approximately 400 submissions to the division. A distant second was *network theory* (17%), while other theoretical perspectives received scant attention (<10%). If institutional theory was in its adolescence in the mid-1980s (Scott, 1987), it seemed to have reached maturity by the mid-2000s. As institutional theory aged in organizational studies, it also broadened its reach; a theory initially formulated to explain stability, persistence, and homogeneity began to be used to account for variation and change.

Institutionalism emerged as a counterpoint to the then-dominant view in organizational studies of "a diverse and differentiated world of organizations… geared towards explaining variation rather than its absence" (DiMaggio & Powell, 1983, p. 148). Researchers generated a profusion of definitions of institutions whose only commonality seemed to be that of stability, durability or "relative permanence" (Hughes, 1936, p. 180). This "relative permanence" of institutions occurs because "organizations produce and reproduce their material subsistence and organize time and space" (Friedland & Alford, 1991, p. 232), a process that eventually becomes stabilized, normalized, and fixed as an institution.

The core tenet of institutionalism, that isomorphism legitimates, is its core explanation for field structuration and organizational homogeneity. Due to strong isomorphic forces for legitimacy, organizations tend to converge, in structure and symbol, and conform to central tendencies or a few overworked patterns in cognition or norms in their industry or organizational field (Glynn & Abzug, 2002). Fields that are structured via isomorphism result from several factors, including the interconnectedness among organizations (DiMaggio & Powell, 1983; Greenwood & Hinings, 1988; Tolbert & Zucker, 1983); network interrelationships (Galaskiewicz & Wasserman, 1989); shared understandings, beliefs, and norms; and "pressures exerted by broader societal expectations as well as from organization–organization interdependencies" (Dacin, 1997, p. 50)

And yet, although DiMaggio and Powell (1983, p. 148) were clear, even emphatic, about their focus—"We seek to explain homogeneity, not variation"—the study of variation and change has become part of the institutional canon. In some ways, institutional theory has long wrestled with the notion of change as it sought to explain persistence. Selznick (1992, p. 326) seemingly foreshadowed the tension, casting it as the trade-off between responsiveness and integrity: "The challenge is to maintain institutional integrity while taking into account new problems, new forces in the environment, new demands and expectations. A responsive institution avoids insularity without embracing opportunism." Even as institutions "change in character and potency over time," it is necessary for researchers to understand the process of institutional change over time (Dacin et al., 2002, p. 45).

As a way of understanding the role of change—and the potential triggers for institutional innovation—we focus on the four variants of institutional theory identified by Scott (1987)—that is, institutionalization as normative, as social construction, as culturally embedded, and as a bundling of logics and practices. We discuss each of these four in light of its potential for enabling institutional innovation. We note, however, that the variants are neither mutually exclusive nor independent; rather, understanding institutionalization typically involves taking a number of these variants into account. However, for parsimony and ease of discussion, we treat the four variants as separable and distinctive perspectives on institutionalism and institutionalization.

Institutionalization as Normative

One variant Scott (1987) identified views institutionalization as a process of instilling value (e.g., Selznick, 1957) and emphasizes the importance of history. "By instilling value, institutionalization promotes stability: persistence of the structure over time" (Scott, 1987, p. 494). Thus, the normative order of institutions is an important feature of structuration and stability. However, values, norms, and beliefs shift over time for societies,

organizations, and institutions. For instance, consider the valuation today placed on being "green" and on promoting environmental sustainability, which is viewed as a "critically important problem" (Gulati, Henderson, & Tushman, 2013):

> The challenge of sustainability is increasingly becoming a mainstream business issue. McKinsey's focus on the "resource revolution" is symptomatic of a broadening understanding that firms can no longer take either supplies of cheap raw materials or the easy disposal of waste for granted. Many firms are focusing on the risks inherent in ignoring the social, political and regulatory shifts that may shape the business environment in unexpected ways as environmental problems become increasingly pressing and social structures around the world come under stress, while some firms see the opportunity to significantly differentiate themselves from their competitors by creating entirely new business models to address the challenges we face.

Similarly, changes in American society's moral sentiments have changed the institution of marriage. Allowing gay couples to marry (or to have legal standing as domestic partners) has triggered institutional innovations in health insurance benefits, the adoption of children, taxation policies, inheritance laws, and the definition of family, all of which have affected organizational policies in human resources. While these practices are not novel, changes in policy have nonetheless became legitimized, making them accessible to a broader population.

Thus, changes in the value bases defining institutions can ripple through an organizational field to shape innovations in programs and policies. From the perspective of treating institutionalization as a normative process, we propose that institutional innovations will emerge that are not only novel and useful but also in alignment with prevailing norms and values. Moreover, we expect that such institutional innovations will diffuse more rapidly within an organizational field and be more easily and more effectively adopted by the organizations that populate the field.

Institutionalization as Social Construction

A second variant that Scott identified is that of institutionalization as a process of creating reality and social order over time: social constructionism (e.g., Berger & Luckmann, 1967). Like Selznick (1957), Scott emphasized "the necessity of employing an historical approach": "Institutions always have a history, of which they are the products. It is impossible to understand an institution adequately without an understanding of the historical process in which it was produced" (Berger & Luckmann, 1967, pp. 54–55, cited in Scott, 1987, p. 495). Institutionalists have demonstrated that such historical processes need not be linear; rather, discrete moments or periods may punctuate how institutionalization proceeds over time (Glynn & Abzug, 2002). The transitions from one period to the next may provide opportune moments for triggering institutional innovations.

Institutional change seems to occur and recur at somewhat regular intervals or historical periods (Abzug & Mezias, 1993). For instance, Dacin (1997) demonstrated that institutional norms varied discretely and periodically over time; she found that these time periods had significant effects on the founding and survival of Finnish newspapers. In their study of organizational name changes, Glynn and Abzug (2002) illustrated periodicity in the institutionalization of organizational naming practices. They found that different name patterns prevailed in different time periods and exerted isomorphic pressures for naming conformity within that period; as a result, they concluded, "Over time, organizational names have changed, but they have done so with patterned regularity" (Glynn & Abzug, 2002, p. 268). And yet, in spite of the evidence on periodicity, little is known about what drives periodic institutional change over time (Dacin et al., 2002).

We theorize that these moments of transition, from one historical period to the next, are times when institutional stability and isomorphism may be somewhat weakened and institutional innovations may play a greater role. To the extent that innovations can bridge from old and familiar institutions to new and creative ones, it is more likely that they will succeed in shaping the next institutional order (e.g., Hargadon & Douglas, 2001; Lounsbury & Glynn, 2001; Navis & Glynn, 2011).

In treating institutionalization as a process of creating reality, the focus is on the role of social construction in creating and ordering cognitive, normative, and behavioral patterns of interaction in collectives (Meyer & Rowan, 1977; Zucker, 1977). The appeal of this approach—and its fit with other social science theories—may account for the enormous popularity of institutional theory in recent decades (Greenwood, Oliver, Sahlin, & Suddaby, 2008a). The critical insight here is that, despite their seeming stability, permanence, and

impenetrability, institutions are essentially a human creation (Rao, 1994). As Scott (1987, 495) explained:

> Social order is based fundamentally on a shared social reality which, in turn, is a human construction, being created in social interaction. It is recognized that man or woman as a biological organism confronts few limits or constrains in the form of instinctual patterns, yet constraints develop in the form of a social order.

Drawing on Berger and Luckmann (1967), Scott (1987) noted that institutionalization occurs as actors take action, then interpret and classify that action as "typifications." As they are reproduced and reciprocated, these become habitualized and associated with certain roles or classes of actors (e.g., "Supervisors give orders, workers follow them"). This process occurs in three phases or "moments": externalization, objectification, and internalization (p. 495). This approach is reflected in the work of Zucker (1977) and Meyer and Rowan (1977), with the latter emphasizing the rule-like status by which social understandings become concretized.

In his study of the early days of the US automobile industry, Rao (1994) demonstrated how favorable organizational reputations were socially constructed as an outgrowth of the legitimation that flowed from carmakers' victories in certification contests. Glynn and Marquis (2004) demonstrated how short-lived legitimacy may be when cognitive reconstruction occurs and the type of legitimacy changes: Organizations that quickly innovated to append "dot-com" to their names in the "unjustifiable euphoria" of the Internet boom (at the turn of the century) were quickly illegitimated with the "abrupt and equally unjustified skepticism" (DiMaggio, Hargittai, Neuman, & Robinson, 2001, p. 319) of the Internet bust. Thus, isomorphic forces can quickly change in the face of broader cultural, economic, or environmental shifts; as a result, the prototype for conformity can be a moving target, providing an opportunity for the emergence of an institutional innovation.

In their study of the historical development of the new technology of cochlear implants, Garud and Rappa (1994) showed how scientists' individual cognition about technological claims, routines, and evaluations resulted in a collective level of shared cognition that directed the institutionalization of the innovation. Hargadon and Douglas (2001) demonstrated how Thomas Edison acted as a skilled cultural operative in interpreting his innovation of electricity in ways that resonated with people's understanding of gas utilities. More generally, new innovations need to be interpreted and framed in ways that appeal to their audiences (Kaplan & Tripsas, 2008; Weber, Heinze, & DeSoucey, 2008).

Building on these multiple strands that conceptualize institutionalization as a process of social construction, we propose that institutional innovations will need to be interpreted by key social actors to make them more understandable (and perceived to be novel and useful) and yet, consistent with more familiar or existing taken-for-granted understandings, to make them more legitimate. Moreover, we expect that institutional innovation will emerge, not necessarily in a linear, incremental fashion, but in periodic bursts that change the field.

Institutionalization as Culturally Embedded

The third variant that Scott (1987, p. 498) identified is that of institutional systems as culturally embedded; as such, they represent a class of elements that, in contrast to technical elements, "stresses the role played by cultural elements—symbols, cognitive systems, normative beliefs—and the sources of such elements." The relevance of this version of institutionalism is that it embeds innovation in its cultural and social milieu. It is a view consistent with cultural entrepreneurship (Lounsbury & Glynn, 2001), which similarly emphasizes the role of "rational myths" (Meyer & Rowan, 1977), shared belief systems (Scott, 1987), or narratives that explain and justify innovations (Navis & Glynn, 2010, 2011).

Beyond enabling interpretations, culture can also function as a set of resources that enable innovation. Conceptualizing culture as a "toolkit" of resources, Swidler (1986) emphasized the role of agency in the way that actors might assemble cultural elements to construct strategies of action in different situations. Moreover, Swidler (1986) pointed out how culture is significant, not because of the values it signifies, but because it affords individuals particular strategies of action for which they are culturally equipped. As a resource or a form of capital, culture can be appropriated in ways that make innovations useful, and, as such, can contribute to one of the key dimensions of innovation. For example, Weber et al. (2008) showed how broad shifts in cultural sentiments in favor of grass-fed livestock led to the creation of new markets for these products that transformed the

meat and dairy industry. Glynn, Lockwood, and Raffaelli (in press) demonstrated how luxury boutique hotels were able to differentiate themselves from competitors by claiming an identity associated with cultural themes and more broadly situated societal trends associated with environmental sustainability. And Glynn (in press) illustrated how the rise of Martha Stewart resulted in part from her ability to create innovative products by reframing them within the context of cultural trends.

Drawing from notions of institutionalization as culturally embedded, we propose that institutional innovation will appropriate relevant cultural resources from broader contexts that enable interpretation, direct strategies for action, and aid adoption and implementation.

Institutionalization as a Bundling of Logics and Practices

The fourth and last variant that Scott (1987) identified is that of institutions as distinct social spheres, each with its own particular set of belief systems, logics, and substantive content which have high degrees of durability. Because each sphere is so distinctive, there is often little integration or coherence across institutional spheres. This view has gained currency recently, with an explosion of work on institutional logics.

Friedland and Alford (1991) launched organizational inquiry into institutional logics with their seminal article, which identified five distinct institutional spheres in Western society (i.e., family, religion, market, democracy, and the bureaucratic state) and associated each with a core logic that constitutes both actors and society. Thornton, Ocasio, and Lounsbury (2012) comprehensively summarized this perspective and focused on how institutional logics can be mechanisms of organizational change. Their approach "redirects scholarship away from institutional isomorphism and persistence and toward institutional transformation, for which logics are the tools of change" (Glynn, 2013). Logics motivate change because they not only function as cognitive frames of reference but also guide action by their connection to practice.

The institutional logic of innovation can be thought of in a number of different ways. One is in terms of the logic that underlies a particular innovation. For instance, innovation has long been conceptualized in terms of a "closed" logic in that the locus of innovation resided in the collective (e.g., team or organization) that sought the new innovation. Recently, however, there is growing interest in "open innovation," which extends the boundaries of the collective to embrace anyone who can contribute (Baldwin & von Hippel, 2011). The shift in the beliefs embedded in the particular logic of innovation reflect not only assumptions about who is best qualified to innovate but also the practices used in innovation, particularly in terms of who is invited to participate.

A second way is to think about the role of logics is to consider how innovations may incorporate multiple and different logics. For instance, the innovation of the microfinance institution incorporated both the logic of the market and the logic of social welfare (Battilana & Dorado, 2010) to create a hybrid organizational form. Thus, in a way similar to the "toolkit" function of culture, logics can be supple resources that can enable the beliefs embedded in the innovation and its practices.

To summarize, our review of the institutional literature revealed a number of important contacts or compatibilities between institutionalism and innovation, in spite of the potential friction that can ensue when "innovations meet institutions" (Hargadon & Douglas, 2001, p. 476) as stability encounters change. In particular, our review of institutionalism points us to several possible features of institutional innovation: (1) institutional innovations may be understood not as value-free (or purely technical) but rather are often normative or value-laden; (2) institutional innovations may progress not in a linear or incremental fashion but in bursts of change, in historical periods over time; (3) institutional innovations are socially constructed, embedded in cultural understandings, but also appropriating cultural elements as resources; and (4) institutional innovations can be characterized in terms of the logics that they embody and put in practice.

More importantly, our reading of the institutional literature suggests a critical dimension of institutional innovation that differentiates it from innovations in general: institutional innovations are legitimate. Thus, we conceptualize institutional innovations in terms of three key dimensions: novelty, usefulness, and legitimacy. Next, we turn to formalizing these insights theoretically.

A Theoretical Framework on Institutional Innovation

As a starting point, we revisit our initial conceptualization of institutional innovation as novel, useful, and legitimate change that disrupts, to greater or less degrees, the cognitive, normative,

or regulative mainstays of an organizational field. Our reading of the literature on institutional theory, and particularly the four theoretical variants on institutionalization identified by Scott (1987), affirmed the viability of our approach. We now leverage these insights to articulate a theoretical framework for understanding institutional innovation. We organize our framework into two areas: *definition and composition* of institutional innovation and *processes* of institutional innovation.

Definition and Composition of Institutional Innovation

We view institutional innovation as being located at the intersection of three dimensions: novelty, usefulness, and legitimacy. The first two of these define innovations in general (and in organizations) but the third—legitimacy—is the hallmark of institutional innovation. Hagel and Brown (2013, pp. 14–15) described how VISA, with its creative ownership and governance structure, was an institutional innovation:

> In the late 1950s, many large banks were struggling to drive adoption of consumer credit cards. No single organization seemed to be able to solve the problem. Many smaller banks wanted to be able to offer credit cards, but the overhead to set up a credit card operation, as well as back-office processing costs, were prohibitively large.
>
> National BankAmericard (the name would be changed to Visa in 1976), acted as a jointly owned utility, enabling traditional competitors to work together to gain the advantages of a centralized payment-processing system. Within a year of its development in 1970, the program had recruited 3,000 banks to participate in this new venture, forming a nationwide network of banks that backed the system. Within seven years, the company was generating $20 billion in sales, reshaping the emerging credit card business in the process. Part of VISA's strategy involved defining the governance structure for the newly connected banks, allowing the banks to jointly own the new business entity while preserving VISA's ability to move rapidly and flexibly.

Figure 22.1 depicts the relationship among the three salient characteristics of institutional innovation—novelty, usefulness, and legitimacy—as illustrated in the case of VISA.

Legitimacy involves the comprehension and acceptance of a change (Glynn & Abzug, 2000) such that audiences endorse or authorize the change. Dacin et al. (2002, p. 48) explained how legitimation can enable innovation:

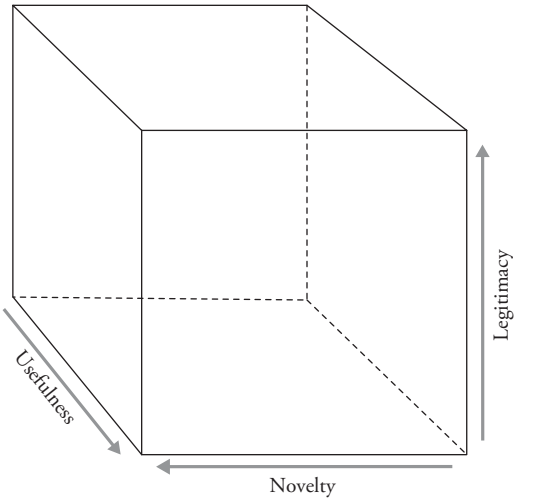

Fig. 22.1 Three Dimensions of Institutional Innovation: Usefulness, Novelty, and Legitimacy.

> A number of studies … emphasize the need to legitimate change, either through some form of conformity to field-level cognitive interpretations (Glynn & Abzug, 2002), or through market feedback (Lee & Pennings, 2002), or through the development of constitutive rules that provide guidelines for change (Hinings et al., 2002) as well as links to these actors (Casile & Davis-Blake, 2002).

To secure legitimacy for a new innovation, organizations seek to conform to prevailing practices (or institutionalized norms, cognition, or practices) to demonstrate their social fitness. To legitimate an institutional innovation, different strategies are necessary. One strategy involves framing the new institutional innovation in terms of older institutions, bridging from the past to the present. For instance, several researchers have noted how entrepreneurs frame their new innovation in terms of older or more familiar institutionalized beliefs or practices, often symbolically by using cues, frames, stories, or metaphors (e.g., Hargadon & Douglas, 2001; Lounsbury & Glynn, 2001; Navis & Glynn, 2010; 2011). Alternatively, institutional innovation might be legitimated in terms of new beliefs, needs, problems, or issues. For instance, Hoffman (1999) showed how "green" innovations came about in response to the perceived crisis in the natural environment. And Weber et al. (2008) showed how grass-fed beef gained legitimacy by being framed as a superior product to traditional beef.

Legitimacy is a dynamic process that connects an institutional innovation to relevant sets of institutional stakeholders who, in turn, can grant or withhold legitimacy. To the extent that the innovation resonates with these audiences—and is perceived as novel and useful—it is more likely to succeed. This is what happened in the case of VISA. When it achieves this, institutional innovation is more likely and will be situated at the apex of the intersection of novelty, usefulness, and legitimacy, as depicted in Figure 22.2.

In contrast to other innovations, which may be more technical than social, institutional innovations are shrouded in legitimated meanings, socially constructed from the values they embody or the cultural configurations that they appropriate or that embed them. Institutional innovations can signal this symbolically, via language, symbols, or images, or strategically, in terms of their problem-solving capabilities or usefulness. Such symbolic vehicles (e.g., meanings, language, stories) are "carriers of cultural resources" (Glynn & Watkiss, 2011, 2012) that have the capability to bind together a community and enlarge possibilities for collective action (Swidler, 1986).

Importantly, though, the perceived novelty of institutional innovations may, at times, need to be tempered by legitimacy. Thus, rather than seeming uniquely distinctive, institutional innovation may need to be perceived as *legitimately* distinctive (Navis & Glynn, 2011): Being perceived as too new and unfamiliar may threaten its legitimacy, whereas being perceived as not new enough may threaten its innovativeness. Legitimacy may constrain the perception of novelty, with a need to cast the new innovation within the existing institutional order. Hargadon and Douglas (2001, p. 476) explained:

> To be accepted, entrepreneurs must locate their ideas within the set of existing understandings and actions that constitute the institutional environment yet set their innovations apart from what already exists. . . . One cultural determinant of an innovation's value is how well the public, as both individuals and organizations, comprehends what the new idea is and how to respond to it. And it is the concrete details of the innovation's design that provide the basis for this comprehension, as well as for new understandings and actions to emerge, which then, in turn, change the existing institutional context.

They went on to explain how these dynamics played out in the case of Edison's innovation, to its ultimate success (Hargadon & Douglas, 2001, p. 498):

> Despite his vision of a new electric world of lighting and household appliances, Edison purposefully hobbled his innovation to fit cleanly within the technical roles currently given to gas. By mimicking virtually every aspect of the familiar gas system, save for its noxious fumes, Edison ensured his users would both recognize the purpose of his innovation at the outset and know without reflection how to use it in their everyday lives.

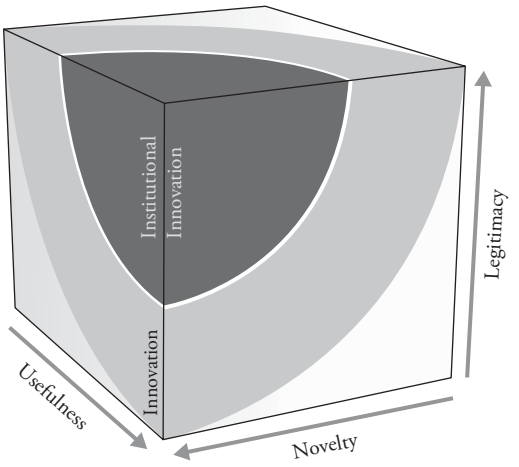

Fig. 22.2 Graphic Comparison of Innovation and Institutional Innovation.

Processes of Institutional Innovation

We conceptualize the processes undergirding institutional innovation in terms of two major factors: first, the way in which these processes unfold over time, and second, their generative potency to change an organizational field. In terms of the former, our review of the institutional theory literature suggests that the process of institutional innovation may unfold not linearly or incrementally, but rather in a series of eras or historical periods that are characterized by distinct and different social orders (e.g., Abzug & Mezias, 1993; Glynn & Abzug, 2002). Such a view is consistent with models of the innovation process that depict it moving through different eras; synthesizing these different approaches will be important to mapping the movement of institutional innovations through time. There is a need for such work (Dacin et al., 2002, p. 53): "There is still little known about the mechanisms that drive the waxing and waning of the power of institutions across time. . . . Further

examination of the temporal embeddedness of institutions may provide insights into the power, pacing, sequencing, and momentum of institutional change."

As well as mapping how institutional innovations may unfold over time, understanding their degree of generative potency is an important issue. Generativity expands available resources and capabilities so as to create new possibilities for action. In their study of Infosys, Garud, Kumaraswamy, and Sambamurthy (2006, p. 283) attributed its success to the fact that "Infosys has seeded each element of its organizational design with generative properties i.e., the routine application of these elements for day to day performance also yields new possibilities for the future." The launch of Apple's iPod also reflects generative potency. Although the device itself was not that revolutionary from a purely technical standpoint, it did create a significant reconfiguration of actors in the music industry that coordinated an institutional environment; the result was to converge music, artists, distributors, and technology into a new ecosystem or field. Part of the challenge that other manufactures (e.g., Creative, Audible.com, Diamond Multimedia) faced in rolling out digital music players was their inability to build acceptance and legitimacy with key stakeholders in the music industry for the novel medium of downloading music instead of purchasing CDs, records, or tapes. By their very nature, we expect that institutional innovations are generative in transforming, changing, or creating organizational fields.

Discussion and Conclusion

In this chapter, we have made an initial foray into theorizing about the nature, processes, and effects of institutional innovation. We sought to elaborate the definition, composition, and processes of institutional innovation, differentiating it from related constructs such as institutional entrepreneurship and field-level change. We defined institutional innovation as novel, useful, and legitimate change that disrupts the cognitive, normative, or regulative mainstays of an organizational field. We discussed how institutional innovation resembles organizational innovation in that it is both novel and useful to the adopting actor, but we extended that definition by suggesting that the innovation must also be accepted as legitimate within its institutional environment. We drew on the extant institutional and innovation literatures to explicate the definition, composition, and processual aspects of institutional innovation. In doing so, we advanced a theoretical framework on institutional innovation which we hope will motivate future research on the subject.

We have sketched the broad outlines of a theory of institutional innovation, but clearly there is more work to be done. We now elaborate four potential directions in which future research might advance our understanding of institutional innovation. These focus on the composition of institutional innovation, the role of time in the development, the diffusion and adoption of institutional innovation, and the evaluation of an institutional innovation by various actors or audiences.

We have argued that institutional innovation is characterized by three elements—novelty, usefulness, and legitimacy—but a useful amendment to our framework might investigate cases when one of these elements is absent. In the absence of legitimacy, innovations are novel and useful but not necessarily institutional. Clearly, this describes the traditional view of innovation, particularly at the organizational level (e.g., Amabile, 1988; Drazin, Glynn, & Kazanjian, 1999; Gopalakrishnan & Damanpour, 1997; Kanter, 1984; Van de Ven, 1986).

It seems useful to examine two other cases: when an innovation is legitimate and useful but not novel, and when an innovation is legitimate and novel but not useful. The first case, that of innovations that are legitimate and useful but not novel to the adopting firm, would seem to characterize those kinds of "best practices" that organizations might routinely adopt or imitate (from other organizations). Legitimate and useful innovations seem to describe those innovations that are broadly diffused and widely implemented by organizations; in other words, an innovation that has become institutionalized. Such innovations tend to be at a later stage of adoption, farther along the steep S curve of diffusion (Rogers, 1995), already adopted by a majority of organizations, and a generally "safer" move for organizations. Here, the motivation is less about innovating to change the status quo and more about not appearing (or being) out of sync (or potentially illegitimate) compared with other organizations in the organizational field. Organizations seek to be isomorphic to secure legitimacy, and they engage in mimeticism, or copying others' innovative practices, to do so. Kelly and Dobbin (1998) show how innovative affirmative action programs in organizations, designed in response to federal legislation, persisted as a legitimate (and presumably useful) organizational practice, even as

regulatory enforcement diminished. Thus, innovations that fade in their novelty can often become diffused and institutionalized as taken-for-granted practices.

A more extreme instance of this situation is when an innovation is novel and useful but *illegitimate*. One might argue that the proliferation of small, short-term, unsecured loans (i.e., "payday loans") is a novel and useful financial innovation to provide liquidity to individuals in need of immediate cash. However, several local and national governments have banned such lending practices to prevent lenders from "preying" on low-income populations by charging them excessive interest rates. Thus, the innovation was both novel and useful (given its high adoption and usage rates) but was seen by many as illegitimate because it failed to meet standards for acceptable lending.

Another recent example might be that of some online universities, which challenged and are doubted by more traditional brick-and-mortar universities. A recent *New York Times* article, entitled "The Trouble With Online College," reported that "The online revolution offers intriguing opportunities for broadening access to education. But, so far, the evidence shows that poorly designed courses can seriously shortchange the most vulnerable students" (New York Times, 2013). Beyond the suggestion of illegitimacy, charges of illegitimacy and wrongdoing have been leveled: "Three primarily online colleges—the University of Phoenix, Kaplan University, and Argosy University—were among 15 for-profit colleges targeted by an undercover government investigation that uncovered possible education fraud and deceptive marketing practices" (GetEducated.com Consumer Reporting Team, 2013). Given the infancy of both online universities and online courses, however, it is still possible that, with change, they may become legitimated.

The second case, that of institutional innovations that are legitimate and novel but not useful, presents a different set of dynamics. This case seems to be conceptually closer to creativity, rather than innovation, given the lack of usefulness. Here, wild, creative ideas are tamed by their comprehensibility, credibility, and perhaps what seems "rational and reasonable" (Van de Ven & Lifschitz, 2013); a label such as "institutional creativity" might be more apt. Returning to the proverbial S curve (Rogers, 1995), these innovations would likely be found at earlier stages of diffusion but would probably diffuse and be adopted fairly quickly, in a steep and narrow S curve, because of their legitimacy. Some fads and fashions may fit this description (Abrahamson, 1991; Abrahamson & Eisenman, 2008). Often firms adopt innovations that are novel and considered appropriate in the field but end up not being useful or helpful to the firm's business model. For example, not all firms that adopted Six Sigma or total quality management (TQM) programs when they were the latest management trends found the practices to be particularly salient or useful to their business (e.g., Kwak & Anbari, 2006).

A related but different extension of our theoretical framework of institutional innovation might be to explicitly incorporate the role of time and temporal dynamics. We have proposed that institutional innovation may proceed in discrete and disruptive bursts, periodically rather than in linear incrementalism. This is because institutional innovation is difficult and involves change, but clearly our ideas require empirical testing. We can speculate that there may be stages or sequences by which the three elements (novel, useful, legitimate) become more or less salient over time or at different phases of diffusion or adoption. For instance, legitimacy could be a leading influence on innovation, promoting the spread and adoption of institutional innovation. At the introduction of the iPad, Apple's reputation affected perceptions of novelty and legitimacy; however, it was not until users experienced it that it was perceived as useful (Watkiss, 2013). Alternatively, legitimacy might also be a lagging attribute, following the realization of the novelty and usefulness of an institutional innovation. For instance, Navis and Glynn (2010) illustrated that legitimacy followed the initial introduction of satellite radio; it was not only that the innovation was made "real" (and available to consumers as a viable alternative to terrestrial radio), but it was also perceived to be a legitimate new form of media. Thus, further investigation into the temporal condition of institutional innovations—in terms of the processes of emergence, adoption, and the three key compositional characteristics—is a potentially fruitful avenue for future research.

Finally, given the normative, social, and cultural aspects of institutional innovation, it would be informative to investigate how key audiences might judge or evaluate its novelty, usefulness, and legitimacy over time and in organizational adoption. As in creativity research (e.g., Amabile, 1988), individuals' subjective judgments of the novelty and usefulness of an institutional innovation might be examined through qualitative or

quantitative methods. Similarly, individuals might be queried or surveyed about their perceptions of legitimacy, particularly as it is cued by symbolic or reputational features (Glynn & Abzug, 2002; Glynn & Marquis, 2004). At the organizational level, legitimacy may be viewed (and inferred) via the patterns of innovation diffusion, adoption, and sustainability over time; to the extent that an institutional innovation is widely shared among the organizations in a field, legitimacy might have been attained. Clearly, the investigation of institutional innovation could leverage theory and empirical findings from the relevant literatures on institutionalism and innovation.

In closing this chapter, we reiterate our initial motivation to spur interest and inquiry into the investigation of institutional innovation. Theoretically, it would enhance our "big picture" thinking about creativity and innovation. By reinforcing the importance of innovation within the context of larger systems of meaning that are shared among actors in a field, our aim is to reinstate some of the early management theories arguing that organizations could act as carriers of values that were legitimated over time (and across the tenure of multiple leaders) to impact the broader society (e.g., Barnard, 1938; Selznick, 1957; Selznick, 1996). Pragmatically, it seems to be an idea whose time has come, given the accelerating pace of change, the continuing development of new technologies, and the need for organizations to be increasingly nimble in adapting to ever-shifting markets and institutions. Most importantly, however, may be the promise that institutional innovation holds: "The result of engaging in institutional innovation is that we can begin to unlock the unlimited potential of ourselves and our organizations" (Hagel & Brown, 2013, p. 19). A novel, useful, and legitimate aspiration, indeed.

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CHAPTER

23

Dynamic Managerial Capabilities: A Perspective on the Relationship Between Managers, Creativity, and Innovation in Organizations

Constance E. Helfat *and* Jeffrey A. Martin

Abstract

Dynamic capabilities are an important means by which organizations alter the ways in which they make their living. Most definitions of dynamic capabilities characterize them as composed of routines. However, there are means by which organizations change the ways in which they pursue competitive advantage that do not fit well within the formal definitions of routines, yet go beyond what is considered ad hoc problem solving. These dynamic capabilities entail patterned behavior, and are the subject of the nascent literature on dynamic managerial capabilities. This chapter describes the relationship among dynamic managerial capabilities, creativity, and innovation in firms.

Key Words: dynamic capabilities, asset orchestration, human capital, social capital, cognition, managerial resources, organizational capabilities, business models

Introduction

Dynamic managerial capabilities were first defined by Adner and Helfat, (2003, p. 1012) as "the capabilities with which managers build, integrate, and reconfigure organizational resources and competences." More generally, we can think of dynamic managerial capabilities as the capabilities with which managers create, extend, or modify the ways in which a firm makes a living, through an impact on factors both within and outside of the firm. Here we focus on the impact of managers on internal organizational resources and capabilities.

The concept of dynamic managerial capabilities builds on the dynamic capabilities literature by drawing attention to the salience of managerial intent and capability in the capacity of organizations to reconfigure their resource base (Martin, 2011). Dynamic capabilities are an important means by which organizations alter the ways in which they make a living, including creating and reconfiguring resources and capabilities (Eisenhardt & Martin, 2000; Teece, Pisano, & Shuen, 1997). Most definitions of dynamic capabilities characterize them as routines. For example, Teece et al. (1997, p. 528) referred to a dynamic capabilities approach as one that sees "competitive advantage stemming from high-performance routines operating 'inside the firm,' shaped by processes and positions." Eisenhardt and Martin (2000, p. 1107) explicitly defined dynamic capabilities as "the organizational and strategic routines by which firms achieve new resource configurations." Helfat and Winter (2011) noted, however, that it is the patterned and practiced aspect of behavior that capabilities enable; such patterning may go beyond a narrow definition of routines (Dosi, Nelson, & Winter, 2000).

As the dynamic capabilities literature continues to develop, it is becoming clearer that there are means by which organizations reconfigure

resources that do not fit well within the formal definitions of routines but yet go beyond what is considered simple ad hoc problem solving (Helfat, Finkelstein, Mitchell, Peteraf, Singh, Teece, & Winter, 2007; Teece, 2007). These dynamic capabilities that entail patterned behavior are the subject of the nascent literature on dynamic managerial capabilities (Adner & Helfat, 2003; Kor & Mesko, 2013; Martin, 2011; Sirmon & Hitt, 2009). The purpose of this chapter is to describe the relationship among dynamic managerial capabilities, creativity, and innovation in firms.

Creativity and Innovation

Creativity is typically considered a precursor to innovation, with innovation being the successful implementation of a creative idea (Amabile, 1988). *Creativity* in organizational settings is "typically defined as the generation or production of ideas that are both novel and useful" (George, 2007, p. 441). The latter criterion of *usefulness* has been used extensively in the creativity literature to differentiate between ideas that are simply novel and those ideas that are truly creative within an organizational setting (e.g., Amabile, 1996; Oldham & Cummings, 1996; Scott & Bruce, 1994). Thus, for a new resource reconfiguration to be considered creative, it must be novel and it also must have the potential to be valuable (Barney, 1991; Peteraf, 1993; Wernerfelt, 1984).[1]

Innovation can be broadly defined as "the adoption of an idea or behavior that is new to the organization" (Hage, 1999, p. 599). It follows that there are many linkages between the large literatures that focus on creativity and innovation and the literatures that focus on organizational capabilities.

Organizational Capabilities

Consistent with prior research, we define organizational capabilities as "the capacity to perform a particular activity in a reliable and at least minimally satisfactory manner (Helfat & Winter, 2011, p. 1244; see also Amit & Schoemaker, 1993; Dosi et al., 2000; Helfat et al., 2007). Several features of this definition are worth noting. First, there must be an objective for the activity (Amit & Schoemaker, 1993). Second, the activity must be repeatable and reliable; otherwise, no real capacity to perform an activity exists. Finally, to perform the activity in a *minimally* satisfactory manner simply means that the outcome of the activity is recognizable as such and functions at least minimally as intended (Helfat et al., 2007; Helfat & Winter, 2011).

Possession of a particular capability does not imply the capacity to generate or capture economic rents from it (Collis, 1994; Winter, 2000). Just because an organization can perform an activity in a minimally acceptable manner does not mean that it will be able to perform that activity well enough to earn an above-average return from it. That is, the organization may perform the activity acceptably but not perform it better than competitors. Capabilities can be divided into two broad categories, which to some extent are intertwined: operational capabilities and dynamic capabilities (Helfat & Winter, 2011).

Operational Capabilities

Operational capabilities are those capabilities that an organization uses to earn a living in the present (see, Helfat et al., 2007; Winter, 2003). Operational capabilities include organizational activities such as production, order fulfillment, and customer service that are essential to an organization's capacity to compete within its particular product markets in the same way as in the past. Such activities employ "more or less the same techniques on the same scale to support existing products and services for the same customer population. Such a capability is ordinary in the sense of maintaining the *status quo*" (Helfat & Winter, 2011, p. 1244, italics in original). As such, they have been referred to as "stationary processes" or "zero-level" capabilities (Collis, 1994; Winter, 2003). This does not mean that operational capabilities are rote activities. Rather, they are purposeful in their intent and entail patterned behavior.

Dynamic Capabilities

Dynamic capabilities are those capabilities that enable an organization to alter the way in which it earns a living in the present. Here we focus on dynamic capabilities within an organization that "*purposefully create, extend, or modify its resource base*" (Helfat et al., 2007, p. 4, italics in original). For example, an organization can develop capabilities that are focused on expanding existing products and services to new markets. A common misinterpretation of the dynamic capabilities perspective is that dynamic capabilities are primarily associated with highly dynamic markets. However, as Eisenhardt and Martin (2000) argued, all markets are dynamic—that is, all are undergoing change to some extent. Therefore, one primary question of interest to dynamic capabilities scholars is the extent of dynamism in the particular markets

of interest. For example, is the market of interest highly dynamic, moderately dynamic, or relatively placid? In each of these cases, a firm must have the capacity to alter the alignment between its resource base, processes, competitive realities and customer demands if it is to survive and thrive (Helfat & Winter, 2011).[2]

The semiconductor industry provides an illustration of different types of market change. Although there were numerous technological developments that enabled the processing power of microprocessors to double every 12 to 24 months, a pattern that became known as Moore's law (Moore, 1965/1998), the fundamental architecture remained the same during the market's growth phase. That is, although the initial microprocessor was a radical innovation, subsequent innovations were not. For example, Intel's 8088 microprocessor architecture, which IBM adopted in its first personal computer, was followed by several generations of microprocessor technology that entailed incremental architectural innovations (Intel, 2008). Significant incremental improvement also took place in chip manufacturing technologies.

Many companies did not survive successive generations of architectural and incremental change in microprocessor design and manufacturing technologies (Eisenhardt, 1989). The dynamic capabilities of the primary microprocessor producers—Intel, AMD, and IBM—became focused on developing and manufacturing newer and more powerful iterations of the base microprocesser technology. Accomplishing this required the application of creativity in combination with numerous routines for new product and process innovation used in a mindful and purposeful way (Helfat & Winter, 2011).

Some dynamic capabilities are intended to generate creative and innovative outcomes that are even more incremental. For example, capabilities for Total Quality Management (TQM) utilize processes that generate novel and useful solutions to problems that may arise in areas such as the production of goods and services. The culmination of these efforts is intended to lead to the adoption of particular solutions—or in other words, innovations.

In summary, it is fair to label a capability operational if its main emphasis is on maintaining the capacity of the organization to earn a living in the same way as in the past. Likewise, if a capability focuses on altering the way in which an organization earns a living, then it is fair to label it a dynamic capability. Indeed, the same capability that is considered an operational capability in one industry might be better categorized as a dynamic capability in another (Helfat & Winter, 2011).

Dynamic Managerial Capabilities

Dynamic managerial capabilities are those capabilities that emphasize managerial activities, individually and in concert with others, to alter the means by which an organization earns a living in the present. The emerging literature on dynamic managerial capabilities captures those capabilities that, while essential to altering the resource base of the organization, do not fit well within the formal definition of a routine (e.g., Feldman & Pentland, 2003; Nelson & Winter, 1982), yet go beyond ad hoc problem solving (Martin, 2011; Teece, 2007). Analogous to dynamic organizational capabilities, dynamic managerial capabilities are directed toward changing the way in which an organization makes a living, including building, integrating, and reconfiguring organizational resources and competencies (Adner & Helfat, 2003, p. 1012).

Dynamic managerial capabilities draw on a set of underlying managerial resources—namely, managerial human capital, managerial social capital, and managerial cognition (Adner & Helfat, 2003). Managerial human capital consists of the knowledge and expertise that managers develop through their prior experience. Managerial social capital is the network of social relationships, both formal and informal, that managers possess and can use to obtain access to resources and information, analogous to the more general construct of social capital. Managerial cognitive resources consist of the mental models and managerial beliefs that shape the choice set of resource actions that managers may consider. These three categories of resources that underpin dynamic managerial capabilities are not capabilities in and of themselves. Rather, they are the individual-level assets that are available to managers and likewise to the firm. This relationship between dynamic managerial capabilities and managerial assets (resources) is analogous to the relationship between organizational capabilities and the organizational assets on which these capabilities draw, such as an organization's human capital, social capital, and organizational identity (Figure 23.1).

The emerging dynamic capabilities literature encompasses concepts such as asset orchestration (Helfat et al., 2007; Sirmon & Hitt, 2009), resource orchestration and resource management (Sirmon, Hitt, Ireland, & Gilbert, 2011), and managerial

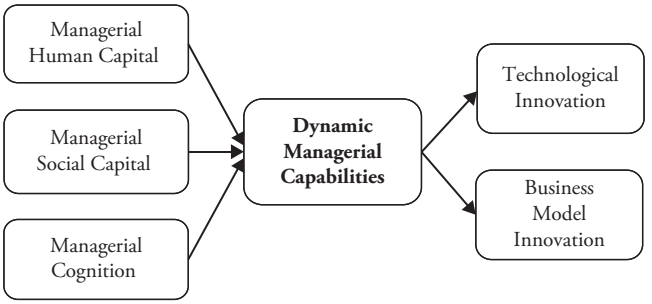

Fig. 23.1 Dynamic Managerial Capabilities and Creativity and Innovation in Organizations.

entrepreneurial action (Teece, 2012). Asset orchestration "include[s] the search, selection, and the configuration/coordination functions that managers perform" (Helfat et al., 2007, p. 115). Asset orchestration and resource orchestration are often used interchangeably in the literature. Resource management refers to the more general managerial activity of effectively managing an organization's resources through resource investment and deployment (Chirico, Sirmon, Sciascia, & Mazzola, 2011).

In summary, dynamic managerial capabilities are individual-level capabilities that have important organizational implications. Individual managers matter because they have different skills, experiences, networks, and mental models of how things can work. Moreover, the concept of dynamic managerial capabilities presumes that the managers of interest have some authority and/or control over organizational resources and thus the capacity to act with them. This notion of the capacity to act with resources separates dynamic managerial capabilities from the many types of individual creative actions that take place within organizations. Likewise, dynamic managerial capabilities are likely to vary across organizations and, as such, to be a potential source of competitive advantage.

Impact of Dynamic Managerial Capabilities on Creativity and Innovation

Here we consider two types of innovation: technological innovation and business model innovation (see Figure 23.1). As noted earlier, we refer to innovation as an outcome rather than a process. That is, we address the content of an innovation rather than the process of creating it.

A technological innovation includes any type of alteration to an existing product or process technology, as well as any new technology. New technologies can be new-to-the-world or new-to-the-firm; both are relevant from the perspective of a focal organization (Leiponen & Helfat, 2010). Firms also may have staff dedicated to the pursuit of technological innovation, including departments devoted to research and development (R&D) and new-product development. Business model innovation concerns alterations in the set of interlinked activities that firms undertake (Zott & Amit, 2007) and is often associated with a shift in the overall strategy of an organization. Business model innovation requires the design of a new business model or redesign of an existing business model, as well as configuration or reconfiguration of firm activities and associated resources. Although business model innovation often stems from the top of an organization, firms may have staff (such as those in strategic planning) whose efforts are directed toward business model innovation.

Almost by definition, any type of innovation requires creativity. An innovation begins with an idea. Even if the innovation does not constitute a radical break from the past, someone or some group must have come up with the idea in the first place. As noted earlier, creativity in organizational settings refers to the generation of novel and potentially useful ideas. Creativity is required not only to generate the initial idea for an innovation but also to further develop and refine the idea; new ideas normally require much more development in order to be useful, and the best route to making them useful is frequently unclear. Often, such development involves trial-and-error before a solution is found.

Managers contribute in important ways to both technological and business model innovation. For technological innovation, managers in charge of R&D and new-product development have substantial input into the development of new ideas and may even propose new ideas themselves. These managers

also shape the eventual outcome through the managerial processes and decisions that guide the innovation process (e.g., funding level, composition of the development team). Managers at the top of organizations also may shape technological innovations by scanning the external environment for new technologies of potential use in their organizations (Helfat & Eisenhardt, 2004), by investing in the pursuit of specific new technologies, by establishing an appropriate organizational structure to pursue technological innovation (e.g., the use of cross-functional teams, centralization vs. decentralization of R&D units), or by changing the existing structure. For business model innovation, top management has a particularly important role, because putting in place a new business model for an entire organization is likely to require leadership from the top. However, managers lower in the organization also may play an important role in coming up with ideas for new business models and in implementing them.

Sensing, Seizing, and Reconfiguring

The capabilities that managers use in an effort to promote change of any type, including technological innovation and business model innovation, are dynamic capabilities by definition. The role of dynamic managerial capabilities in creativity and innovation can be viewed through the lens of Teece's (2007) tripartite division of dynamic capabilities into those for sensing, those for seizing, and those for reconfiguring (or transforming). Although Teece (2007, p. 1319) focused on enterprise-level sensing, seizing, and reconfiguring capacities, he pointed to a role for top management as well. Here, we apply this categorization to individual managers, including, but not limited to, those at the top of the organization, as it relates to technological and business model innovation.

The sensing function of dynamic managerial capabilities provides the capacity to recognize an opportunity for technological or business model innovation. Creativity is likely to be especially important in generating ideas for new innovations of both types. As noted earlier, managers may themselves come up with new ideas for innovations, and managers are critical in managing the process through which organizations sense innovations. Sensing is likely to involve elements of brainstorming, problem-solving through improvisation (Miner, Bassoff, & Moorman, 2001), and environmental scanning, as well as more structured approaches to idea development through dedicated R&D and new-product development units.

Once an idea for a technological innovation has been developed, in order to bring the innovation to fruition, the organization must "seize" the opportunity by making investments, such as in plant and equipment. To seize an opportunity, managers must decide on the level of investment needed, the appropriate organizational structure, the type of asset deployment, the personnel involved, and so on. Business model innovation also may involve managerial decisions for seizing that relate to investment, organizational structure, and asset deployment. In addition, business model innovation likely will require reconfiguration of the existing organizational structure, resources, and routines. The same is true of technological innovations if they involve coordinated change across multiple parts of the organization. Generally, sensing, seizing, and reconfiguring call for dynamic managerial capabilities of asset orchestration, involving "orchestrating complementary and co-specialized assets, inventing and implementing new business models, and making astute investment choices (including with regard to R&D and M&A) in situations of uncertainty and ambiguity" (Helfat et al., 2007, p. 25).

As noted earlier, three types of managerial resources underpin dynamic managerial capabilities: managerial human capital, managerial social capital, and managerial cognition. In what follows, we explain how each of these managerial resources underpins dynamic managerial capabilities for sensing, seizing, and reconfiguring involved in technological and business model innovation.

Managerial Human Capital

Managerial human capital refers to knowledge and expertise, which is generally derived from education and work experience, including both formal training and on-the-job learning (see Bailey & Helfat, 2003; Castanias & Helfat, 1991, 2001). We can think of managerial human capital as a stock of knowledge and expertise on which managers can draw in order to sense opportunities and threats, seize opportunities, and reconfigure organizational resources, routines, and structure. Some of this knowledge is specific to the individual units in which managers operate. Other aspects of the knowledge are specific to particular technologies, firms, functional areas, individual industries or sets of related industries, (the latter refers to industries with similar but not identical resources, customers, and so on). And some knowledge may be completely generic (Bailey & Helfat, 2003; Castanias & Helfat, 1991, 2001).

The nature of a manager's human capital is likely to be important for his or her sensing capacity for technological and business model innovation. For example, technological innovation benefits from absorptive capacity (Cohen & Levinthal, 1989). Without the absorptive capacity to understand new information, managers are less likely to be able to generate new ideas. It also is well known that individuals more easily learn things that are related to what they already know (Cohen & Levinthal, 1989). Thus, when scanning the environment, a manager is more likely to understand information that is related to his or her preexisting human capital. That is, new ideas for technological or business model innovations that are sparked by environmental scanning are likely to be related to a manager's human capital. For example, a manager with a chemical engineering background is likely to come up with very different ideas for a technological innovation than a manager with a background in fine arts.

The specificity of a manager's human capital also affects the types of new ideas that are generated. Managers with greater firm-specific human capital, such as those with longer tenure in the firm, are likely to come up with new ideas that are more closely tailored to the resource base of the firm. Firm-specific human capital may lead to incremental rather than radical innovations if familiarity with the domain limits the scope for new ideas. Alternatively, the "foundational view" of creativity (Weisberg, 1999) suggests that deep immersion in a specific domain also can produce novel ideas through identification of anomalies (Kaplan & Vkaili, 2013; Taylor & Greve, 2006). By implication, in some instances firm-specific human capital may provide an advantage for creativity in radical innovation, as may other forms of human capital that result from prior experience in a particular setting (such as technology-specific, functional-specific, or industry-specific human capital).

Managerial human capital also is important for the seizing and reconfiguring functions of dynamic managerial capabilities. Managers are likely to rely on their prior experience when making investment commitments for technological or business model innovation, including prior functional-area expertise and general management know-how (e.g., for coordination across business units), as well as firm-specific and industry-specific knowledge of technology and business models. As noted earlier, prior managerial experience in a particular domain can prove valuable to creativity, not only in incremental innovation but also in radical innovation. The same logic applies to reconfiguration, in which managers are likely to rely on their human capital when making decisions to alter the routines, resource base, and organizational structure of an organization.

Managerial Social Capital

Managers also are likely to draw on social capital in sensing, seizing, and reconfiguring. Managerial social capital results from relationships with others. These relationships provide conduits for information that may be especially helpful in sensing opportunities for technological and business innovation. Managers who are in brokerage positions span structural holes, which enables them to link individuals in different networks both within and across companies and to obtain superior access to new information and knowledge (Burt, 1992). This positioning may facilitate environmental scanning, and the information thus obtained may spark new ideas. Social ties to individuals in different networks may also provide a manager who is in a brokerage position with qualitatively different types of information, facilitating the recombination of knowledge that is fundamental to innovation (Kogut & Zander, 1992). Managers differ in their positions in a social network; for example, some are brokers, but many are not. These differences in managerial social capital may lead to differences in the sensing activities of managers due to differential access to information.

Managerial social capital is also likely to be important to dynamic managerial capabilities for seizing and reconfiguring. Social ties can confer influence, control, and power (Adler & Kwon, 2002). For example, social ties to others outside the organization can provide access to resources such as financing and skilled personnel that are needed to seize opportunities to develop technological and business model innovations. Advantageous positions in an internal social network, such as a position of centrality, may confer power over resources that are also useful in seizing opportunities. Similarly, internal power and influence derived from social capital may facilitate alterations in personnel, organizational structure, procedures, and physical assets involved in reconfiguration. Because managers differ in their internal and external social capital, seizing and reconfiguring activities are likely to differ across managers as well.

Managerial Cognition

Cognition refers to mental representations (or knowledge structures) and the associated mental processes. Research in management has tended to focus on the former, using various terms in addition to mental representations such as cognitive maps (e.g., Barr, Stimpert, & Huff, 1992), mental models (e.g., Prahalad & Bettis, 1986), frames (e.g., Kaplan, 2008), and schema or interpretive schemes (e.g., Dougherty, 1992). These mental structures serve as a basis for managerial decision making (Walsh, 1995), in much the same way as human capital does. That is, managers' accumulated representations of the world shape the ways in which they perceive and interpret new information (Huff, 1990). In an analogy to human and social capital, these representations might be termed "cognitive capital" on which managers draw when searching for and interpreting new information and when making decisions.

Managerial cognitive capital is likely to affect the sensing of new opportunities for innovation. How managers interpret the new information that they receive, and what information they decide to search for in the first place, depends in part on their mental models. This, in turn, affects the knowledge available for recombination in technological innovation and the way in which managers "see" opportunities for business model innovation. Mental representations also affect seizing and reconfiguring. For example, the "dominant logic" in a company, which reflects managerial belief structures and frames of reference (Prahalad & Bettis, 1986), is likely to influence decisions to make investment commitments to particular technologies or business models or to reconfigure an organization.

Differences between managers in their mental models can lead to differential innovation outcomes. For example, Acha (2002) provided evidence that differences in the "technology frames" through which managers in the oil industry interpreted information about new technologies were associated with differences in the extent of technological innovation as measured by patents and publications. In particular, companies in which managers emphasized the importance of leading-edge technology had many more patents than did companies in which managers viewed technology as a means to solve operational problems. Gavetti (2012) also showed that mental models can affect business model innovation. He described how the head of the Merrill brokerage firm combined a mental model of the existing stock brokerage business with a mental model of supermarkets to develop a new "supermarket" business model of stock brokerage. Mental representations of managers can also hinder business model innovation. For example, despite having been a pioneer in digital imaging technology, Polaroid proved unable to shift its instant photo camera business to digital cameras because of rigid mental models held by its top management (Tripsas & Gavetti, 2000).

Interactions of Human Capital, Social Capital, and Cognition

These three underpinnings of dynamic managerial capabilities—human capital, social capital, and cognition—not only have separable effects but also interact with one another in ways that affect creativity and innovation. Managerial capacity to sense opportunities for new technological and business model innovations depends on an individual's accumulated knowledge and expertise obtained through education and work experience, as well as social relationships. In addition, the way in which managers use this accumulated knowledge depends on their mental models—that is, on the way in which this knowledge is stored and processed in the brain.

These three factors are linked systematically to the capacity of managers to be creative and innovate, as well as their ability to manage the creativity and innovativeness of their organizations. The managerial capacity to generate new ideas and to implement them is not simply random; instead, it depends in systematic ways on dynamic managerial capabilities. This capacity for creativity and innovation is also likely to be constrained: Individuals who possess a particular configuration of human capital, social capital, and cognition are likely to face difficulty innovating in settings that call for a different configuration. In other words, creativity and innovation require some knowledge of the setting in question, and not all human and social capital transfers easily from one setting to another. Mental models are often domain-specific as well.

Conclusion

Dynamic managerial capabilities are critical for sustained organizational creativity and innovation. Although organizations have occasional bursts of creativity and innovation, doing this on a continual basis requires capabilities. The capabilities of individual managers can help organizations to sense and

seize opportunities for technological and business model innovation and to reconfigure organizational resources needed to support innovation. Indeed, differences between organizations in their creativity and innovation may well result from differences in the dynamic capabilities of their managers.

Future research would benefit from more closely examining the ways in which the domain-specific dynamic capabilities of managers contribute to creativity and innovation within organizations. In particular, it seems worthwhile to dig more deeply into the question of how managerial human capital, social capital, and cognition, which underpin dynamic managerial capabilities, affect technological and business model innovation. For example, the work of Taylor and Greve (2006) showed that domain-specific prior experience of individuals has a positive effect on the generation of novel innovations, but they did not examine the underlying human capital, social capital, and cognition. It would be helpful to examine the extent to which the human capital, social capital, and cognition of individual managers leads to the generation of novel innovations and under what conditions. In addition, other research suggests that recombination of knowledge leads to the generation of novel innovations (for a review, see Kaplan & Vkaili, 2013). Therefore, it seems worth examining whether teams that consist of managers with different human capital, social capital, and cognition produce more novel innovations.[3]

Research on the relationship between dynamic managerial capabilities and innovation and creativity has important implications for practice, including human resource management. Firms seeking to generate and implement creative approaches to business models and technology can benefit from assessing not only the human capital of individual managers and management teams, but also their social capital and cognition. As research proceeds, we may also learn more about effective ways to provide managers with such experience, including what types of job rotations may most effectively enhance creativity and innovation and the circumstances under which hiring managers from outside the organization may enhance organizational creativity and innovation.

Notes

1. According to the resource-based view, the extent to which a resource is valuable, rare, inimitable, and non-substitutable (VRIN) affects the extent of competitive advantage that may (or may not) be derived from the resource (Barney, 1991).
2. For further discussion of the relationship between the nature of dynamic capabilities and the extent of market dynamism, see Eisenhardt and Martin (2000) and Peteraf et al. (2013).
3. Although prior research has found that greater diversity of demographic characteristics of top management teams positively affects innovation, relatively little of this research has examined novel business model innovation and technological innovation.

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PART 3

Entrepreneurship

CHAPTER

24

Prigogine's Theory of the Dynamics of Far-From-Equilibrium Systems: Application to Strategic Entrepreneurship and Innovation in Organizational Evolution

Robert A. Burgelman

Abstract

This chapter discusses how 1977 Chemistry Nobel Prize winner Ilya Prigogine's theoretical insights into the dynamics of far-from-equilibrium systems in the physical sciences inform the study of social systems. The insights of Prigogine and his coworkers into the inherent unpredictability of social systems, their autonomous evolution, and their time-dependent success or failure help explain path dependence in technological evolution and the view of organizational becoming. Their observations about how stochastically emerging innovations (and mutations) become incorporated into a system's deterministic relations, and thereby allow it to continue to evolve, find a parallel in an independently developed model in strategic management. This model distinguishes between an organization's autonomous and induced strategy processes related to internal entrepreneurship and innovation that help it match the internal and external ecological dynamics that together determine its evolution and longevity.

Key Words: dynamics, far-from-equilibrium, inherent unpredictability, autonomous evolution, time-dependent success/failure, path dependence, organizational becoming, autonomous innovation, induced innovation, internal/external ecology

Introduction

This chapter offers a perspective on how the theoretical concepts and insights of Ilya Prigogine (1917–2003, the 1977 Nobel Prize winner in Chemistry), which are rooted in complexity theory, can inform organization theory and inspire strategic management scholars interested in organizational evolution and innovation. To that end, the first section of this chapter provides a brief synopsis of some the insights of Prigogine and his collaborators[1] and also draws attention to some of the controversies that his views have created in physics. The next section briefly summarizes how Prigogine and his collaborators have applied the insights gleaned from studying the dynamics of far-from-equilibrium systems in the physical sciences to the study of social systems. This is followed by examples of how other scholars have applied the theory of nonlinear dynamics of far-from-equilibrium systems in economics and organization theory.

Although Prigogine's theoretical insights have potentially important implications for all levels of social systems, the main purpose of this chapter is to examine how they help inform the role of strategic entrepreneurship and innovation internal to the firm in matching the internal and external ecological dynamics that together determine an organization's evolution and its longevity. Then, to meet this purpose, I draw on my own work concerning the role of strategic entrepreneurship and innovation in organizational evolution to establish conceptual links with some of the insights

generated by Prigogine and his collaborators, and I also suggest some linkages to Schumpeter's (1934, 1942) industry-level theoretical ideas about innovation and entrepreneurship. The final section briefly highlights the potential of Prigogine's work to build bridges between the physical and social sciences.

Prigogine's Seminal Scientific Insights: A Brief Synopsis

Dissipative Structures

Prigogine's research on dissipative structures in physics and chemistry generated new insights into the "self-organizing" capacity of nonlinear dynamic systems functioning in far-from-equilibrium conditions, the creative and irreversible role of time in nature (the "arrow of time"), and the roles of "sensitivity to initial conditions" and "instability."

In *Exploring Complexity: An Introduction* (1989), Prigogine and his coauthor, Nicolis, began with Bénard's experiments concerning thermal convection in simple physical systems (at the beginning of the 20th century) and went on to identify a remarkable set of new (emergent) phenomena in physics. Bénard's experiments showed that imposing an external constraint on a system (in this case, increasing the temperature differential imposed on a liquid held between a heated lower plate and a cool upper one) moves it farther and farther away from equilibrium and, beyond a threshold value, makes it possible for complex self-organizing behavior to emerge.[2] When the constraint reaches a second critical value, the new structure becomes turbulent, which Nicolis and Prigogine viewed as "one aspect of a general trend of several classes of systems to evolve in a *chaotic* fashion under certain conditions" (1989, p. 15, italics in original).[3] They stated:

> To summarize, we have seen that nonequilibrium has enabled the system to avoid the thermal disorder … and to transform part of the energy communicated from the environment into an ordered behaviour of a new type, the *dissipative structure*: a regime characterized by symmetry breaking, multiple choices, and correlations of a macroscopic range. We can therefore say that we have witnessed the birth of complexity." (1989, p. 15, italics in original)

They emphasized that, given the appropriate conditions, the emergence of the complexity associated with the dissipative structures is consistent with the existing laws of physics; they also noted that, although it is modest, the new form of complexity is similar to that found in biological systems.

Fluctuation and Bifurcation

A key concept in Prigogine's scientific work is the possibility of "bifurcation and symmetry breaking." Nicolis and Prigogine (1989) pointed out that a state variable of a physical-chemical system can be fundamentally affected by a control parameter: For small values of the parameter, the system is capable of damping small internal fluctuations or external disturbances and remains in asymptotic stability, but beyond a critical value, the system acts like an amplifier and moves toward a new regime, with a potential for entering into differentiated alternative states (bifurcation). The authors underscored the key implication, that the experimenter cannot determine in advance what state the system will end up in: "only chance will decide, through the dynamics of fluctuations" (Nicolis & Prigogine, 1989, p. 72). They concluded, "We have succeeded in formulating, in abstract terms, the remarkable interplay between chance and constraint, between fluctuations and irreversibility" (p. 73). Referring again to biological evolution, they suggested that fluctuations can be viewed as the physical counterpart of mutants, whereas the search for stability can be viewed as the equivalent of biological selection.

The End of Certainty: From Being to Becoming

In *The End of Certainty: Time, Chaos, and the New Laws of Nature* (1996), Prigogine stated that the dream of his youth was to contribute to the unification of science and philosophy by resolving the "enigma of time" (p. 72), which refers to the discrepancy between the "reversible time" of classical physics and the "irreversible time" of human experience. However, resolving the enigma of time involved an intellectual struggle of the highest order and intensity with classical physics because, as Einstein had stated unequivocally, "There is no irreversibility in the basic laws of physics. You have to accept the idea that subjective time with its emphasis on the now has no objective meaning" (Prigogine, 1980, p. 203).[4] Prigogine, in contrast, argued that the theoretical framework of classical physics "seems to indicate that in some sense the present already 'contains' the past and the future. We shall see that this is not so. The future is not included in the past. Even in physics, as in sociology, only various possible 'scenarios' can be predicted" (1980, p. xvii). This led him to develop the physics of "becoming"—to complement, without repudiating, the physics of "being" (Prigogine, 1980).[5]

Caveat: Dissonant Scientific Collegial Responses

Although the point is not critical for the purposes of this paper, it is nevertheless worth noting that some of Prigogine's views, especially as he began to discuss them in the context of the philosophy of science and seemed to posit that they fundamentally changed the scientific understanding of nature (Prigogine, 1996; Prigogine & Stengers, 1979), and thereby set in motion their popularization, have created serious dissonance within the scientific community. Jean Bricmont (1995), for instance, offered a spirited defense of the classical view (especially that of Laplace and Boltzmann, but also that of Darwin), pointing out, for example, that determinism and unpredictability are not necessarily in conflict (unpredictability is to be viewed simply as a manifestation of our ignorance). And he warned that "most people working in sociology or psychology have very little to learn from the alleged 'leap from Newtonianism to Prigoginism' " (p. 159). More important for our purposes, however, is the old truth that "the proof of the pudding is in the eating." The next section, therefore, reports how Prigogine applied his theoretical insights to the analysis of the dynamics of social systems.

Application to Social Systems

Nicolis and Prigogine's discussion of how the analysis of nonlinear dynamic systems capable of performing transitions in far-from-equilibrium conditions applies particularly well to human societies can be found in the section entitled "Self-Organization in Human Systems" in *Exploring Complexity* (1989, pp. 238–242).

Inherent Unpredictability

Moving from physical to social systems, Nicolis and Prigogine (1989, p. 232) stated, requires the introduction of new elements: "New elements come into play and call for a language in which strategy, anticipation, symbols, and ritualization become the key words." They pointed out that the evolution of a social system involves "an interplay between the behavior of its actors and impinging constraints from the environment.... Contrary to the molecules ... human beings develop individual *projects* and *desires*.... The difference between desired and actual behavior therefore acts as a constraint of a new type which, together with the environment, shapes the dynamics." (p. 238, italics in original). This led the authors to ask "whether, under those circumstances, the overall evolution is capable of leading to some kind of global optimum or, on the contrary, whether each human system constitutes a unique realization of a complex stochastic process whose rules can in no way be designed in advance" (p. 238). Based on the analysis of the relevant parallels in physical systems, they suggested that the answer to this question should lean toward the second alternative.

Autonomous Evolution

This answer led Nicolis and Prigogine to view a social system's evolution (they used a mathematical model of the development of an "urban center" as illustration) as an "autonomous process." They suggested that a realistic description of this evolution "is to let the system evolve for a certain period of time, brutally modify its state by launching a new activity or an 'innovation,' again let the system follow its autonomous dynamics until a new innovation is launched, and so forth" (1989, p. 241).[6] The radical implication of this second possibility is that there is no grand vision or plan guiding the evolution of the system, but simply that the system finds a stable and viable pattern: "Recording a particular history among the multitude of the possible histories does not necessarily reflect the action of a global planner attempting to optimize some overall function, but simply that this particular pattern is a stable and viable mode of behavior" (1989, pp. 240–241). This implication, in my view, seems consistent with Jacques Monod's (1970) observation in the biological sphere that *invariance precedes teleonomy*; in other words, existence determines the reason for being, and not the other way around.

Time-Dependent Success or Failure

Based on the illustrative theoretical modeling of the "urban center" development, Nicolis and Prigogine (1989, pp. 241–242) observed the existence of a large number of solutions and of intricate bifurcation phenomena; starting from a space in which variables are initially distributed at random, a distinct pattern gradually emerges which, in the absence of any massive disturbance, remains stable indefinitely. In other words, they considered the possibility of multiple dynamic equilibria. And they concluded (1989, p. 242): "If a new activity is launched at a certain time, it will grow and stabilize. If the place is well chosen, it may even prevent the success of similar attempts made nearby at a later time. However, if the same activity is launched at a different time, it need not succeed: it may regress to zero and represent a total loss."

The inherent unpredictability, autonomous evolution, and time-dependent success or failure of nonlinear dynamic social systems capable of performing transitions in far-from-equilibrium conditions have some important implications. As suggested in the next section, they also find a correspondence, for example, in some types of patterns of technological evolution and in an alternative view of organizational change.

Examples from Economics and Organization Theory

Prigogine and his collaborators' inquiries into the formation of complexity, irreversibility, and indeterminism form part of the foundation of the new science of "complex adaptive systems," which has produced novel concepts that have gained currency in fields such as political science (e.g., Axelrod and Cohen, 2000), economics (Arthur, 1987, 1989, 1994; David, 1990, 2007; North, 1990), and history (e.g., Ferguson, 1998; Gaddis, 2002). Management scholars have also attempted to introduce some of these ideas into administrative science (e.g., Anderson, 1999; Brown & Eisenhardt, 1997; Burgelman, 1983c; Burgelman & Grove, 2007; Davis, Eisenhardt, and Bingham, 2009; Levinthal, 1997; McKelvey, 1997, 2004; Meyer, Gaba, & Colwell, 2005; Thietart & Forgues, 1995; Tsoukas & Chia, 2002). In this section, I briefly discuss applications related to the idea of "path dependence" in theory about technological evolution in economics and applications related to the idea of "becoming" in theory about organizational change.

Path Dependence in Technological Evolution

Prigogine and his collaborators' theoretical explorations of the role of fluctuations in the bifurcations and self-organizing processes in far-from-equilibrium dynamic systems and the possibility of time-dependent sources of success and failure have found parallels in modern economic ideas of "increasing returns to adoption" and "path dependency" associated with certain types of technological evolution (e.g., Arthur, 1987; 1989; 1994). Arthur pointed out that the evolutionary process involved is "*non-ergodic*—or more informally we can say that it is *path dependent* in the sense that the outcome depends on the way in which adoptions build up, that is, on the path the process takes" (1987, p. 438). An important aspect of the competing-technologies adoption process is that it is "inherently unstable, and it can be swayed by the accumulation of small historical events, or small heterogeneities, or small differences in timing" (1987, p. 438). An important theoretical implication is that "What we have in this simple model is order (the eventual adoption-share outcome) emerging from fluctuation (the inherent randomness in the arrival sequence). In modern terminology, our competing-technologies adoption process is therefore a *self-organizing process"* (1987, p. 438).

Organizational Becoming as the Outcome of Continuous Change

Although few of the organizational scholars interested in exploring the application of complexity theory directly have drawn on Prigogine's work, Tsoukas and Chia (2002) explicitly introduced his idea of "becoming" (Prigogine, 1980). They did so by arguing that organizational change is the normal condition rather than the exception. Drawing on Weick's (1979) seminal concept of the social psychology of "organizing" and some of his other work on organizational change, as well as on the ethnographic research of Feldman (2000), Orlikowski, (1996, 1997), and others, they argued that although these authors have inspired new thinking about organizational change, they have not gone far enough. Tsoukas and Chia's more radical proposition was that "Change must not be thought of as an emergent property of organization. Rather, organization must be understood as an emergent property of change." (2002, p. 570). Following through on this, they argued that "Organizations are in a state of perpetual becoming because situated action within them is inherently creative." Moreover, referring to Orlikowski's study of the customer support department of a software company, they suggested (Tsoukas & Chia, 2002, p. 576) that it "shows organizational change to be an 'ongoing improvisation enacted by organizational actors trying to make sense of and act coherently in the world (Orlikowski, 1996: 65)'."

Examining the implications of their radical proposition, Tsoukas and Chia, being management scholars, could not escape asking what, then, is the role of managerial intentionality? Referring to Wittgenstein (1958), they proposed that "managers need to clear their vision to *see* what is going on and, at the same time, help fashion a coherent and desirable *pattern* out of what is going on." (2002, p. 579, italics in original). They referred to my early research on internal corporate venturing (ICV) and commented (2002, p. 579): "Whether

local changes are amplified and become institutionalized depends on the 'structural context,' created to a large extent, as Burgelman [1983b] has convincingly demonstrated, by senior managers. Looking at change from within, managers need to be attentive to the historically shaped interpretive codes (i.e., the discursive template) underlying organizational practices, and how such codes and the associated practices mutate over time as a result of individuals' attempting to cope with new experiences."

Tsoukas and Chia are right that the process model of ICV (Burgelman, 1983b) and the model of the interplays between action and cognition at multiple levels of management (Burgelman, 1988) show that change in organizations—in this case, change in corporate strategy—can be driven locally by individual actors whose interlocking activities change organizational policies and systems. However, they seem to miss an important point, that it is the activation of "strategic context" determination, rather than the "structural context," that plays the key role in the change process. Strategic context determination is an emergent part of the strategy-making process that becomes activated by key actors in organizations to resolve the indeterminacy that exists between newly emerging autonomous strategic initiatives and the corporate strategy in force at a particular moment in time. To create a pathway for resolving this indeterminacy, *the strategic context determination process serves to suspend—for some time—the selective effects of the existing structural context*. Strategic context determination processes thus are part of the means by which organizations are able to evolve in an ongoing and possibly never-ending process of "becoming" and to avoid the stagnation and stasis associated with a stable and unchanging equilibrium (where nothing of interest happens).

Parallels with the Role of Strategy Making in Organizational Evolution

In this section, I briefly discuss further how some of the insights from my research on the role of internal strategic entrepreneurship and innovation can be related to some of Prigogine and his collaborators' insights about the dynamics of complex systems. Informed by the methodology of longitudinal qualitative research (Burgelman, 2011), I do this from the inside out; that is, I relate ideas independently developed in the field of strategy and organization to ideas developed in the field of complexity studies, rather than taking ideas from complexity theory and applying them to the field of strategy and organization (an outside-in approach). The inside-out approach seeks to avoid the potential trap of prematurely imposing general and abstract concepts from other fields of science onto strategic and organizational phenomena, which may limit the depth of insight that can be gained from first identifying and examining such phenomena on their own substantive terms. Conversely, the inside-out approach serves to provide independent corroboration of the potential generality of newly identified substantive strategic and organizational phenomena.

Internal Corporate Venturing as a Source of Organizational Becoming

Longitudinal field research of ICV in a diversified major corporation (Burgelman, 1983b) produced behavioral data concerning activities of different levels of management involved in the ICV process that could not all be mapped onto Bower's (1970) process model of strategic capital investment. This anomaly was resolved by extending Bower's process model to encompass "strategic context determination" as a critical part. As noted earlier, strategic context determination was identified as the emergent part of the strategy-making process that became activated by key actors at multiple levels in the organization as they tried to resolve the indeterminacy that existed between newly emerging ICV initiatives and the corporate strategy in force at a particular moment in time. Strategic context determination thus could be viewed as part of the means through which corporate strategic change and organizational becoming are achieved.[7]

The ICV research also revealed that strategic context determination involved interplays between action and cognition at multiple levels of management and that the strategy-making process was fundamentally a social learning process. This showed the inherent intertwining of process and content in strategy making, which was captured in the proposition that *process generates content, but content disciplines process* (Burgelman, 1988). The disciplining effect of content on process may lead to potentially interesting forms of path dependency. For instance, my later research on Intel's strategic evolution (discussed later) suggested that, over time, a company's *generic* strategy—differentiation *or* cost leadership (Porter, 1980)—may be a stronger inertial force than its *substantive* strategy at a particular time (Burgelman, 2002a, chapter 4).

In addition, my ICV research discovered an anomaly in relation to Chandler's fundamental proposition that "structure follows strategy" (Chandler, 1962). I found that the creation of a new venture division was, at least in part, a response to the company's already having had a number of new venture initiatives dispersed in different divisions *before* top management articulated a deliberate corporate-level diversification strategy. This finding suggested that in the case of ICV, *structure follows strategic behavior*, and this led to postulating the existence of *autonomous* strategic initiatives (not driven by the existing corporate strategy) in parallel with *induced* strategic initiatives (driven by the existing corporate strategy) (Burgelman, 1983a).

Strategy Making as a Variation–Selection–Retention Process

The discovery of the autonomous and induced strategy processes, in turn, led to making a conceptual link with the variation–selection–retention framework of cultural evolutionary theory, which had recently been introduced into organization theory (Campbell, 1969; Weick, 1969). Integrating Chandler's, Bower's and my own ICV findings produced an evolutionary framework of the strategy-making process (Burgelman, 1983a). Figure 24.1 diagrams this framework in established companies.

As shown in Figure 24.1, induced strategic action exploits opportunities that are within the scope of a company's current strategy and that extend the company further in its current product-market environment (E). Autonomous strategic action, which emerges spontaneously from an organization's capabilities, pursues opportunities that emerge through exploration outside the scope of the current strategy and provides the basis for entering into and exploiting new product-market environments (e). The framework of induced and autonomous strategy processes turned out to be useful as a theoretical foundation for integrating strategic management and corporate entrepreneurship (Burgelman, 1983c).[8]

Stumbling Onto Prigogine's Ideas of Self-Organization and Becoming

While working on the paper (in fall 1981) in which I intended to integrate strategic management and corporate entrepreneurship, I stumbled onto *From Being to Becoming*, a book written by Ilya Prigogine, a famous fellow Belgian having recently won the Nobel Prize in Chemistry. Intrigued by the title and browsing through the highly mathematical chapter on self-organization, a topic of interest, I was struck by its final paragraph:

> This "over creativity" of nature emerges naturally from the type of description being suggested here, in which "mutations" and "innovations" occur stochastically and are integrated into the system by the deterministic relations prevailing at the moment. Thus, we have in this perspective the constant generation of "new types" and "new ideas" that may be incorporated into the structure of the system, causing its continual evolution. (1980, p. 128)

The parallel between Prigogine's conclusion and the model of induced and autonomous strategic initiatives seemed immediately clear: Prigogine's observation of "mutations" and "innovations" occurring stochastically mapped directly onto the autonomous process; and his observation that they can become integrated into the system by the "deterministic relations prevailing at the moment" mapped directly onto the induced process. It also seemed clear that the strategic context determination process provided the critical means through which the "integration into the system" is fostered. The framework thus could possibly provide a stepping stone in developing a theory of organizational adaptation as "becoming"—a view of an open-ended, unpredictable, but potentially manageable future.

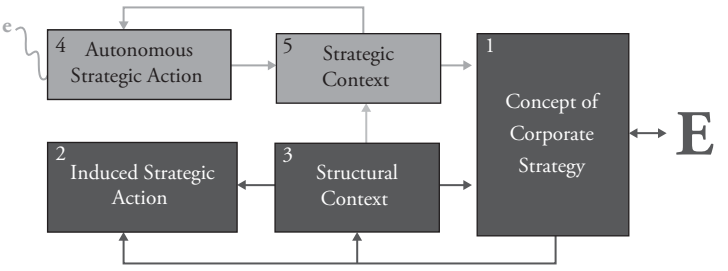

Fig. 24.1 An Evolutionary Framework of the Strategy-Making Process in Established Companies.
Note. Burgelman, R. A. (2002a). *Strategy is destiny: How strategy-making shapes a company's future* (p. 9). New York, NY: The Free Press.

The Role of Tension and a Link to "Creative Destruction"

But what drives autonomous strategic behavior, which is inherently risky, at the individual level? And why do organizations tolerate it? One possible answer to the first question was that the strategy-making process constitutes an "opportunity structure" for individual careers (Burgelman, 1983c, 1991). Although some individual participants may pursue autonomous initiatives because of temperament and the inherent creative value they gain from it personally, others may do so because their access to the induced strategy process has become more restricted (for a number of possible reasons) and they seek to advance their career through pursuing opportunities in the autonomous strategy process. One possible answer to the second question was that differences between desired and actual profitable growth determine an organization's support for autonomous strategic behavior (Burgelman, 1983c; 1991; Burgelman & Valikangas, 2005). These sorts of performance pressures (at the individual and organizational levels) can be viewed as manifestations of Nicolis and Prigogine's "constraints of a new type" (1989, p. 286): Sources of "tension" are analogous to a control parameter which, beyond a threshold level, drives the system (individual or organization) away from equilibrium and opens up the possibility for new strategic choices (1989, pp. 60–61).[9]

It also seems potentially interesting to recast Schumpeter's concept of "creative destruction" (1934, 1942) in terms of this sort of tension at the industry level of analysis. In some cases, or at some times, companies may operate in a stable industry structure and develop a strategy-making process geared toward coping with linear strategic dynamics, which are relatively easy to understand and predict (e.g., Barnett & Hansen, 1996; Porter, 1980). In most cases today, however, the emergence of "hyper-competition" (e.g., D'Aveni, 1994), innovation driven by companies' "dynamic capabilities" (e.g., Teece, Pisano, & Shuen, 1997), and "disruptive technology" (e.g., Christensen & Bower, 1996) has stimulated renewed interest in the Schumpeterian entrepreneurial process that creates a "gale of creative destruction" in an industry. The Schumpeterian entrepreneur is typically a newcomer (startup) who engages in rule-changing strategic actions that create tension in the industry and, if successful, may result in nonlinear strategic industry dynamics. Nonlinear strategic dynamics are governed by positive (force-amplifying) feedback loops in the interactions between the players in the industry, and their outcomes are difficult to understand and predict (e.g., Burgelman & Grove, 2007). As a result, the industry structure is radically changed. However, if the Schumpeterian newcomer wants to be able to stay in control of the strategic change process, it faces the challenge of dealing with the internal and external "complexity" generated by the nonlinear strategic dynamics that it has set in motion (Burgelman & Grove, 2007).

Internal Ecology of Strategy Making

Casting the strategy-making process in terms of the variation–selection–retention paradigm of cultural evolutionary theory also required confronting some of the theoretical and empirical implications of the newly emerging field of organizational ecology in organization theory, which left little role for strategy in organizational evolution (e.g., Hannan & Freeman, 1977, 1984). Rather than suggest that organizational ecology was flawed or irrelevant, however, the evolutionary framework of the strategy-making process only suggested that it was incomplete (Burgelman, 1991). It proposed to complete the ecological theory of organizational evolution by viewing large, complex organizations as ecological systems in their own right. It proposed that the strategy-making process could be reconceptualized in terms of an internal ecological process in which induced and autonomous strategic initiatives competed for the organization's resources, governed by the organization's *internal selection environment*. As such, the internal ecology of strategy making could be viewed as an additional level of analysis that complemented the organization, population, and community levels of analysis considered in the organizational ecology literature (Burgelman, 1991).

This perspective was strengthened by longitudinal field research on the strategic evolution of Intel Corporation (Burgelman, 1991, 1994, 1996, 2002a, 2002b; Burgelman & Grove, 2007). This research found that Intel's strategy making resembled an internal ecology in which induced (memory-related) and autonomous (microprocessor-related) initiatives competed in the company's internal selection environment for scarce resources based on their success in the external competitive environment. Strategy making viewed through the lens of internal ecological processes provided insight into forces driving organizational change that were not contemplated in the original theoretical articulations of organizational ecology (Hannan & Freeman, 1977, 1984).

Established companies continue to remain subject to the selection force of the external environment, and many, even very large ones, do in fact succumb to it in the long run (Burgelman & Grove, 2007). But established companies have also gained the opportunity to substitute, to some extent, internal selection for external selection. This is the central idea of the internal ecology model of strategy making. An established company can be viewed as an ecological system in its own right, and its survival and continued success depend on the functioning of its internal ecology of strategy making, which constitutes an adaptive organizational capability. Whereas ecological processes at the level of organizational populations (industries) involve organizational founding and disbanding rates, the internal ecology of strategy making involves entering new businesses and exiting from failing businesses over time. Different parts of the internal ecology of strategy making can be linked to different forms of adaptation, and this helps reconcile opposing ideas about various consequences of strategic change (Burgelman & Grove, 2007).

Strategic Dissonance and Strategic Inflection Points

My research on the role of strategy-making in Intel's evolution also discovered that tension at the organizational level of analysis is likely to take the form of "strategic dissonance." Strategic dissonance is caused by increasingly conflicting views among top executives; it signals that the organization is reaching a "strategic inflection point" (similar to a bifurcation point) and that continued adaptation will require new strategic choices (Burgelman & Grove, 1996). In Intel's case, strategic dissonance in the early 1980s resulted from gradually increasing divergences between the competencies required to be successful in the commoditizing semiconductor memory business (excellence in manufacturing, which the company did not have) and the company's existing competencies (design and process technology)—as well as between its corporate strategy as stated by top management (to pursue the semiconductor memory business) and the strategic actions taken by middle-level managers (allocating scarce manufacturing capacity away from memory products). By 1985, this tension—manifested in strategic dissonance—reached a critical level, forcing top management to choose between (1) trying to regain a viable position in the commoditized memory business and (2) fundamentally changing strategic direction, exiting from the memory business, and focusing the company on the business of microprocessors for personal computers (PCs).

Coevolutionary Lock-in and a Link to "Prospect Theory"

Realizing that Intel, starting with the x386 product generation, could become the sole-source supplier of microprocessors for the fast-growing PC industry (because of the workings of increasing returns to adoption), top management decided in 1985 to focus the company in that direction. This decision solidified and legitimized a corporate transformation that had already been in the making—through the working of its internal selection environment—for several years. It turned out to be the right decision made at the right time, and it made the company extremely successful for a period of about 10 years (1987–1997).

However, this corporate transformation and the extraordinary success that the company was able to achieve also transformed Intel's strategy-making process from an "internal ecology model" into a "rational actor model" (Burgelman, 2002b, pp. 4–6). This change systematically favored the induced strategy process and emaciated the capacity to activate strategic context determination processes, thereby reducing the chances for autonomous strategic initiatives to become integrated into the corporate strategy going forward. The CEO's rallying cry—"The PC is It!"—vectored all strategic action toward pursuing profitable growth opportunities in the PC industry. As Craig Barret, Andy Grove's successor as Intel's CEO, put it, the core microprocessor business had become like a "creosote bush": a desert plant that poisons the ground around it to prevent other plants from growing nearby.

The unintended consequence of the company's extraordinary success was "coevolutionary lock-in" (Burgelman, 2002b)—a new form of strategic inertia. Coevolutionary lock-in meant that Intel had to make more and more resource commitments to continue driving the PC industry and became more and more specialized to that industry. This made it increasingly difficult to pursue new business opportunities (such as networking, in which some parts of the company were already quite seriously engaged but could not get top management's full support).

It seems not unreasonable to hypothesize that the potential for coevolutionary lock-in is high for highly successful firms, especially if, like Intel,

they remain strongly focused in a narrow business sector. Also, interestingly, coevolutionary lock-in can again be related to Nicolis and Prigogine's insights. As noted earlier, they found that in the case of intricate bifurcation phenomena with concomitant new choices, these choices and their success or failure are highly time dependent. That is, if an activity is launched at the wrong time, it may never take off and may regress to zero; on the other hand, if it is launched at the right time, it will grow, and in the absence of massive disturbance, it will remain stable indefinitely (at least as long as the success lasts), even preventing the success of similar attempts made nearby at a later time (1989, pp. 241–242). Intel was to some extent lucky (Andy Grove called it "earned luck") to be at the time confronted by a strategic inflection point in a position where it could decide to become sole source (IBM had failed to insist on exclusivity when first sourcing from Intel). After making that transformative strategic choice, Intel achieved a period of stability (supported still by increasing returns to adoption) that lasted for the period of Grove's tenure as CEO.

In light of the Intel example, Prigogine and Nicolis's notion of time-dependent success or failure—making strategic choices at the "right" or "wrong" time—can also be potentially fruitfully related to the idea of "reference points" with respect to domains of gains or losses in prospect theory (e.g., Kahneman, 2011). Given that Intel was in the domain of losses in the semiconductor memory business, it was perhaps not surprising that top management took the risk of transforming the company to become a winner in the business of microprocessors for PCs. Given that Intel was thereby able to enter into the domain of extraordinary gains, it was perhaps also not surprising that top management subsequently was reluctant to persist in seeing through several new but risky growth opportunities outside the now-familiar PC microprocessor business.

Order, Complexity, and Chaos

Coevolutionary lock-in drew attention to the potential limitations of "guided evolution" (Lovas & Ghoshal, 2000). It also confirmed the importance of strategic context determination in maintaining a balance between induced and autonomous strategy processes (Burgelman & Grove, 2007). The importance of this balance provided a link to Kauffman's (1993) theory about "adaptation at the edge of chaos." In his stylized analysis of Boolean networks, Kauffman (p. 234) distinguished between three regimes that such networks can exhibit: ordered, complex, and chaotic. He viewed complex systems—poised between order and chaos—as the "natural culmination of selective evolution" (p. 235). The importance of balancing induced and autonomous strategy processes seemed particularly clear in light of Gould's (2002) succinct translation of the idea of adaptation at the edge of chaos:

> . . . that a system must be adaptive, but that too much (and too precise) a local fitting may freeze a system in transient optimality with insufficient capacity for future change. Too much chaos may prove fatal by excessive and unpredictable fluctuation, both in external environments and internal states. . . . Adaptation at the edge of chaos balances both desiderata of current functionality and potential for future change, or evolvability. (pp. 1273–1274)

Discussion and Conclusion

This chapter has provided a brief summary of some of the most important insights of Ilya Prigogine, one of the great physical scientists of the 20th century, who, with the help of long-time collaborators, also endeavoured to examine the implications of his insights for the study of social systems. As discussed in some detail in this chapter, some organization and management scholars have already been inspired by Prigogine's rich and creative insights. Others, no doubt, will find it rewarding to familiarize themselves with these insights, even though this will perhaps not directly lead them to change their research direction. I, for one, am grateful for the chance encounter with Prigogine's work early on, while my main ideas were still taking shape.

Toward Consilience and a New Philosophy of Science

Prigogine and his collaborators were, of course, keenly aware that concepts such as coherence, complexity, and order have long been part of Darwinian theory in biology and the social sciences and have only recently been introduced into physics to describe the behavior of ordinary physical systems (e.g., Nicolis & Prigogine, 1989, p. 13). It seems somewhat ironic, then, that it is only after the integration of these concepts into the new physical sciences of "complexity" and "chaos" that social scientists have begun to seriously re-examine how they approach these phenomena. McKelvey (2004), for instance, pointed out that the "fast-motion science"

of complexity may be better equipped to study order in the biosphere than the "slow-motion" variation and selective retention theory of Darwinian gradualism. However, taking into account the working of dual transmission mechanisms (genetics and learning), the variation–selection–retention theory of cultural evolution can be a fast-motion science (Boyd & Richerson, 1985; Richerson & Boyd, 2005). It would therefore seem that there is room for organizational evolutionists to fruitfully explore how they can relate their work to complexity science. The good news is that all of this somewhat roundabout development may very well be a significant manifestation of what O. E. Wilson (1998) called "consilience": the drive toward the unity of knowledge.

Not only did Prigogine attempt to draw implications from his work in the physical sciences for the theoretical and empirical study of social systems, but he was also led by his far-reaching and revolutionary insights into the nature of the physical world, especially his highly controversial conclusions about irreversibility and the "arrow of time," to attempt to lay the foundation for a new philosophy of science and for a "new alliance" between humankind and the endeavors of its modern sciences (e.g., Prigogine & Stengers, 1979). Aware that many important questions have not yet been asked or remain unresolved, he nevertheless tried to lay part of the foundation for finding "the narrow path that avoids the dramatic alternatives of blind laws and arbitrary events" (Prigogine, 1996, p. 189). Although some scholars in the physical sciences remain highly sceptical of this statement,[10] it would seem to resonate better in fields of social science such as strategic management. There, the concept of strategy can be viewed as the means for actors to navigate, within a humanly meaningful time horizon, between two extreme world views—one governed entirely by randomness and one already predetermined completely by fate (Burgelman, 2002a, pp. 3–4). However, to maintain the balance between fit and evolvability that is needed to control destiny in an ever more dynamic external selection environment, the concept of strategy must relentlessly become invigorated and renewed through creativity, innovation, and entrepreneurship.

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Notes

1. Although Prigogine was reportedly always the driving theoretical force, some of these ideas were developed with his long-time collaborators, Grégoire Nicolis and Isabelle Stengers at the Free University of Brussels. Nicolis's careful and methodical approach to scientific and mathematical proof is viewed by some who knew both scientists well as a good complement to Prigogine's more intuitive and "big picture" approach. Stengers was more involved with translating the implications of Prigogine's new vision of physical science for the philosophy of science. I am grateful to Bill McKelvey for relaying this information to me from his own sources. Where appropriate in this paper, I mention the collaborators' names together with Prigogine's.
2. Based on their findings that simple systems can manifest complex behavior under certain conditions, Nicolis and Prigogine posited that "It is more natural, or at least less ambiguous, to speak of *complex behavior* rather than complex systems" (Nicolis & Prigogine, 1989, p. 8, italics in original).
3. McKelvey (2004, p. 76) commented, "Since Bénard (1901), fluid dynamicists' [sic] have focused on the 1st critical value, R_{c1}—the Rayleigh number [a special value of the Reynolds number R, which is a measure of the rate of fluid flow]—that separates laminar from turbulent flows. Below the 1st critical value, viscous damping dominates so self-organized emergent (new) order does not occur. Above the Rayleigh number inertial fluid motion dynamics occur.... Lorenz [1963], followed by complexity scientists, has added a second critical value, R_{c2}. This one separates the region of emergent complexity from deterministic chaos—the so-called 'edge of chaos'." McKelvey pointed out that Prigogine and his collaborators are focused on the self-organizing activity between the 1st and 2nd critical points. His technical definitions are useful to distinguish between "complexity" and "edge of chaos," which is not always clear in the applications of these different theories by management scholars and consultants.
4. Prigogine (1996, p. 165) related the reaction of Einstein (who firmly believed that the distinction between past, present, and future is an illusion) when he was confronted by the great mathematician, Kurt Gödel, with a cosmological model that would allow him to return to his own past: "Einstein was not enthusiastic. In his answer to Gödel, he wrote that he could not believe that he could 'telegraph to his own past.' He even added that this impossibility should lead physicists to reconsider the problem of irreversibility."
5. I thank Bill McKelvey (personal communication) for telling me that, according to one of Prigogine's collaborators, Prigogine spent a long time trying to find the "science" of far-from-equilibrium open systems. Only after friendly conversations with P. Glansdorff, another collaborator (e.g., Glansdorff & Prigogine, 1971), did they realize that the reason they could not find the equations that governed these open systems perhaps was that these systems did not necessarily have to obey a simple predictive equation. They then realized that open systems must become to some degree autonomous, and self-organization and structural evolution were theoretically possible.
6. Prigogine and Nicolis did not specify particular new activities or innovations for the evolving urban center, but one can easily imagine examples such as offering new tax

subsidies to attract additional businesses (a new activity) or adopting a state-of-the-art public transportation system (an innovation).

7. Doing so generalized the process model as a conceptual tool for the study of strategy making and strategic change (e.g., Mintzberg, Ahlstrand, & Lampel, 1998). It was later found useful, for instance, to help conceptualize the strategic business exit process (Burgelman, 1996).
8. In this way, it could be related to Mintzberg's framework of emergent and deliberate strategy (Mintzberg, 1978) and his typology of modes of strategy making (Mintzberg, 1973), and it also served to further illuminate the generative processes that produce "prospectors," "defenders," "analyzers," and "reactors" in Miles and Snow's (1978) typology. Furthermore, induced and autonomous strategy processes can be related to exploitation and exploration in organizational learning (March, 1991) and to theory about organizational ambidexterity (e.g., O'Reilly & Tushman, 2008). For further elaboration, see Burgelman (2002a, pp. 15-17).
9. I thank Bill McKelvey for pointing out the importance of "tension" in Nicolis and Prigogine 's (1989) view of the physical world (i.e., environmental tension in the form of energy differentials). He also noted (personal communication), "For people in Strategy and Organization studies, tension is environmentally imposed, though for lower levels in an organization tension could be imposed by top management.… Steve Jobs being a good example … or it could emerge like 'weeds' [referencing Mintzberg & McHugh, 1985]." I am suggesting here that at the individual level, autonomous strategic behavior is an energy source that can generate critical tension in the organization—Mintzberg and McHugh's "weeds" and Penrose's (1968) "internal impulse to grow" are related ideas. And at the organizational level, performance deficiencies can create critical tension that energizes top management to support autonomous strategic behavior (see also the discussion of "strategic dissonance" in this chapter).
10. In his criticism of Prigogine's popularizing writings, the physicist Bricmont (1995, p. 195) pointed out that "there is no precise sense in which a 'narrow path' has been found between 'blind laws' and 'arbitrary events'." He relegated the statement to poetry rather than science.

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CHAPTER

25

Why Aren't Entrepreneurs More Creative? Conditions Affecting Creativity and Innovation in Entrepreneurial Activity

Howard E. Aldrich *and* Martha A. Martinez

Abstract

Entrepreneurs often encounter contexts in which other people have preset expectations about their practices, processes, and products; these institutionalized expectations often constrain actions to choices deemed "appropriate" and "reasonable." Such constraints arise because institutional forces have created internalized pre-reflective behaviors, including habits and heuristics, that reduce creativity and stifle innovation. By contrast, some conditions, such as institutional complexity and multiple audiences with divergent expectations, provide both the information and the motivation for creative and innovative actions. Finally, entrepreneurial networks facilitate creativity and innovation when they combine both diversity and cohesion within an environment of tolerance for divergent viewpoints.

Key Words: evolution, entrepreneur, creativity, innovation, social networks, learning

Introduction

Entrepreneurship and management scholars have created vibrant literatures on the causes and conditions promoting creativity, whereas sociologists have mostly concentrated on why creativity is so rare. Sociologists are skeptical because empirical studies show disappointingly low observed levels of creativity in the outcomes of most entrepreneurial efforts (Aldrich & Ruef, 2006). Generally, entrepreneurial efforts leading to stable, self-sustainable organizations yield simple replications of existing organizational forms (Aldrich & Fiol, 1994; Aldrich & Martinez, 2001; Gartner, 1985; Low & Abrahamson, 1997). The products and services offered are typically slight variations on what already exists, rather than drastically different ones. Indeed, radical innovation in entrepreneurship is an uncommon phenomenon.

Given this emphasis on the mundane nature of entrepreneurial outcomes, what can sociologists contribute to understanding creativity and innovation in the context of entrepreneurship? We offer two suggestions. First, a sociological perspective provides insight into the obstacles facing creative entrepreneurs. In particular, institutional pressures toward conformity reinforce learned habits and heuristics and push entrepreneurs toward imitation instead of innovation. Second, sociology can illuminate what types of social structures, particularly institutional arrangements and network configurations, *facilitate* entrepreneurial creativity. In this chapter, we limit ourselves to defining entrepreneurship as the creation of new ventures, although we acknowledge that others have defined it more broadly to include other kinds of innovative acts that may take place in established organizations (Shane, 2000). Startups represent the situation most likely to reveal creative and innovative activities by people behaving in an entrepreneurial fashion.

We distinguish creative intentions from creative outcomes. In contrast to "creativity," which

is defined as the capacity to generate novel ideas, innovation is about the translation of those ideas into viable and successful products, processes, systems, and institutions. Innovation thus represents the realization of the potential that is latent in creative ideas. Innovation does not necessarily mean the creation of something that is new to the world, but rather only something new for the individuals or organizations attempting to bring it to life.

As evolutionary theorists, we expect that most variations, even most intentional variations, are likely to be inferior to variations that have previously been selected and retained (Aldrich & Ruef, 2006). A classic example is the rise of bureaucratic structure as an organizational innovation in the early days of the Industrial Revolution in England, as exemplified in Josiah Wedgewood's pottery factory (Stinchcombe, 1965). Despite the subsequent development of alternatives such matrix- and network-based organizations, traditional bureaucracy remains a very common organizational form. Even when innovations might be advantageous, such as when environments change radically, it is quite likely that a high proportion of creative variations will be selected against. Therefore, we are not arguing that creativity necessarily leads to innovation, nor that innovation is necessarily successful. As with any assessment of variations within a selection paradigm, performance and survival depend on the context.

Entrepreneurs in an Iron Cage: Institutional Barriers to Creativity

Entrepreneurs would seem to have more opportunities for creativity and innovation than people working within established organizations. First, they are free from the bureaucratic strictures of firms that suppress creativity and innovation. By enacting their efforts outside established structures, they are not subject to path dependency through bureaucratic mechanisms (McMullen & Shepherd, 2006).

Second, some researchers argue that entrepreneurs of necessity must make do with whatever resources they have, following the principles of bricolage, and thus are driven to find creative ways to satisfy their needs with whatever they can cobble together (Baker, Miner, & Easley, 2003; Baker & Nelson, 2005; Desa, 2012). One example of how bricolage leads to innovation is the growth of crowd-funding websites, which are Internet platforms that allow entrepreneurs to bypass traditional sources of funding and take contributions from the public in exchange for small rewards. Although websites such as Kickstarter and Indiegogo initially focused mainly on "projects" rather than business startups, over time some nascent entrepreneurs began using them as a method of financially bootstrapping their operations. Entrepreneurs argued that traditional sources of funds, such as commercial lending organizations, were unwilling to risk funding their creative ideas for new ventures. Subsequently, a few equity-based platforms developed, such as EquityNet, but for legal and regulatory reasons they were highly restricted in terms of who could use them. After an intensive lobbying campaign by some entrepreneurs and politicians, President Obama signed the Jumpstart Our Business Startups (JOBS) Act into law in April 2012, substantially broadening the possibilities of participation in crowd funding by investors and startups.

Although entrepreneurs may not be subject to bureaucratic pressures, once they initiate the organizing process, they encounter contexts in which other people—vendors, investors, employees, customers, regulators, and others—already have their own expectations concerning "entrepreneurship" and the practices, processes, and products they will be offered. To some extent, such expectations constrain entrepreneurial creativity and innovation. Of course, those expectations might also educate entrepreneurs by showing them what they are supposed to do in particular contexts. Many of these expectations come from institutions, which are collections of stable rules and roles with corresponding sets of meanings that constrain actions (Czarniawska, 2008), leading humans to select activities based on their *appropriateness* rather than on more technical but potentially less appropriate criteria (Biggart & Beamish, 2003). There are certain things entrepreneurs cannot do, regardless of the need for them. An extreme example is the organ donor system in the United States. Even though current organizations fall far short of satisfying the need for organs, schemes that could increase donations, such as creating a free market in human organs—a "market" solution—are considered not only illegal but also immoral (Fourcade & Healy, 2007).

From an institutional perspective, entrepreneurs must learn to symbolically represent their new venture as compatible with existing cultural templates (Clarke, 2011). In the "cultural codes" view of organizational forms, *audiences*—consumers,

investors, vendors, analysts, and so forth—hold the key to the expectations that organizations must meet (Hsu & Hannan, 2005, p. 476). The cultural codes' view acknowledges that organizations face multiple audiences that might hold different expectations, making entrepreneurs' jobs difficult, especially if a venture is the first of its kind and thus might be creating an entirely new industry. For instance, Khaire (2014) found that pioneering entrepreneurs in the Indian fashion industry had to frame high-end fashion in a manner compatible with prevailing social mores. She also found that other organizational forms, such as media firms, retailers, and educational institutions, were critical to establishing the worth of the new industry. Indeed, in some markets, people expect organizations to be "creative" and to offer new products on a regular basis. In such markets, audiences would perceive a lack of creativity and innovation as a sign of organizational decay.

New institutional theory (NIT), the main paradigm for the study of institutional effects, has branched into two alternative views of human agency over the past few decades. The traditional view has emphasized strong constraints on agency, whereas an emerging view emphasizes a range of opportunities for limited agency. In the version of NIT emphasizing strong external constraints, theorists stress that institutional forces severely limit variations in behavior, even when creative and innovative deviations from the norm might help people adapt to local conditions (Meyer, 2008). NIT downplays the likelihood of human creativity and innovation, because entrepreneurs and organizations within the same areas of economic activity are seen as subject to common institutional pressures causing them to develop similar structures and strategies over time, a condition labeled "institutional isomorphism" by DiMaggio and Powell (1983). Routines developed under such conditions persist even when it is clear that they are no longer adequate for dealing with new problems that arise. For example, after natural disasters such as earthquakes and tsunamis, government agencies often respond with preset programs that fit poorly the actual circumstances produced by the disaster (Aldrich, 2012).

Why do institutional environments have such powerful effects on individuals? Underlying institutional theory's view is a set of assumptions about the extent to which habits and heuristics make humans highly susceptible to their surroundings. Accumulated evidence indicates that much of human behavior is driven by habits and reactions to context-specific cues, rather than by contemplative forethought (Dalton, 2004; Dequech, 2013; Hodgson, 2004; Wood, Quinn, & Kashy, 2002). Habits are dispositions to act in particular ways under particular conditions, and they play an important role in how people respond to new situations. Therefore, understanding why institutional forces have such strong effects on the likelihood of entrepreneurial creativity requires a brief exploration of habits and heuristics.

Much of what entrepreneurs bring to startup attempts involves social or automatic cognition, unconscious mental processes, and habitual behaviors of which they are unaware (Bargh & Williams, 2006). When they encounter ambiguities or uncertainties in handling complex tasks, people are quite likely to fall back on habitual ways of responding, rather than crafting a creative response in the moment (Hodgson, 2004). For example, when a shipping clerk does not show up for work in a small firm and an order must be processed quickly, entrepreneurs might jump in and do the work themselves. Handling the emergency in this way means that entrepreneurs lose opportunities to learn from the situation. Rather than stepping back and asking whether work could be reorganized so that people could be cross-trained and employee absences covered by other workers, entrepreneurs are likely to just deal with the situation on an emergency basis and then go on to something else.

In this case, the habit of dealing with crises by doing the work themselves undermines the search for a creative solution to a long-run problem. Baker et al. (2003) described a similar process, calling the emergency response "improvisation" and noting that firms that were highly competent improvisers might undermine their prospects of developing design and execution competencies. Thus, ironically, firms that are excellent improvisers may be poor long-range planners. The effects of habits are even stronger in contexts with severe time and resource constraints.

Heuristics—cognitive shortcuts used by individuals when they are resource and time constrained—go hand-in-hand with habits in explaining much of entrepreneurial behavior (Aldrich & Yang, 2014). Formerly, researchers in the cognitive heuristics field treated reliance on heuristics as a cognitive deficiency on the part of humans. They noted that people relied too heavily on judgments based on small samples, were overly impressed by highly visible and easily available

information, and seemed unable to grasp the laws of probability (Kahneman, 2003). Subsequent developments in the "adaptive decision program" and then in the "ecological rationality" research program offered grounds for greater optimism regarding how well people do when using simple heuristics in real-world situations (Todd, Gigerenzer, & Group, 2012).

Rather than emphasizing human fallibility, the new approach identifies much of human behavior as ecologically rational, positing that people use information that is appropriate and helpful, given what is available in their local environments. They use simple decision rules, such as "take the best," that suffice in situations in which they must conserve time and resources, similar to the behavior that March and Simon (1958) referred to as "satisficing." The converse of this principle is that entrepreneurs may be able to recognize where creativity and innovation are needed and modify their typical decision strategies. We can think of entrepreneurs as people doing as well as they can and being as creative as possible within the constraints they experience.

The ecological rationality approach helps us understand why, for example, a simple rule such as "imitate the majority in the industry" for choosing new organizational routines is ecologically rational if the environment is stable or changing slowly and information search is costly and time-consuming. Similarly, a simple rule such as "imitate the most successful firm in the industry" is ecologically rational when individual learning is slow and information search is costly and time-consuming. New ventures, therefore, often adopt the structures of incumbent firms in their industry. Although not very creative, it is a rational choice for entrepreneurs wishing to grow their ventures successfully (Khaire, 2010).

Thus, the principle of ecological rationality, coupled with learned habits, helps us understand why entrepreneurs often take seemingly irrational shortcuts with regard to knowledge and learning in constructing their startups, rather than pursuing a more creative or innovative strategy. In effect, the institutional context triggers the appropriate heuristic, short-circuiting the possibility of a deeper analysis. To the extent that the heuristics were learned in qualitatively similar contexts, they are a safer strategy than pursuing creative variations. We turn now to a consideration of institutional contexts that might actually promote creative and innovative entrepreneurial actions.

Institutional Structure and Creative Opportunities

So far, we have emphasized the characteristics of institutional structures that limit the prospects for entrepreneurial creativity and innovation. In the past few decades, however, social theorists have moved away from focusing solely on the constraints imposed by cultural norms and institutions. In this more recent version of NIT, agency and social construction are emphasized, with analysts seeing institutions as less constraining and people as more capable of learning how to flexibly adapt to new circumstances (Powell & Colyvas, 2008). Inspired by Granovetter's (1985) essay on the embeddedness of social action, theorists have begun to treat social structure as both constraining and facilitating creative actions. In organizational and entrepreneurship theory, investigators have developed models in which structure and agency are expected to be more balanced and where social structure, under the right circumstances, can be a catalyst for change and creativity. For example, in their study of garbage collectors in San Diego, Turner and Fern (2012) noted that when workers were released from the constraints of working within established firms and free to select their own opportunities, they were more likely to innovate. Once bureaucracy was eliminated, creativity was unleashed.

In this section, we explore two aspects of institutional structures that create, rather than limit, conditions facilitating entrepreneurial creativity and innovation: institutional complexity, and the extent to which entrepreneurs face multiple audiences with divergent expectations. We offer examples showing that increasing complexity often creates openings that creative entrepreneurs can exploit and that heterogeneous audience expectations can provide opportunities for creative entrepreneurial interpretive work.

First, in the face of rising institutional complexity in the 21st century, institutional theorists have abandoned the assumption of unity and coherence in the effects of institutions. Theorists no longer assume that each "field" has a semicoherent set of norms and enforcers and instead now accept that institutional environments are too complex for individuals to fully know what is expected of them (North, 2005). Institutional complexity is even more pronounced in a globalized economy, where uncertainty has increased because of the decentralized nature of cross-national environments, in which organizations and subsidiaries are affected by contradictory institutional regimes (Cantwell,

Dunning, & Lundan, 2010). For example, entrepreneurs deciding which nation to enter to test their new business concept may be faced with a highly complex situation with no easy resolution. A weak institutional environment might prevail in one nation, characterized by a lack of accountability, political instability, and poor regulation, whereas just the opposite institutional structure might be found in an adjacent nation (Bingham & Eisenhardt, 2011). In this situation, entrepreneurs must decide whether they should enter the nation with the best fit to their current capabilities or try to learn new capabilities and enter the other nation.

Although chaos and uncertainty may create stressful conditions, they also can provide entrepreneurs with new prospects and resources for innovation and change (Scott, 2008). Modern institutions not only constrain but also empower through the creation of particular roles and practices, because virtually all contemporary actors operate in multiple institutional environments that offer them a wealth of varied examples, information, and other resources. Institutional environments also change over time, pressuring entrepreneurs to create new strategies that fit them. Institutional changes can be e*xogenous*, coming from shocks and jolts, such as the typical cyclical crises of capitalism, and from invasions of "foreign" ideas from other populations and communities (Bradley, Aldrich, Shepherd, & Wiklund, 2011). Changes can also be *endogenous*, coming from conflicts between elements of the environment and organizations' failures to achieve their claimed goals.

Second, institutional theory posits that discrepancies in expectations across multiple audiences might actually make it easier for creative entrepreneurs, because they can exploit ambiguities and play audiences off against one another. Discrepant expectations have three potential effects: they can enhance cognitive creativity, they can reduce the sense of a single "best" solution to problems, and they can create opportunities for entrepreneurs to select niches in which they can satisfy one set of expectations while being shielded, at least temporarily, from alternative expectations. For example, entrepreneurs in the cultural arts and entertainment industries often exploit the highly divergent expectations of the heterogeneous markets they face (DiMaggio, 1982).

In the face of ambiguity, entrepreneurs can search for identities and labels that will give them a market advantage. For example, new firms in the enterprise software industry try to claim market labels which they think will attract venture capital funding, particularly those that will allow them to claim that they are a "market maker" rather than a "market taker" (Pontikes, 2012). In current institutional environments, being a "market maker" is associated with high levels of creativity. Regardless of whether venture capitalists actually force entrepreneurs to be creative, they can at least force them to pretend that they exemplify the image they project.

More generally, building on evolutionary models, Baker et al. (2003) described a process in which entrepreneurs creatively reinterpret what they have done in the past, arguing that this process shapes firms' future strategies and behavior. In their argument, periodic demands from external audiences for future-oriented accounts trigger the selection of some prior activities over others. The selected activities are then replicated and sustained "because they become embedded in formal, public plans and relationships with resource providers" (p. 264). This pattern of selectively repeating and reinforcing prior selected variations creates strong path dependence in strategic action.

Government action may increase institutional complexity by generating institutional changes, upsetting the established order. Aldrich and Ruef (2006) identified a number of ways in which this might happen: fresh program initiatives, heightened political turbulence, changes in regulation or deregulation, and new macroeconomic policies. Government initiatives can be a strong external stimulus for many organizations, populations, and communities. For example, in the United States, the fortunes of entrepreneurs pursuing initiatives through alternative sources of energy, such as solar and wind power, have waxed and waned as government support has been offered and withdrawn time and again in the past few decades (Sine & Lee, 2009). Political turbulence can disrupt ties between established organizations and resources, rearranging organizational boundaries and freeing resources for use by new organizations; this happened, for example, in the brewing industry in the early 20th century (Carroll & Swaminathan, 2000). Regulation and deregulation significantly change the institutional context, affecting the types of products or services organizations can offer as well as their internal procedures (Haveman, 1995). Direct government support can encourage the creation of new organizations through enhanced legitimacy via the symbolic consequences of

governmental action, as well as through direct subsidy (Schneiberg, 2005). Macroeconomic policies can affect unemployment levels and the availability of credit, thereby forcing organizations to develop new strategies (Aldrich, 2010). Any of these four governmental actions can disrupt the established order, catalyzing opportunities for creative action.

Entrepreneurs are often instrumental in creating institutional contradictions and changes as they create new ventures, encountering problem situations and drawing on emergent social practices (Gross, 2009). Changing norms and values shape the construction of entrepreneurial identities, entrepreneurial intentions, and the willingness of resource providers to support new ventures, transforming industries in the process. For example, in their analysis of the emergence of the wind power sector in the energy industry, Sine and Lee (2009) showed that at the state level, changing attitudes about the environment motivated some entrepreneurs to create wind power firms for ideological reasons, reflecting the new cultural schema. Their actions and resulting sociocultural changes, in turn, opened up opportunities to entrepreneurs who were not ideologically motivated and thus not subject to the same cultural constraints, stimulating innovation within the industry.

Emerging industries represent a particularly interesting case for the analysis of entrepreneurial creativity and innovation (Aldrich & Fiol, 1994). Because standards have yet to be established and audiences are still unsure about what to look for in a new product or service, entrepreneurs can attempt to differentiate their ventures from others by emphasizing their uniqueness. However, the potential cacophony produced by heterogeneity across the new entrants could doom the entire industry to slow growth or even extinction. For example, in the United States, the "pay per call" telephone information industry in the 1980s failed to develop uniform standards and self-monitoring and was subsequently quashed by government regulation (Aldrich & Ruef, 2006, p. 205). Theorists have thus posited that early on, a new industry's survival depends on whether entrepreneurs engage in collective action and present a common front to audiences, at least in the basic product and service characteristics (Van de Ven & Garud, 1993).

Trade associations often play this role, especially in the manufacturing sector (Spillman, 2012; Staber & Aldrich, 1983). Larger firms usually take the lead in creating trade associations, subsidizing small firms in the interests of facilitating unified action across the entire industry. Before a trade association is formed, pioneer entrepreneurs who engage in consistent framing of core issues can build a united front for the new industry. Consistent framing helps generate cognitive legitimacy for the new industry (Khaire, 2014). As consensus forms around the core characteristic of the products or services, paradoxically, entrepreneurs might find themselves pushed to the periphery as the industry consolidates around a dominant design and innovation is discouraged. For example, the discovery of cheap and abundant natural gas, which is a relatively familiar technology, has in many ways undermined enthusiasm for solar technologies that require more from consumers, both financially and cognitively.

We have stressed the difference between attempts at creativity and innovative outcomes to emphasize the uncertainty facing entrepreneurs pursuing creative paths. However, some industries are more welcoming to creative intentions than others. For example, entrepreneurs in the creative industries—art, fashion, design, and entertainment (books, film, music, and television)—are positioned to have an impact not only on new firms in an industry but also on the larger society. The material objects of culture produced in these industries are manifestations of symbolic values and expressions of identity, and innovations affecting them can lead to cultural change. For example, entrepreneurial actions can lead to a reconsideration of what has been traditionally valued in the culture, raising the profile and the legitimacy of new values and identities that eventually supersede the old. In India, for example, the emergence and institutionalization of a market for modern Indian art and high-fashion clothing had a collective and cultural impact, reconfiguring traditional cultural values (Khaire, 2014).

The institutional conditions we have reviewed increase institutional complexity and generate divergent expectations that disrupt established practices and create opportunities for entrepreneurial improvisation. Finding little guidance from existing practices, and thwarted in their attempts to use habitual responses, entrepreneurs may begin to improvise. Improvisation occurs when the design and execution of novel action converge, with entrepreneurs unable to follow the classic planning model of "design, then execute" (Baker et al., 2003; Miner, Bassof, & Moorman, 2001). Instead, they

design the firm, even as they are creating it. For example, in Baker et al.'s (2003) study of 25 knowledge-intensive startups, most did not begin with a preset design and plan for carrying out the venture but began instead with opportunities that emerged through conversations with suppliers and customers. Novelty arises under such unsettled circumstances because entrepreneurs are not following preset routines; instead, they improvise spontaneously, based on feedback from their trials. Lack of access to resources and an inchoate organizational structure may actually provide entrepreneurs with more space for spur-of-the-moment innovations and opportunities for greater creativity.

Institutional structures can thus be sources of both constraint and opportunity with respect to entrepreneurial creativity and innovation. From a constraint perspective, institutional structures define the rules of the game, the norms, and the standards of appropriate conduct within which entrepreneurs must operate. From an opportunity perspective, however, internal contradictions and conflicts within institutions enable and even motivate creativity along several fronts. First, the intersection of contending expectations can generate creative sparks that open new frontiers of possibility. Second, skillful entrepreneurs who recognize rifts in the institutional fabric can exploit them in creative ways, taking advantage of the chaos and uncertainty that are characteristic of unsettled situations. Finally, entrepreneurs must either frame creative products and processes in ways that are compatible with existing institutions or engage in collective action to change the institutional order, if they are to attain success (Khaire, 2014). In heterogeneous environments, entrepreneurs have greater scope within which to find hospitable niches. Thus, from an evolutionary perspective, creativity and innovation are context dependent.

Entrepreneurial Creativity and Networks

We have noted that institutions configure patterns of social action and frame expectations. Social networks, defined as relatively enduring patterns of connections between people and groups, have similar effects. Studies of social networks show that network structures may either amplify or stifle the creativity of people within them. Network theorists have especially concentrated on two characteristics of social networks that can affect creativity: *cohesion* and *diversity*. Cohesion is characterized by high emotional investment in strong ties to close friends and family members. Following the basic principle of homophily—the tendency to associate with individuals similar to oneself—individuals exclusively involved in highly cohesive networks tend to have access to the same types of resources and share similar ideas (McPherson, Smith-Lovin, & Cook, 2001). In particular, research shows that shared values and norms, reinforced via cognitive social capital, strongly affect social behavior (Nahapiet & Ghoshal, 1998; Zukin & DiMaggio, 1990). In addition, all social groups exert pressures for conformity to varying degrees. In groups of homophilous individuals, the pressures are especially intense. Thus, homogeneity increases over time, hastening the process of social reproduction (McPherson, Popielarz, & Drobnic, 1992).

Cohesion may cause the reproduction of a familiar organizational form because of direct social pressures, such as the pressures experienced in family business groups, but reproduction might also be associated with the cognitive consequences of strong cohesive communities (Liao & Welsch, 2003). Cohesion tends to create a common outlook among people who are strongly involved in emotion-laden social interactions. Such shared systems of meanings enable individuals within a network to make sense of the information they receive (De Carolis & Saparito, 2006), but because it creates similar interpretations of reality, this shared understanding can reduce the likelihood of developing unique approaches.

Strong ties are more likely to diffuse norms and values across individuals, and the cognitive social capital implied in these relationships can act as barriers, blocking new information and thereby discouraging both creativity and innovation (Jack, 2005). For example, when it comes to recruiting employees, many entrepreneurs rely on family members, whether paid or unpaid (Heck & Trent, 1999). Although employees related by kinship tend to be more reliable and cheaper (Anderson, Jack, & Dodd, 2005; Stewart, 2003), hiring them exclusively may diminish the amount of diverse information available to entrepreneurs. The problem is exacerbated when leadership succession involves passing a family business down from older to younger generations, whose members may have spent their entire working careers within the family business (Handler & Kram, 1988).

Entrepreneurial activities within communities formed by ethnic minorities provide an excellent example of the effects of cognitive capital. Strong cohesive communities transfer industry-specific business knowledge to their members; newcomers

learn business skills through apprenticeships with other members of the same ethnic group (Waldinger, 1986), often leading to specialization of an ethnic group in a particular industry (Waldinger, Aldrich, & Ward, 1990). For example, in the United States, studies have found Koreans specializing in retail groceries in Atlanta and liquor stores in Los Angeles, South Asians in the motel business in the southeast, and Chinese in the garment business in New York City. Within ethnic groups, most entrepreneurs use a very similar organizational form. When they are formed primarily by strong ties with individuals of similar cultural backgrounds, networks tend to foster imitation or, at best, modest innovations.

In contrast, diverse networks and indirect ties create opportunities for boundary-spanning and bridging ties and, as a consequence, opportunities for higher levels of creativity and innovation. By *diversity,* we mean ties to persons of differing characteristics and social locations along a variety of dimensions such as sex, age, occupation, socioeconomic status, industry, and ethnicity (Lin, 2001). For example, knowing individuals who perform a similar job but work in other industries provides entrepreneurs with access to potentially valuable knowledge about alternative routines and practices, potentially enabling creative adaptations (McEvily & Zaheer, 1999; Zahra, Ireland, & Hitt, 2000). Entrepreneurs with diverse networks and many weak ties are more likely to be innovators (Elfring & Hulsink, 2007), as are entrepreneurs who have contacts that go beyond their local environments (Cooke, Clifton, & Oleaga, 2005; Cooke & Wills, 1999). For example, Uzzi and Spiro (2005) noted that creative people tend to be embedded in networks of artists or scientists who share ideas and act as both critics and fans for each other.

Diversity in learning, the raw material of creativity, is partially a function of the range of sectors through which entrepreneurs move and depends on the number of "structural holes" in an entrepreneur's network formed by direct and indirect contacts. *Structural holes* exist when persons to whom entrepreneurs are linked are not themselves connected to one another (White, Boorman, & Breiger, 1976). Ties can be *bridges* between sectors where a nascent entrepreneur currently has no direct ties (Burt, 1992). Diverse ties with a variety of experiences can help entrepreneurs build bridges that link the activities of their new ventures with external actors and therefore let them take advantage of structural holes (Jones & Macpherson, 2006). Even if entrepreneurs lack direct access to diverse others, they may still gain access to them via brokers (Burt, 2005). Not surprisingly, transnational networks, which by definition are diverse and bridge structural holes related to local knowledge, are especially likely in high-technology industries where innovation and creativity are the norm (Coe & Bunnell, 2003). Entrepreneurs playing such broker roles may find themselves in awkward situations, forced to choose between favoring local colleagues and cutting better deals with overseas partners (Obstfeld, 2005).

Three issues regarding diversity and its effects on entrepreneurial creativity deserve more attention. First, two individuals with equal levels of diversity in their networks may have access to information, ideas, and resources of varying quality. Researchers have explored the issue of the "quality" of resources offered via social networks by focusing on simple instrumental actions such as finding a job or accessing capital (Kim, Longest, & Aldrich, 2013; Lin, Ensel, & Vaughn, 1981), in which higher social status means better resources overall. Most studies of diversity and creativity concentrate on functional rather than status-related diversity, which leaves unanswered perhaps the most interesting question: to what extent does the status of network members affect creativity? Is creativity more likely in the relatively homogeneous halls of Harvard or slums of Mumbai? Or are we more likely to find creativity precisely where extremely different social statuses meet, as Simmel (1950) and Wirth (1938) predicted with regard to the effects of economically and ethnically diverse urban areas?

Second, strong network connections do not necessarily lead to entrepreneurial creativity. Some researchers have argued that weak connections tend to be more diverse than strong ones (Granovetter, 1973; Granovetter, 1974; Lin, 2001, p. 111). At the level of entrepreneurial founding teams, those with primarily strong connections have lower functional diversity and possibly greater isolation (Ruef, Aldrich, & Carter, 2003). Several nationally representative studies of entrepreneurial ventures in the process of formation have found that entrepreneurs tend to assemble teams of cofounders very much like themselves (Ruef, 2010). Along gender, racial, and occupational dimensions, new teams are highly homogeneous. For example, same-sex teams are more than twice as likely to appear as would be expected by chance. Extreme homogeneity substantially reduces the likelihood that divergent viewpoints will be expressed within a team (Reagans & McEvily, 2003).

Tie strength by itself is not necessarily predictive of diversity across the spectrum of someone's social network. If entrepreneurs develop strong connections with significantly different others, those diverse connections can offset the effects of having a high proportion of ties composed of close connections. For example, a survey of small and medium enterprises in the transportation sector found that any diverse tie, either weak or strong, resulted in higher levels of innovation (Julien, Andriambeloson, & Ramangalahy, 2004). Strong cohesive networks in a team, combined with diverse connections to outsiders in what is called a "small world configuration," may represent an ideal environment for both creativity and innovation (Uzzi & Spiro, 2005). Whereas the ties to others provide channels for information flow, cohesiveness within a team creates the right levels of trust and goodwill necessary to make those ideas become reality (Aldrich & Kim, 2007).

Some research suggests that it is important for entrepreneurial teams to surface disagreements as a way of bringing important issues to the table for discussion, potentially enhancing organizational performance through the consideration of diverse points of view (Nemeth, 1997; West & Meyer, 1998). The diverse others are important, not necessarily because of the content of their ideas but because they raise arguments and objections that an otherwise homogeneous group would not take seriously. By injecting alternatives into the discussion, those with a minority viewpoint enhance the overall quality of the decision.

Third, theorists have raised the issue of the extent to which entrepreneurs can proactively translate promising personal networks into effective actions, because merely possessing a large and diverse network is not a sufficient condition for creativity. Entrepreneurs must still enact and use their networks in specific ways. We predict that entrepreneurs who use their diverse ties to discuss abstract ideas will tend to generate and adopt more creative and radical innovations, whereas those who have diverse ties but only monitor their behavior will tend to imitate others, similar to their counterparts with less diverse ties (Burt, 2004). Raising unique ideas with audiences having diverse expectations gives entrepreneurs opportunities to experiment with their ideas in a hospitable environment before trying to execute them.

Based on the social network literature, we have identified some circumstances that might spur entrepreneurial creativity. Entrepreneurs with diverse ties to others obtain more useful information than entrepreneurs with homogeneous ties, other things being equal. Within entrepreneurial teams, strong cohesion facilitates rapid action, as long as the team's culture allows for the airing of diverse points of view. To take advantage of diversity, as Welter (2012) pointed out, a supportive institutional context is important so that trust can be translated into collective actions. Building on our arguments in the previous section, strong, cohesive, and diverse entrepreneurial teams that are at the intersection of conflicting institutional forces are best placed to enact creative strategies. In the face of chaos and uncertainty, such teams will have ready access to valuable information and be prepared to move quickly to take advantage of it.

Conclusion

We began this chapter by considering the limits to entrepreneurial creativity and innovation posed by institutional constraints and people's reliance on habits and heuristics as guides to everyday behavior. Neoinstitutional theory posits that social and cultural pressures lead individuals to choose actions that are "appropriate" rather than "the best," undermining a search for creative solutions. Habits and heuristics reinforce this tendency, such that much of human behavior is driven by replication of the familiar rather than thoughtful reflection on the present circumstances. Although decision theorists no longer think of cognitive heuristics as signs that humans are cognitively incompetent, even crediting them with ecological rationality still does not lead to an assumption that humans will make creative and innovative choices.

Despite this heavy emphasis on institutional constraints, we offered grounds for believing that institutional structures sometimes facilitate creative and innovative actions. First, institutional complexity—which seems to be increasing in the 21st century—often leads to conflicts and contradictions in structures that leave space for creative entrepreneurial activity. We have noted the role of government action in generating conditions that heighten institutional complexity and pointed out the disruptive consequences of the emergence of new industries. Second, the increasing complexity of institutional contexts means that many entrepreneurs face multiple audiences with divergent expectations. Skillful entrepreneurs may be able to turn such situations to their advantage, playing multiple audiences off against one another and finding ways to segment, isolate, or simply conceal the implications of their creative actions.

Social network analysis also highlights some conditions that could facilitate entrepreneurial creativity and innovation. The social network literature has focused on two features of social networks: cohesion and diversity. Entrepreneurs in cohesive networks benefit greatly from the trust engendered by such ties, enabling them to move quickly to take advantage of opportunities. Unfortunately, however, without diversity in their networks, the information available is often incomplete and highly redundant with what is already known through many other sources. In contrast, entrepreneurs in diverse networks—which can also be cohesive—gain access to more distant and richer information, increasing the likelihood that unprecedented actions will be stimulated.

Teams create about one third of all business startups, especially in knowledge-intensive and high-capitalization industries. Team-based startups are also much more likely to survive and grow. Therefore, it is particularly important to understand the likelihood of creative and innovative behavior within startup teams. Despite well-known arguments about the importance of within-team diversity, most startup teams are highly homogeneous and thus potentially hampered by lack of access to heterogeneous information sources and constrained by a limited range of viewpoints within the team. We speculate that the notoriously low survival rate of startups could stem, in part, from limits to creative and innovative action imposed by their starting conditions.

We conclude by noting that within the field of entrepreneurship, research has been biased by a focus on successful outcomes, with investigators selecting mostly successful firms to study. Such research has not only reinforced the heroic image of innovative entrepreneurs that has plagued entrepreneurship research for decades but has also taken for granted a connection that should be made problematic: the link between creative intentions and outcomes. As Blute (2010, p. 18) pointed out, "There is no evidence in any area of human endeavor that, as a statistical body, innovations are biased in the direction that would be required for them to spread successfully. In fact, most fail." Surely, some creative projects that resulted in entrepreneurial success began as something else, and some projects that began with the best of intentions failed miserably. Based on our review of the literature, we still have much to learn with regard to understanding the conditions generating and rewarding creative and innovative entrepreneurial actions.

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CHAPTER

26 Entrepreneurship as Emergence

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Abstract

The emergence perspective provides an important lens through which to examine entrepreneurship. Complementary to other entrepreneurship-related perspectives (e.g., the individual–opportunity nexus), the emergence perspective emphasizes individuals' idiosyncratic interactions that lead to novel resultant structures and specifically, the attributes of those interactions (e.g., irreversibility, nonlinear change, unpredictability/surprise, supervenience). Emergence represents a process that flows from the tension of order and disorder, routinization versus creativity, organization versus chaos. We extend the emergence perspective by discussing the emergence of three entities as the entrepreneurial process unfolds: the venture, the opportunity, and the entrepreneur. We further discuss how the emergence perspective can be integrated with other entrepreneurship perspectives as a means to advance scholarly understanding of entrepreneurship.

Key Words: emergence, opportunity, venture, entrepreneur, nonlinear change

Introduction

Venture creation involves an unceasing dynamic as the individual copes with unfolding events, many of which are unpredictable and uncontrollable. The failure to win a key account, the loss of one's entire inventory due to a water pipe break, the winning of a patent, receiving a major cash infusion from an investor, or a key employee's leaving to start a competing venture are but a few examples of the thousands of novel events encountered by the entrepreneur. Such events occur in differing volumes, velocities and volatilities depending on the venture (Morris, Pryor, & Schindehutte, 2012b). They produce ongoing incongruities and changing realities, such that continual flux and encounters with novelty become essential characteristics of the entrepreneurial experience (Schindehutte & Morris, 2009). As such, venture creation is a creative process, yet one in which the initially conceived idea for the venture can be simply reinforced or radically disrupted through subsequent sparks of creativity that are endogenously or exogenously stimulated.

As disruptions punctuate everyday operations in a venture, they collide with any sense of order has been achieved by the entrepreneur. Tsoukas and Chia (2002) argued that entrepreneurs, while trying to bring order to their circumstances, must continually reweave their webs of beliefs and habits of action to accommodate new experiences. While entrepreneurs may seek the establishment of routines and stability, they are forced to improvise and adapt as new developments create changing demands and opportunities. Unfolding events introduce variety, which feeds individual learning and exploratory behavior. Learning, in turn, is instrumental in the individual's ability to adapt. Improvisational and adaptive behaviors serve to generate new events or realities. In this way, the entrepreneurial experience becomes a crucible involving the confluence of change, improvisation, learning, adaptation, and ongoing challenges to one's assumptions, perceptions, and beliefs.

Viewed as a crucible, a key characteristic of the new venture creation process is emergence

(Lichtenstein, Carter, Dooley, & Gartner, 2007). Emergence differs from growth, evolution, or the pursuit of a new direction by an entity. It instead represents the establishment of a new type of order (Lichtenstein et al., 2006). Emergence refers to order creation in which novel and coherent structures and patterns are derived during self-organization (Goldstein, 1999). The entity is in the process of becoming something it was not before. Emergence might involve changes that lead to growth or decline or simply the reshaping of the new venture without any real effect on size. Similarly, emergence does not necessarily unfold in predetermined stages of birth, growth, maturity, and decline (Aldrich & Ruef, 2006) but is rather viewed as more random. Compared to evolutionary, life cycle, growth, and other entrepreneurship models (e.g., the individual–opportunity nexus model of Shane and Venkataraman [2000]), the emergence perspective recognizes the critical influence of novel events in shaping how new ventures develop. More specifically, the emergence perspective asserts that the properties of emergence (i.e., the nature of entrepreneurs' experiences and the order through which ventures are created) are fundamental to the understanding of subsequent order creation within new ventures.[1]

In this chapter, we explore the central role of emergence in entrepreneurship. The nature and underlying properties of emergence are examined, together with the theoretical underpinnings of an emergence framework. This conceptualization is then applied to the identification of an opportunity, the creative molding of a business concept and new venture, and the formation of an entrepreneur. Ways in which an emergence perspective complements other contemporary perspectives in entrepreneurship are identified. Implications of an emergence perspective for ongoing theory development and entrepreneurial practice are drawn.

A Theoretical Foundation

Emergence concerns how order is created through novel and coherent structures and patterns during self-organization (Goldstein, 1999). The emergent order that is created may not be easily or predictably reducible to its component parts. Rather, the emergent order is characterized by properties that did not exist within the system before the self-organization (Standish, 2001). A common example of emergence employed within the literature is how oxygen and hydrogen, both gases, can combine to form water, a liquid.

With roots in philosophy, emergence has received considerable attention from scholars in the area of complex systems theory. This theoretical perspective has been cited not only for its explanatory power but for its generalizability across a variety of different contexts. A complex adaptive system is an open system with a large number of interconnected components (e.g., people, information, technology) that form 'a dynamic web of interrelated self-organizing networks, whose individual nodes take on meaning through their relationships with others, and whose overall patterns cannot be fully predicted' (Wilson, 1996, p. 624).

With a complex adaptive system, the adaptive element suggests a capacity to change and learn from experience amid a range of complex issues, ambiguous choices, and uncertain outcomes. Openness to the fluctuating environment creates far-from-equilibrium conditions in which a system is at the edge between order and chaos (Waldrop, 1992). "By staying in this intermediate zone, these systems never quite settle into a stable equilibrium but never quite fall apart. Rather, these systems, which stay constantly poised between order and disorder, exhibit the most prolific, complex and continuous change" (Brown & Eisenhardt, 1997, p. 29).

A central feature of any complex adaptive system is emergence. Emergence is not simply the result of the process of interactions (i.e., a new state or entity). Rather, it takes place *during* the process of interacting (McKelvey, 2001). Emergent properties arise when components combine in unpredictable ways and component parts form something unlike the parts themselves. These properties are novel when they are unpredictable, unexplainable, and irreducible to component parts (Humphreys, 1997). With a self-organizing system, a master plan becomes somewhat problematic because much behavior is unscripted (Plowman, Baker, Beck, Kulkarni, Solansky, & Travis, 2007). A fluid structure emerges from a "soup" of interacting components that are themselves in flux. Given that the emergence of order in structures, processes, and routines is a messy process, the emergence of any given phenomenon can be difficult to explain. This difficulty will become clearer when we further explore the underlying properties of emergence in the next section.

Emergence is a function of the dynamic environments in which an entrepreneur operates. At the same time, emergence represents an entrepreneur's efforts to create order within the environment

and some semblance of stability. Certain external forces can elicit corresponding changes in the new ventures if the forces are viewed as presenting new opportunities, threats, or other complexities. In other cases, an entrepreneur might simply maintain the existing order despite external forces that are not viewed as immediately relevant. Yet a third alternative is that external forces might create contexts that reinforce the opportunities exploited by a new venture, leaving the entrepreneur to maintain a status quo. The order embodied in new ventures in their eventual ideal emergent states represents the entrepreneur's conceptualization of how to effectively exploit opportunities and neutralize threats. In reality, some entrepreneurs achieve a more effective balance of order and disorder than others.

Properties of Emergence

As a perspective, the concern of emergence is not simply the presence of growth or a resultant emergent state. Rather, the emergence perspective concerns how the interactions among components lead to the creation of novel, resultant emergent states (McKelvey, 2004). Interestingly, although the example of hydrogen and oxygen forming water is used commonly within the emergence literature, scholars have not discussed how hydrogen and oxygen can also combine to form hydrogen peroxide, another liquid with quite different properties from water (e.g., hydrogen peroxide's oxidizing properties lead to its use in bleaches and other cleaning agents). The formation of hydrogen peroxide is a very different process than the formation of water, highlighting the importance of understanding the specific interactions that lead to a resultant emergent state. As such, the emergence perspective focuses on the nature of interactions, including the properties of irreversibility, adaptive tension, nonlinear change (surprise/unpredictability, feedback, amplification), reciprocal interactions/coevolution, and supervenience (i.e., how the emergent order can, in turn, impose structure on its underlying components [Sawyer, 2001]). These properties are summarized in Table 26.1.

The notion of irreversibility recognizes that interactions at a previous point in time and the outcomes that are formed via these interactions cannot be reversed such that the individuals and other resources involved in the interactions are returned to their previous states (Schindehutte & Morris, 2009). To explain, emergence may create new structures that cannot easily be reduced back to their components. Even if the creation of a new emergent structure could be reversed, however, previous interactions and their outcomes at the very least become a part of individuals' memories that shape future perceptions, beliefs, and, ultimately, behaviors. Learning supports the development of new cognitive structures (i.e., emergence) that shapes future actions. For example, learning can result in cognitive structures that influence future creativity by providing new information that either supports analogical reasoning and other conceptual combinations or limits creative thinking by erecting tunnel vision (Ward, 2004). Finally, emergence may cascade into other interactions in the broader system which the individual cannot control, leading to a systemic disruption. For example, an entrepreneur's introduction of new products to the market may ultimately end in failure, but other entrepreneurs may build on the initial entrepreneur's efforts to provide more successful products.

Adaptive tension refers to some sort of motivational trigger that serves as the impetus of change (Lichtenstein et al., 2007). In other words, individuals are viewed as being in potential states of dynamic equilibrium; they can experience some sort of instability or tension in their lives that leads them to seek change as a means of reestablishing stability (Headey & Wearing, 1989). This tension can originate intrinsically or extrinsically, leading to anxiety, dissonance, or another form of stressor. For entrepreneurs, adaptive tension may surface intrinsically as a need for autonomy or desire for greater wealth, or extrinsically with the loss of a job or the birth of a child, among many other possibilities.

Nonlinear change represents the potential for emergence to diverge from the path originally intended, leading to an emergent resultant state that can be wholly different from that initially imagined (Schindehutte & Morris, 2009). Nonlinear change can surface for various reasons and can result in varying levels of nonlinearity, from incremental to radically creative divergence (Madjar, Greenberg, & Chen, 2011). For example, entrepreneurs may face nonlinearity simply because of unpredictability in market conditions, industry changes, or various environmental trends (i.e., new technological developments). Such unpredictability may lead to positive or negative feedback that transforms how the entrepreneur thinks about the opportunities, leading them to either intensify their current behaviors or refocus their behaviors on different objectives. The unpredictability of the situation

Table 26.1 Properties of Emergence and Entrepreneurship

Property	Explanation
Irreversibility	Emergence occurs based on unfolding and accumulating experiences. New experiences are continually added, creating an increasingly nuanced and interconnected emergence process. The unique combination of events defining a particular entrepreneur's experience leaves an indelible stamp, such that it is impossible to return to a pre-emergent state.
Adaptive tension	Myriad unexpected and uncontrollable events combine with ongoing intrinsically based disruptions to create instability in entrepreneurs' lives and lead them to seek change as a means of adjusting back to a more stable state.
Presence of nonlinear change and feedback, where small inputs can produce large outcomes	Small, random events have the potential to be amplified and, based on feedback, fundamentally shift the entrepreneur's path of emergence.
Surprise, where nonobvious or unexpected behaviors come from the object in question	Ventures produce and encounter (interact with) a stream of unpredictable, surprise events, both positive and negative. Further, a moment of sudden insight, or an instinctual or improvisational act, can prove to be instrumental in affecting outcomes.
Reciprocal interactions between micro-level events and behaviors and emergent macro-structures	Large numbers of internal and external variables constantly interact at micro-, meso-, and macro-levels to produce a venture that often differs markedly from what was originally intended. Emergence and the subsequent behaviors of those involved can radically shape the structures in which they are embedded and create new structures.
Co-evolution among components of the system and increasing complexity	Co-evolution occurs (1) among the components that form the opportunity, the venture, or the entrepreneur and (2) as a result of the interplay among the emergent opportunity, venture, and entrepreneur.
Supervenience of resultant structure over components	The novel resultant structure that surfaces through emergence can establish structure for the components (e.g., individuals, routines/activities, interactions) that initially came together to form the resultant structure.

creates an "open problem" that leads the entrepreneur to define the parameters of a solution allowing for more creative, radically nonlinear change (Unsworth, 2001).

In addition to the unpredictability of the entrepreneur's context and the feedback that may be cultivated, the entrepreneur's basic interactions with other individuals may transform how they think about an opportunity. For example, a customer may ask an entrepreneur to provide a product that the entrepreneur had not previously considered. In addressing this customer's need, the entrepreneur could essentially enter a new market not previously intended. At the same time, the customer presents a "closed problem," providing constraints on what is considered to be a viable solution, yet leading to a more incrementally creative, nonlinear change (Unsworth, 2001). Importantly, nonlinear change can be more than a mere digression from the entrepreneur's intended path in that what might be considered even minor interactions can be amplified to radically transform the entrepreneur's resultant structures (Plowman et al., 2007). For instance, an initial market entry of an entrepreneur into a tangential niche may eventually become the entrepreneur's primary revenue driver as the market gains traction. As such, an incrementally creative divergence can eventually lead to activities that are radically divergent from the initial order.

Reciprocal interactions are an important part of the emergence perspective, recognizing that all parties involved in the interactions are influenced by those interactions. Individuals not only enjoy "influxes of meaning from their network of connections" (McKelvey, 2004, p. 323) but also influence meaning within their network of connections. An entrepreneur's behaviors are influenced, for example, by observing other entrepreneurs, interacting with customers about their needs, and working with suppliers to understand

what might be feasible solutions to the customers' needs. The feedback and wholly new information that the entrepreneur absorbs through interactions with others can support creative insights that can either disrupt or reinforce an existing order (De Stobbeleir, Ashford & Buyens, 2011; Zhou, Shin, Brass, Choi, & Zhang, 2009). At the same time, the entrepreneur's own behaviors disrupt the system, shaping these other stakeholders' expectations and behaviors in a process of co-evolution.

Supervenience refers to how the emergent order can, in turn, impose structure on its underlying components (Sawyer, 2001). For example, when establishing a new organization, the entrepreneur provides incentives and establishes controls that not only prescribe how other employees should behave but also limit, in some regards, how the entrepreneur himself or herself should behave. In this way, supervenience provides structure to the emergent order that limits how the order can or will continue to emerge. To the extent that the existing order promotes values of conformity, reduces available resources to support experimentation with new ideas, or promotes a strong organizational identification, the supervening structure is more likely to limit creativity and nonlinear change (Madjar et al., 2011; Woodman, Sawyer, & Griffin, 1993).

These emergent properties have been investigated in a wide variety of contexts. Consider three examples. In a classic study, Becker (1953) characterized how one becomes a marijuana user. He found that the behavior emerges from a sequence of social experiences during which the activity is given meaning and the judgments of objects and situations (e.g., marijuana, drug paraphernalia, users, usage contexts) are modified. Fundamental changes take place in the person and his or her perceptions of the activity and the experience it represents. Barnard and Solchany (2002) discussed physical, emotional, and psychological transformations of women as they become mothers. Becoming a mother includes reciprocal interactions between mother and child that result in structural changes (e.g., in daily routines, physiology, and cognition [such as beliefs about the important things in life]) within each party. The authors described a dynamic process, with unceasing change that can be overwhelming, in which the woman must flexibly adapt to transformations and concomitant losses together with an ongoing range of feelings. What emerges is some level of mothering capacity, maternal role attainment, and changes in personal attributes (e.g., attitudes, moods, identity). As a third example, Plowman et al. (2007) examined radical emergence in the Mission Church of San Antonio, Texas. Emphasizing the roles of destabilizing conditions, amplifying actions, dynamic interactions, fractal patterns, and scalability, they described how, initiated by an small change, a declining inner city church was transformed in terms of purpose, membership, stakeholders, funding sources, services offered, and performance metrics.

Emergence and Entrepreneurship

Within entrepreneurship, limited attention has been devoted to emergence. Noting its importance, various observers (e.g., Bygrave, 1989; McKelvey, 2004; Stevenson & Harmeling, 1990) have raised concerns about the limited ability of extant theory in entrepreneurship to address the dynamic and emergent nature of new ventures. Bird (1992) argued that venture emergence depends on the entrepreneur's willingness and ability to sustain temporal tension, bridging the interval between an evolving vision, current conditions, and ongoing developments. Katz and Gartner (1988) examined organizations-in-creation and suggested that emergence is driven by intentionality or purposefulness, resource acquisition, boundary definitions, and establishment of appropriate exchanges. They also emphasized how lack of structural inertia enables the early-stage organization to experiment with and abandon different approaches without incurring significant cost. Gartner (1993) has also proposed a vocabulary of entrepreneurial emergence. Arguing that the way we discuss a phenomenon affects our ability to think about it, he encouraged more integration of such terms as "being," "genesis," "emergent evolution," "equivocal," and "variation" into the lexicon of entrepreneurship.

Brush, Manolova, & Edelman (2008) empirically validated and extended the work of Katz and Gartner, demonstrating that the order to startup activities is nonlinear. They also found that entrepreneurs who accumulated the initial properties at a slower pace were more likely to successfully organize than those who did so quickly. Relative to a faster approach aimed at achieving a threshold of legitimacy, the authors speculated that a more deliberate approach in constructing order enables a more effective understanding of how the various components of the overall order fit together, leading to a more solid business conceptualization and more effective capabilities. Other work has explored legitimacy-creating activities as a component of emergence (Delmar & Shane, 2004) and

the interplay of perceived environmental conditions and planning on emergence (Liao & Gartner, 2006).

A key question concerns exactly what is emerging in a venture creation context. The extant research tends to emphasize the venture as the subject of emergence (e.g., Brush et al., 2008; Lichtenstein et al., 2007). However, as the entrepreneurial endeavor unfolds, processes and interactions at multiple levels would seem to result in the parallel emergence of the underlying opportunity that drives the venture, as well as the emergence of the individual as an entrepreneur (Table 26.2). We now consider each of the three forms of emergence.

Venture Emergence

The venture that is created is often not the one that was intended. Peter Drucker (1985, p. 189) explained as follows:

> When a new venture does succeed, more often than not it is in a market other than the one it was intended to serve, with products and services not quite those with which it has set out, bought in large part by customers it did not even think of when starting, and used for a host of purposes besides the ones for which the products were designed.

Drucker's conclusion has been borne out in findings by other researchers (e.g., Ardichvili, Cardozo, & Ray, 2003; Lichtenstein et al., 2006; Nicholls-Nixon, Cooper, & Woo, 2000; Sarasvathy, 2001) and highlights the unplanned and unpredictable nature of venture emergence. The unpredictability can result from a number of factors, including luck, the alertness of the entrepreneur to changes in the external environment (Barney, 1986), the bounded rationality of an entrepreneur to foresee all future potential circumstances (Dequech, 2001), and changes in theentrepreneur's personal or business environments that revise what their ideal emergent state is.

As a venture unfolds, goals and motives change, decisions are taken that open or close doors, and the organization adapts or fails to adapt to a multiplicity of developments. Acting in multiple roles without a script, the entrepreneur's actions reflect trial and error, where things work or do not work, and lessons are learned or not learned. As result, although the entrepreneur sought to build an aggressive growth venture, what turns out is a lifestyle venture, or what started out to be a small family business becomes a publicly traded company.

The individual, in starting a venture, is initiating a process of organizational becoming. A venture unfolds as structure is created and modified, resources are acquired and combined, a culture takes root, processes and routines are implemented and updated or replaced, and core elements of a business model are integrated in different ways until something emerges that works, and is then further experimented with until something emerges that works even better. Tsoukas and Chia (2002, p. 570) explained that:

> Organization is an attempt to order the intrinsic flux of human action, to channel it towards certain ends, to give it a particular shape, through generalizing and institutionalizing particular meanings and rules. At the same time, organization is a pattern that is constituted, shaped, *emerging* from change.

Table 26.2 Emerging Elements as a Venture Experience Unfolds

The Opportunity	The Entrepreneur	The Venture
Forces creating the opportunity	Managerial skills	Venture type, growth orientation
Market need	Entrepreneurial competencies	Business model
Market definition, target market**s**	Entrepreneurial mindset	Strategic orientation
Market size		Core competencies
Opportunity window	Entrepreneurial identity	Values, culture
Customer perceptions, loyalties, satisfaction, switching costs		Organizational structure, communications, systems, controls, routines
Nature, extent, and sources of competition		

Effectively, while attempting to stem change, the organization represents an outcome of change.

Organizational emergence refers to how organizations become manifest, or how they come into being. The emerging organization results from a tension between order and disorder, routinized behavior and creativity, predictability and chaos. Gartner (1993) concluded that the ability to understand the process of organizational emergence requires an appreciation for the particular space-time context of a given venture and recognition that the order of events is critical to the process. Lichtenstein et al. (2006) provided evidence of underlying change over time in the basic modes of organizing employed by the entrepreneur. They noted what they called "punctuating shifts" in the organization of the vision, strategy, tactics, and behaviors that guide the venture. These shifts occur roughly in conjunction with one another. Further, they posited that shifts in tactical organizing come just before shifts in strategic organizing, which then produce shifts in vision. They concluded that what emerges from these shifts is fundamentally different from what preceded. In seeking the triggers of these shifts, they pointed to conflict, frustration, fear, and other aspects of negative affect over time, together with the entrepreneur's own self-awareness and agency. In essence, these authors appear to have uncovered the conditions that are conducive to creativity and change. More specifically, negative affect flows from the entrepreneur's view that the status quo is unsatisfactory and attunes an entrepreneur to the source of the problem; positive affect that flows from the entrepreneur's self-awareness, and ability to act, in turn, provides the confidence to seek creative solutions in the form of a new organization (George & Zhou, 2007; Zhou & George, 2001).

Ongoing events and the manner in which they are experienced introduce uncertainty, complexity, diversity, and surprise, forcing improvisation and adaptation, which in turn produce new events that must be processed and responded to. They help demonstrate why one's initial conception of a business model may have been errant in whole or in part, and they open doors to new dimensions of the business. They contradict or reinforce assumptions, routines, and behaviors. They are experienced cognitively, emotionally, and physiologically at multiple levels by the entrepreneur, resulting in behaviors that determine what is being created.

Improvisation and adaptation lie at the heart of organizational emergence. Improvisation involves deliberately chosen activities that are spontaneous and novel and entail the creation of something while it is being performed (Moorman & Miner, 1998). Solutions are created "on the fly," and one creatively addresses problems with novel combinations of tools and materials at hand. Weick (1998) concluded that improvising is close to the root process in organizing. He described a continuum ranging from interpretation, to embellishment, to variation, and then improvisation. Entrepreneurs are likely to be engaged in all four as events unfold, with improvisation resulting in the greatest organizational change. However, a first-time entrepreneur may have relatively little background to draw upon when improvising in a venture's early stages.

In building an organization, entrepreneurs attempt to establish routines and order, but this effort is continually disrupted by events, experiences, and interactions with other individuals that inject new information into the entrepreneurs' cognitive frameworks. Improvisation represents an attempt to accommodate and make sense of new experiences. It leads to new products, services, and processes, as well as changes to routines, norms, and mores. As the volume, velocity, and volatility of events producing these experiences increase, the need for improvisation is likely to increase. The ability to meet this challenge is enhanced by experiences producing positive affect and high engagement levels (Morris et al., 2012b). Moreover, ongoing improvisation improves one's abilities at creating in the moment and increases the repertoire one has to draw upon when doing so. Improvisation, in turn, produces new events, any number of which are unanticipated or represent surprises. The organization is continually being transformed.

Organizational emergence is also affected by behaviors that are less novel or improvisational. A characteristic of emergence is the potential for small inputs to have unpredictably large or unintended impacts. Weick (1979) discussed "small wins," where concrete, complete, implemented outcomes of moderate importance become the basis for a pattern of achievement. Initial, incremental forms of creativity that lead to nonlinear change in the scope of a venture can eventually result in an order that radically diverges from what was initially intended. Hence, reactions to some unfolding event may find entrepreneurs putting in extra (or fewer) hours in a given period, making more (or less) than the usual number of phone calls, meeting with more (or fewer) external stakeholders, or taking more (or fewer) business trips (Gartner, 1993).

These immediate behaviors may ultimately lead to some significant outcome in terms of the development of the business.

Opportunity Emergence

An opportunity is a favorable set of circumstances in the external environment that creates an opening for a new concept or venture. The focus is on situations in which new goods, services, raw materials, markets, and organizing methods can be introduced through the formation of new means, ends, or means–ends relationships (Eckhardt & Shane, 2003). An opportunity represents the chance to fulfill unmet consumer demand or to satisfy currently unsatisfied needs or wants, whether or not those demands, needs, or wants are presently realized (Webb, Ireland, Hitt, Kistruck, & Tihanyi, 2011).

Opportunities come to exist in three general ways. First, they can be approached as objectively existing "out there" in the world, somewhere, awaiting *recognition* (Alvarez & Barney, 2007a). Here, the opportunity is readily apparent for someone who is alert, with relatively low uncertainty surrounding its existence. Conditions of both supply and demand are reasonably well known. Quantification of the opportunity is not especially difficult. Opportunities in this instance are distinct from the entrepreneur and the entrepreneur's solution (i.e., venture/innovation) (Hansen, Shrader, & Monllor, 2011; Shane, 2003).

A second path to realizing an opportunity is *discovery*. In this case, elements of the opportunity exist in the environment, but the actions of the entrepreneur play a role in uncovering and defining the opportunity. Hence, core aspects of supply are known while demand is unknown, or vice versa (Sarasvathy, Dew, Velamuri, & Venkataraman, 2013). The entrepreneur discovers the unknown aspect through an iterative process of interaction, and the act of discovery surfaces with a bisociation, in which the entrepreneur cognitively, and creatively, bridges what were previously disparate knowledge stocks in creating a wholly new knowledge stock that conceptualizes the opportunity (Smith & Di Gregorio, 2002). Uncertainty is higher with discovery compared to recognition, and estimating market potential is more complex because the entrepreneur must resolve the unknown supply/demand condition.

The third path involves the entrepreneur's *creation* of the opportunity (Alvarez & Barney, 2007a; Mitchell, Mitchell, & Smith, 2008). Creation suggests that no market currently exists or is about to emerge, and no market-based need has been specified (i.e., supply and demand are both unknown). The need is at best nascent or lies within some generic problem. Elements that could contribute to the opportunity may or may not be in place, but they have yet to be combined in ways that produce a potential market. Opportunities here are more subjective and are inextricably linked to the entrepreneur (Gregoire, Barr, & Shepherd, 2010; Hansen et al., 2011; Sarason, Dean, & Dillard, 2006). The entrepreneur takes actions that fundamentally change the external environment, in effect creating entirely new openings. Most typically, an innovation is launched by the entrepreneur, significantly disrupting the equilibrium conditions, and opportunities appear in response. The entrepreneur usually has a vision of a market that could exist. Yet, the idea that entrepreneurs can create opportunities does not mean that they control them. Risk, uncertainty, and ambiguity are high, and the need for adjustment and adaptation is ongoing (Klein, 2008).

With both discovery and creation, the entrepreneur and business concept are instrumental in effecting the nature of the opportunity. The entrepreneur is able to influence aspects of customer needs and/or the environmental conditions that surround that need. Thus, these conditions are subject not only to interpretation but also to manipulation by the entrepreneur. It is not just about what one observes or perceives; it also involves the entrepreneur's actions and behaviors and the subsequent learning and sensemaking that take place (Dimov, 2011; Sarason et al., 2006). Hence, opportunities can have an emergent property. In other words, entrepreneurs not only respond to unfulfilled customer needs (i.e., recognition) but can also define and influence the parameters of customer needs by helping customers develop wholly new preferences, values, norms, and beliefs (i.e., creation).

Emergence suggests that the opportunity that ultimately supports a sustainable venture will substantively differ from that which initially led the entrepreneur to act (Dimov, 2011; Dutta & Crossan, 2005). Thus, the entrepreneurial process can begin without a well-defined or sufficiently attractive opportunity and is instead nonlinear; opportunities and the actions used to define and exploit opportunities emerge together and as a consequence of one another.

More specifically, interactions between objective elements (i.e., in the external environment) and subjective elements (i.e., within the entrepreneur) result in emergence. Objectively, endogenous changes to

the market comprise the first mechanism through which opportunities emerge. Entrepreneurs begin exploiting opportunities based on "facts on the ground" related to the market, such as market size, customer demographics and needs, industry characteristics and competitors, and existing products and services. However, these facts are not constant, and events such as the entrance of new competitors or suppliers, or competitors' introduction of innovative technologies or unique business models, may change in a way that substantively reshapes the objective foundation of the opportunity. As markets evolve, so do opportunities. Organizations often discover that their customers' needs and reasons for buying evolve with time, creating tensions between the market and the entrepreneur and altering the opportunities they exploit (Mayadas, Bourne, & Bacsich, 2009). In other instances, businesses may uncover new ways to create value for those currently served or engage in new activities to serve customers they did not initially target (e.g., Baker & Sinkula, 2005; Greenwood & Suddaby, 2006).

Subjective emergence is also important to understand; perceptions are a key driver of decisions and behaviors. The venture experience serves to change the manner in which entrepreneurs perceive objective reality (Morris, Kuratko, & Schindehutte, 2012a). As they develop competencies, learn, and create new knowledge, entrepreneurs enhance their cognitive abilities through use, which, in turn, enhances their capability to ascertain and conceptualize opportunities (Gaglio & Katz, 2001; Haynie, Shepherd, Mosakowski, & Earley, 2010; Tang, Kacmar, & Busenitz, 2012). As individuals develop the cognitive schemas and behaviors necessary to fully conceptualize an opportunity, they can become better at evaluating market conditions and drawing conclusions, reshaping how they perceive an opportunity. Similarly, as they become better able to associate disparate pieces of information, they may more quickly perceive the importance of some new market condition, hastening the pace of opportunity emergence. Important here is not the emergence of the individual entrepreneur (which we examine in the following section), but rather the idea that the emergence of the opportunity is tied to an entrepreneur's subjective interpretations of objective reality. Based on the development of their cognitive schemas, entrepreneurs may subjectively interpret things that may or may not objectively exist. The perceived "facts on the ground" can differ across entrepreneurs based on their specific vantage points and how they subjectively interpret their idiosyncratic experiences and interactions with their environment. In effect, entrepreneurs' subjective realities can lead to emergence of uniquely different opportunities.

The entrepreneurs' subjective interpretations likely play a significant role in how they envision the emergence of created opportunities. Unlike opportunity discovery, in which demand or supply is known, opportunity creation involves the establishment of both demand and supply by entrepreneurs. In such cases, limited objective criteria exist to inform the entrepreneurs' interpretations of their environments. Instead, entrepreneurs envision demand and supply and then go about seeking to create the conditions that support their vision. Their activities involve forming and molding new customer needs (similar to how Apple created the need for well-designed products), establishing the infrastructure through which products will be delivered efficiently and effectively to these to-be-defined customers, and forming organizations to support the necessary routines and activities that will enable the entrepreneurs to appropriate value from their envisioned opportunities. Because of the additional sources of uncertainty involved in creation, this form of opportunity emergence likely entails more reciprocal interactions/coevolution, surprises/unpredictability, and nonlinear change than discovery-based emergence.

Emergence of the Entrepreneur

Extensive research over the past half-century has produced few generalizations about the nature of those who create ventures (Baron & Markman, 2000; Bird, 1989; McClelland, 1986). No standard prototype of the entrepreneur has emerged, and it remains impossible to predict who will be an entrepreneur, much less who will be successful as an entrepreneur. Similarly, attempts to develop general typologies of entrepreneurs (e.g., Miner, 1996; Vesper, 1980) have provided little insight regarding how these different types are developed or form.

Difficulties in generalizing about those who create ventures can be traced to the idea that becoming an entrepreneur is an emergent phenomenon, with each individual emerging in a unique way. Of the millions of people who start ventures, there is far more diversity than commonality. Although some may have certain characteristics before they start, or at least rudiments of these characteristics, many others do not. The venture experience becomes the medium in which traits, skills, competencies, and cognitive styles are developing within the

entrepreneur as the business unfolds. Hence, individuals do not start out as entrepreneurs or entrepreneurial types; rather, they become entrepreneurs through enacting entrepreneurial activities. Even serial entrepreneurs pursuing a second or third venture continue their individual emergence as they interact with new and old stakeholders, encounter new and similar experiences, and face similar and different external forces and circumstances. Importantly, the emergence of individuals as entrepreneurs can involve reinforcement of preexisting traits, skills, competencies, and cognitive styles as much as the development of new ones.

Each individual's venture creation experience is unique and is affected differently by their experiences. The individual is being formed and transformed into something he or she was not before. In effect, unfolding events introduce variety to the venture context, and this variety feeds individual learning and exploratory behavior. Likewise, unfolding events can present similar experiences and interactions that reaffirm the entrepreneur's prior emergent states. Learning is instrumental in the individual's development as an entrepreneur. The degree of formation or transformation is specific to the individual. Therefore, any two individuals can emerge from a similar context in very different ways. The question becomes one of identifying the variables around which the entrepreneur is being formed. Let us consider four key variables: business skills, entrepreneurial competencies, an entrepreneurial mindset, and an entrepreneurial identity.

With regard to business skills, the entrepreneur is becoming a manager, ultimately responsible for all facets of a self-created organization and performance outcomes. While these skills can include technical capabilities such as selling, budgeting, or production, they also include development of a leadership style, ability to delegate, and ability to create and maintain an ethical climate, among other capabilities. For novice entrepreneurs, this simultaneous emergence as a manager can result in transformative changes. For experienced entrepreneurs, past experiences may have previously supported the development of such qualities, but novel experiences can continue to alter or transform (or simply reinforce) the entrepreneur's emergence. As an example, an experienced entrepreneur may have sought to initiate organizational change in a previous venture that was characterized by a strong hierarchical culture. Therefore, the entrepreneur was able to take a more "command" approach in pushing change (Huy, 2001). In the new venture, however, the entrepreneur exploited an opportunity in a technological domain outside of his or her area of expertise. Because of this, the entrepreneur promoted a more collective culture to support communication and mutuality. The "command" approach to facilitate organizational change in such a context would more likely result in significant backlash (Huy, 2001), requiring the entrepreneur to instead learn new skills in terms of educating others about the need for change and socializing with employees to persuade them of the necessity of change.

Ongoing events surrounding the venture are instrumental in formation of these skills, because they introduce variety, disruption, feedback, and reinforcement. A person who knows nothing about and may be uncomfortable with selling may learn to become adept at the sales process through the dynamic interactions, tensions, unexpected behaviors, generation of new knowledge, and related properties of emergence. Similarly, day to-day demands and negative feedback may transform a good delegator into a micromanager. As such, not all learning experiences facilitate the emergence of positive qualities in entrepreneurs.

Another emergent area concerns entrepreneurial competencies. Venture creation involves a number of unique capabilities for which the typical entrepreneur has often neither received formal training nor learned experientially prior to the venture. Competencies such as opportunity recognition, resource leveraging, guerrilla skills (e.g., creative employment of unconventional tactics, utilization of resources in nontraditional ways, tapping resources others do not see as resources, doing more with less, capitalizing on one's surroundings), and adeptness at managing and mitigating risk can be acquired from everyday experiencing in the venture (Morris, Webb, Fu, & Singhal, 2013). The individual may not set out to learn or develop these capabilities, and depending on prior experiences, individuals may enter a new context with some level of existing competence. However, unfolding events produce conflicts and crises that force the entrepreneur to experiment with activities that enable the learning of new or enhanced capabilities. Such experiments grow out of observation of other entrepreneurs, advice received from various parties, and the resourcefulness, inventiveness, and cleverness of the entrepreneur. Competencies such as these develop as a function of practice (Morris et al., 2013). Hence, the more one leverages or comes up with effective guerrilla marketing tactics and adjusts based on results, the better one becomes

at such behaviors. Further, the competencies interact with one another, such as where mitigating risk is accomplished by effectively leveraging resources. The entrepreneur's capabilities emerge as a function of these interactions and their outcomes (Morris et al., 2012b). Moreover, the nature of the experience (high positive versus negative affect) can foster the kinds of exploratory activity, creativity, and learning that underlie these competencies (Baron, 2008).

Another emergent outcome concerns the development of an "entrepreneurial mindset." A mindset is reflected in a person's overall attitudes, assumptions, inclinations, disposition, and outlook. It represents a personal philosophy, formed over time by experiences, and produces a strong inclination to behave in certain ways. Ireland, Hitt, and Sirmon (2003) defined the entrepreneurial mindset as an ability to sense, adapt, and react under conditions of uncertainty and ambiguity. McGrath and MacMillan (2000) claimed that it includes alertness to new opportunities, approaching opportunities with enormous discipline, selection of and focus on certain opportunities, adaptive execution, and leveraging of capabilities. Carsrud and Brannback (2009) emphasized a motivation to continually create products, processes, markets, and ventures. Other elements include entrepreneurial self-efficacy, an optimistic outlook, a desire for independence, and a proactive attitude (Bird, 1989; Chen, Greene, & Crick, 1998; Hmieleski & Baron, 2009).

This kind of mindset emerges as a venture takes form. Let us take, for instance, the entrepreneur's tolerance of ambiguity as a component of this mindset. Although there is research to suggest that successful entrepreneurs are tolerant of ambiguity, there is no evidence that entrepreneurs are more tolerant of ambiguity when the measurement is taken before or at the time the venture is started. Events produce ambiguity, and as these events are given meaning and made sense of, the individual learns to survive and progress in the midst of such ambiguity. Unconsciously, and over time, he or she reinterprets the relative need for clarity or exactitude that is required to comfortably perform. Of course, this happens to differing degrees with any given entrepreneur. The emergent nature of the entrepreneurial mindset is further reinforced by the work on serial entrepreneurs. These individuals often demonstrate such a mindset, borne out of earlier ventures in which they were involved (McGrath & MacMillan, 2000).

Finally, let us consider the formation of identity. Anthropologists have argued that performance of the self in experiential events becomes a means of forming an identity (Bruner, 1986). Psychologists have noted that ongoing states of activity (engagement, evaluation) are instrumental in forming self-identity (Barab, Hay, & Yamagata-Lynch, 2001). An identity emerges through a process of negotiation as social realities are shaping the individual and the individual is shaping social realities (Turner, 1986). Hoang and Gimeno (2005) conceptualized identity as a structure of meanings relating to the self that changes over time and over successive roles, and thus as a dynamic construct intimately linked to emergence processes. Consistent with these perspectives, an entrepreneurial identity emerges as the venture is created and implemented over time.

Entrepreneurial identity has four dimensions: identity attributes (i.e., personal traits associated with the role, such as being a risk-taker), identity content (i.e., the task of the entrepreneur, such as opportunity identification or organization building), how the individual regards the role of the entrepreneur (i.e., positive or negative assessments the individual has of the entrepreneurial role and how he or she thinks others view this role), and identity centrality (i.e., the subjective importance of the entrepreneurial identity vis-à-vis other identities that make up the individual's self-concept) (Hoang & Gimeno, 2005). These dimensions are interacting as individuals experience the venture and engage in social interactions, resulting in updates to and refinements of their entrepreneurial identity.

Entrepreneurial identity can form around a number of different attributes of being an entrepreneur (Down & Reveley, 2004; Hoang & Gimeno, 2005; Morris, Miyasaki, Watters, & Coombes, 2006; Murnieks & Mosakowski, 2007; Shepherd & Haynie, 2009). As examples, the emergent identity could center on that of organization builder, job creator, taker of risks, change agent, contributor to society, or innovator. Further, role identities interact. The gay individual who creates a venture may well see himself as a gay entrepreneur, or as an entrepreneur who happens to be gay (Schindehutte, Morris, & Allen, 2005). Identity is further defined by the type of venture one creates and the roles one plays in creation, because the events and experiences being processed, and how they are processed, vary significantly depending on venture context. The identity that emerges in an entrepreneur building a lifestyle venture can differ from that in a person creating a high-growth venture; likewise, it is likely to differ if one is creating something alone or with partners or family members.

It is also important to note that venture outcomes along the way have an impact on entrepreneurial

identity formation. For instance, positive and negative outcomes (and affect) can lead to changes in role regard or in the centrality placed on the entrepreneurial identity relative to other self-identities (e.g., mother, person of faith, environmentalist) held by the individual. Further, as identity emerges, it tends to affect information processing, learning, and behavioral choices, and as a result, the processing of ongoing events is affected. Hence, experiencing outcomes contributes to identity formation, which in turn influences how things are experienced.

How Emergence Complements Other Entrepreneurship-Based Perspectives

As a scholarly domain, entrepreneurship has recently entered a renaissance period in terms of theory development. Scholars have set forth various perspectives to understand entrepreneurship-related phenomena, including the individual–opportunity nexus, effectuation, and bricolage perspectives, among others. Derived from complexity science, emergence provides yet another complementary lens through which to study and understand entrepreneurship. In this section, we compare and contrast the key assumptions and tenets of emergence with those of these other perspectives in order to make more salient the unique insights that can be drawn from viewing entrepreneurship through an emergence lens. Table 26.3 highlights the key similarities and differences across these perspectives.

While entrepreneurship scholars continue to wrestle with what defines the essence of entrepreneurship (e.g., opportunity, innovation, venture creation, breaking constraints), there has

Table 26.3 Comparison of Entrepreneurship Perspectives

	Individual–Opportunity Nexus	Effectuation	Bricolage	Emergence
Key idea	Individuals recognize, evaluate, and exploit opportunities	Individuals with effectual logic emphasize control, and individuals with causative logic emphasize prediction	Individuals facing penurious environments make do with the resources at hand	Individuals' idiosyncratic interactions lead to a nonlinear, irreversible creation of new resultant structures
Assumptions	Individual agency, knowledge heterogeneity, disequilibrium, entrepreneurial action requires both an individual and opportunity	Individual agency, cognitive heterogeneity, goal development and choice are independent processes	Individual agency, penurious environments, resource limitations, resource heterogeneity	Individual agency, disequilibrium, constant and dynamic interaction among actors within a system, path dependency, heterogeneity across individuals
Independent variables	Individual and contextual differences	Effectual versus causative logic	Resource seeking, new resource combinations, avoiding challenges, improvisational competencies	**Process attributes:** nonlinearity, amplification of small change, unpredictability, adaptive tension, irreversibility, reciprocal interactions, supervenience
Dependent variables	Opportunity recognition, opportunity evaluation, opportunity exploitation, growth	New market creation, strategic actions (e.g., planning, formation of alliances), failure characteristics, innovation	Growth, routinization, new resource combinations, new market creation	**Novel resultant structures:** The individual entrepreneur, the opportunity, the venture

been agreement in terms of the key assumptions that characterize the domain. In presenting their individual–opportunity nexus perspective, Shane and Venkataraman (2000) described the assumptions that underlay their thoughts. The individual–opportunity nexus perspective asserts that entrepreneurship occurs through a process in which individuals recognize, evaluate, and exploit opportunities. A key assumption underlying this perspective is that entrepreneurs operate in environments of disequilibrium, where prices do *not* accurately convey all information regarding the value of resources, given constant technological, sociocultural, political, economic, institutional, and industry changes that disrupt the price system (Eckhardt & Shane, 2003). Second, entrepreneurs differ in their ability to recognize and exploit opportunities created by inaccurate price information due to knowledge heterogeneity; that is, differences in individuals' education, experiences, and cognitive frameworks shape their ability to recognize and exploit opportunities (Shane & Venkataraman, 2000). As a third assumption, individuals are characterized by agency in undertaking entrepreneurial activities. Individuals might be shaped by their environments, but they also have the ability to act and shape their environments. These assumptions (i.e., disequilibrium, knowledge heterogeneity, and agency), whether explicitly stated or implicitly recognized, seemingly underlie not only the individual–opportunity nexus perspective but also the other entrepreneurship perspectives, including emergence.

While sharing these core assumptions, the emergence lens departs from these other perspectives in key ways. We address each perspective separately below. However, although each of these perspectives alone suffers limitations in explaining entrepreneurship-related phenomena, there are opportunities for integrating the emergence perspective within each of these perspectives to advance scholarly understanding.

Individual–opportunity nexus. As stated previously, the individual–opportunity nexus perspective is premised on the notion that individuals recognize, evaluate, and exploit opportunities. The perspective has provided significant cohesion and scholarly progress within the entrepreneurship domain (Shane, 2012). Since this perspective was set forth, significant research has been conducted examining individual differences as shaping opportunity recognition and evaluation (Baron & Ensley, 2006; Short, Shook, Ketchen, & Ireland, 2010), contextual influences as shaping individuals' activities within the process (Webb, Tihanyi, Ireland, & Sirmon, 2009), and understanding of what opportunity means, among other considerations.

Although it is a cohesive force underlying entrepreneurship scholarship, the individual–opportunity nexus perspective inherently represents an oversimplification of how entrepreneurship unfolds. As described earlier, the process is a linear undertaking in which individuals recognize opportunities, evaluate them, and then exploit the most attractive opportunities. However, in many cases, what the entrepreneur recognizes initially as an opportunity changes as he or she interacts with the market during opportunity exploitation (Sarason et al., 2006). Evaluation and exploitation activities provide important sources of feedback that may ultimately redefine what the opportunity is (if it exists at all). Nonlinearity may be introduced not only through feedback but also through the entrepreneurs' interactions with other stakeholders. Such interactions may provide important insights that lead entrepreneurs to re-evaluate key criteria, such as how they deliver their product to the market or what markets are best served by their technology. Changing environmental conditions can lead to recognition of more attractive opportunities that change the focus of the venture or otherwise push the entrepreneur to re-evaluate current activities. These sources of nonlinearity are not explained within the individual–opportunity nexus perspective. Without subsuming nonlinearity within its framework, the nexus perspective also overlooks how irreversibility of investments and other interactions that occur during emergence can enhance or constrain the entrepreneur's future actions and how minor deviations that may arise during the venture creation process can be amplified through the entrepreneur's subsequent activities and completely transform how the opportunity is conceptualized.

The individual–opportunity nexus perspective also emphasizes the role of the individual entrepreneur. However, entrepreneurs often exploit opportunities by organizing ventures, and these ventures can impose constraints on how entrepreneurs exploit the opportunities; they can also provide a setting for a wholly new set of interactions that can change the conceptualization of the opportunity or how the opportunity should be exploited. In other words, the supervening effect

of the organization on the individuals within it is overlooked by focusing merely on the entrepreneur. Finally, Shane and Venkataraman (2000) realized the potential for one entrepreneur's activities to create a broader influence as other entrepreneurs observe that individual and undertake similar activities. Their consideration of this point is set forth more as an assumption, however, and we expect that scholarly understanding can be further advanced by trying to explain why some entrepreneurs have a broader influence on society than others.

Effectuation. The effectuation perspective distinguishes between two logics used by entrepreneurs in defining and exploiting their opportunities. Causation, as a "logic of prediction," occurs when entrepreneurs define the opportunity and then decide how they will exploit it through mobilizing resources. In contrast, effectuation, as a "logic of control," occurs when entrepreneurs discern what resources they have available to mobilize to help define what the opportunity will be (Sarasvathy, 2001). More specifically, causation is premised on "accurate predictions, careful planning and unwavering focus on targets" whereas effectuation favors "eschewing predictions, imaginative rethinking of possibilities and continual transformations of targets" (Dew, Read, Sarasvathy, & Wiltbank, 2009, p. 290). Whereas causation is more aligned with the linear focus of the individual–opportunity nexus perspective, effectuation incorporates logic consistent with emergence. For example, the continual transformations associated with effectual logic suggest the potential for nonlinearity.

At the same time, the effectuation perspective overlooks key factors and may benefit by incorporating an emergence perspective. The effectuation perspective focuses internally on the entrepreneur, emphasizing one's internal logic as defining activities and objectives. For instance, the perspective recognizes the importance of engendering partnerships as a means of mobilizing resources (e.g., Dew et al., 2009). However, the effectuation perspective overlooks the basic interactions, feedback, and supervenience that may influence the entrepreneur's logics over time (i.e., shifting an entrepreneur's logic from effectuation to causation, or vice versa). Similarly, the effectuation perspective does not alone consider why entrepreneurs may transition, such as with divergence from an initial course of action to convergence on a set of routines, in order to more efficiently exploit an opportunity. Incorporating an emergence perspective and the notion of adaptive tension offers the potential to explain why entrepreneurs may become more causative in logic as they operate in a given market.

Bricolage. Bricolage refers to entrepreneurs making do with the resources at hand (Baker, Miner, & Eesley, 2003; Levi-Strauss, 1966). Bricolage is a more narrowly focused perspective of entrepreneurship, primarily considering how entrepreneurs manage resources in penurious environments. In essence, the bricolage perspective complements the emergence perspective in a number of ways. First, the penurious nature of environments creates an adaptive tension within entrepreneurs to change their situation through bricolage. Second, bricolage represents nonlinearity in entrepreneurial activities as entrepreneurs "scavenge" resources in novel and different ways to overcome the limitations of penurious environments. Baker and Nelson (2005) distinguished between parallel and selective bricoleurs. Parallel bricoleurs employ bricolage repeatedly and consistently across domains, without regard to institutional boundaries, and without a particular focus on an overarching opportunity. In contrast, selective bricoleurs employ bricolage more sparingly, perhaps merely as a means to start up their ventures or during a transition phase that becomes amplified but then is refocused. The authors suggested that the greater level of nonlinearity characterizing parallel bricolage seems to undermine the growth witnessed by these entrepreneurs relative to those who employ selective bricolage. As a third overlap with the emergence perspective, the authors recognized the importance of reciprocal interactions with other stakeholders as supporting bricolage and the nonlinear activities that entrepreneurs employ to create stability in their contexts.

At the same time, the bricolage perspective's narrower focus presents some limitations that could perhaps be offset by incorporating an emergence perspective. For example, whereas the bricolage perspective focuses on the catalyst of a penurious environment, an entrepreneur's adaptive tension can surface from intrinsic sources (e.g., need for autonomy) and from resource-rich environments (e.g., an individual's inheriting a large sum of money and then wanting to make her own wealth). Such differences in the "resources at hand" and what motivates entrepreneurial activity in the first place may ultimately shape how those resources are

managed. In addition, the bricolage perspective seemingly focuses on opportunity exploitation. The emergence of an opportunity and a venture coincides, however, with the emergence of the entrepreneur, given the entrepreneur's basic interactions and feedback. The emergence of entrepreneurs through the nonlinearity of bricolage may ultimately shape the cognitive frameworks that cause them to recognize new opportunities or re-evaluate how they exploit existing opportunities. By incorporating a more holistic and dynamic consideration of emergence, scholars may gain a greater understanding of bricolage, such as why some entrepreneurs become locked into parallel bricolage while other entrepreneurs can remain as more selective bricoleurs.

Future Research Needs

The emergence perspective continues to develop within the entrepreneurship domain. At the same time, a number of questions remain, which, if addressed, can significantly enhance scholarly understanding of how emergence occurs. This section seeks to underscore a few current limitations of the emergence perspective.

A primary question for scholars employing an emergence perspective in the entrepreneurship domain is, "What is the ultimate outcome or dependent variable explained?" Despite the focus of an emergence perspective on the process of emergence and the properties that define that process (e.g., nonlinearity, amplification, irreversibility), scholars desire to explain how entrepreneurs' emergence processes differ in these attributes and why and how the different processes result in varying levels of success. On the one hand, we have suggested that the opportunity, the venture, and the entrepreneur represent three entities that may co-emerge into resultant structures through entrepreneurship. On the other hand, questions remain as to when emergence ends as entrepreneurs continue to explore new opportunities and are involved in new interactions. Are the opportunity, venture, and entrepreneur ever truly emerged? How do we compare opportunities, ventures, and entrepreneurs in a quasi-emergent state, especially when these entities are likely to be in differing states of emergence?

Given the complexity of emergence, notably the different interactions and experiences with which entrepreneurs are involved, the overall number and diversity of activities that entrepreneurs perform, and the unpredictability of small changes, emergence lends itself to a more qualitative research approach. (Chiles, Meyer, & Hench [2004] & Plowman et al. [2007] provide two excellent examples of qualitative studies examining emergence.) Nevertheless, qualitative studies alone are susceptible to concerns of generalizability and should be complemented by more quantitative studies to ascertain the veracity of the theory's assertions (McKelvey, 2004). As scholars have converged on the defining attributes of emergence processes (e.g., nonlinearity, irreversibility), we encourage the development of well-validated scales to capture these constructs. Scholars may also want to consider whether we want to examine entrepreneurs' perceptions of nonlinear change as facilitating emergence, or whether a more fruitful avenue of research would be to examine entrepreneurs' idiosyncratic susceptibilities to change (i.e., based on their attention to their environments, their creativity, and so on).

Finally, a defining characteristic of the emergence perspective is the potential for nonlinearity in entrepreneurship. Nevertheless, convergence toward establishing efficient routines represents an important facet of being an effective entrepreneur and overcoming liabilities of newness (Singh, Tucker, & House, 1986)—that is, convergence is an important component of entrepreneurial emergence. It seems that although nonlinearity and divergence are important considerations for emergence scholars, understanding how entrepreneurs balance convergence/linearity alongside the creative sparks that drive divergence/nonlinearity will provide more effective insights into successful emergence.

Conclusions

The emergence perspective offers much promise for advancing our understanding of entrepreneurship and how entrepreneurs creatively respond to their novel experiences. Emergent phenomena are in constant flux, and their development is nonlinear, largely unpredictable, and increasingly complex. The ambiguity and uncertainty endemic to entrepreneurship are heightened as we come to understand that the opportunity, the venture, and the entrepreneur are themselves taking new shapes and developing new dimensions—becoming something they were not before. As a result, linear theoretical models, cross-sectional methodologies, and conventional statistical analyses are ill-equipped to capture entrepreneurial emergence. The implication is that researchers must focus less on inputs and outcomes and more on the transformational processes.

Consider the notion of an opportunity. Much of the language of entrepreneurship research continues to treat opportunities as a type of objective reality. Yet, until the entrepreneur begins the creative process of forming a venture, many aspects of a given opportunity are not apparent and may not yet exist. Small developments can lead to discovery of dramatic new possibilities. Moreover, based on his or her changing skills, perceptions, and ongoing actions, aspects of a given opportunity are frequently being co-created by the entrepreneur. Similarly, changes within the venture interact with changes in the environment to transform the parameters and content of an opportunity. Complexity escalates because the exploitation of a given aspect of an opportunity can result in changes to that and other aspects. All the while, less attractive opportunities become more attractive, and vice versa.

Turning to the venture, emergence moves our perspective away from the created entity and toward the process of becoming an organization. Every entrepreneur pursues a unique path, with each experienced event informing and shaping the next. The building of a company is the outcome of a complex series of events, actions, and interactions that cannot be reversed. It is a trial-and-error journey marked by amplification effects and feedback loops as complex interactions occur on multiple levels. The journey is complicated by ongoing events that introduce conflict, crises, and complexity as well as new possibilities. As things unfold, entrepreneurial behaviors (adaptation, improvisation, intuitive actions, effectuation, and bricolage) are frequently the defining factors in determining what sort of venture emerges.

Emergence further suggests that traditional inquiries concerning "who is an entrepreneur?" must give way to questions of "how is an entrepreneur formed?" One is formed into an entrepreneur as a function of the processing of streams of salient events as a venture takes shape, with the experience being instrumental in determining the kind of entrepreneur one becomes. As they construct reality, entrepreneurs are constructing themselves, including developing new skills, honing their competencies, and shaping their cognitive frameworks. Key variables receiving heightened attention from scholars, such as entrepreneurial identity, an entrepreneurial mindset, and entrepreneurial competencies, are better understood as transformations in the entrepreneur that emerge in different ways and degrees based on immersion in the new venture context. As one emerges as an entrepreneur, he or she processes external and internal developments in new and different ways, resulting in decisions that lead to ongoing changes to the company. Yet, emergence of systems, structure, and culture within the venture can also change how the entrepreneur sees herself or himself, how time is allocated, and the areas in which ongoing personal development is concentrated. These company developments can result in changes to the entrepreneur's motives, goals, risk proclivity, need for control, and comfort with ambiguity. To the extent that entrepreneurs undertake creative solutions to address opportunities and create nonlinear change in their ventures, we expect that they themselves will emerge in transformative ways as individuals.

The co-emergence of the opportunity, the venture, and the entrepreneur are the essence of the phenomenon of entrepreneurship. Venture creation represents a unique combination of elements that are both known and unknown, controllable and uncontrollable, stable and chaotic, expected and unexpected, simple and complex, and positive and negative. It is a crucible that transforms these elements into something new and different—and the result is often something capable of having a transformative impact on communities and economies.

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Note

1. The emergence perspective overlaps with dynamic equilibrium models, in particular the foci on (1) exogenous changes that can disrupt order (equilibrium) and create a new order (equilibrium), and (2) the nature of the existing order (equilibrium) as influencing the creation of the new order (equilibrium). The emergence perspective, however, recognizes that in some dynamic contexts, order may never fully emerge but rather stay in a state of flux (i.e., disequilibrium) (Brown & Eisenhardt, 1997; Waldrop, 1992). More importantly, the emergence perspective emphasizes specific properties of entrepreneurs' experiences and the order they create as defining subsequent emergence.

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CHAPTER

27 Corporate Entrepreneurship: Accelerating Creativity and Innovation in Organizations

Donald F. Kuratko

Abstract

Developing organizational environments that cultivate employees' interest in creativity and commitment to innovation is critical to successful competition in today's global economy. The existence of a corporate entrepreneurship (CE) strategy implies that a firm's strategic intent is to leverage creative and entrepreneurial opportunities for growth- and advantage-seeking purposes. CE has gained greater research attention with a focus on the factors that influence an organization's willingness to initiate and sustain a CE strategy through entrepreneurial and creative behaviors. This chapter examines the concept of CE, the organizational antecedents conducive to CE, and the managerial roles needed at all levels of management, thus presenting a more complete understanding of the concepts behind a CE strategy. The chapter concludes with the future challenges for CE facing all organizations.

Key Words: corporate entrepreneurship, innovation, creativity, strategic entrepreneurship, corporate venturing

Introduction

The world is in the midst of a new wave of economic resurgence, and entrepreneurship and innovation are the catalysts. The development, application, and enhancement of new technologies are occurring at a breathtaking pace. Innovation is determining the way business is conducted at every level, producing an entrepreneurial imperative for the 21st century (Kuratko, 2009).

Ireland, Kuratko, and Morris (2006a, 2006b) pointed out that to simultaneously develop and nurture current and future competitive advantages, especially those that are grounded in innovation, firms increasingly rely on corporate entrepreneurship (CE) as a strategy. Firms that exhibit CE are typically viewed as dynamic entities prepared to take advantage of new business opportunities when they arise, and with a willingness to deviate from prior routines, strategies, business models, and operating environments to embrace new resource combinations that hold promise for new innovations. In general, CE flourishes in established firms when individuals are free to pursue actions and initiatives that are novel to the firm.

Developing organizational environments that cultivate employees' interest in creativity and commitment to innovation is critical to successful competition in today's global economy. The existence of a CE strategy implies that a firm's strategic intent is to continuously and deliberately leverage entrepreneurial opportunities (Shane & Venkataraman, 2000) for growth- and advantage-seeking purposes. Covin and Miles (1999) contended that innovation is the single common theme underlying all forms of CE.

Employees engaging in entrepreneurial and creative behaviors are the foundation for organizational innovation. In order to develop "corporate innovation," organizations must establish a process through which individuals in an established firm pursue entrepreneurial opportunities to innovate without regard to the level and nature of

currently available resources. However, to be successful, entrepreneurial activity must be carefully integrated into the organization's overall strategies (Morris, Kuratko, & Covin, 2011).

CE and the creative behaviors through which it is practiced have been initiated in established organizations for a host of purposes, including profitability (Vozikis, Bruton, Prasad, & Merikas, 1999; Zahra, 1993), strategic renewal (Guth & Ginsberg, 1990), innovativeness (Baden-Fuller, 1995), gaining knowledge to develop future revenue streams (McGrath, Venkataraman, & MacMillan, 1994), international success (Birkinshaw, 1997), growth (Zahra, Kuratko, & Jennings, 1999), and the effective configuration of resources as the pathway to developing competitive advantages (Borch, Huse, & Senneseth, 1999; Covin & Miles, 1999; Covin, Slevin, & Heeley, 2000; Ireland, Kuratko, & Covin, 2003b; Kuratko, Covin, & Garrett, 2009). Regardless of the reason the firm decides to engage in CE, it has become a major strategy in all organizations (Morris et al., 2011; Narayanan, Yang, & Zahra, 2009).

However, although many believe in the need for and inherent value of entrepreneurial action on the part of established organizations (Hitt, Ireland, Camp, & Sexton, 2001; Kuratko, Goldsby, & Hornsby, 2012; Morris et al., 2011), much remains to be revealed about how CE strategy is enacted in organizational settings. Fortunately, knowledge accumulation on the topic of CE has been occurring at a rapid rate, and many of the elements essential to construction of a theoretically grounded understanding of CE can be readily identified from the extant literature over the last 4 decades. The theoretical and empirical knowledge about the domain of CE and the entrepreneurial behavior on which it is based has gained greater research attention. Moreover, critical factors that influence an organization's willingness to continue implementing a CE strategy as well as managers' willingness to continue engaging in entrepreneurial and creative behaviors have been examined recently, which enhances our understanding of CE practices (Dess, Ireland, Zahra, Floyd, Janney, & Lane, 2003; Hornsby, Kuratko, Shepherd, & Bott, 2009; Hornsby, Kuratko, & Zahra, 2002; Kuratko, Hornsby, & Goldsby, 2004).

This chapter begins with an examination of the concept of CE, followed by an analysis of the elements that comprise a CE strategy. By focusing on the organizational antecedents conducive to CE and the managerial roles needed at all levels of management, this chapter seeks a more complete understanding of the concepts behind a CE strategy. The chapter concludes with the future challenges for CE facing all organizations.

The Concept of Corporate Entrepreneurship

The concept of CE has evolved over the last 4 decades, and the definitions have varied considerably over time. Early research in the 1970s focused on teams and how entrepreneurial activities inside existing organizations could be developed (Hanan, 1976; Hill & Hlavacek, 1972; Peterson & Berger, 1972). This early research was sparse because this concept was not widely acknowledged in existing organizations.

In the 1980s, some researchers concluded that entrepreneurship and bureaucracies were mutually exclusive and could not coexist (Duncan, Ginter, Rucks, & Jacobs, 1988; Morse, 1986). However, there arose far more researchers who embraced the idea of CE activity and conceptualized CE as embodying entrepreneurial behaviors requiring organizational sanctions and resource commitments for the purpose of developing different types of value-creating innovations (Alterowitz, 1988; Burgelman, 1983a, 1983b, 1984; Kanter, 1985; Pinchott, 1985; Schollhammer, 1982). So, for the most part in the 1980s, CE was defined simply as a process of organizational renewal (Sathe, 1989).

During the 1990s, more comprehensive definitions of CE were proffered as researchers focused on the use of CE for re-energizing and enhancing the firm's ability to develop the skills through which innovations can be created (Borch et al., 1999; Jennings & Young, 1990; Merrifield, 1993; Zahra, 1991). New venture creation within existing organizations and the transformation of ongoing organizations through strategic renewal were proposed as two major forms of CE (Guth & Ginsberg, 1990). CE could entail formal or informal activities aimed at creating new businesses in established companies or entrepreneurial innovations through product, process, or market initiatives. These innovations could take place at the corporate, division (business), functional, or project levels (Zahra, 1991). Demonstrating that the two major forms of CE introduced at the beginning of the decade still dominated the landscape, Sharma and Chrisman (1999, p. 18) suggested that CE "is the process whereby an individual or a group of individuals, in association with an existing organization, create a new organization or instigate renewal or innovation within that organization."

As these definitions became more accepted in the literature, 21st century scholars linked CE to firms' efforts to establish sustainable competitive advantages as the foundation for profitable growth (Hornsby, Kuratko, Shepherd, & Bott, 2009; Kuratko, Ireland, Covin, & Hornsby, 2005b; Kuratko, Ireland, & Hornsby, 2001). In this regard, Morris et al. (2011) described CE as being manifested in companies through either corporate venturing or strategic entrepreneurship.

Corporate venturing approaches have as their commonality the addition or development of new businesses (or portions of new businesses via equity investments) within the corporation. This can be accomplished through three implementation modes—internal corporate venturing, cooperative corporate venturing, and external corporate venturing. By contrast, strategic entrepreneurship approaches have as their commonality the exhibition of large-scale or otherwise highly consequential innovations that are adopted in the firm's pursuit of competitive advantage. These innovations may or may not result in new businesses for the corporation. With strategic entrepreneurship approaches, innovation can be in any of five areas—the firm's strategy, product offerings, markets served, internal organization (i.e., structure, processes, and capabilities), or business model (Morris et al., 2011).

Corporate venturing, the first major category of CE, includes various methods for creating, adding to, or investing in new businesses, which may be considered "internal" or "external" (Ireland et al., 2003b; Kuratko et al., 2009; McGrath, Keil, & Tukiainen, 2006). With *internal corporate venturing*, new businesses are created and owned by the corporation. These businesses typically reside within the corporate structure but occasionally may be located outside the firm and operate as semiautonomous entities. Among internal corporate ventures that reside within the firm's organizational boundaries, some may be formed and exist as part of a preexisting internal organizational structure, and others may be housed in newly formed organizational entities within the corporate structure. *External corporate venturing* refers to entrepreneurial activity in which the firm invests in new businesses created by parties outside the corporation (via the assumption of equity positions) or acquired by the corporation. These external businesses are typically very young ventures or firms in early growth stages that offer the acquiring corporation access to a new technology or product line that is currently not being pursued internally. In practice, new businesses might be developed through a single venturing mode or any of the two venturing modes. Therefore, a firm's total venturing activity is equal to the sum of the ventures enacted through the internal and external modes. With corporate venturing, creating an entirely new business is the main objective (Covin & Miles, 2007).

It is impossible, however, to evaluate the success or failure of corporate venturing initiatives unless management's goals for this activity are clear. Companies often create venture evaluation and control systems that assess venture performance on criteria that follow from the venture's founding motive. Tidd and Taurins (1999) concluded that there are two sets of motives that drive the practice of internal corporate venturing: leveraging, to exploit existing corporate competencies in new product or market arenas, and learning, to acquire new knowledge and skills that may be useful in existing product or market arenas. When the primary motive is leveraging, some of the specific reasons that firms engage in corporate venturing include the following: to exploit underutilized resources; to extract further value from existing resources; to introduce competitive pressure onto internal suppliers; to spread the risk and cost of product development; to divest non-core activities. The learning motives can also be broken down further. Three major types of organizational learning tend to receive the greatest emphasis: to learn about the process of venturing, to develop new competencies, and to develop managers.

In another study of corporate venturing practice, this one including firms engaged in both internal and external corporate venturing, Miles and Covin (2002) reported that the firms pursued venturing for three primary reasons: (1) to build an innovative capability as the basis for making the overall firm more entrepreneurial and accepting of change, (2) to appropriate greater value from current organizational competencies or to expand the firm's scope of operations and knowledge into areas of possible strategic importance, and (3) to generate quick financial returns.

Strategic entrepreneurship constitutes a second major category of approaches to CE. Whereas corporate venturing involves company involvement in the creation of new businesses, strategic entrepreneurship corresponds to a broader array of entrepreneurial initiatives that do not necessarily involve the addition of new businesses to the

firm. Strategic entrepreneurship involves simultaneous opportunity-seeking and advantage-seeking behaviors (Ireland, Hitt, & Sirmon, 2003a). This means that firms take actions to "exploit" their knowledge for current opportunities in the environment while also "exploring" new innovations that may benefit them in the future (Hitt, Ireland, Sirmon, & Trahms, 2011). The innovations that are the focal points of strategic entrepreneurship initiatives represent the means through which opportunity is capitalized on. These are innovations that can be developed in any activity in the company. By emphasizing an opportunity-driven mindset, management seeks to achieve and maintain a competitively advantageous position for the firm.

These innovations can represent fundamental changes from the firm's past strategies, products, markets, organization structures, processes, capabilities, or business models. Or, they can represent fundamental bases on which the firm is differentiated from its industry rivals. Hence, there are two possible reference points that can be considered when a firm exhibits strategic entrepreneurship: (1) the amount of the firm's transformation relative to its previous state (i.e., transforming its products, markets, internal processes, and so on) and (2) the amount of the firm's transformation relative to industry conventions or standards (again in terms of product offerings, market definitions, internal processes, and so forth). Strategic entrepreneurship can take five forms—strategic renewal, sustained regeneration, domain redefinition, organizational rejuvenation, and business model reconstruction (Covin & Miles, 1999; Ireland & Webb, 2007).

The major thrust behind CE is the revitalization of innovation and individual creativity in corporations. Creativity is a powerful tool for individuals seeking to develop new ideas that result in innovations for the organization (Sawyer, 2006). The corporate environment can be an ideal setting for individuals to share ideas and expand their creative thinking, because research has demonstrated that creativity tends to be a socially constructed phenomenon (Csikszentmihalyi, 1996; Sternberg, Kaufman, & Perez, 2002).

As individual creativity and organizational innovation have advanced, it appears that CE is now being viewed with a "venturing" focus or a "strategic" focus. Therefore, examining the research that focuses on the various aspects of a CE strategy may be important for scholars to move the field forward.

Corporate Entrepreneurship Strategy

Increasingly, environmental triggers are interpreted by decision makers as requiring the formation and use of CE as the core of the firm's efforts to adapt strategically. Lumpkin and Dess (1996) suggested that organizations facing a rapidly changing, faster-paced competitive environment might be best served by implementing CE behaviors as an adaptation mechanism. When using CE as the source of strategic adaptation to the realities of a firm's external environment, the intention is to rely on innovation as the foundation for creating new businesses or reconfiguring existing ones (Kuratko et al., 2012). As firms innovate more regularly, they must be willing to accept considerable, although reasonable, levels of risk (Miller & Friesen, 1982). To Sykes and Block (1989), reasonable risks are "affordable" to the organization in terms of its current and future viability as an operating entity. Resulting from successful use of CE, firms may deliberately reposition themselves within their environment, including the main arenas in which they compete (Covin & Slevin, 1991).

Morris et al. (2011) contended that when the actions taken in a large firm to form competitive advantages and to exploit them through a strategy are grounded in entrepreneurial actions, the firm is employing an *entrepreneurial strategy*. Further, when establishing direction and priorities for the product, service, and process innovation efforts of the firm, the company is formulating its *strategy for entrepreneurship*. The choice of using a strategy for CE as a primary means of strategic adaptation reflects the firm's decision to seek competitive advantage principally through innovation, creativity, and entrepreneurial behavior on a sustained basis (Russell, 1999). If we compare these two strategies, both address issues that are external and internal to the firm. However, the application of entrepreneurial thinking to the firm's core strategy is primarily dealing with external questions such as identifying unmet needs in the market and how the firm can best pursue innovation on a sustained basis. Alternatively, the development of a strategy for entrepreneurship is especially concerned with internal questions, including the appropriate entrepreneurial environment for employees to seek and discover company innovations. Clearly, both aspects of a CE strategy are needed (Morris et al., 2011).

For success in using CE, those within the firm must be encouraged and nurtured in their use of it. Without awareness, encouragement, and nurturing,

the entrepreneurial behavior that is linked to CE will not surface or be used consistently throughout the firm (Kuratko et al., 2001). Furthermore, an awareness of what CE calls for in terms of behavior on the part of individuals permits an analysis of choices. Typically, organizational members compare and evaluate the opportunity costs of engaging in entrepreneurial behavior with those of either not doing so or engaging in other behaviors. Lower opportunity costs, relative to the costs of other behavior, engender a commitment to engaging in entrepreneurial behavior (Amit, Muller, & Cockburn, 1995; Shane & Venkataraman, 2000).

In comprehensive arguments, Burgelman (1983a, 1984) and Burgelman and Sayles (1986) contended that organizational innovation, along with other strategic activities, surfaces through two models: induced strategic behavior and autonomous strategic behavior. Of the two models, induced strategic behavior occurs more frequently in organizations. Comparatively, induced strategic behavior captures formal entrepreneurial behavior, whereas autonomous strategic behavior is entrepreneurial behavior that surfaces informally in the firm. The more resource-rich the firm, the greater the likelihood that autonomous strategic behavior will emerge.

Burgelman's (1983b) induced strategic behavior approach is a top-down process whereby the firm's strategy and structure provide the context within which entrepreneurial behavior is elicited and supported. The responsibility for establishing a strategy and forming a structure that can induce entrepreneurial behavior rests with top-level managers. That is, the structures put in place for the organization will either enhance entrepreneurial behaviors by encouraging cross-discipline communications or discourage such behavior with departments that fail to communicate with each other. In addition, the strategy of the organization must convey an emphasis on entrepreneurial activity for the organization. Thus, induced strategic or entrepreneurial behavior can be shaped by the firm's structural context. Although Burgelman's (1983b) analysis focused on induced strategic behavior, it did not suggest ignoring the importance of autonomous strategic behavior for successful CE actions. Indeed, both induced and autonomous strategic behavior are important to a firm's CE efforts, whether they are oriented to creating new businesses or reconfiguring existing ones.

In the induced strategic behavior model, top-level managers oversee, nurture, and support the firm's attempts to use entrepreneurial behavior as the foundation for product, process, and administrative innovations (Heller, 1999). A CE strategy that is intended to elicit and support induced strategic behavior should also include degrees of flexibility through which autonomous strategic behavior is allowed and indeed encouraged to surface. Properly viewed as a formal tolerance of autonomous strategic behavior, an intentional commitment of this type is a conscious strategic decision on the part of the firm's upper-level decision makers to foster innovative entrepreneurial behavior, regardless of whether its origin rests with formal or informal processes (Bird, 1988).

Based on the discussion presented thus far, a CE strategy is best defined by Ireland, Covin, and Kuratko (2009, p. 21) as "a vision-directed, organization-wide reliance on entrepreneurial behavior that purposefully and continuously rejuvenates the organization and shapes the scope of its operations through the recognition and exploitation of entrepreneurial opportunity."

Internal Environment for Corporate Entrepreneurship

In order to understand the most effective internal environment for corporate entrepreneurial activity, an examination of antecedents to individual entrepreneurial behavior is critical. Much of our understanding of the impact of organizational antecedents on individual-level entrepreneurial behavior is based on the empirical research of Kuratko and his colleagues (Hornsby, Kuratko, Holt, & Wales, 2013; Hornsby, Kuratko, & Montagno, 1999; Hornsby et al., 2009; Hornsby et al., 2002; Kuratko, 1993; Kuratko, Hornsby, & Bishop, 2005a; Kuratko et al., 2004; Kuratko et al., 2005b; Kuratko & Montagno, 1989; Kuratko, Montagno, & Hornsby, 1990; Hornsby, Naffziger, Kuratko, & Montagno, 1993).

In the Kuratko et al. (1990) study, results from factor analysis showed that what had been theoretically argued and hypothesized to be five conceptually distinct factors that would elicit and support entrepreneurial behavior on the part of first- and middle-level managers (i.e., top management support for CE, reward and resource availability, organizational structure and boundaries, risk taking, and time availability) were actually only three in number. More specifically, based on how items loaded, Kuratko et al. (1990) concluded that three factors—management support, organizational structure, and reward and resource

availability—were important influences on the development of an organizational climate that supports entrepreneurial behavior on the part of first- and middle-level managers. Although this study's results did not support the hypothesized five-factor model, the findings established the multidimensionality of antecedents of managers' entrepreneurial behavior. However, later studies were conducted that supported the five factors.

To extend the earlier work of Kuratko et al. (1990), Hornsby et al. (1999) conducted an empirical study designed to determine whether organizational culture creates variance in entrepreneurial behavior between Canadian and US managers. The results, based on data collected from all levels of management, showed no significant differences between Canadian and US managers' perceptions of the importance of all five factors—management support, work discretion, rewards/reinforcement, time availability, and organizational boundaries—as antecedents to their entrepreneurial behavior. These findings partially validate those reported by Kuratko et al. (1990) and support the importance of the five initial organizational antecedents of managers' entrepreneurial behavior in companies based in a second (albeit similar) national culture.

Hornsby et al. (2002) developed the *Corporate Entrepreneurship Assessment Instrument (CEAI)* to partially replicate and disentangle previously reported findings. The instrument featured Likert-style questions that were used to assess antecedents of entrepreneurial behavior. Results from factor analyses suggested that there are, in fact, five stable antecedents of middle-level managers' entrepreneurial behavior. The five antecedents are (1) *management support* (the willingness of top-level managers to facilitate and promote entrepreneurial behavior, including championing innovative ideas and providing necessary resources); (2) *work discretion/autonomy* (top-level managers' commitment to tolerate failure, provide decision-making latitude and freedom from excessive oversight, and delegate authority and responsibility); (3) *rewards/reinforcement* (development and use of systems that reward based on performance, highlight significant achievements, and encourage pursuit of challenging work); (4) *time availability* (evaluating work loads to ensure time to pursue innovations and structuring jobs to support efforts to achieve short- and long-term organizational goals); and (5) *organizational boundaries* (precise explanations of outcomes expected from organizational work and development of mechanisms for evaluating, selecting, and using innovations).

When attempting to inventory the firm's current situation regarding readiness for innovation, managers need to identify parts of the firm's structure, control systems, human resource management systems, and culture that inhibit and parts that facilitate entrepreneurial behavior as the foundation for successfully implementing corporate innovation. Ireland et al., (2006a, 2006b) established a "corporate entrepreneurial health audit" that utilized the CEAI but altered the title to the *Corporate Entrepreneurship Climate Instrument.* Their instrument still uses the five dimensions to CE (management support, work discretion/autonomy, reinforcement, time availability, and organizational boundaries). It measures the degree to which a firm's culture supports entrepreneurial activity because it can be used to develop a profile of a firm across the five internal environmental dimensions. Low scores in one specific dimension of the instrument suggest the need to focus on that particular dimension for improvement in order to enhance the firm's readiness for entrepreneurial behavior and eventually successful corporate innovation. It highlights the specific dimensions of the internal work environment that should be the focus of ongoing design and development efforts.

Managers and employees across a firm are most likely to engage in entrepreneurial behavior when the organizational dimensions to that behavior are effectively perceived, widely known, and universally accepted. Individuals assess their entrepreneurial capacities in reference to what they perceive to be a set of organizational resources, opportunities, and obstacles related to entrepreneurial activity (Hornsby et al., 2009). Once it is determined that the value of an environment encouraging entrepreneurial behavior exceeds that of all other organizational behaviors, managers are more likely to continuously champion, facilitate, and nurture that innovation-friendly environment.

In summary, the literature on the organizational antecedents to CE has been emerging in recent years. The literature reviewed demonstrates the growing importance of identifying the attributes of an organizational environment conducive to CE activity. However, even with the appropriate environment, the importance of managers at all levels within that environment need to be understood.

Sustaining the Corporate Entrepreneurial Strategy: Critical Roles of Managers

The presence of these internal environmental antecedents may be sufficient to prompt an organization's leaders to explore the possibility of adopting a CE strategy; however, the commitment of individuals throughout the organization to making a CE strategy work is necessary to ensure that entrepreneurial strategy becomes a regular and important activity in the organization (Kuratko et al., 2005b). Alignments must be created in evaluation and reward systems such that congruence is achieved in the entrepreneurial behaviors induced at the individual and the organizational levels (Hornsby et al., 2009). Thus, although external conditions in the firm's competitive market may be increasingly conducive to the adoption of a corporate entrepreneurial strategy, managers should harbor no illusions that the effective implementation of these strategies will be easily accomplished.

For corporate entrepreneurship/innovation to operate as a strategy, it must "run deep" within the organization. Eisenhardt, Brown, and Neck (2000) perhaps best captured the strategies along an "innovation" continuum with their observations that firms possessing entrepreneurial strategies remain close to the "edge of time," judiciously balancing the exploitation of current entrepreneurial opportunities with the search for future entrepreneurial opportunities. Top managers are increasingly acknowledging the need to respond to the entrepreneurial imperatives created by their competitive landscapes. Minimal responses to these entrepreneurial imperatives, reflecting superficial commitments to CE strategy, are bound to fail. Moreover, whereas top management can instigate the strategy, top management cannot dictate it. Those at the middle and lower ranks of an organization have a tremendous influence on and significant roles in entrepreneurial and strategic processes (Hornsby et al., 2009). Without sustained and strong commitment from all levels of the organization, entrepreneurial behavior will never be a defining characteristic of the organization.

Thus, it is imperative that managers at all organizational levels recognize the critical strategic roles they must fulfill for the organization to be successful (Floyd & Lane, 2000; Ireland, Hitt, & Vaidyanath, 2002). According to Floyd and Lane, senior-, middle-, and first-level managers have distinct responsibilities with respect to each subprocess. Senior-level managers have *ratifying, recognizing*, and *directing* roles corresponding to the competence definition, modification, and deployment subprocesses, respectively. These roles, in turn, are associated with particular managerial actions.

Burgelman (1984) contended that in successful CE, senior-level management's principal involvement takes place within the strategic and structural context determination processes. In particular, senior-level managers are responsible for *retroactively rationalizing* certain new businesses into the firm's portfolio and concept of strategy based on their evaluations of those businesses' prospects as desirable, value-creating components of the firm. Senior-level managers are also responsible for *structuring* the organization in ways that accommodate and reinforce the business ventures embraced as part of the firm's strategic context. Overall, Burgelman viewed senior-level managers as having a *selecting* role in the corporate venturing form of CE.

Ling, Simsek, Lubatkin, and Veiga (2008) examined 152 firms in regard to the impact of "transformational" CEOs' on CE. Their research demonstrated that the transformational CEOs had a significant role in directly shaping four salient characteristics of top management teams: behavioral integration, risk-taking propensity, decentralization of responsibilities, and long-term compensation. This study provided impetus to the importance of the "directing" role that top management must embrace.

In summary, senior-level managers have multiple and critical roles in CE activity. These managers are responsible for the articulation of an entrepreneurial strategic vision and for instigation of the emergence of a pro-entrepreneurship organizational architecture. Moreover, through specific manifestations of entrepreneurial actions, senior-level managers are also centrally involved in the defining processes of both the corporate venturing and strategic renewal forms of CE, and they proactively respond to various entrepreneurial imperatives.

In examining the role of middle-level managers, research has highlighted the importance of these managers' entrepreneurial behaviors to the firm's attempt to create new businesses or reconfigure existing ones (Floyd & Wooldridge, 1992; Ginsberg & Hay, 1994; Kanter, 1985; Pearce, Kramer, & Robbins, 1997). This importance is manifested in terms of both the need for middle-level managers to behave entrepreneurially and the requirement for them to support and nurture others' attempts to do the same. Middle-level managers' work as change agents and promoters of innovation is facilitated by their organizational centrality.

Kuratko et al. (2005b) proposed a model of middle-level managers' entrepreneurial behavior. They contended that middle-level managers *endorse, refine,* and *shepherd* entrepreneurial opportunities and *identify, acquire,* and *deploy* resources needed to pursue those opportunities. Regarding the *endorsement* of entrepreneurial opportunities, middle-level managers often find themselves in evaluative positions vis-à-vis entrepreneurial initiatives emerging from lower organizational levels. In an induced sense, middle-level managers endorse CE perspectives coming from top-level executives and "sell" their value-creating potential to those who have the primary responsibility for implementation—first-level managers and their direct subordinates.

Their *refinement* behaviors characteristically involve molding the entrepreneurial opportunity into one that makes sense for the organization, given the organization's strategy, resources, and political structure. It is characteristically the job of middle-level managers to convert malleable entrepreneurial opportunities into initiatives that fit the organization. Through the *shepherding* function, middle-level managers champion, protect, nurture, and guide the entrepreneurial initiative. To interact effectively with first-level managers, middle-level managers must possess the technical competence required to understand the initial development, subsequent shaping, and continuous applications of the firm's core competencies. Simultaneously, to interact effectively with senior-level executives, middle-level managers must understand the firm's strategic intent and goals as well as the political context within which these are chosen and pursued. Resulting from these interactions is the ability of middle-level managers to champion strategic alternatives from those below (i.e., first-level managers) and to make them accessible to those above. These behaviors ensure that entrepreneurial initiatives originating at lower organizational levels are not "orphaned" once their continued development requires support beyond what can be given by individuals at those lower levels.

The pursuit of entrepreneurial opportunities necessitates the *identification* of resources needed to convert the entrepreneurial concept into a business reality. Knowing which resources will be needed to pursue any given entrepreneurial opportunity will be difficult because entrepreneurial initiatives tend to evolve in their scope, content, and focus as they develop (McGrath & MacMillan, 1995). Whereas the resource identification function requires middle-level managers to know what resources are needed to pursue the entrepreneurial opportunity, the resource *acquisition* function requires that they know where and how to get those resources. Middle-level managers are often most responsible for redirecting resources from existing operations to entrepreneurial initiatives appearing to have greater strategic value for the firm (Burgelman, 1984). It might be argued that the middle management level is where entrepreneurial opportunities are given the best chance to flourish based on the resources likely to be deployed in their pursuit. In summary, evidence shows that middle-level managers are a hub through which most organizational knowledge flows (Floyd & Wooldridge, 1990, 1994; King, Fowler, & Zeithaml, 2001).

Floyd and Lane (2000) argued that first-level managers have three basic roles: *experimenting* roles corresponding to the competence definition subprocess; *adjusting* roles corresponding to the competence modification subprocess; and *conforming* roles corresponding to the competence deployment subprocess. First-level managers' experimenting role is expressed through the initiation of entrepreneurial projects. The adjusting role is expressed through, for example, first-level managers' response to recognized and unplanned entrepreneurial challenges. Finally, the conforming role is expressed through first-level managers' adaptation of operating policies and procedures to the strategic initiatives endorsed at higher organizational levels.

Overall, research demonstrates that organizations pursuing CE strategies must recognize the integrated set of entrepreneurial actions at the senior, middle, and first levels of management. In one empirical examination of managers' relation to employees in the CE process, Brundin, Patzelt, and Shepherd (2008) studied the entrepreneurial behavior of employees in entrepreneurially oriented firms and found a direct relation to managers' emotions and actions. The employees' willingness to act entrepreneurially increased when managers displayed confidence and satisfaction about an entrepreneurial project. It was also shown that the employees' willingness to act entrepreneurially decreased when managers displayed frustration, worry, or bewilderment about an entrepreneurial project.

In another empirical study of 458 managers at different levels in their firms, the entrepreneurial actions within the context of CE were examined (Hornsby et al., 2009). This study found that the relationship between perceived internal antecedents (as measured by the CEAI; Hornsby et al.,

2002) and corporate entrepreneurial actions (measured by the number of new ideas implemented) differed depending on the managerial level. Specifically, the positive relationship between managerial support and entrepreneurial action was more positive for senior- and middle-level managers than it was for first-level managers, as was the positive relationship between work discretion and entrepreneurial action. The few studies that have explored managerial levels (primarily conceptual studies) have emphasized the role of first-level managers in a "bottom-up" process of CE (Burgelman, 1983a, 1983b, 1984). This study offered a counterweight to the "bottom-up" process with arguments and empirical support for the notion that, given the specific organizational antecedents necessary for CE activity, senior managers demonstrated a greater ability to "make more of" these specific conditions (such as work discretion, time availability, organizational boundaries, and managerial support) to potentially implement more entrepreneurial ideas than first-level managers did.

Even with the differences found in regard to levels of management, the Hornsby et al. (2009) study reinforced the belief that, working jointly, senior-, middle-, and first-level managers are responsible for developing the entrepreneurial behaviors that could be used to form the core competencies through which future competitive success can be pursued.

Relevant Issues for the Future

There are certain relevant issues that confront organizations working toward a CE strategy. The true value of a CE strategy lies in the extent to which it helps organizations create a *sustainable entrepreneurial mindset* (McGrath & MacMillan, 2000). However, in order to maintain this entrepreneurial mindset, managers must be aware of the issues that lie ahead.

First, current thinking pertaining to the need to "unleash the entrepreneurial hostages" in organizations by simply removing constraints on their innovative behaviors likely ignores the importance to innovation of encouraging, directing, restricting, and prohibiting innovative behaviors and initiatives according to their alignments with the organization's interests. Not all CE behavior is good for the organization, even though the literature in the area of corporate innovation often implicitly regards such behavior as inherently virtuous. As noted by Kuratko and Goldsby (2004), the encouragement of CE can and often does result in counterproductive, rogue behavior by organizational members. Thus, the deliberate design and development of organizational systems reflecting the organizational dimensions for an environment conducive to corporate innovation is critical. Organizations should focus on the antecedents that create an environment conducive to entrepreneurial activity so that the innovative potential that resides within the organization is leveraged for the highest and best organizational purposes (Kuratko, 2009; Morris et al., 2011).

A second issue, related to the preceding point, is that the exhibition of certain controls is not antithetical to the interests of corporate innovation but rather inherent to those interests. A study by Goodale, Kuratko, Hornsby, and Covin (2011) showed that innovation is a process amenable to the application of structured, disciplined oversight. Therefore, the organization should design and develop innovation-facilitating and control-facilitating mechanisms that complement one another. The successful pursuit of innovation demands that managers approach the innovation challenge with the understanding that the means by which potentially desirable innovation outcomes might be generated can be well understood and deliberately constructed. There are rules, methods, and general process knowledge that can be brought to bear as resources in the facilitation of successful innovation efforts. It is often not the absence of rules and well-understood procedures that results in successful innovation, but their presence.

A third issue deals with a deeper understanding of projects. There is a "grief" that may be associated with project failures (Shepherd, Covin, & Kuratko, 2009). Although failure can be an important source of information for learning, this learning is not automatic or instantaneous. The emotions generated by failure (i.e., grief) can interfere with the learning process, and grief recovery may be an important component for individual innovation to continue. Recognizing the grief process and how it can be managed by individuals and organizations for enhanced learning (Shepherd & Kuratko, 2009) is critical to the grief recovery process. Having failed innovators recover more quickly from the emotions of grief, learn more from their project failures, and remain committed to future innovative endeavors will likely enhance the organization's sustained innovative output.

A final issue relates to managers' keeping their finger on the pulse of the entrepreneurial transformation. This involves constructive monitoring

and control of the developing opportunities (Morris et al., 2011). The dynamic entrepreneurial organizations of this 21st century will be ones that are capable of merging strategic action with entrepreneurial action on an ongoing basis (Ireland, Hitt, Camp, & Sexton, 2001). The strategic mindset includes more innovative concepts in leading organizations today, so it is important to recognize a critical factor that Covin and Slevin (2002) pointed out. The "hardware" side of organizations (strategy, structure, systems, and procedures) is the contextual framework within which individuals take their behavioral cues. The "software" side of organizations (culture and climate), although more subtle and informal, is the locus for the acceptance or rejection of true entrepreneurial activity. Organizations cannot simply send an edict to the organizational members that entrepreneurial activity and innovations are to take place. Rather, they must focus on the development of an entrepreneurial climate to facilitate the entrepreneurial actions of organizational members.

Conclusion

The 21st century is now a time when innovation is recognized widely as the path to competitive advantage and success in organizations of all types and sizes (Kuratko et al., 2012). A sustainable CE strategy will drive organizations toward innovation through the challenging global economy (Kuratko, 2009). As Baumol (2004) stated, "The outlook is, indeed, that there will be no break in the acceleration of innovation, and that the innovations in prospect will be as difficult for us to comprehend as those now thoroughly familiar to us would have been to our ancestors."

The major thrust behind CE is a revitalization of innovation, creativity, and leadership in today's organizations. It appears that CE may possess the critical components needed for the future productivity of all organizations. If so, then recognizing entrepreneurial strategies in contemporary organizations will be critical.

In summary, this chapter has provided insights from the current research on CE strategy in order to establish a stronger frame from which researchers and practitioners can find what ultimately impacts organizational success. It is clear that organizations are choosing to pursue CE strategies, and as the research on CE continues to expand, there will be greater understanding of the entire concept.

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CHAPTER

28 Entrepreneurial Identity and Resource Acquisition: The Role of Venture Identification

Greg Fisher *and* Suresh Kotha

Abstract

This chapter adopts an identity perspective in examining the acquisition of resources for new ventures. The proposed conceptual model integrates organizational identity theory and individual identity theory to outline how the individual identity of a resource provider interacts with the entrepreneurial identity of a new venture to foster venture identification, the "sense of oneness" that a resource provider feels in relation to a new venture. Venture identification is proposed as a key determinant of entrepreneurial resource acquisition. The cognitive and affective mechanisms underlying venture identification are outlined and integrated into the model. Venture uncertainty is proposed as a moderator influencing the relationship between venture identification and resource acquisition.

Key Words: new ventures, resource acquisition, entrepreneurial identity, individual identity, uncertainty

> New companies are guilty until proven innocent. Most of them fail. Investors know this. Entrepreneurs don't—or at least choose not to believe this. Their company will be different from all others. Is this clash of views a problem? Businesses need capital so that they can invest in people, physical assets, inventory, and so on. But investors are gripped by the fear of failure and possible loss of precious capital.… Entrepreneurs are captivated by the opportunity and are blind to the possibility of failure. They have to be. Otherwise they wouldn't set out on the crazy journey of building a new company. How can the two sides come together?
>
> *(Berkery, 2007, p. 1)*

Introduction

Resource acquisition has been described as one of "the greatest challenges faced by entrepreneurs" (Brush, Greene, & Hart, 2001, p. 71). The challenge stems from the uncertainty (Knight, 1921) and equivocal nature of entrepreneurial opportunities. Resource providers typically possess less information than entrepreneurs about new opportunities and the proposed means of exploitation (Amit, Brander, & Zott, 1998); and the value of entrepreneurial opportunities is largely unknown before exploitation (Shane, 2003; Stuart, Hoang, & Hybels, 1999). For those reasons, resource providers are usually reluctant to commit resources to new ventures (Schoonhoven & Romanelli, 2001).

Yet entrepreneurs are dependent on resources—capital, labor, and social networks—to develop new enterprises. Although not all entrepreneurs depend on external resources (Bhide, 2000), many need expertise, connections, or validation from external entities to nurture and grow their venture. For ventures in the early stages of development, much of the initial support that entrepreneurs get from external resources can come from angel investors who can provide seed funding, important referrals, and/or expertise.

Research on new venture resource acquisition has focused on what entrepreneurs can do to portray a venture as a good risk (Navis & Glynn,

2011), making a venture seem plausible and attractive to potential resource providers. Because entrepreneurs control the flow of information about a venture's plausibility, they can benefit from being strategic about the personal and venture information they disclose (Kirsch, Goldfarb, & Gera, 2009; Lounsbury & Glynn; 2001; Navis & Glynn; 2011, Zott & Huy, 2007).

Many entrepreneurs use cultural tools (Swidler, 1986) to make a venture appear viable and attractive in order to garner resources from external parties. Researchers have identified two sets of cultural tools—symbolic actions (Rindova, Petkova, & Kotha, 2007; Zott & Huy, 2007) and entrepreneurial narratives (Lounsbury & Glynn, 2001)—that are used to attract resources. Entrepreneurial narratives are stories entrepreneurs tell about their ventures (Lounsbury & Glynn, 2001); symbolic actions invoke institutional and cultural resources to distinguish a company from its rivals (Rindova et al., 2007) and to draw "attention to the meaning of an object or action that goes beyond the object's or action's intrinsic content or functional use" (Zott & Huy, 2007, p. 70).

Studies have shown that through such cultural tools, resource seekers communicate entrepreneurial identity claims to potential resource providers. Identity claims are statements about "the founders, organization, and market opportunity of an entrepreneurial entity that give meaning to questions of 'who we are' and 'what we do'" (Navis & Glynn, 2011, p. 480). Lounsbury and Glynn (2001) observed that entrepreneurial identity is embedded in stories about the venture, with the "individual entrepreneur or the new venture" as the narrative subject and "a successful new enterprise, profitability, [venture capital] funding, or a positive reputation with potential stakeholders" as "the ultimate object or goal of the narrative" (p. 549). According to Lounsbury and Glynn, stories serve to "identify and legitimate new ventures, thus mediating between extant stocks of entrepreneurial resources and subsequent capital acquisition and wealth creation" (p. 546).

Zott and Huy (2007) have shown how entrepreneurs use symbolic actions to create an identity for new ventures. Those firms that were able to create clear, professional identities accessed greater resources for their proposed ventures.[1] Martens, Jennings, and Jennings (2007) provided evidence that when new ventures construct an unambiguous identity in documents filed as part of an initial public offering (IPO), they garner greater financial resources at the IPO. More broadly, Santos and Eisenhardt (2009) described how entrepreneurs in a nascent market space used identity mechanisms to shape organizational boundaries and construct market niches. They found that entrepreneurs who succeeded in making their ventures a cognitive referent for an emerging space used identity mechanisms such as adopting familiar templates, signaling leadership, and disseminating stories about their ventures. This was not the case with entrepreneurial ventures that failed to make an impact in an emerging market space.

This body of research suggests that entrepreneurs, with varying degrees of success, attempt to actively construct and enhance a venture's identity, which, once successfully constructed, affects how potential resource providers perceive the venture. That perception can lead to the garnering of resources from external parties. However, much of the extant research has focused on entrepreneurs and their attempts to create and enhance their identity. Such studies provide useful insights into the identity construction process but are silent about the role of external resource providers in relating to those identities.

The heterogeneity of resource seekers (entrepreneurs) is mirrored by a corresponding heterogeneity in resource providers, yet most research assumes that resource providers are homogenous in how they react to the organizational identities constructed in entrepreneurial ventures. How and why resource providers vary in their evaluations of entrepreneurial ventures remains relatively unexplored.

The purpose of this chapter is to represent new venture resource acquisition as a two-sided process in which the resource provider's attributes interact with the attributes of the new venture as a basis for resource allocation decisions. It is our premise that in resource allocation decisions, heterogeneity on the parts of both resource provider and venture jointly account for whether the venture is able to garner resources. Our research question is, *Why do resource providers vary in their evaluation of new ventures?*

To address this question, we theorize how the individual resource provider's identity relates to cultural tools employed to convey a venture's essence. We propose an interactional model (Chatman, 1989) of venture identification to predict when and why resource providers are likely to assess new ventures as plausible and attractive. Building on social psychology and sociology literatures, we argue that the overlap between a new venture's entrepreneurial

identity and a resource provider's individual identity affects how strongly the resource provider will identify with the new venture. The resulting identification then can influence the resource provider's perception of the venture's attractiveness and plausibility.

We believe that resource providers vary in their evaluation of a new venture because of variations in their individual identities. In this context, individual identity represents the interpretive structure that mediates how people think, feel, and act (Gecas, 1982; Markus & Wurf, 1987; Schlenker, 1985) and refers to "the totality of self-descriptions and self-evaluations subjectively available to an individual" (Hogg & Abrams, 1988, p. 24). A person's identity may comprise a variety of elements evolving from membership in or linkages with different social groups or organizations (Ashforth & Mael, 1989; Stryker & Serpe, 1982). Identification of individuals with social groups and organizations creates a psychological attachment that influences the choices and behaviors that follow (Dutton, Dukerich, & Harquail, 1994).

Research across a range of disciplines suggests that an individual's identity can significantly affect the choices he or she makes (Akerlof & Kranton, 2000, 2005, 2010; Bolton & Reed, 2004; Reed, 2004; Stryker, 1980, 1989; Stryker & Burke, 2000; Stryker & Serpe, 1982). Identity invokes a set of rules for decision making, and when those rules are applied, decisions become more predictable (March, 1994). Therefore, individual identities translate into action through the rules attached to ones self-concept (Burke & Stets, 2009). Because identity exerts a powerful influence on individual choice, it should have an impact on decisions to provide resources to early-stage new ventures.

Based on these arguments, we propose a more complete model of entrepreneurial resource acquisition for early-stage ventures that takes into account the provider's identity in conjunction with cultural tools (stories and symbols) used to convey a venture's essence. Leveraging insights about the role of identity in decision making and ideas from the literature on organizational identification, we propose a conceptual framework that models entrepreneurial resource acquisition as a two-stage process. Stage 1 focuses on how an overlap between a resource provider's identity and a new venture's entrepreneurial identity can lead to venture identification. Stage 2 highlights that when a resource provider identifies with an entrepreneurial venture, this identification can positively affect the provider's assessment of the venture's plausibility and attractiveness.

We first briefly review the literature on entrepreneurial identity, individual identity, and identification. Drawing on prior research, we then analyze how the individual identity of resource providers affects their identification with a new venture, which in turn influences perceptions of a new venture's plausibility and attractiveness. We conclude with a discussion of implications for research and practice, including suggestions of empirical strategies that will advance the understanding of venture identification and its role in entrepreneurial resource acquisition.

Identity and Identification

The Nature of Entrepreneurial Context

The context for creating a new venture is inherently ambiguous and uncertain. The uncertainty stems from multiple sources. Entrepreneurial actions unfold over time, and given that the future is unknowable by definition, these actions are inherently uncertain (Mises, 1949). Entrepreneurial actions also involve the creation of new products and services, and the novelty of such activities can enhance venture uncertainty (McMullen & Shepherd, 2006). Also, entrepreneurs in nascent markets face high levels of ambiguity because such markets are characterized by fleeting industry structures, unclear product definitions, and no clear logic to guide actions (Santos & Eisenhardt, 2009).

The uncertainty and ambiguity associated with the entrepreneurial process produces equivocal situations that have numerous or disputed interpretations (Powell & Colyvas, 2008) for which what is real and what is not is yet to be determined. Weick (1979) argued that equivocal environments are not necessarily "disordered, indeterminate, and chaotic. Instead [they are] rich with possible connections that could be imposed" (p. 174) and such situations are subject to various degrees of interpretation.[2]

In general, actors facing equivocal situations make an effort "to construct a plausible sense of what is happening, and this sense of plausibility normalizes the breach, restores the expectation, and enables projects to continue" (Weick, Sutcliffe, & Obstfeld, 2005, pp. 414–415). Similarly, potential resource providers who are exposed to the equivocal nature of the entrepreneurial process seek to make sense of the situation. If they are able to make sense of what an entrepreneur is attempting to do, then equivocality is reduced; this reduction then serves as an impetus for taking action to support the venture (Weick et al., 2005).

Entrepreneurial Identity and Equivocality

Entrepreneurial identity is a relatively recent concept and owes its origins to literature on organizational identity, a set of self-referential claims made by an organization with respect to its "central character, distinctiveness, and temporal continuity" (Albert & Whetten, 1985, p. 265). Organizational identity thus represents what members believe to be their organization's central, enduring, and distinctive character (Ashforth & Mael, 1996; Corley, Harquail, Pratt, Glynn, Fiol, & Hatch, 2006; Dutton & Dukerich, 1991; Livengood & Reger, 2010; Reger, Gustafson, DeMarie, & Mullane, 1994; Whetten, 2006).

Navis and Glynn (2011, p. 479) extended this notion into the entrepreneurial domain by proposing the "entrepreneurial identity" concept as the claims around an entrepreneurial entity that address questions of "who we are" and "what we do." Entrepreneurial identity represents a multiple-level construct incorporating identity claims about the founder (individual level), the proposed new venture (organizational level), and the focal institutional sector (market level). Identity claims at all three levels operate as a mechanism for resource providers to make sense of a venture's plausibility and viability.

Organizational identity claims are especially relevant under equivocal conditions, serving as a device for sensemaking. They allow shared awareness and understanding to emerge from different perspectives and varied interests (Glynn, 2000; Weber & Glynn, 2006; Weick, 1995). In the entrepreneurial context, claiming an identity helps reduce the equivocality surrounding a new venture by communicating the essence of the opportunity to internal and external audiences (Navis & Glynn, 2011). In this way, entrepreneurs attempt to reduce the equivocality surrounding their activities by claiming and communicating a clear identity that signals "who we are" and "what we do" as an emerging entity. When objective data about a new venture's performance is unavailable, identity claims serve as a basis for evaluation.

Identity, Choice, and Identification

Identity theory posits that social factors define the self, giving rise to a social psychological model of self called "identity" (Hogg, Terry, & White, 1995), which then serves as an anchor for decision making (Akerlof & Kranton, 2010; March, 1994; Reed, 2004). The "concept of self" defined by social factors is composed of multiple identities, each achieving primacy or saliency at different times and points in one's life (Mead, 1934; Stryker, 1980, 1989). Research suggests that individuals make choices and behave in ways that conform to internalized sets of values that align with a definition of "who I am" (Cast, 2004; Stryker, 1989).

Individuals are motivated to act in concert with their highly valued and salient identities because this verifies a sense of self, leading to positive affect and serving as a source of self-esteem (Burke, 2004; Seo, Barrett, & Bartunek, 2004; Stets, 2004). They make decisions to align with self-conceptions so as to avoid dissonance between that self-concept and behavior (Burke, 1980, 1991). Thus, identities serve as critical predictors of decisions and behavioral outcomes (Hogg et al., 1995), especially in ambiguous or uncertain contexts in which an appropriate choice is not obvious.

Research in the domains of social psychology (Stryker, 1980, 1989; Stryker & Burke, 2000; Stryker & Serpe, 1982), consumer behavior (Bolton & Reed, 2004; Reed, 2004), and economics (Akerlof & Kranton, 2010) highlights that an entity's identity not only affects the outcome of a decision but plays a significant role in the process. Identity invokes a set of rules for making a decision in certain situations, and these rules can predict the outcome of an individual's decisions (March, 1994). The link between individual identity and that of an organization is called identification, meaning "the perception of oneness or belongingness to some human aggregate" (Ashforth & Mael, 1989, p. 21). Organizational identification happens "when a person's self-concept contains the same attributes as those in the perceived organizational identity" (Dutton et al., 1994, p. 239). Therefore, organizational identification is the degree to which a member defines himself or herself using the same attributes that define the organization.

Studies have linked organizational identification with a number of organizational outcomes (for an extensive review, see Ashforth, Harrison, & Corley, 2008). For example, organizational identification has been found to influence a member's cooperation, effort, participation, and organizationally beneficial decision making (Bartel, 2001; Kramer, 2006; Simon, 1976; Tompkins & Cheney, 1985), as well as intrinsic motivation (e.g., Kogut & Zander, 1996; van Knippenberg & van Schie, 2000), task performance (e.g., van Knippenberg, 2000; Yurchisin, 2007), and information sharing and coordinated action (e.g., Cheney, 1983; Grice, Gallois, Jones, Paulsen, & Callan, 2006; Tyler, 1999).

Almost all of the research on individual identification with an organization has focused on how employees identify with an organization; hence, as Elsbach (1998, p. 232) pointed out, there is a paucity of studies on "individuals' identification with organizations of which they are not members" (1998, p. 232). A study by Scott and Lane (2000) partially addressed this shortcoming by articulating how managers construct an organizational identity for broader stakeholders (e.g., investors, customers, suppliers). However, little is known about how people outside of a stakeholder group come to identify with an organization and perhaps to take steps to become important stakeholders.

Integrating research on entrepreneurial identity, individual identity, and organizational identification, it is possible to propose an interactional model linking a venture's identity with the individual identity of a potential resource provider. The proposed model provides a micro-view of how individual-level variables interact with organizational-level variables in resource provider assessments of venture plausibility and attractiveness, a crucial step needed for resource acquisition.

A Proposed Model of Venture Identification

Drawing on past identification research (e.g., Ashforth et al., 2008; Dutton et al., 1994), we define venture identification as the sense of oneness or connectedness a resource provider develops in relation to a new venture. This happens when the entrepreneurial identity of the new venture overlaps with the individual identity of a potential resource provider.

Entrepreneurial Identity, Resource Provider Identity, and Venture Identification

As a baseline proposition to the conceptual model that we develop, we posit that the greater the overlap between the prominent identity elements of a new venture and those of an individual resource provider, the stronger the level of venture identification. The stronger the level of identification, the more likely it is that the resource provider will perceive a venture to be plausible and attractive and support it with resources. There are cognitive and affective mechanisms driving venture identification. Studies have suggested that cognitive and affective processes work in concert and reinforce each other to influence organizational identification (Ashforth et al., 2008).

The first (cognitive) mechanism draws on the concept of understandability. That is, resource providers feel more connected to a venture when it matches their sense of who they are (their identity), simply because familiar information is easy to process and understand (Dutton et al., 1994). Overlapping identities of ventures and individual resource providers serve to reduce the equivocality existing in an entrepreneurial situation. Because equivocal situations are open to multiple interpretations, individuals strive to reduce the level of equivocality in order to make decisions and take action (Weick, 1979). Social psychologists point out that people attend to and process "self-relevant" information differently than "self-irrelevant" information (Markus & Wurf, 1987). The more a provider's identity overlaps the identity of a new venture, the easier it will be to make sense of what a venture is doing and feel a stronger sense of unity (Weick et al., 2005).

The second (affective) mechanism draws on the concept of homophily, which means, "love of the same" (Lazarsfeld & Merton, 1954).[3] People are attracted to that which they perceive as similar to themselves. Social identity theory suggests that because people strive to have a positive identity, they prefer those people or things from a similar social category (Jackson, Brett, Sessa, Cooper, Julin, & Peyronnin, 1991). Because social categorization allows for in-group/out-group comparisons (Tajfel, 1982), people tend to be biased toward their own group (Bass & Duntemann, 1963; Brewer, 1979; Dustin & Davis, 1970). Therefore, even relatively superficial similarities, such as the same occupation, can influence attraction. This effect has been shown to be particularly strong during the early stages of acquaintance (Duck, 1977; Franke, Gruber, Harhoff, & Henkel, 2006). Moreover, although similarity is perceived as rewarding, dissimilarity works as a negative reinforcement (Byrne, 1971). Thus, perceived similarity causes a positive affective reaction, which in turn fosters an evaluative response (see Lefkowitz, 2000).

In the entrepreneurial context, homophily has been used to explain founding team composition; that is, individuals tend to establish new ventures with individuals who have similar characteristics (Ruef, Aldrich, & Carter, 2003). Homophily also explains why entrepreneurs prefer network ties with those from similar social and cultural backgrounds (Vissa, 2011). In the uncertainty and ambiguity of the entrepreneurial process, individuals find security working with those who are similar. We predict

that resource providers will demonstrate similar patterns of behavior in narrowing their assessment set when deciding which new ventures to support.

In sum, using the cognitive mechanisms of understandability and the affective mechanism of homophily, we suggest that when resource providers recognize that elements in a new venture's entrepreneurial identity overlap with their own, they will feel a greater sense of oneness or identification with the venture.

A practical example of how identity overlap between an investor and a venture can influence perceptions of venture identification comes from Stross's description of how venture capitalist Bob Kagel became interested eBay in 1995:

> It was the fishing lure that hooked Kagel. . . . When he went to eBay's site, he was surprised to discover many for sale, including one rare item made by a famed carver from Flint, Kagel's hometown. Kagel bid and lost, but the experience pulled him into eBay's world. Over the next two weeks he met with [founder] Omidyar outside of Benchmark's offices and discovered he was . . . consumed by the idea of *community* . . . The more Omidyar talked about his community vision, the more Kagel as he put it, was "lovin' him—this guy is good people."
>
> *(Stross, 2000, pp. 27–28)*

Kagel eventually became the first investor in eBay via the Benchmark Venture Capital Fund. The identity connection between Kagel and eBay illustrates the idea that a venture will likely attract an investor with an individual identity that overlaps with the venture's entrepreneurial identity. When Kagel connected with the value proposition of the venture, he discovered that he and Omidyar cared about the same things and connected on a personal level. Therefore, the baseline proposition for the venture identification model is as follows:

> *Proposition 1 (P1): As a venture's entrepreneurial identity overlaps a resource provider's identity, the resource provider's identification with the proposed venture should increase.*

Because entrepreneurial identity is constructed across individual and organizational levels of analysis, overlapping identity elements at each level will influence whether a resource provider is likely to engage with the entrepreneur and identify with the venture. For the purpose of distinguishing between identifications at different levels of analysis, we label identification between resource providers and founders as "founder-level identification" and identification between resource providers and the organizational aspects of a venture as "organization-level identification."

FOUNDER-LEVEL IDENTIFICATION

Entrepreneurs often make claims about "who we are" when portraying their ventures to a broader audience. Such claims focus on the individual identities of a venture's founders (Navis & Glynn, 2011). The concept of homophily suggests that resource providers are more likely to feel a sense of connectedness with a venture when the entrepreneurs are similar to themselves; that is, when they have the same age, gender, educational background, alma mater, personal philosophy, and so on (Franke et al., 2006; Matusik, George, & Heeley, 2008; Murnieks, Haynie, Wiltbank, & Harting, 2011).[4] This sentiment was echoed in an interview we conducted with a noted venture capitalist:

> I don't think that I could have ever backed Larry Elision [founder of Oracle] or Rob Glazer [founder of Real Networks]. From a financial perspective, it would have been a mistake [not to back them], but as entrepreneurs, they are just too different from me, I could not see us working together. It does not mean they are bad people; we would just not have been a good fit in terms of building a company.
>
> *(Unpublished interview, January 21, 2011)*

Based on these arguments we propose the following:

> *Proposition 2 (P2): As the venture founders' individual-level identity ("who we are") claims overlap with a resource provider's identity, the resource provider's identification with the proposed venture should increase.*

ORGANIZATION-LEVEL IDENTIFICATION

The organization-level identity of an entrepreneurial venture captures statements and symbols pertaining to a venture's strategy, technology, practices, and focal market segments. Organizational identity claims answer the question of "what we do" (Navis & Glynn, 2011). In the entrepreneurial context, such claims take on a heightened significance. Venture assessment is a complex process that involves gauging the potential of an emerging market that may or may not materialize, appraising a nascent technology that may or may not work, and estimating the economic viability of a proposed venture that lacks sufficient historical accounting

and financial data (Florin, Lubatkin, & Schulze, 2003). Add to that the sheer volume of information about myriad technologies being developed, and potentially promising ventures seeking resources may seem overwhelming (Wadhwa & Kotha, 2006).

Under such conditions of information scarcity, complexity, uncertainty, and ambiguity, individuals cannot depend on rational or logical modes of decision-making and judgment, which may be preferred when reliable and discernable information is available (Kahneman, 2011). When conditions are uncertain and complex, people seek out that which is familiar (March & Simon, 1958). People see uncertain and complex scenarios through the lens of their own experience and self-perception. Therefore, when resource providers have limited and complex information about an entity, their judgments will be bounded by their own experience and they will focus on those ventures with an organizational identity that reflects attributes that overlap their own. A new venture whose organizational identity reflects the individual identity of a resource provider is more likely to garner attention and be understood by the resource provider. For instance, if a venture proposal highlights technical innovation as central to its activities, a provider with an engineering background is more likely to be attracted to and understand that value proposition than someone with a non-technical background. In such a case, the identity overlap between investor and venture will increase the likelihood that the investor will identify with the venture. However, if resource providers do not share an identity with a venture, they will likely make little effort to understand the venture and will be more likely to dismiss it.

Alexis Maybank, the co-founder of Gilt Groupe, Inc., a fashion retailing website for high-end clothing brands, describes how the disconnect between the identity of potential resource providers and the organizational-level identity of the venture she founded created challenges in acquiring resources. "At investor meetings where we pitched the idea, not a single firm had a female partner. So when explaining fashion to a bunch of men in khaki pants and blue button-down shirts, their response was always 'Oh, let me see if my wife thinks if this is a good idea'" (quoted in Debaise, 2010). The men, lacking knowledge of women's fashion, failed to identify with the business, were unwilling to evaluate it, and found it unworthy of investment.

Organization-level identity claims serve as a touchstone for resource provider sensemaking (Navis & Glynn, 2011); they provide a means for resource providers to understand the venture. If resource providers are unable to relate to a venture's main activities, they likely will not appreciate its value proposition and economic potential. When this happens, they will be less motivated to engage with the entrepreneur. But if they readily relate to the activities, symbols, and markets of the venture, they will be more likely to engage and appreciate the venture. This leads to the following proposition:

> *Proposition 3 (P3): As the organization-level identity ("what we do") claims about the venture overlap a resource provider's identity, the resource provider's identification with the proposed venture should increase.*

Table 28.1 shows identity elements matched across different levels of analysis.

Identity Salience, Centrality, and Venture Identification

Identity is generally made up of multiple elements. At the individual level, Stryker and Serpe (1994) described individuals as possessing a multiplicity of selves. At the organizational level, Pratt and Foreman (2000) pointed out that organizations could also be conceptualized as having many selves. Because multiple facets of identity cannot always be jointly accounted for when making decisions and taking actions, decision makers often need to make trade-offs between different identity elements to be able to make decisions. To account for the more influential elements of identity that take precedence in the face of trade-offs, researchers have proposed the concept of identity salience at the individual level (Stryker & Serpe, 1994) and identity centrality at the organizational level (Whetten & Mackey, 2002).

IDENTITY SALIENCE

Identity salience is "a readiness to act out an identity as a consequence of the identity's properties as a cognitive structure or schema" (Stryker & Serpe, 1994, p. 17). Because salient identity elements are self-defining, they are likely to invoke action (McCall & Simmons, 1978; Stryker, 1968; Wiley, 1991). Mael (1988) found that people who viewed their alma mater as an important element of their individual identity were more likely to donate to the institution and to encourage others to attend their school. People whose alma mater is less salient in their self-concept will prioritize other things

Table 28.1 Identity Overlap Across Different Levels of Analysis

Entrepreneurial Identity Elements		Investor Identity Elements
Level of Analysis	**Identity Elements**	
Founders (individual level) *"Who we are"*	Ethnicity of the founders	Ethnicity of the investor
	Gender of the founders	Gender of the investor
	Education of the founders	Education of the investor
	Profession of the founders (e.g., teacher, lawyer, doctor)	Profession of the investor (e.g., teacher, lawyer, doctor)
	University that the founders attended	University that the investor attended
	Work experience of the founders	Work experience of the investor
	Hometown of the founders	Hometown of the investor
Organization (organizational level) *"What we do"*	Nature of the product or service offering (e.g., online retailer, SaaS provider)	Interest or expertise in product or service offering (e.g., online retailer, SaaS provider)
	Mission of the venture (e.g., social, technological advancement, creativity)	Personal mission or purpose (e.g., social, technological advancement, creativity)
	Processes employed in the venture (e.g., JIT, TQM, Lean)	Expertise or interest in a particular process (e.g., JIT, TQM, Lean)
	Entering a particular market sector (e.g., education, sports equipment, fashion)	Personal interest or experience in a market sector (e.g., education, sports equipment, fashion)

Note. Examples are illustrative and not exhaustive. Adapted from Navis & Glynn (2011).

over university activities and opportunities. In the entrepreneurial context, if elements of a new venture's entrepreneurial identity overlap with salient elements of a resource provider's individual identity, the likelihood that the resource provider will identify with the venture should increase. Thus, when venture capitalist Kim Smith introduces herself as "daughter of two educators" and "founding team member at Teach For America and AmeriCorps" in her public biography (Investors Circle, 2010), it is not surprising that most of her investments have been in ventures with a strong focus on education.[5] The more that salient elements of a resource provider's identity overlap with the entrepreneurial identity of a new venture, the higher the level of venture identification. Therefore, we propose:

> *Proposition 4 (P4): As a venture's entrepreneurial identity overlaps with more salient elements of the resource provider's individual identity, the resource provider's identification with the proposed venture should increase.*

IDENTITY CENTRALITY

The concept of identity centrality captures the extent to which an organization's identity is fundamental and shared across an organization as well as embedded in the organization's structure (Corley et al., 2006). Whetten and Mackey (2002, p. 16) described central attributes of organizational identity as those that "organizational members generally consider essential to the organization ('without these we would be a different kind of organization')."

The concept of identity centrality was evident to Webvan and Peapod, the online grocery-retailers who entered the market in the 1990s. Each claimed an entrepreneurial identity in "technology driven e-commerce" and "grocery retail." Yet for Webvan, e-commerce and technology were central to the description of their business as "setting the standards for Internet retailing" and "an innovative business system with proprietary business design" (Webvan Group Inc., 1999). Peapod focused on grocery retail as the central element of its identity and described its business as "smart shopping for busy people" and an "interactive grocery shopping experience" (Peapod, 1997). Although both ventures appeared to claim similar identities in technology and grocery retail, a deeper analysis revealed that central aspects of their organizational identities differed significantly (Navis, Fisher,

Raffaelli, & Glynn, 2011) and that this difference influenced the types of resource providers they attracted. Peapod attracted resource providers from the retail sector, whereas Webvan attracted Silicon Valley venture capitalists who had little experience in grocery retail.

The central elements of an organization's identity tend to be prominently featured in the organization's claims about who it is, what it does, and where it operates. As the central elements of an organization's identity are clarified and conveyed to an external audience, they become closely tied to sensemaking activities related to that organization (Navis & Glynn, 2011; Weick, 1995). It seems logical that central elements of a venture's identity would feature prominently in a resource provider's inclination to identify with a new venture. Hence, we propose the following:

Proposition 5 (P5): As more central elements of a venture's entrepreneurial identity overlap with elements of the resource provider's identity, the resource provider's identification with the proposed venture should increase.

Venture Identification and Resource Provider Support

As noted, the entrepreneurial context is uncertain and ambiguous. The equivocal nature of such a context means that there are multiple ways to interpret the actions and intentions of a new venture. An individual resource provider has to make decisions about whether to support a venture in the face of such uncertainty and ambiguity. If that resource provider identifies with a new venture seeking resources, the provider is more likely to make an effort to understand the assumptions underlying its business and operating model (Dutton et al., 1994). With greater effort and understanding, the resource provider is better able to make sense of the new venture's context (Navis & Glynn, 2011). This helps reduce the perceived equivocality of the situation, meaning that the resource provider can comprehend what the venture is doing, which increases the likelihood that action will be taken to support the venture with resources (Weick, 1995).

In addition to comprehension, identification also prompts an emotional connection between an individual and a venture, which also fosters action. Tajfel (1978) pointed out that identity has an emotional significance. Similarly, Harquail (1998, p. 225) argued that identification "engages our hearts". In general, identification stemming from perceived similarity between a person and an organization causes an affective reaction, which in turn nurtures positive evaluative responses (see Lefkowitz, 2000). In other words, when potential resource providers identify with an entrepreneurial venture, they are likely to be affectively aroused, prompting them to perceive the venture as attractive.

Because identification with a venture allows a resource provider to understand the venture and prompts an emotional connection, the resource provider may desire to support the venture with resources. In our context, when a resource provider identifies with a new venture, the resource provider supports the venture because it provides an opportunity for self-expression (Dutton et al., 1994). Just as employees who identify with an organization support the organization through "cooperation, effort, participation, and organizationally beneficial decision making" (Ashforth et al., 2008, p. 336), the cognitive and affective elements of venture identification prompt a resource provider to support a venture materially. Hence we propose the following:

Proposition 6 (P6): When a resource provider identifies strongly with a new venture, then the resource provider is most likely to provide resources to the venture.

Venture Uncertainty

Although venture identification is an important factor in accounting for resource acquisition for new ventures, it is likely to vary in importance depending on some of the characteristics of the venture. Because identification is an important driver of decision-making under conditions of uncertainty, and because the level of uncertainty associated with a new venture can vary, we propose that resource providers will vary in their inclination to depend on identification with a venture based on the level of uncertainty associated with the venture.

The level of uncertainty of a new venture often stems from market and technological features of the venture (McGrath & McMillan, 2000; McKelvie, Haynie, & Gustavsson, 2011). Organizations operating in new or emerging markets are associated with higher levels of uncertainty compared to organizations operating in more mature markets where norms and business practices are relatively well established (Navis & Glynn, 2011). Similarly, if the venture seeks to exploit a new or emerging technology, the entrepreneur faces higher levels of uncertainty in terms of timing, costs, and the

establishment of technological standards compared to a venture utilizing an established technology (McGrath & McMillan, 2000).

As entrepreneurs establish ventures in new or emerging markets by exploiting new or emerging technologies, the uncertainty associated with a venture increases, and resource providers usually cannot depend on objective historical data when making decisions. As uncertainty increases, they must rely more on their level of identification with a venture to make investment decisions. Hence, we propose that under high levels of uncertainty, venture identification will be more strongly related to resource provider support of a new venture:

> *Proposition 7 (P7): Under high levels of uncertainty, the relationship between venture identification and resource provider support for a new venture becomes stronger.*

Figure 28.1 shows our model of how the identity of a new venture interacts with a resource provider's identity to prompt venture identification, leading to provision of resources to the new venture.

Discussion and Implications

The conceptual model proposed here moves beyond the one-sided perspective of entrepreneurial resource acquisition by exploiting an important insight from the identity literature; namely, that actors identify more strongly with an organization when their self-concept reflects attributes similar to those in the perceived organizational identity (Dutton et al., 1994). We have posited that entrepreneurial resource acquisition involves a two-sided identity matching process. Our theoretical exposition examines how matching identity attributes at different levels of analysis—the individual level (founder-level attributes and resource provider attributes) and the venture level (entrepreneurial identity and resource provider identity)—adds another dimension to our understanding of whether a new venture will be able to garner resources.

Leveraging insights about the role of identity in decision-making with ideas from the organizational identification literature, we modeled entrepreneurial resource acquisition as a two-stage process (see Figure 28.1). Stage 1 suggests that an overlap between a resource provider's identity and a new venture's entrepreneurial identity leads to venture identification. We provided both cognitive and affective bases for why a resource provider would identify with a new venture. The cognitive connection allows a potential resource provider to interpret identity claims; as a result, the venture becomes more understandable, reducing the equivocality of the entrepreneurial context and making the venture appear plausible. The affective basis for connection arises because a venture with familiar identity elements provides investors with the opportunity to reinforce their positive self-concept, manifesting in an affective reaction that prompts positive evaluative responses (Lefkowitz, 2000).

In Stage 2, as the level of identification increases, it has a bearing on a resource provider's sensemaking, thereby affecting his or her assessment of attractiveness and plausibility. This perception affects whether a venture will receive resources. The framework also posited that identity salience and centrality moderate the main effects of identity overlap and venture identification during stage 1, and that venture uncertainty moderates the main effect between identification and resource provision during stage 2.

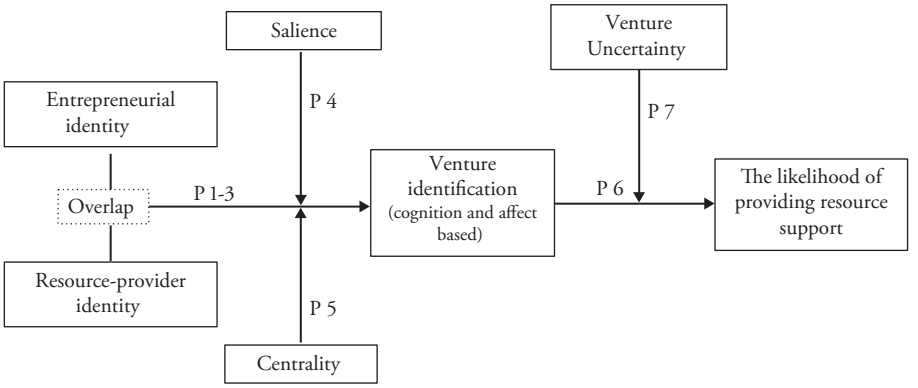

Fig. 28.1 Model of Venture Identification and Resource Acquisition.

Implications for Entrepreneurship Research

We contribute to the literature on entrepreneurial resource acquisition, which is a topic of significant interest to entrepreneurship scholars. With a few exceptions (Lounsbury & Glynn, 2001; Navis and Glynn, 2011; Zott & Huy, 2007), entrepreneurship research has focused on objective rather than subjective judgments and the roles they play in a resource provider's decision to support new ventures. Whereas researchers have examined market characteristics such as demand, growth, industry munificence, and the desirable characteristics of founders (e.g., prior experience, knowledge, venture success), as well as their impact on investor evaluation of new venture proposals (cf. Douglas & Shepherd, 2002; Hall & Hofer, 1993; Muzyka, Birley, & Leleux, 1996), we add the role of subjective judgments highlighting the sensemaking mechanisms that potential investors employ as they evaluate the funding requests of new ventures.

This study is one of the few that have emphasized the important role of identity in the entrepreneurial context, and it echoes the observation of Navis and Glynn (2011, p. 493) that in entrepreneurial settings, "identity is more transparent as a set of claim-making activities, an aspect that was foundational in early formulations of organizational identity [Albert & Whetten, 1995] but that has somewhat diminished in more recent work. Thus, understanding identity work in entrepreneurial settings may enable reclamation of seminal thinking." We extend this work by proposing that any attempt to predict how entrepreneurs garner resource support should also consider the resource provider's identity elements (see Table 28.1).

Specifically, we contribute to the literature on cultural tools and the critical role they play in a new venture's resource acquisition process. Although past studies (e.g., Lounsbury & Glynn, 2001; Navis & Glynn, 2011; Zott & Huy, 2007) have provided rich insight into how entrepreneurs leverage cultural tools to garner legitimacy and communicate identity, the resource provider's role in the process had remained unexplored. By incorporating identity factors and conceptualizing resource allocation decisions as an identity-matching process, we enhance the perspectives on entrepreneurial resource acquisition. Theoretically, our exposition provides a more complete and holistic view of how the features of both the venture and resource provider interact in the provision of resources to new ventures.

The ideas in this chapter also have implications for the literature at the intersection of innovation and entrepreneurship. Entrepreneurs often commercialize radical innovations as a basis for establishing new firms (Shane, 2001). Resource acquisition is frequently a key concern for entrepreneurs attempting to commercialize radical innovations (Berkery, 2007). It takes time and capital to successfully commercialize a novel technology and/or create a new market category based on a radical innovation (Bhide, 2000). However, given the novelty and uncertainty surrounding ventures with a radical innovation at their core, entrepreneurs who pursue such ventures often have the most difficulty accessing resources. This means that those entrepreneurial ventures with innovation at their core that require significant resources often have the hardest time raising resources. It also means that nations, societies, and communities could miss out on the opportunity to enhance their competitiveness and well-being if entrepreneurs with innovative concepts are never provided resources to develop and commercialize their innovations. The framework outlined in this chapter describes how entrepreneurs with innovative ideas may position themselves to overcome this daunting challenge. By seeking resources from resource providers who will readily identify with the innovations embedded in their ventures, entrepreneurs will more easily access much needed resources and create more opportunities to take their innovations to market.

Implications for Future Research and Extensions

Our proposed conceptual framework offers avenues for future research. The propositions within the framework could be tested with data from a variety of sources. For example, researchers could analyze investment decisions within angel investment networks where many individual angel investors evaluate multiple new ventures on a regular basis. Business plan competitions hosted at universities, where judges award monies (resources) to winning plans, may also be fertile sources of data. Such settings provide the opportunity to amass samples of new venture proposals; after controlling for the ventures' objective merits, these could be examined for entrepreneurial and resource provider identities and the roles they jointly play in resource acquisition.

Researchers may also analyze resource providers' perceptions using experimental vignettes that manipulate aspects of entrepreneurial identity. In

a laboratory setting, one may capture aspects of a resource provider's identity and then analyze that provider's decision to fund a hypothetical business plan using "choice modeling" techniques such as conjoint analysis (Lohrke, Holloway, & Woolley, 2010; Shepherd & Zacharakis, 1999). By capturing and categorizing elements of an investor's individual identity and comparing them, along the lines proposed in Table 28.1, with the entrepreneurial identities claimed in a hypothetical business plan, it would be possible to empirically validate the propositions we propose.

These theoretical concepts may provide a foundation for theoretical elaboration of the causes and consequences of identification in new ventures. Researchers may wish to examine how venture identification influences outcomes beyond the initial acquisition of resources. For example, venture identification may have implications for longer-term working relationships between founders and investors, or venture identification may affect decision-making practices within the board of directors of an entrepreneurial firm. Such processes would likely be influenced by the strength of the identification between venture and investor, as well as the source of the identification of the investor (affective vs. cognitive) and the level of identity consistency within the venture (founder level and venture levels).

We specifically theorize how an individual resource provider's identity can overlap with the entrepreneurial identity of a new venture and the implications this holds for identification and resource acquisition. Although individuals make many early-stage venture investment decisions—in the United States, 265,400 individual angel investors funded 61,900 ventures in 2010 (Sohl, 2011)—organizations such as venture capital partnerships or corporate venture capital funds are regularly involved in providing resources to new ventures. In such cases, the investing organization's identity may be relevant for assessing the degree of identification achieved and the resources that follow (Albert & Whetten, 1985). Therefore, it may be useful to extend our proposed model to account for this possibility.

This proposed framework has important implications for the practice of entrepreneurship (i.e., how entrepreneurs garner resources via venture proposals). Along with the objective merits of their entrepreneurial proposals, entrepreneurs should recognize the subjective perceptions resource providers use to interpret them. Specifically, entrepreneurs should become cognizant of the identity they project by their use of cultural tools when seeking resources from individual investors. Certain features of their entrepreneurial identity may appeal to some providers but not others; entrepreneurs must be strategic in their approach. Although it may be challenging to gather information on the identities of resource providers, evaluating them correctly can help ventures make sense of provider decisions. By focusing on resource providers who identify with them and their proposed ventures, the likelihood of garnering resources will increase. And for resource providers, understanding their identity elements and how these can influence evaluations of new venture proposals may allow them to make better decisions.

Conclusion

The extant research on entrepreneurial resource acquisition has focused on one side of a two-sided equation. Through resource allocation or acquisition decisions, variation among resource providers and among ventures will jointly account for the outcome. To develop a clearer understanding of resource acquisition in new ventures, researchers should account for identity elements of both the venture and the resource provider. The conceptual framework provided here moves this process a step forward, by incorporating identity as a linking construct between resource providers and ventures, and lays the groundwork for theory advancement and empirical testing of how new ventures overcome resource constraints.

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Notes

1. Zott and Huy (2007) identified a set of symbolic actions that entrepreneurs used to create an identity: (1) demonstrating personal credibility (displaying a business school degree from a prestigious university); (2) portraying professional organizing (emphasizing the company's website, its offices, or its dress code); (3) emphasizing organizational achievement (using prototypes, product demonstrations, trial sites, and awards to represent partially working organizational artifacts); and (4) highlighting stakeholder relationships (dropping high-profile names, mentioning relationships with famous people or companies, or involving prestigious outsiders as company representatives in meetings).
2. Entrepreneurs seek to reduce equivocality associated with new venture creation as they establish organizational

boundaries, seek resources, communicate goals, and enter into exchange relationships (Katz & Gartner, 1988).

3. People tend to favor and bond with those who are similar. This principle has been reported in a vast array of network studies (see McPherson, Smith-Lovin, and Cook, 2001, for an extensive review of more than 100 studies that have observed homophily in some form or another).
4. There is a risk that entrepreneurs may not be fully transparent and may try to claim to be something they are not to obtain the resources they need. If resource providers suspect or recognize that an entrepreneur is making fictitious claims, then the resource provider's identification with the venture will likely decrease. If a resource provider fails to distinguish between genuine and false claims, then he or she is likely to be tricked into identifying with a venture.
5. Identity salience is sometimes operationalized as the things that people say to introduce themselves for the first time in different contexts.

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CHAPTER

29 Socioemotional Wealth: An Obstacle or a Springboard to Creativity, Innovation, and Entrepreneurship in Family Firms?

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Abstract

This chapter takes a socioemotional wealth (SEW) perspective to explain how families influence the sensing and seizing of entrepreneurial opportunities in family firms. Specifically, this model proposes that some aspects of the family's SEW are conducive to opportunity recognition, while others impair it. Moreover, the presence of SEW goals leads family owners to favor certain entrepreneurial outcomes because there is a socioemotional reward for the family, even if there are no clear economic advantages. It is also suggested that family ownership negatively affects firms' transforming capacity in innovation. The end goal of this presentation is to enhance understanding of the positive and negative aspects of the family dimension on entrepreneurship and to guide future research in this area.

Key Words: family firms, socioemotional wealth, opportunity recognition, entrepreneurship, innovation

Introduction

Studies agree that with the competitive landscape of the 21st century becoming increasingly dynamic and uncertain, all firms must engage in continuous entrepreneurial activities in order to revitalize their business (Zahra, 1996; Zahra, Hayton, & Salvato, 2004). Key factors in firm success are sensing, seizing, and transforming capabilities (Lichtenthaler & Muethel, 2012; Teece, 2007), where sensing refers to opportunity identification, seizing to exploitation of these opportunities, and transforming to the firm's ability to explore new areas of scientific and technological knowledge in order to remain competitive (Makri, Hitt, & Lane, 2010; Makri & Lane, 2007). The need to develop these "dynamic innovation capabilities" (Teece, 2007) may be even greater for family firms that desire to succeed across generations (Chirico & Nordqvist, 2010; Lichtenthaler & Muethel, 2012). Simply put, family firms with strong intentions of transgenerational control need to develop an entrepreneurial mindset (Zellweger, Nason, & Nordqvist, 2012), as well as the ability to shed or redeploy assets before they start to decline (Habbershon & Pistrui, 2002).

However, although research on entrepreneurship in family firms is increasing (e.g., Carnes & Ireland, 2013; Kellermanns, Eddleston, Barnett, & Pearson, 2008; Short, Payne, Brigham, Lumpkin, & Broberg, 2009; Zellweger & Sieger, 2012), additional research is needed on this topic in general (Nordqvist & Melin, 2010) and on the development of dynamic innovation capabilities in particular (Kellermanns & Eddleston, 2006). Extant literature expresses two contradictory views. Whereas some scholars depict family firms as a context in which entrepreneurship flourishes because of kinship ties and a long-term orientation (Ward, 1987; Zahra et al., 2004), others view family firms as too conservative and inflexible to take the necessary

risks associated with entrepreneurship and innovation (Autio & Mustakallio, 2003; Morris, 1998; Zahra, 2005).

This controversy results partly from the fact that existing studies have adopted a limited view of entrepreneurship when studying family firms, focusing only on seizing opportunities (i.e., creating new products or markets). Sensing remains relatively unexplored; family considerations rarely appear in research on why, when, and how entrepreneurial opportunities are identified by some individuals but not others (Aldrich & Cliff, 2003). This oversight is particularly important in the case of family firms, because opportunity identification is regarded as a key factor for entrepreneurship in established organizations (Covin & Miles, 1999; Venkataraman, 1997). Also absent from the literature is a consideration of family owners' influence on the firm's transforming capacity (i.e., a firm's ability to explore new areas of scientific and technological knowledge that could lead to incremental or radical innovations). Moreover, when discussing the entrepreneurial outcomes of family firms, authors typically do not distinguish between different corporate entrepreneurial activities. In light of recent research that demonstrates the distinct behavior of family firms regarding product innovation and new venture creation (Chrisman & Patel, 2012; Gomez-Mejia, Campbell, Martin, Hoskisson, Makri, & Sirmon, 2014a), we believe this distinction is key to understanding families' influence on their firms' entrepreneurial activities.

This chapter aims to fill these gaps by adopting a dynamic and multifaceted approach to entrepreneurship within established companies. This approach implies analyzing not only how the family affects entrepreneurial outcomes (seizing opportunities) but also how it influences the ability to recognize entrepreneurial opportunities (sensing opportunities) and the ability to explore new areas of knowledge (transforming capacity).

To do so, we employ the socioemotional wealth (SEW) framework developed by Gomez-Mejia and colleagues (Gomez-Mejia, Cruz, Berrone, & De Castro, 2011; Gomez-Mejia, Cruz, & Imperatore, 2014; Gomez-Mejia, Haynes, Nuñez-Nickel, Jacobson, & Moyano-Fuentes, 2007; Gomez-Mejia, Makri, & Larraza-Kintana, 2010), which stresses the role of noneconomic factors in the management of the firm as the key feature that distinguishes family firms from other organizational forms (Gomez-Mejia et al., 2011).

SEW affects the sensing of new opportunities through its influence on creativity, prior knowledge, and social networks. Our analysis of opportunity seizing distinguishes "new entry," or the creation of new markets (Block & MacMillan, 1993), from product and technological innovation within the existing organization (Habbershon, 2006; Zahra, 1996). Additionally, we examine the factors that contribute to a family firm's ability to explore new areas of knowledge (more specifically, scientific knowledge) and thereby transform its technology platforms. We espouse a dynamic capabilities perspective (Teece, 2007) to provide an integrated framework for the study of entrepreneurship in family-owned companies.[1]

The SEW framework explains why some of the unique characteristics of family owners favor opportunity recognition while others hinder it. Specifically, our model suggests that long-term orientation conduces to opportunity recognition, whereas a strong emotional attachment impairs it. This contradiction partly explains the "entrepreneurial puzzle" in family firms. As Carnes and Ireland (2013, p. 1400) recently suggested: "Additional work is necessary for us to enhance our understanding of conditions and factors that have positive or negative effects on actions taken in family firms to reach outcomes that are associated with competitive success." In doing this work, we reinforce proposals that SEW, as a multidimensional construct, can explain the existence of different reference points among family principals (Berrone, Cruz, & Gomez-Mejia, 2012; Gomez-Mejia et al., 2014b) associated with positive or negative valence (Kellermans et al., 2008).

Our distinction among different ways of seizing opportunities also contributes to explain previous contradictory findings in studies of entrepreneurship in family firms. We argue that preservation of SEW takes priority; hence, the firm is more likely to favor certain entrepreneurial outcomes because there is a socioemotional reward for the family, even if there is no clear evidence of economic advantages. Therefore, the decision to innovate or to enter new markets is not driven solely by economic motives.

The chapter uses an "interactionist approach" (Dimov, 2007) that takes into account personal as well as contextual factors that enhance or inhibit an individual's creativity and the firm's sensing, seizing, and transforming capabilities. Until now, opportunity recognition studies have been mostly devoted to understanding why some individuals are more

creative than others, ignoring the social context in which individual thinking is embedded (Perry-Smith, 2006). In contrast, innovation studies largely address the importance of the family context (Chrisman & Patel, 2012; Gomez-Mejia et al., 2014a).

This chapter is divided into three parts. The first part revisits the concept of entrepreneurship as a dynamic process and examines its main elements. The second part establishes a set of propositions using an SEW logic to guide future research on the sensing and seizing of opportunities in family firms as well as family firms' transforming capacity. The third part offers concluding remarks.

Theoretical Background: Entrepreneurship as a Multifaceted and Dynamic Process

In line with entrepreneurship research (Wiklund & Shepherd, 2008), our approach to examining the entrepreneurial process in family firms focuses on the creation of not only new ventures but also new products, markets, or technologies. That is, rather than delimiting entrepreneurship as a static process leading to starting a new business, we consider it as a dynamic process that begins with sensing new opportunities and continues with seizing such opportunities, where seizing can include a new product, a new market, or a new technology. We examine each of the elements of this process before explaining their meaning in the context of family-owned firms.

Sensing Entrepreneurial Opportunities

Although some scholars suggest that an opportunity exists only if it actually generates economic wealth (Eckhardt & Ciuchta 2008), implying that sensing and seizing are entangled processes, others define opportunities independently of whether their potential is realized. For example, Alvarez and Barney (2013) hold that competitive market imperfections generate the *potential* for economic wealth, but that potential may or may not be realized. Here, we view the sensing of entrepreneurial opportunities as independent from seizing, and, like most scholars, we consider opportunity recognition to be a critical first step if not a core aspect of entrepreneurship (Christensen, Madsen, & Peterson, 1994; Hills, 1995; Shane & Venkataraman, 2000; Stevenson, Roberts, & Grousbeck, 1985; Wiklund & Shepherd, 2003).

Kirzner (1973) was the first to use the term "alertness" to explain the individual entrepreneur's recognition of opportunities. He defined it as "an individual ability to identify opportunities which are overlooked by others." Building on Kirzner's work, several authors have suggested factors that allow some individuals to identify opportunities (Shane & Venkataraman, 2000): cognitive capacities (i.e., individual creativity), information processing skills, knowledge, and social interactions (Ardichvili, Cardozo, & Ray, 2003; Tang, Kacmar, & Busenitz, 2012).

CREATIVITY

Opportunity recognition has been linked to creativity (Hills, Shrader, & Lumpkin, 1999; Long & McMullan, 1984). Indeed, some authors define opportunity recognition as a form of creativity that can result in organizational innovation and/or new venture opportunities (Lumpkin & Lichtenstein, 2005). According to Dimov (2007), opportunity identification implies that entrepreneurs use creative processes to perceive new ideas and to put them into action. Amabile (1996, p. 82) defined entrepreneurial creativity as "the implementation of novel ideas to establish a new business or new program to deliver products or services."

Initial creativity research focused primarily on creativity as an individual trait (Barron & Harrington, 1981), but more recent perspectives tend to focus on how contextual factors can constrain or facilitate individual creativity (Perry-Smith, 2006). Baron (2007) and Dimov (2007) have called for analysis of both personal and organizational factors. The context imposes social roles, identities, and cultural norms that may facilitate or inhibit the individual's creative accomplishment (Amabile, 1988; De Carolis & Saparito, 2006). Individuals' psychological relationships with their groups, teams, or organizations may influence the extent to which they feel motivated to engage in creative behaviors (Hirst, Van Dick, & van Knippenberg, 2009). Flexible reward systems, collaborative leadership styles, and efficient communication channels have been said to foster creativity in organizational settings (Amabile, Conti, Coon, Lazenby, & Herron, 1996; Perry-Smith & Shalley, 2003), as have workplaces that encourage risk taking and autonomy (Amabile, 1983). Conversely, the tendency to act without adequate thought, abruptly, and with little or no regard for potential negative consequences can impair creativity (DeYoung, 2010; George & Zhou, 2007).

KNOWLEDGE

Several empirical studies have found that knowledge conduces to opportunity recognition (Corbett,

2006; Shane, 2000; Shepherd & DeTienne, 2005). The underlying argument of these studies is that, rather than being evenly distributed, information about underutilized resources, new technology, or unstated demand that may create business opportunities is "dispersed according to the idiosyncratic life circumstances of each person in the population" (Shane & Venkataraman, 2000, p. 222). Entrepreneurs' existing knowledge can help them more efficiently process this fragmentary and sometimes even contradictory information (Alvarez & Buseniz, 2001).

Yet, because too much domain knowledge may impede outside-the-box thinking, the link between knowledge and opportunity recognition is contingent on one's mode of learning (Dimov, 2007). Background and experiences not only give information but also influence cognitive processes (Baron, 2006). What counts is not only what one knows, but also how one applies and extends his or her knowledge in a particular situation (Weisberg, 1999).

Moreover, entrepreneurs possess different types of knowledge: explicit, as in scientific or technological knowledge, or tacit and personal, which is more difficult to communicate and imitate. Both are relevant to opportunity seeking (Lane & Lubatkin, 1998), but tacit knowledge is critical, because it represents much of what the firm knows and it is not easily transferred (Barney, 2002). Tacit knowledge develops through the interaction between an individual and the situation, becoming context specific.

Therefore, as in the case of creativity, the influence of prior knowledge on the opportunity recognition process cannot be understood without analyzing the context in which knowledge is developed and transferred.

SOCIAL NETWORKS

Entrepreneurs' social networks are another important factor influencing opportunity recognition (Hills et al., 1997). Networks provide access to diverse or novel information (Burt, 1992), which may in turn be instrumental for the development of opportunities (Singh, 2001). Following Granovetter's (1973) classic article on the strength of weak ties, research has highlighted the positive effect of weak ties and the negative effect of strong ties on creative actions (Perry-Smith, 2006). When actors cultivate networks of optimal size and weak strength that simultaneously link them to contacts in very different social worlds, they are more likely be exposed to different and unusual ideas (Baer, 2010) and to develop higher autonomy (Perry-Smith & Shalley, 2003). This may, in turn, enhance their alertness toward new business opportunities, because several researchers have found that team diversity is related to higher creative performance (Payne, 1990; Visart, 1979).

In contrast, when individuals share common attitudes and beliefs, the information that circulates among them is likely to be redundant, and the closeness and affect among them can produce conformity, which keeps them from sensing opportunities (Amabile, 1996). Although strong ties may provide some benefits for opportunity recognition, such as social support and trust (Ibarra, 1992), work-related information relevant to opportunity seeking can be effectively exchanged across weaker ties (Perry-Smith & Shalley, 2003).

Thus, network characteristics may facilitate or constrain the individual's recognition of new business opportunities, depending on the context, because certain factors may make it more likely that one will take advantage of a particular type of network (Amabile, 1996).

Seizing Entrepreneurial Opportunities

Seizing opportunities may involve developing new companies, new products, new markets, or new technologies. Entrepreneurs have indeed a wide range of possibilities for creating wealth, some of which do not necessarily involve starting a new independent firm (Carter, Dimitratos, & Tagg, 2004). In established organizations, entrepreneurial outcomes include not only new entries but also product innovations (Shane & Venkataraman, 2000) and the creation of new technologies (Makri et al., 2010).

NEW ENTRY

New entry is seen as a key aspect of entrepreneurship (Davidsson & Wiklund, 2001). According to Lumpkin and Dess (1996, p. 136), "New entry is the act of launching a new venture, either by a start up firm through an existing firm (business venturing) or via internal corporate venturing." Established companies can adopt different modes of organizing their business ventures. Among these, companies are increasingly using external corporate venturing to learn from knowledge sources beyond the boundaries of the firm. External corporate venturing refers to the creation of new businesses in which a corporation uses external partners in an equity or nonequity

interorganizational relationship (Miles & Covin, 2000; Sharma & Chrisman, 1999). External venturing can facilitate the development of new products, markets, or technologies (Dushnitsky & Lenox, 2005; Keil, 2002), and the firm can learn from its partners (Lane & Lubatkin, 1998; Mowery, Oxley, & Silverman, 1996; Rosenkopf & Almeida, 2003; Rothaermel, 2001) to increase invention quantity and quality (Ahuja & Katila, 2001; Makri et al., 2010; Vermeulen & Barkema, 2001), and more generally to become more innovative and grow faster (Stuart, 2000).

Research on corporate entrepreneurship shows that companies vary significantly in their use of different entry mechanisms because of their diverse environments and other contextual variables (Badguerahanian & Abetti, 1995; Hitt, Nixon, Hoskisson, & Kochhar, 1999).

NEW PRODUCTS/MARKETS AND TECHNOLOGIES

Most authors accept that entrepreneurship is largely based on innovations (Stopford & Baden-Fuller, 1994). The innovativeness of a firm, therefore, is assessed from the point of view of generating a new product to capitalize on a marketplace's opportunities (Brown & Eisenhardt, 1995; Ozsomer, Calantone, & Di Benedetto, 1997), creating a completely new market, or adopting a new technology that can lead to improved products or processes (Sciulli, 1998; Subramanian, 1996).

Central to the literature on innovation is the distinction between improving an existing design and creating a new concept that departs significantly from existing ones (Freeman, 1982)—that is, the distinction between incremental and radical innovation. Whereas incremental innovation introduces relatively minor changes to existing products or services, radical innovation implies the use of fundamentally different principles and procedures and the creation of new designs (Dess & Beard, 1984). As a result, these two types of innovation have different consequences, and they also require different types of organizational capabilities (Henderson & Clark, 1990).

Transforming Knowledge

The entrepreneurial process does not end once the firm discovers a new technology or develops a new product. Rather, in order to remain competitive, firms need to continually renew their existing knowledge base by recombining technological components in a novel manner (Fleming & Sorenson, 2004). The recombination process leading to an invention[2] is facilitated by two types of knowledge: scientific (knowledge about the core design concepts and the way in which they are implemented in a particular component) and technological (knowledge about the ways in which the components are integrated into a coherent whole). Science and technology affect the process of discovery in different ways.

Rip (1992) argued that technology[3] is about exploitation, adapting and combining what is known to achieve what is desired. It is driven by pressures from markets for products and services (Balmer & Sharp, 1993; Clark, 1987) and begins with an idea of what is needed to respond to those pressures. When a solution to a technological problem is not obvious, the firm works backward from its preconceived ends and evaluates potential starting points (solutions) until an optimal one is found (Nightingale, 1998).

Science, on the other hand, is exploratory and driven by the interests of researchers (Balmer and Sharp, 1993). While it has a known starting point, it searches towards unknown ends (Nightingale, 1998). These sociological and cognitive differences suggest that scientific knowledge can enrich innovation (Makri & Lane, 2007) and enhance a firm's transforming capability in research and development (R&D). The nonlinear and cumulative manner in which scientific knowledge evolves suggests that it can move a technological community away from its existing trajectory, leading to radical innovations. Technological knowledge evolves in a linear and noncumulative manner, moving a technological community along its existing trajectory and leading to incremental innovations (Makri et al., 2010). Simply put, scientific knowledge is a key indicator of a firm's transforming capacity because it facilitates exploration (Makri et al., 2006; Makri et al., 2010).

The Entrepreneurial Process in Family Firms: A Socioemotional Wealth Approach

The discussion to this point suggests that because entrepreneurship is a process of sensing and seizing opportunities, it is highly context dependent. Family businesses provide a unique organizational context to study the entrepreneurial process, because they are influenced by a number of distinctive contextual factors, such as a strong family identity, loyalty, and transgenerational intentions (Berrone et al., 2012). Families determine

norms, culture, and values, and they condition access to key resources needed for the entrepreneurial process (e.g., human capital, financial resources) (Aldrich & Cliff, 2003). Sirmon and Hitt (2003) recognized that a family business is a context prone to developing firm-specific, mainly tacit knowledge. Similarly, Cruz, Gomez-Mejia, and Becerra (2010) highlighted the uniqueness of individual relationships in the family context, characterized by kin networks, trust, and altruism.

The literature on family businesses largely addresses the influence of the unique aspects of the family on several strategic outcomes (see the work of Gomez-Mejia and his colleagues). However, despite the importance of fostering entrepreneurship in family businesses, how family ownership affects the entrepreneurial process is not yet well understood. Taking a family embeddedness perspective on entrepreneurship, Aldrich and Cliff (2003) pointed to the family as a key influence on both opportunity recognition and exploitation. But research on how families recognize the renewal of opportunities is practically nonexistent (Nordqvist & Melin, 2010), and the influence of family owners on the transforming capacity of the firm has not yet been established.

Most empirical articles examining entrepreneurship in family firms have focused on the concept of entrepreneurial orientation, or the processes and practices that make a firm entrepreneurial (Covin & Slevin, 1986, 1991). For instance, Salvato (2004, p. 74) concluded that "entrepreneurship in medium-sized family firms is intrinsically related to individual CEO-characteristics, to aspects of the relationship between family and firm, to governance and organizational characteristics, and to ownership structure." Additionally, Kellermanns et al. (2008) concluded that multigenerational involvement was a strong predictor of entrepreneurial behavior in family firms, and Martin and Lumpkin (2003) found that autonomy, risk-taking, and competitive aggressiveness decreased as later generations were involved in the family firm. Finally, Casillas, Moreno, and Barbero (2010) found that environmental dynamism significantly moderates the relationship between the next generation's involvement and entrepreneurial orientation in family contexts.

The other bulk of empirical evidence on entrepreneurship and family firms comes from studies on innovation, mainly using R&D expenditures as a proxy for innovation. For example, Block, Miller, Jaskiewicz, and Spiegel (2013) found that family ownership in publicly traded US firms in research-intensive industries correlated inversely with R&D intensity, whereas Chin, Chen, Kleinman, and Lee (2009), using a sample of Taiwanese electronics companies, found that family ownership reduced the quality and quantity of patents. Indeed, regardless of their theoretical approach, most studies have found that family firms tend to underinvest in R&D relative to non-family firms (Chrisman & Patel, 2012; Gomez-Mejia et al., 2014a; Muñoz-Bullón & Sanchez-Bueno, 2011).

Although these studies have done a great job in examining how family ownership affects entrepreneurial *outcomes*, none of them has captured how the unique family business context may facilitate or impede different aspects of the entrepreneurial *process*. As the next section shows, the SEW approach is designed precisely to capture the impact of family ownership on the process of entrepreneurship.

The Pervasive Effect of Socioemotional Wealth

The concept of SEW was first introduced by Gomez-Mejia et al. (2007) as a framework to integrate existing theories explaining empirical differences between family and non-family firms. The SEW model represents an extension to the Behavioral Agency Model, or BAM (Wiseman & Gomez-Mejia, 1998). According to the BAM, firm choices depend on the reference point of the dominant principals, who aim to preserve accumulated endowment in the firm. For family firms, that reference point is SEW rather than economic efficiency (Gomez-Mejia et al., 2007).

SEW was first defined by Gomez-Mejia et al. (2007) as the stock of affect-related value that a family derives from its controlling position in a particular firm. It includes aspects such as the fulfillment of needs for belonging, affect, and intimacy (Kepner, 1983); the continuation of family values through the business (Handler, 1990); of the family dynasty (Casson, 1999); or protection of the family's social capital (Arregle, Hitt, Sirmon, & Very, 2007). Losing this SEW implies a loss of closeness, reduced status, and/or failure to meet the family's expectations. Then, the model predicts that family owners are "loss averse" with respect to SEW; that is, they will embrace risky decisions that preserve SEW even if doing so decreases economic wealth.

Implicit in this reasoning is consideration of SEW as a unique reference point that guides family owners' strategic decisions. This view has

been recently modified by a more nuanced conceptualization of SEW that disaggregates it into five dimensions (referred to as the FIBER model; Berrone et al., 2012). These dimensions are family control and influence, family identity, sense of dynasty, emotional attachment, and social ties. These dimensions represent different aspects of the non-economic utilities that family owners derive from owning the firm and, more importantly, different reference points that may justify family principals' heterogeneous responses to different strategic outcomes (Berrone et al., 2012). Hence, it is possible that the salience of various SEW dimensions may vary across family firms and that, as argued later, they might have conflicting effects on creativity, innovation, and entrepreneurial activities.

The SEW model has received empirical support regarding strategic outcomes such as diversification (Gomez Mejia et al., 2010), environmental performance (Berrone, Cruz, Gomez-Mejia, & Larraza-Kintana, 2010), and innovation (Chrisman & Patel, 2012). Recent research has also provided preliminary support for the differential effect of the SEW dimensions (Cruz, Larraza-Kintana, Garces-Galdeano, & Berrone, 2014).

However, although the ubiquitous drive to preserve the family firm's SEW is likely to affect individuals' perceptions of their work environment, the process by which the presence of socioemotional goals affects sensing opportunities is unknown. Similarly, our understanding of the influence of SEW goals on the seizing of opportunities is incomplete, restricted to the study of family influence on innovation outcomes. To fill in these gaps, in the next sections we develop some propositions following a SEW approach to the entrepreneurial process in family firms.

Sensing: Socioemotional Wealth and the Recognition of Entrepreneurial Opportunities in Family Firms

Our model proposes that the presence of SEW within family firms influences how individuals, groups, and organizations identify business opportunities through its impact on creativity, prior knowledge, and social networks. However, the direction of the effect is not clear because, although some aspects of SEW may foster opportunity seeking, others may inhibit it. Therefore, the final impact of SEW on the sensing of opportunities depends on the weight family owners give to each of the different components of the family SEW.

SOCIOEMOTIONAL WEALTH, CREATIVITY, AND SENSING OPPORTUNITIES IN FAMILY FIRMS

One of the mechanisms organizations use to enhance creativity is setting creativity goals. In doing so, organizations are essentially signaling to employees what is being valued. If goals for creativity are not established but there are goals for other aspects of performance (e.g., financial), then creative performance is significantly less likely to occur (Shalley, 1991). Simply put, assigning a creativity goal can cause individuals to spend more time thinking about a task and trying to expand the range of potential solutions. This type of critical reflection requires a long-term orientation rather than a focus on immediate financial payoffs. Because creativity often evolves through trial and error, even organizations that do set creativity goals may not achieve much creativity if employees are pressured to achieve immediate results or punished for failed attempts (Amabile, 1998; Jung, 2001).

A long-term orientation characterizes family firms in which family owners' have a strong intention of handing the business down to future generations (Berrone et al., 2012). When this is the case, the firm symbolizes the heritage and tradition of the family (Casson, 1999) and might not be sold easily (Zellweger, Kellermanns, Chrisman, & Chua, 2012). Thus, we expect that family firms that emphasize the family dynasty dimension of SEW would have a long-term orientation and a higher level of tolerance for occasional failures that lend well to the setting of creativity goals.

The SEW preservation also acts as an internal sustaining force that propels organizational members to persist in the face of environmental challenges (Gomez-Mejia et al., 2007). Research suggests that when the "family identity" dimension of SEW is perceived as highly salient, the firm becomes in itself a projection of the core values of the family (Berrone et al., 2010). Symmetry of personal and firm goals leads to higher commitment from family owners as well as spontaneous selfless cooperation beneficial to other organizational members, such as supervisors, peers, and subordinates (Mowday, Porter, & Steers, 1982). In firms in which the family identity dimension of SEW is particularly salient, the family members' strong sense of belonging is often transferred to the rest of the employees. Such forces have been associated with higher levels of creativity, because individuals are most creative when they are motivated primarily intrinsically (Amabile and Gryskiewicz, 1987; Glynn and Webster, 1993; Shalley, 1995).

The discussion suggests that a strong commitment to continuity in family firms and a high identification of family owners with the firm encourage creativity within the organization. Formally stated,

Proposition 1a: The Family Identity and the Family Dynasty dimensions of SEW will foster creativity in family firms, by setting creativity goals and promoting intrinsic motivation among organizational members.

However, evidence also suggests that sometimes the desire to preserve SEW can make the organizational climate too restrictive, inhibiting the creative process (Kellermanns & Eddleston, 2006). We argue that this negative influence derives from the emotional overtones of some family owners and from their desire to retain family control over the firm's strategic decisions, two key dimensions of family SEW.

Emotions are inseparable from everyday work in all organizations (Ashforth & Humphrey, 1993), but in family firms emotions may be so intense that the boundaries between the family and the company become rather porous (Berrone et al., 2010). When the emotional attachment dimension of SEW becomes salient, family members are more likely to be altruistic towards each other (Schulze, Lubatkin, & Dino, 2003). Although family altruism is generally reputed to temper self-interest inside the family business (Chrisman, Chua, & Litz, 2004), it may also have negative consequences. Altruistic motives lead parents to overprotect their adult children and care for them even if they know they are going to free ride (Buchanan, 1975). This might create a "paternalistic culture" in the organization that tends to overprotect employees who are members of the controlling family (Cruz et al., 2010). As a result of this overprotection, family employees are denied the possibility of making autonomous choices and the freedom to express their ideas (Chirico & Nordqvist, 2010). All of this creates family inertia, which in turn inhibits creativity among family employees.

Because creativity involves uncertain and untested approaches (Tesluk, Farr, & Klein, 1997), the presence of this paternalistic culture may also significantly penalize employees who do not belong to the family system. If non-family employees feel they will be punished for failing at work, it is far easier, more efficient, and potentially more practical for them to avoid trying a new, possibly better approach. Moreover, in firms where family principals are concerned about the desire to preserve family control, another key dimension of family SEW (Berrone et al., 2012), the altruism and psychological safety to family members will generally not be extended to non-family members. Such a concession might be interpreted as a loosening of the family's control of the firm. Therefore, as the desire to preserve family control becomes stronger, so will the belief that employees outside the family system may be penalized for negative consequences of creative behavior; hence, there will be greater reluctance among members of the non-family system to engage in creative behavior.

Lastly, there is another pervasive effect on the firm's creativity if family owners put too much emphasis on maintaining family control. When this is the case, decision making is concentrated in a few entrenched individuals whose main aim is to preserve control and traditions, rather than to create wealth (Berrone et al., 2012). The company perpetuates a culture that is inward looking and rigid (Konig et al., 2013), inhibiting the exploration of new methods and practices (Zahra et al., 2004).

This suggests the following:

Proposition 1b: The Family Control and the Emotional Attachment dimensions of SEW will tend to inhibit creativity in family firms by engendering inertia among family employees and perceptions of organizational injustice among non-family employees.

SOCIOEMOTIONAL WEALTH, KNOWLEDGE, AND SENSING OPPORTUNITIES IN FAMILY FIRMS

When ensuring the company legacy to be bequeathed to descendants is an important goal for family owners (i.e., when the family dynasty dimension is more salient), they are more likely to involve children early in the family firm. Such intergenerational grooming transfers family firm–specific human capital (Sirmon & Hitt, 2003) in the easiest way, through direct exposure and experience (Lane & Lubatkin, 1998). This firm-specific knowledge may make family members more productive within the family firm, although not necessarily outside it (Sardeshmukh & Corbett, 2011; Vallejo, 2009).

Early entrepreneurial experience makes these family members more alert to signals than others because they have a better appreciation for the type of information being sought. Cooper, Folta, and Woo (1995) demonstrated that entrepreneurial experience provides benchmarks for assessing the relevance of information, which in turn can lead to a better understanding of the value of opportunities that become available (Davidson & Honing,

2003). Family members who get a ground-level view of the business operations and a better understanding of the social dynamics within the firm can understand the competitive challenges and opportunities, make decisions as a group, explore various alternatives, and discuss the risks associated with these options (Habbershon, 2006; Zahra, 2005). These arguments suggest that when the dynastic motive is prioritized, the presence of SEW will foster opportunity recognition through its impact on the development of tacit knowledge.

However, other aspects of SEW may have a pervasive effect on the family owners' ability to recognize new business opportunities. Specifically, we argue that when family owners prioritize the family control dimension of SEW, there will be a lower propensity to share privileged information outside the family system. This lack of sharing will, in turn, negatively affect opportunity recognition in two ways. First, reluctance to share privileged information with non-family employees will hinder the process of recognizing potentially valuable opportunities as a result of inadequate information availability. Second, it also evokes a reciprocal reticence from non-family employees who sense the inequity of their relationship with the organization. Lubatkin, Ling, and Schulze (2007) suggested that non-family employees' perceptions of fairness will be dependent on the extent of self-control exhibited by these individuals.

This discussion suggests that as in the case of creativity, the influence of SEW through knowledge is a double-edged sword: The early involvement of children gives them the knowledge to sense opportunities, but the reluctance to share information with non-family employees may suppress this effect. This leads to the following proposition:

Proposition 2a: The Family Dynasty dimension of SEW favors tacit knowledge and entrepreneurial experiences that facilitate opportunity recognition in family firms.

Proposition 2b: The Family Control dimension of SEW reduces the likelihood of family members' sharing information with non-family employees and thus impedes opportunity recognition in family firms.

SOCIOEMOTIONAL WEALTH, SOCIAL TIES, AND SENSING OPPORTUNITIES IN FAMILY FIRMS

In family firms, kin networks based on strong social ties become an integral part of the SEW that families strive to preserve over time (Berrone et al., 2012). Cruz, Justo, and De Castro (2012) argued that SEW provides kinship ties with some of the same collective benefits that arise in closed networks, including the development of "collective social capital" (Coleman, 1990). This social capital allows the family firm to enhance its ties with external stakeholders (Miller & LeBreton-Miller, 2006; Sirmon & Hitt, 2003), to build more effective relationships with suppliers and customers (Sirmon & Hitt, 2003), and, consequently, to collect broader information about new opportunities, preventing the firm from becoming rigid or stagnant (Sirmon, Arregle, Hitt, & Webb, 2008). Externally, family members become deeply embedded in their communities and tend to be active there (Graafland, 2002; Lansberg, 1999). Whereas other firms may engage with the community at a rudimentary level (for instance, by providing information or philanthropic donations), family firms dominated by social ties consider the community in firm decision making (Boehm, 2005). In such firms, expanding networks and fostering network diversity will be the norm, and external ties nurture entrepreneurial opportunity recognition (Aldrich & Cliff, 2003; Habbershon, 2006; James, 1999).

However, the social capital literature also warns against "too much collective capital," which can limit access to information and new ways of doing things (Coleman, 1988). This is likely to happen in family contexts when emotional attachment is too high, because the presence of SEW goals also endows kinship ties with the characteristics of strong (versus weak) ties (Nahapiet & Ghoshal, 1998). Although the resulting relational trust and strengthening of closeness (Uzzi, 1997) may to some degree facilitate opportunity recognition, creativity studies show that this is not a key requirement for sharing innovative ideas across functional boundaries (Burgelman, 1983). On the contrary, the closeness and affect of strong ties can produce conformity and lead to "relational inertia" (Gargiulo & Benassi, 1999), which hinders the sensing of opportunities (Amabile, 1996).

Thus, the network diversity that emerges as a result of binding social ties with external stakeholders may foster creative thinking and opportunity recognition, whereas the network homogeneity that results from the emotional attachment between family members may stifle opportunity recognition. Formally stated,

Proposition 3a: The Binding Social Ties dimension of SEW engenders a higher level of network diversity that improves opportunity recognition in family firms.

Proposition 3b: The Emotional Attachment dimension of SEW engenders closed networks that impair opportunity recognition in family firms.

Seizing: Socioemotional Wealth and Entrepreneurial Outcomes in Family Firms

The SEW approach predicts that family owners will favor certain entrepreneurial outcomes because there is a socioemotional reward for the family, regardless of any associated economic gains. The aim here is to understand the trade-offs (financial versus SEW) that family owners face when deciding the best way to seize business opportunities. Specifically, our model proposes that the presence of different SEW dimensions associated with different family owners' goals will affect the choice among product innovation, technological innovation, and new entry.

SOCIOEMOTIONAL WEALTH AND TECHNOLOGICAL INNOVATION

Investment in R&D, if it leads to successful innovation, can help the firm compete and ultimately survive (Ahuja, Lampert, & Tandon, 2008; Bushee, 1998; Nelson & Winter, 1982; Palmer & Wiseman, 1999; Sundaram, John, & John, 1996). The importance of successful R&D is even greater in high-technology sectors, because they are typified by rapid change. A key factor for success in such settings and a potential benefit of R&D for the family owners is resilience to rapidly changing external environments. (Gomez-Mejia et al., 2007). However, undertaking significant R&D may demand talent not available within the family and raises the probability that family members will lose control (Gomez-Mejia et al., 2007).

The science/technology distinction that we noted earlier corresponds to March's (1991) distinction between exploration—which is characterized by search, variation, experimentation, flexibility, and discovery—and exploitation—which is characterized by refinement, efficiency, implementation, and execution. Knowledge generated by exploration is often distant from the existing knowledge base of the firm (Katila, 2001), whereas exploitative learning is a directed search emphasizing limited variety (McGrath, 2001) and building closely on the existing knowledge base.

Because, in comparison to exploitation, returns from exploration are systematically less certain (March, 1991), firms tend to prefer "tried and true" solutions over novel ones (Benner & Tushman, 2002). This tendency is even greater in family firms. Whereas exploration increases the possibilities of recombining existing knowledge into new innovations (Fleming, 2001) and protects the firm from being locked into a particular technological trajectory, it also increases complexity and thus the difficulty of maintaining family control. Block et al. (2013), using patent data for US companies, showed that family firms produce innovations of less technological significance and less economic value than non-family firms. This suggests that family ownership may affect a firm's transforming capacity as follows. On one hand, family owners for whom family control and emotional attachment to the firm are dominant (see Proposition 1b) will be less likely to invest in scientific knowledge and the uncertainty that accompanies it and would rather invest in technological knowledge which is more certain. As a result, those firms are less likely to develop radical technological innovation. On the other hand, family owners for whom family identity and family dynasty are prevalent (see Proposition 1a) will be more likely to invest in the uncertain process of scientific knowledge and the long-term orientation that accompanies it. Formally stated,

Proposition 4a: The Family Control and the Emotional Attachment dimensions of SEW are less likely to foster investments in science and therefore less prone to develop radical technological innovations among family firms.

Proposition 4b: The Family Control and the Emotional Attachment dimensions of SEW are more likely to promote investments in technology and therefore more likely to develop incremental technological innovations among family firms.

Proposition 5: The Family Identity and the Family Dynasty dimensions of SEW are more likely to encourage investments in science and therefore more likely to develop radical technological innovations among family firms.

SOCIOEMOTIONAL WEALTH AND PRODUCT INNOVATION

Previous studies have suggested that because family firms are more averse to loss of control than non-family firms, they are less willing to diversify either domestically or internationally (Anderson & Reeb, 2003), and if they do pursue international diversification, they tend to focus on culturally close regions (Gomez-Mejia et al., 2010). The underlying assumption is that diversification jeopardizes SEW. Similarly, family firms may be more reluctant to

diversify into unrelated product categories because such a move often requires expertise and resources from external parties and therefore threatens SEW (Gomez-Mejia et al., 2014a).

These arguments do not imply that family firms do not engage in product innovation. On the contrary, Miller and LeBreton-Miller (2005) argued that their long-term orientation and persistence give family firms an advantage in developing new products. Accumulated knowledge and traditions allow family owners to capitalize on their family brand and reputation to produce new products in a region, and their dominance can give them advantage even over larger national players (Habbershon, 2006). However, these arguments imply that the innovations are based on existing or related products. This is to say, product innovation in family firms is accomplished by "creating the new through the old" (Nordqvist & Melin, 2010, p. 224). To use Aldrich and Martinez's (2001) terms, this implies that family owners are more likely to be reproducers than innovators when it comes to products. Developing completely new products is highly risky from an SEW preservation point of view, because it may "induce important changes in the way the family-owned firm is organized, and this is likely to engender resistance from family members who may feel their traditional sphere of influence is being threatened" (Gomez-Mejia et al., 2007, p. 7).

Additionally, recent research suggests that family firms have a responsive market orientation, which focuses on satisfying current customers, rather than a proactive market orientation, which addresses latent customer needs and completely new markets (Lichtenthaler & Muethel, 2012). Based on these arguments, we expect product innovation in family firms to be more incremental than radical. More specifically, based on the arguments leading to Propositions 4 and 5, we expect that family owners who use the family control and the emotional attachment dimension of SEW as main reference points will be more likely to develop incremental technological innovations and thereby incremental product innovations. On the other hand, family owners who use the family identity and family dynasty dimension of SEW as main reference points will be more likely to develop radical technological innovations and by extension radical products. Formally stated,

Proposition 6a: The Family Control and the Emotional Attachment dimensions of SEW are more likely to foster incremental product innovations among family firms.

Proposition 6b: The Family Identity and the Family Dynasty dimensions of SEW are more likely to generate radical product innovations among family firms.

SOCIOEMOTIONAL WEALTH AND NEW ENTRY

Organizations entering new or established markets can either launch a new independent company (business venturing) or engage in internal corporate venturing. Moreover, business venturing can be accomplished independently or through interorganizational relationships (external corporate venturing). In what follows, we argue that the family control dimension of SEW fosters new entry.

For family owners, new venture creation reduces risk, because owning multiple businesses implies that resources can be moved between firms, reducing the overall risk of failure. This strategy is particularly relevant for family owners who use family control as a main reference point, because they have most of their wealth tied to one company rather than in a diversified portfolio of investments (Galve-Górriz & Salas-Fumás, 2003; Gomez-Mejia, Larraza-Kintana, & Makri, 2003). Therefore, family owners who emphasize the family control dimension of SEW may promote greater diversification in the firm's portfolio of businesses in order to spread their risk and ensure family influence (Casson, 1999; Chami, 1999).

Moreover, as the family grows, family owners need to generate not only more wealth (Miller, Steier, & LeBreton-Miller, 2003) but also a new job for every member who joins the business (Cruz & Justo, 2012). This need is even greater for family owners who use family dynasty as a main reference point. Starting a new venture or a new division of the business meets both needs (Barach, 1984). Additionally, new generations can "experiment" with new ventures without risking the whole family wealth. As Sieger, Zellweger, Nason, and Clinton (2011, p. 327) argued, family owners develop business portfolios to "seek growth while protecting the firm's core activity." Accordingly, new venture creation gives family owners who emphasize the family control and the family dynasty dimensions of SEW the opportunity to find a middle ground between being entrepreneurial and preserving the SEW attached to the family's core activity. Formally stated,

Proposition 7: The Family Control and the Family Dynasty dimensions of SEW make family owners more likely to engage in business venturing when entering new markets.

Use of the SEW framework also sheds some light on the mode in which family firms choose to create new ventures. Firms in general are increasingly adopting external corporate venturing, because interorganizational learning from alliance partners facilitates the development of new products, markets, or technologies and the firm's ability to create new knowledge. For family firms, however, external corporate venturing threatens SEW because the increased variance in the knowledge being integrated increases complexity and thus the difficulty of monitoring these new activities (Oxley, 1997). This threat is even greater for family owners who use family control as a main reference point. As the firm enters multiple partnerships simultaneously, it becomes increasingly difficult to maintain family control and autonomy. Including multiple external partners in the innovation process restricts the family firm's decision-making latitude, and such restriction will be especially felt in family firms with a family CEO (Classen, Van Gils, Bammens, & Carreem, 2012). Formally stated,

Proposition 8: The Family Control dimension of SEW makes family owners less likely to engage in external corporate venturing when entering new markets.

Conclusions

Our dynamic capabilities framework suggests that family ownership affects the entrepreneurial process of sensing, seizing, and transforming. Although past research has explored how family ownership affects entrepreneurial outcomes, no study has examined how family ownership may facilitate or impede these three steps of the entrepreneurial process. We argue that various SEW dimensions differentially affect the entrepreneurial process of sensing, seizing, and transforming and that, hence, higher or lower salience of particular SEW dimensions may influence the behavior of family firms. Our general thesis is that these three steps of the entrepreneurial process, along with the five dimensions of SEW, are key to understanding how entrepreneurship in family firms differs from that in non-family firms. Our framework suggests that the family's networks and multigenerational involvement give family owners a potential advantage over non-family firms in discovering new business opportunities, but emotional attachment and emphasis on maintaining family control can make them less prone to exploration. Furthermore, we argue that, all things considered, the avoidance of net SEW losses is conducive to greater business venturing and lower corporate venturing in family firms.

Our SEW framework also provides some insights into how family dynamics can facilitate or constrain firms' seizing and transforming capacities. In particular, we argue that new entry decisions will be driven by a desire to protect the family's SEW. As a result, family businesses are more likely to start new businesses and enter new markets alone and less likely to form alliances with other organizations. Further, we expect that family owners for whom family control and emotional attachment to the firm are dominant will be less likely to invest in scientific knowledge, which makes them less likely to discover radical technological or product innovations. On the other hand, family owners for whom family identity and family dynasty are prevalent will be more likely to invest in scientific knowledge and hence more likely to develop radical technological and/or product innovations.

A vast body of research on family firms has focused on understanding the effect of family ownership on firm performance. These studies suggest that evidence is inconclusive as to whether family firms outperform non-family firms. In a recent meta-analysis, Van Essen, Carney, Gedajlovic, Hengens, and Van Osterhout (2013, p. 26) concluded that "family control has a modest, but statistically significant positive effect on performance." Simply put, empirical evidence thus far shows that family firms are a viable form of economic organization and that they can perform at least as well or slightly better than their non-family counterparts. Our study contributes to this body of research by looking at how some aspects of family ownership are beneficial for entrepreneurship, innovation, and, by extension, firm performance, while others hinder it. Family owners need to be mindful of how their emotional attachment, identity, long-term commitment to the family, and need to control its fate affect the mode, quantity, and quality of innovations.

Notes

1. Throughout the chapter, we use the terms "family-controlled" and "family-owned" firms interchangeably, given that there is no consensus in the literature as to what the precise definition of a "family firm" is or should be.
2. Innovation involves discovering an invention and then exploiting it through product development, manufacturing, marketing, distribution, and after-sales service. As a result, an innovation differs from an invention in that it provides direct economic value to the firm and is diffused to other parties beyond the discovering firm (Makri, Hitt, & Lane, 2010; Makri, Lane, & Gomez-Mejia., 2006).
3. Patents are considered a representation of technological knowledge, whereas papers and citations to them are viewed as representations of science (Meyer, 2000).

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INDEX

f denotes figure; *t* denotes table