

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

Michele Rigolizzo *and* Teresa Amabile

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; Nemhard & 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 Housenborg, 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, Engstrom (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 helicopter¹ or Charles Babbage’s 1837 analytical machine². 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 underexplored 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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