PERSPECTIVES

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THE CREATIVITY DILEMMA

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Creativity—the production of ideas that are simultaneously novel and useful (Amabile, 1983, 1996)—is intimately linked to innovation, which entails the conversion of ideas into new products, services, or ways of doing things (e.g., Kanter, 1988; West, 2002). Most studies on innovation differentiate at least two activities in the innovation process: idea generation and idea implementation (e.g., Amabile, 1988; Bledow, Frese, Anderson, Erez, & Farr, 2009; Sarooghi, Libaers, & Burkemper, 2015). Previous research has consistently documented that the production of ideas is a positive predictor of idea implementation (Axtell, et al., 2000, 2006). However, the correlation between creativity and innovation needs clarification (Baer, 2012) because it is characterized by tensions (Lewis, Welsh, Dehler, & Green, 2002), paradoxes (Miron, Erez, & Naveh, 2004), contradictions (King, Anderson, & West, 1991), and dilemmas (Benner & Tushman, 2003). To interpret tensions and outcomes when studying innovation processes, March's (1991) framework of exploration and exploitation has become an essential lens. Idea generation is exploratory in nature, but idea implementation is exploitative. Exploration engages firms in divergent thinking through search, discovery, experimentation, risk taking, flexibility, and variation. Exploitation emphasizes convergent thinking including selection, refinement, execution, and variance reduction.

The opposing nature of idea generation (an exploratory activity) and idea implementation (an exploitative activity) derives from resource-allocation constraints, discrepancies in organizational adaptation, and divergent organizational output (Lavie, Stettner, & Tushman, 2010). First, exploration and exploitation compete for scarce resources and entail distinctive skills and capabilities. By allocating resources, organizations make a conscious choice to emphasize new possibilities and experimentation—to shift away from a firm's existing knowledge or short term productivity and to leverage currently available knowledge to address immediate needs. This tension between idea generation and idea implementation is akin to the problem of deciding whether the present should be hedged for the future (Lavie et al., 2010). The second dichotomy is the distinction between flexibility and stability. Experimenting with new ideas requires flexibility and is associated with uncertainty and change. Implementing new ideas requires adaptation to things already known and is associated with stability and inertia (Lewin, Long, & Carroll, 1999; March, 1991). Third, idea generation and idea implementation produce different outputs. Returns from idea generation are less certain and more remote in time, but also potentially greater (compared with returns from idea implementation, which is more certain), and easier to achieve and closer in time (March, 1991).

Another important characteristic of the innovation process is its complexity (Anderson, Potočnik, & Zhou, 2014; Bledow et al., 2009). Idea generation and idea implementation cannot be separated easily but have clear overlaps (Bledow et al., 2009). As these activities are quite different in nature, flexibly switching between them is a challenging task (Rosing, Frese, &

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Bausch, 2011). Therefore, firms must integrate exploration and exploitation and handle their different requirements at the same time. Scholars suggest that ambidexterity theory is useful for managing conflicting demands at multiple organizational levels, in the context of innovation in organizations (Bledow et al., 2009). Ambidexterity is the ability to manage tasks that imply some forms of trade-off. It means that organizations should devote sufficient attention to manage and reduce the tensions that arise between exploration to ensure its future viability (idea generation) and exploitation to ensure its current viability (idea implementation) (Levinthal & March, 1993). In other words, ambidexterity requires a firm to be able to overcome conflict and maintain a balance between convergent and divergent thinking, as key to an innovation process's success (Bledow et al., 2009).

A final aspect of the trade-off between exploration and exploitation concerns how the activities are combined. The idea of a "balance" can be misleading if it implies that moderate and equal amounts of exploration and exploitation are always superior. Recently, some authors (e.g., D'Souza, Sigdyal, & Struckell, 2017) have emphasized the need to contextualize the relative importance of exploration and exploitation activities. That is, depending on external circumstances such as the dynamics of the market, the relative importance of these activities can shift. This study acknowledges this phenomenon and does not assume a predetermined optimal mix of exploration and exploitation, although both kind of activities are necessary.

Managing ambidexterity through creativity mechanisms

An organization can take many actions to encourage creativity (Burroughs, Dahl, Moreau, Chattopadhyay, & Gorn, 2011; Dunne & Dougherty, 2012; Harvey & Kou, 2013; Klotz, Wheeler, Halbesleben, Brock, & Buckley, 2012). For example, Apple and IDEO use brainstorming sessions to access the group's collective creativity (Gobble, 2014). Training programs or experiential development (e.g., job rotations) are also organizational initiatives that attempt to improve creativity (Hunter, Cassidy, & Ligon, 2012). They point to organizational planning as a tool to promote creativity.

Extant literature provides a mix of results regarding the effectiveness of creativity improvement programs. Brainstorming methods are often criticized because of their impractical outputs (Sinfield, Gustafson, & Hindo, 2014). In the same vein, extrinsic incentives (e.g. rewards) for creativity have been long debated in the literature, since many empirical studies have found that external rewards are detrimental to creativity (Klotz et al., 2012). Even though some literature has shown that training can positively influence creative outcomes, whether creativity can be taught remains an open question (Burroughs et al., 2011).

Extending these studies, this research discusses how conflicting demands can be managed by formally using creativity within an organization to enhance its capability for developing something novel and meaningful. This means that a combination of creative methods is necessary for an effective innovation process. Creative methods need to foster both divergent and convergent thinking and be able to flexibly switch between them. Because tensions between creativity and innovation span all levels of an organization, this research separately examines the trade-offs between opposing logics underlying the innovative process, at individual and team levels. The focus on these two levels is for the sake of illustration and brevity, although arguments at the organizational level could also be made.

Ambidexterity of creativity mechanisms at the individual level

Ambidexterity at the individual level refers to a person's ability to perform explorative and exploitative activities and to switch between these mindsets (e.g., from idea generation to idea implementation) (Bledow et al., 2009, p. 322). To achieve ambidexterity, individuals must deal with the tensions created by engaging in high-creativity breakthrough activities (divergent thinking) along with detailed aspects of subsequently converting ideas into innovations (convergent thinking).

At the individual level, creativity can be elicited in many ways. Burroughs et al. (2011) identify individual training and rewards as key facilitators in relationships with creativity. If we consider creativity as a form of performance behavior that depends on motivation and ability (Heider, 1958), individuals must be motivated to engage in creativity and be able to generate new and useful ideas. Training is typically geared towards shaping a set of skills that facilitate cognitive flexibility and creative thoughts. According to Amabile (1988, p. 131), "creativity-relevant skills include a cognitive style favorable to taking new perspectives on problems, an application of heuristics for exploration of new cognitive pathways, and a working style conducive to persistent, energetic pursuit of one's work." Rewards are usually used as a signal of good performance that can positively influence creative behavior through enhancing extrinsic motivation (Klotz et al., 2012). This is especially relevant for individuals not naturally inclined to seek out new ideas.

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Such elements clearly improve performance for creativity at the individual level, but the innovation process is not solely a matter of divergent thinking. It also requires convergent thinking skills that allow implementation. To meet the demands of the innovation process, Taylor and Greve (2006) suggest that gaining profound and diverse domain expertise enables individuals to successfully perform both explorative (idea generation) and exploitative (idea implementation) activities to such an extent that the tension between the two activities dissolves. Relevant domain expertise gives individuals technical skills and special talent in the domain in question, providing a set of cognitive pathways for solving organizational problems (Amabile, 1988). Certainly, it is impossible to innovate unless individuals have knowledge and experience in the domain upon which they can later reflect to solve problems more creatively.

Thus, providing individuals with creative-relevant skills and/or extrinsic rewards to use those skills is not a sufficient basis for becoming ambidextrous. Creativity mechanisms operating on an individual level may not be effective in terms of innovation if not accompanied by profound and diverse experience (e.g., job rotation) in the problem-solving domain.

Ambidexterity of creativity mechanisms at the team level

Teams are capable of innovation when members use divergent thinking to generate ideas and then aggregate their individual ideas into the group's innovative outputs through a convergent process such as conformity and consensus seeking (George & Zhou, 2007; Nemeth, 1986). This yields a useful dichotomy between the exploration of new ideas and the alignment of team members towards the common goal of innovation (Miron et al., 2004). Previous researchers have argued that ambidextrous teams need to acknowledge the variety of traits that individuals bring to the process (cognitive style, skills, expertise, personality) and integrate these variables into innovative outputs to achieve other performance criteria such as quality and efficiency (Bledow et al., 2009). Diversity in teams ensures that different requirements of the divergent and convergent processes are met.

Many mechanisms can be employed to stimulate creativity at the team level, but one deserves particular attention: brainstorming. Brainstorming is a tool that accesses the team's collective creativity by taking down the barriers that stop individuals from suggesting ideas (Gobble, 2014). It mainly focuses on the individual's production of multiple new ideas or divergent thinking. Although an idea may have been influenced by others' comments, individuals within the team generate ideas with little development or evaluation, relying on their own interpretation of the problem framework to do so (Harvey & Kou, 2013). Brainstorming is clearly relevant for idea generation, but without teamwork, this tool is of little value in shifting ideas into innovative outputs. This view coincides with the current questioning of the usefulness of brainstorming (Basadur, Basadur, & Gordana, 2012; Gobble, 2014). Challenges in translating new ideas into innovation exist because individuals lack experience in real-world situations (Basadur & Basadur, 2009) that can allow them to put attention to detail and improve the quality of ideas through a convergent decision-making process that yields collective outcomes.

By focusing on idea implementation, this research identifies a second key creativity tool at team level: multidisciplinary team work. Relying on a diversity of members' knowledge, experience, and expertise, the multidisciplinary team helps to share understanding and view. It creates a common language, which guarantees that the output of the creative process is correctly implemented by providing a mechanism for refining and improving (Miura & Hida, 2004). Integrating the depth and breadth of their experiences, these teams compare and evaluate ideas, and build consensus about the implied real situation.

Innovation at the team level succeeds not only because members stimulate divergent new ideas but also because they excel at implementing new ideas. Accordingly, combining brainstorming with multidisciplinary teamwork plays a role in ambidexterity at the team level. Brainstorming is a loose tool that allows for more risk taking and the emergence of new ideas, while multidisciplinary team building is more rigid, permitting little room for the expression of deviant point of views, which is required for innovation.

Implications for practices

Managers should be aware of the opposing forces that underlie the innovation process. Idea generation emphasizes exploration and divergent thinking, but idea implementation does the opposite, emphasizing exploitation and convergent thinking. These contradictions can be resolved with an ambidextrous combination of creative methods. Managers need to do more than merely promoting creativity within organization; they should monitor idea implementation to identify whether there might be any sign of counterproductive outcomes. This study suggests that a combination of different creativity mechanisms applied with ambidexterity may be more effective than a

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single creativity method to encourage innovation. For example, providing creative-relevant skills for individuals and/or extrinsic rewards for experienced individuals may be insufficient in terms of innovation, if not accompanied by technical skills to solve operational problems. Similarly, at the team level, brainstorming may be insufficient to promote innovation if it does not come with multidisciplinary team work that integrates a diversity of experiences and builds consensus about the implied real situation. Because the conversion of new ideas to innovation spans all levels of an organization, this study suggests that managers could improve their level of innovation success by addressing ambidexterity of creativity mechanisms at different levels of analysis. This observation is especially relevant at the team level, given that creativity and innovation are social processes bolstered by team-based structures.

Another important managerial implication pertains to how situational contingencies may interfere with the creativity-innovation link. Using European Union Community Innovation Survey (CIS2010) data, Revilla and Rodriguez-Prado (2018) study the impacts of creative methods related to operating context. Their results find differences in creativity-innovation links associated with organizational size, R&D (Research and Development) intensity, industry (manufacturing or services), and culture. For instance, their findings show that sufficient size is required to successfully implement ambidexterity. Despite the problems faced in trying to innovate, large firms are more capable of dealing with the challenges of ambidexterity than small firms. The implication here is that managers should adopt a growth strategy to acquire necessary resources to simultaneously generate and implement new ideas, as proposed by Sarooghi et al. (2015). Similarly, their results suggest that managers should invest enough in R&D to build the absorptive capacity that facilitates the acceptance of ideas and oversees correct implementation. Their research also advises service firms about their additional risk in terms of innovation. Managers who pursue innovation in the services sector should be cautioned that they might encounter resistance to innovation due to its intangible nature, the higher personal involvement of workers, and the required presence of clients. Finally, their study underscores the importance of culture in implementing ambidexterity and suggests that tight cultures are better equipped than loose cultures to integrate idea creation and implementation. This finding challenges the dominant view in innovation research that divergent thinking is a prerequisite for innovation. Moreover, they advise managers to consider how geographic location encourages divergent or convergent thinking. That is an important aspect to consider when deciding where to geographically locate the R&D activities.

AUTHOR'S NOTE

A more complete version of this research can be found on Revilla, E., Rodríguez-Prado, B. (2018). Bulding ambidexterity through creativity mechanisms: Contextual drivers of innovation success. Research Policy, 47(9), 1611-1625. doi:10.1016/j.respol.2018.05.009

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