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A Dialectic Perspective on Problem Identification and Construction

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The paper by Bledow, Frese, Anderson, Erez, and Farr (2009) raises important issues relating to creativity and innovation in organizations. Bledow et al. cover the range of creativity and innovation requirements and the tensions between these different requirements from the individual, team, and organizational perspectives. Furthermore, they discuss the path from ideas to implementation, including idea generation, idea evaluation, idea selection, and various steps associated with implementation. However, the review of Bledow et al. has focused on the middle (idea generation) and late stages (implementation) of creativity and innovation. The purpose of this commentary is to focus on the early stage of creativity and innovation that did not get the attention needed in the review, that of problem identification and construction.

Problem identification and construction is viewed as the first step in creative problem solving (e.g., Mumford, Mobley, Uhlman, Reiter-Palmon, & Doares, 1991). During this process the problem to be solved is recognized and identified (Is there indeed a problem?), defined (What is the nature of the problem?), and constructed (What are the parameters of the problem to guide possible solutions?). These are critical elements that occur prior to idea generation and can have a strong influence on subsequent processes such as idea generation or idea evaluation.

Specifically, past research suggests that creative individuals engage in problem identification and construction more than less creative individuals (Getzels & Csikszentmihalyi, 1976) and that problem identification and construction ability is linked to creative performance above and beyond intelligence or divergent thinking (e.g., Reiter-Palmon, Mumford, O'Connor Boes, & Runco, 1997). In addition, past research suggests that active engagement in problem construction, typically induced through instruction or training, improves creative performance (Mumford, Reiter-Palmon, & Redmond, 1994; Reiter-Palmon et al., 1997). Problem construction and identification has been found to be critical for creative problem solving in a variety of settings and for a variety of occupations, such as artist, scientist, and manager. Finally, the term *opportunity recognition* has been used in entrepreneurship research to describe this process and is viewed as a critical aspect for successful entrepreneurs (Baron, 2006).

The review of the research indicates the importance of problem identification and construction for creative problem solving and innovation. However, how are problems identified and constructed? Mumford et al. (1994) suggest that problem identification and construction is based on problem representations developed from experience. Problem representations are

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cognitive structures that reflect the problem-solving effort (Holyoak, 1984). Specifically, problem representations include information about problem-solving goals, information and procedure used, and any restrictions and constraints placed on the solution. Several points are of particular importance. First, attention to environmental cues will influence which problem representation will be elicited. Attention is typically directed toward information that is goal relevant, fits with previous experiences, or is incongruent. Second, individuals tend to be cognitive misers and will try to construct problems in a way that is similar to previously encountered problems. Third, when encountering novel problems, multiple problem representations may be activated and incorporated into a new way of constructing the problem.

It is these characteristics that lead to tensions in the problem identification and construction process. One inherent tension in this process stems from attention to cues. Both highly consistent and highly inconsistent cues are likely to be attended to. Consistent cues are more likely to elicit a single problem representation, whereas inconsistent cues are more likely to elicit different, and possibly incongruent, problem representations that have to be integrated (Mumford et al., 1994). Problem identification and construction resulting from the use of multiple incongruent problem representations is more likely to be explorative, since the use of different problem representations requires a novel integration. Problem identification and construction resulting from the use of a single problem representation will likely produce routine solutions or, in the case of a creative solution, one that is more exploitative, as it will be similar to previous solutions or use more elements of previous solutions.

A related tension exists as a result of the nature of the elements of the problem representation that are attended to. First, the various goals elicited can be in conflict (or be perceived to be in conflict) with one another. For example, this can occur when there is pressure for both quality and quantity. In addition, other elements may conflict with the goals of the problem-solving effort. Specifically, restrictions may conflict with goals, therefore eliminating some of the possible solutions from consideration. In both cases, the result of these conflicting elements may be a reduced number of possible solutions. However, identifying quality elements, that is, those that are important for solving the problems, even when in conflict with one another, results in increased creativity (Butler, Scherer, & Reiter-Palmon, 2003).

Another tension results from the goals associated with the problem-solving effort. Although the specific goals will vary based on purpose and situation, an important individual difference variable likely to influence the goals identified is that of regulatory focus. According to Higgins (1998), regulatory focus can be of a promotion focus, which is related to advancement, growth, and an approach strategy, or of a prevention focus, which is related to safety, responsibility, avoiding errors, and avoidance strategies. It is expected that individuals with differing regulatory focus will view the same problem differently, with those with a promotion focus viewing the situation as a challenge, and those with a prevention focus viewing the same situation as a threat (Reiter-Palmon & Robinson, 2009). This may be particularly apparent in explorative efforts, in which the novelty and risk are greater. Furthermore, individuals with a promotion focus are more likely to attend to cues signaling achievement and goals, whereas individuals with a prevention focus are more likely to attend to cues signaling constraints and restrictions (Higgins, 1998).

In addition, although individuals are more likely to attend to cues that signal a desired goal and fit with past experiences as well as with their regulatory focus, regulatory focus can also be situationally induced. That is, cues in the environment can signal either a promotion or prevention focus. It is therefore important to understand not only the regulatory focus of the individual but also the environmental cues

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that might lead to a state regulatory focus. Additional tension may result from a mismatch between trait and state regulatory focus. Although no research exists on the effects of regulatory fit or regulatory mismatch on creativity and innovation, there is some indication that there are benefits to both. Specifically, past research suggests that regulatory fit contributes to ease of processing, increases task enjoyment, and increases confidence in the outcome (Cesario, Grant, & Higgins, 2004; Lee & Aaker, 2004). However, it was also found that individuals expend less effort when there is regulatory fit compared with mismatch (Vaughn, Malik, Schwartz, Petkova, & Trudeau, 2006). It is not clear how this sort of fit or mismatch will affect creative problem solving. It is possible that fit would lead to less effort resulting in less creativity, although it is also possible that fit would result in increased enjoyment, persistence, and feeling of confidence, all important for creativity and innovation. It is even less clear how fit or mismatch will affect problem identification and construction specifically.

The discussion up to this point has focused on the individual and the tensions within the individual as a result of the problem identification and construction process. However, one additional point should be made with regard to teams and larger units such as organizations. Just as this early process sets the stage for later processes of idea generation, idea evaluation, and implementation for the individual, it is likely that the same occurs in teams and larger units. However, in addition to the tensions occurring within an individual, at the team level additional complexity emerges as a result of the need to integrate multiple individuals' thoughts, problem constructions, and approaches.

It is clear that individuals identify and construct problems in very different ways based on past experiences, personalities, and situational cues (Reiter-Palmon & Robinson, 2009). It is less clear, however, how these different problem representations and constructions are then merged and combined in a team environment to create shared understanding. Reiter-Palmon, Herman, and Yammarino (2008) suggested that differences in the way problems are identified and constructed lead to differences in which solutions are viewed as appropriate. In teams, the same tensions that exist in the problem identification and construction process within the individual are also likely to exist, with the added complexity that different individuals have resolved these tensions in different ways.

These issues, in turn, can lead to conflict regarding the best solution, which is not easy to resolve as the sources of the differences are not well articulated (Cronin & Weingart, 2007). Conversely, it has been suggested that a focus on problem identification and construction in team problem solving not only can lead to improved creativity but also can be used to create shared understanding and trust (Basadur, Pringle, Spernazini, & Bacot, 2000). Specifically, in a case study involving union and management negotiation, Basadur et al. (2000) found that a focus on problem identification and construction resulted in increased trust, less conflict, and new and innovative solutions.

The commentary presented here highlighted the importance of the early process of creative problem solving and innovation, that of problem identification and construction. In addition, the commentary has attempted to highlight some tensions that are specific to this process but that can have an impact on later processes in the creativity and innovation cycle for both individuals and teams.

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