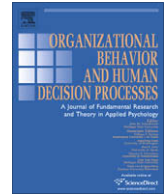




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First, get your feet wet: The effects of learning from direct and indirect experience on team creativity

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ABSTRACT

How does prior experience influence team creativity? We address this question by examining the effects of task experience acquired directly and task experience acquired vicariously from others on team creativity in a product-development task. Across three laboratory studies, we find that direct task experience leads to higher levels of team creativity and more divergent products than indirect task experience. Moreover, our results show that the difference in team creativity between direct and indirect task experience persists over time. Finally, our findings demonstrate that transactive memory systems fully mediate the effect of direct task experience on team creativity. Teams who acquired task experience directly are more creative because they develop better transactive memory systems than teams who acquired experience vicariously. We discuss how our findings contribute to understanding the effects of prior experience on team creativity, and the role of transactive memory systems in creative tasks.

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Introduction

As an increasingly important tool that organizations use to get work done, groups and teams dominate the makeup of many organizations (Devine, Clayton, Phillips, Dunford, & Melner, 1999; Kozlowski & Ilgen, 2006). Through their groups, organizations strive to maintain and enhance their effectiveness within rapidly changing environments. To successfully achieve this goal, organizational members need to develop ideas that are novel, useful, and appropriate (Amabile, 1996, 1997, 2000) while working within their teams – i.e., they need to be creative.

Prior research has highlighted the role of prior experience in enhancing team creativity. Some studies have demonstrated that prior experience leads to faster execution of creative ideas (Taylor & Greve, 2006) and allows individuals to recognize opportunities to be creative (Shane, 2000). Yet, other studies have suggested that prior experience narrows attention toward working solutions at the expense of new ones (Audia & Goncalo, 2007). In addition, no prior research has examined which team processes explain the relationship between different types of experience and team creativity, and whether any differential effects of types of experience persist over time.

This paper addresses this gap by investigating how and why different types of experience affect team creativity. We distinguish between *direct* and *indirect* experience, and examine their effects on creativity in product-development settings. Across industries, companies whose employees quickly develop novel, in-demand products are likely to achieve greater success than companies that introduce more “run-of-the-mill” products (Brown & Eisenhardt, 1995). Thus, for many organizations, product development is a potential source of competitive advantage (e.g., Brown & Eisenhardt, 1997; Clark & Fujimoto, 1991).

An examination of the relationship between prior experience and team creativity is important, as more teams in organizations attempt to learn indirectly from the experience of others through programs that promote the transfer of best practices and the like (e.g., see Jensen & Szulanski, 2007) instead of acquiring experience directly. Indirect experience is valuable because it provides teams with access to knowledge about which they do not have direct experience. Both direct and indirect experience have been shown to enhance performance outcomes such as quality and speed (e.g., Argote, Gruenfeld, & Naquin, 2001; Edmondson, 1999; Ellis et al., 2003; Wilson, Goodman, & Cronin, 2007). However, direct and indirect experience may have different effects on a team's ability to generate new knowledge and find new solutions to a problem. For example, a team that adopts a new technology developed by another team may not have the understanding and

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tacit knowledge about possible alternative solutions that were tested during the development process.

We suggest that team creativity varies based on the type of experience considered, and that the development of transactive memory systems (TMS) among team members explains these differential effects. Transactive memory has been defined as the cooperative division of labor for learning, remembering and communicating team knowledge (e.g., Hollingshead, 1998; Lewis, 2003; Wegner, 1986, 1995). A TMS system provides the team with a system for distributing and coordinating knowledge based on members' areas of expertise (Gibson, 2001; Hinsz, Tindale, & Vollrath, 1997). Teams with well-developed TMS have been shown to perform better than teams lacking them (e.g., Austin, 2003; Hollingshead, 2000; Lewis, 2003; Liang, Moreland, & Argote, 1995; Moreland, Argote, & Krishnan, 1996; Moreland & Myaskovsky, 2000). Although the benefits of TMS have been documented for task performance dimensions such as speed or accuracy, no prior work has tested whether those benefits extend to creativity. Drawing on prior research on TMS and group creativity, we argue that the type of prior experience team members acquire affects the development of TMS which, in turn, influences team creativity.

Different types of prior experience

Groups and organizational units learn directly from their own experience and indirectly from the experience of others (Darr, Argote, & Epple, 1995; Levitt & March, 1988). Our concept of *direct task experience* is similar to the concept of learning-by-doing found in the learning and product-development literatures (for a recent review of the learning literature see Argote & Todorova, 2007). Participants in the direct experience condition in our studies practice on a task similar and related to the one that they will be asked to perform as a team.

Our concept of *indirect* experience is similar to the concept of knowledge transfer (e.g., Argote & Ingram, 2000; Szulanski, 2000) and the concept of vicarious learning (Bandura, 1969, 1977). These terms refer to the process through which individuals or social units learn to perform activities by absorbing the experience of others. In our study, we define *indirect experience* as the process in which members gain experience at the task at hand by watching another team practice a similar and related task. We also consider the case of *no prior task experience* – situations in which team members lack experience relevant to the task at hand.

We examine the effects of these types of prior experience on two major dimensions of team creativity that are relevant to product development: the level of creativity and component divergence. The level of creativity categorizes products based on their novelty and originality, while component divergence categorizes products based on the extent to which they recombine elements and knowledge of existing products. These two creativity dimensions can be independent. A creative product can consist of new materials and technologies that the team has no experience working with (high on component divergence) or can result from combining known materials and technologies in an entirely new way (low on component divergence) (Gatignon, Tushman, Smith, & Anderson, 2002; Goncalo & Staw, 2006).

Background and hypotheses development

Prior experience and creativity level

Prior experience can stimulate creativity by improving the capacity of each individual member to create a product and/or by improving the capacity of the team to share and combine individ-

ual contributions to create a collective product. By gaining first-hand experience, teams can better understand the task requirements, learn from their mistakes and learn to better coordinate their activities. Direct experience with the task allows individuals to develop a transactive memory system. Further, transactive memory systems transfer from one task to a related one (Lewis, Lange, & Gillis, 2005). As noted by Kozlowski and Ilgen (2006, p. 85):

When each team member learns in a general sense what other team members know in detail, the team can draw on the detailed knowledge distributed across members of the collective. The development of transactive memory involves the communication and updating of information members have about the areas of the other members' unique knowledge. (...) In this way, team members use each other as external memory aids, thereby creating a compatible and distributed memory system.

Teams with well-developed transactive memories know who is good at which tasks and who knows what. This knowledge enables team members to exchange ideas smoothly and to envision new combinations of subtasks that members could perform, thereby increasing their creativity. In addition, prior knowledge and experience are important sources for the creation of novel solutions and original activities (Conti, Coon, & Amabile, 1996; Ruscio, Whitney, & Amabile, 1998). Thus, we expect teams with direct task experience to be more creative than teams with no prior task experience.

We also expect teams with direct task experience to be more creative than teams with indirect experience. Both direct experience and indirect experience allow teams to adopt successful approaches to task performance. Members are more likely to be able to identify good and bad practices when they tried the task themselves. Acquiring experience directly provides less noisy data compared to the case of indirect experience, where identifying good and bad practices underlying the performance of others is complicated by behavioral and social biases of inference (Denrell, 2003; Levitt & March, 1988). Further, teams learning through indirect experience do not have opportunities to learn who is good at what and how to coordinate their activities to develop a transactive memory system. Therefore, direct task experience will be more valuable to teams interested in creating original and useful products than indirect experience. Thus, we predict:

Hypothesis 1. The level of team creativity will be significantly higher in the direct task experience condition than in the indirect task experience condition or the no prior task experience condition.

Through indirect task experience, groups accumulate information by observing other groups working together on a similar task. Such information provides the basis for vicarious learning and creative thinking. Groups have been found to learn from the experience of other groups (Kane, Argote, & Levine, 2005). Team members use indirect experience to better evaluate the consequences of specific actions and approaches to the task. Observing members of another team leads to improvements in performance without team members having to actually perform the task (Bandura, 1969, 1977). Teams whose members engage in vicarious learning can avoid costly errors and search effort and choose creativity-enhancing sequences of action and interactions based on what they learn from the experience of others. Therefore, we predict that:

Hypothesis 2. The level of team creativity will be significantly higher in the indirect task experience condition than in the no prior task experience condition.

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