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INVESTOR IN PEOPLE

WHEN AND WHY PRIOR TASK EXPERIENCE FOSTERS TEAM CREATIVITY

Francesca Gino, Gergana Todorova, Ella Miron-Spektor and Linda Argote

ABSTRACT

This chapter presents a theoretical framework for the effects of prior task experience on team creativity. We distinguish among different types of experience within teams, namely direct and indirect prior task experience. We argue that different types of prior task experience differentially influence team creativity, and that the prior experience–creativity relationship is mediated by the development and use of transactive memory systems (TMS). We also argue that team characteristics such as identity and communication moderate the effect of prior task experience on TMS, and task characteristics such as uncertainty and interdependence moderate the effect of TMS on group creativity.

INTRODUCTION

To outperform their competitors in a rapidly changing environment, organizations must continuously gain new knowledge and create novel

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products, processes, and services (De Dreu & West, 2001; Bunderson & Sutcliffe, 2003). That is, organizations need to both *learn* and *be creative* in order to be successful in the marketplace. The concept of learning describes a change in an organization that occurs as a function of experience (Argote, 1999; Levitt & March, 1988), while creativity describes the development of an idea that is novel, useful, and appropriate (Amabile, 1997, 2000). Although many scholars have studied learning and creativity in the last three decades and have made significant contributions in these two research areas, the two literatures have remained relatively disconnected. As a result, little is known about the effect of learning from experience on creativity. Examining the relationship between learning and creativity is extremely important because the processes leading to learning may substantially differ from those leading to creativity (Audia & Goncalo, 2007; Benner & Tushman, 2003) but both are required for long-term organizational survival and success. This suggests that there are potential benefits in integrating research on learning from experience and creativity.

This chapter examines such possibility and investigates the effect of prior task experience on creativity at the team level.[1] We focus on teams because they have increasingly become a basic building block in organizations (Lawler, Mohrman, & Ledford, 1995). Indeed, many organizations rely on teams to carry out both operational and strategic tasks, such as designing and producing new products, delivering services to customers, or developing strategies to respond to changes in the environment. We distinguish among different types of prior task experience within teams. We define task experience within a team as what occurs to a team in the process of performing a certain task. For example, hospital surgical teams gain experience from each procedure they perform. Similarly, consulting teams gain experience from each consulting engagement, as do new product development teams with each product they design. Team experience is comprised of knowledge, as well as motivational and social components (Argote & Todorova, 2007).

Empirical findings on the effect of experience on creativity have been mixed. Several studies have shown that more experience translates into faster execution of creative ideas but also leads to a narrower focus on strategies or practices that have been successful in the past. Consequently, individuals with more experience generate a higher number of ideas as compared to less experienced individuals, but their ideas tend to be incremental (Audia & Goncalo, 2007). Research in the innovation literature suggests a similar pattern. When organizations exploit past knowledge instead of exploring new knowledge domains, they tend to generate incremental rather than

radical innovation (Benner & Tushman, 2003; Gupta, Smith, & Shalley, 2006). Other studies, however, suggest the opposite trend and find that prior experience is an essential component of high levels of creativity and radical innovation. Prior experience, indeed, can allow team members to better combine existing knowledge into new ideas. This tends to happen when team members gain experience while working together in the same knowledge domain where they are supposed to innovate (Taylor & Greve, 2006).

Apart from these mixed findings on the effects of prior task experience, there has been little examination of the *type* of experience that influences team creativity. In this chapter, we review theories and research on learning from experience and creativity to develop a theoretical framework for the effect of different types of prior task experience on team creativity. Specifically, we address two central questions: (1) what type of prior task experience is most beneficial for team creativity and (2) which characteristics of both teams and tasks moderate the effect of prior task experience on team creativity.

Our proposed framework helps reconcile the conflicting findings discussed above in two ways. One possible explanation for the mixed findings about the influence of prior experience on creativity might have to do with the type of experience. Teams may learn directly from their own experience, or indirectly from the experience of others (Levitt & March, 1988). While indirect experience is mainly based on explicit knowledge, direct experience also fosters the creation of tacit knowledge that is unique, less transferable, and can lead to new understandings and ideas (Argote, McEvily, & Reagans, 2003; Nonaka & Takeuchi, 1995; Polanyi, 1962). Thus, direct experience may stimulate the development of radically new ideas or products, while indirect experience can lead to more incremental improvements.

We suggest that the development and use of transactive memory systems (TMS) represent the central team processes necessary for group creativity to take place. The development and use of TMS enable team members to effectively share and combine their individual knowledge and ideas and, thus, to generate new ideas as a group. Thus, in our framework, TMS mediates the effect of prior task experience on team creativity.

A second potential explanation for conflicting results on the effects of experience on creativity is related to the boundary conditions under which teams benefit the most from different types of prior experience. We argue that both team and task characteristics can either complement or substitute prior task experience and thus either strengthen or weaken the positive effect of prior task experience on team creativity. Thus, our framework includes moderators for the relationship between prior task experience and the

development of TMS at the team level, and for the relationship between TMS and group creativity. Specifically, we suggest that team characteristics such as identity and communication moderate the effect of prior task experience on the development of TMS. As for the TMS-group creativity link, we propose that the relationship is moderated by task characteristics such as uncertainty and interdependence.

The dependent variable of interest in our proposed framework is creativity at the team level. Group creativity may result from the generation of a creative idea by a team member that is directly adopted by the other team members without further modifications. We focus on a different type of group creativity. We view group creativity as the result of collaboration and combination of team inputs (Paulus & Nijstad, 2003). We focus on this type of group creativity because it describes how teams, rather than individuals, generate new ideas and is thus more central to the study of group creativity.

GROUP CREATIVITY

Creativity involves the development of original ideas that are useful and influential (Amabile, 1983; Mayer, 1999). Creativity can be defined as a process as well as an outcome (Ancona & Caldwell, 1992; Dougherty & Hardy, 1996). As an outcome, creativity is defined in terms of various features (Amabile, 1996; Kurtzberg, 1998; Vosberg, 1998), such as fluency (i.e., the number of ideas generated in response to a problem, task, or situation), flexibility (the number of different categories the generated ideas belong to), originality (the novelty of each idea), and usefulness (the practicality of the generated ideas). As a process, creativity is the result of two main types of thinking, divergent and convergent thinking (Nemeth, 1986).

To date, most creativity research has focused on individual creativity, most notably Amabile's (1983, 1996) componential theory of individual creativity. According to her theory, three main components determine individual creativity: task motivation, domain-relevant skills, and creativity-relevant processes. Consistent with this theory, empirical evidence has robustly shown that individuals who possess higher levels of these components tend to be more creative than individuals who possess lower levels of such factors (Conti, Coon, & Amabile, 1996; Ruscio, Whitney, & Amabile, 1998).

In recent years, scholars have started to recognize the need to study creativity at the group level. Creativity is vital to the life and survival of modern organizations in both the public and private sectors, most of which increasingly rely on teams to carry out work. Groups now dominate the

makeup of many companies (Lawler et al., 1995). For instance, 50–90% of all U.S. organizations use groups to accomplish organizational activities and goals (Devine, Clayton, Philips, Dunford, & Melner, 1999; Lawler et al., 1995; Gordon, 1992), and more than half of all U.S. employees currently spend at least part of their day working in a group setting (Stewart, Manz, & Sims, 1999). However, despite the central role of groups in the modern organization and the increasing use of teams to foster creativity within firms (Mohrman, Cohen, & Mohrman, 1995; Tesluk, Farr, & Klein, 1997), we still know relatively little about the factors that enhance and inhibit *group* rather than individual creativity (Kasof, 1995; Paulus, Brown, & Ortega, 1999).

The majority of existing research on group creativity has investigated the suboptimality of group performance compared to individual performance on creativity tasks (Sternberg, 1995), showing that groups generate fewer ideas or solutions to problems than the same number of individuals working alone (McGrath, 1984). Studies of group creativity have focused on explaining such suboptimality by examining factors such as social loafing or evaluation apprehension (Karau & Williams, 1993), conformity (Larey & Paulus, 1999), and conditions under which interactions among group members negatively influence creativity (Paulus, Larey, & Dzindolet, 2000). Related research has investigated the influence of various properties of groups (such as diversity and climate) that may contribute to team creativity (see Paulus & Nijstad, 2003).

One potentially important factor that has not received much attention in the creativity literature is the experience team members gain while working together on a task, that is, prior task experience. Different types of *prior task experience* may lead to different levels of team creativity (Gino, Argote, Miron-Spektor, & Todorova, 2009) and it is thus important to distinguish among types of experience team members gain while working together. We focus our discussion on prior task experience, or the experience a team gains with a task.

TYPES OF PRIOR TASK EXPERIENCE

In our work, we distinguish between two types of prior experience relevant to the task a team is facing: direct and indirect (Gino et al., 2009). Both direct and indirect prior task experience have been studied in the past in the learning literature. For example, Levitt and March (1988) suggested that groups as well as organizational units learn in two main ways: directly from their own experience and indirectly from the experiences of others.

This proposition has received strong empirical support. In a study of learning in pizza stores belonging to a franchise, Darr, Argote, and Epple (1995) found that each store learned both from its own experience and from the experience of other stores in the franchise.

The learning literature has also studied a type of learning similar to our concept of direct prior experience, namely learning by doing. Team learning by doing refers to the ability of a team to improve productivity by regularly repeating the same action or behavior. Pisano (1996) examined the concept of learning by doing in product development and demonstrated that it improved productivity. In our own work, we define direct prior task experience as the process through which group members perform the task together as a team, thus gaining experience together in the task at hand or on a similar task (Gino et al., 2009).

The learning literature has also investigated the properties of indirect prior task experience. Within the learning literature, indirect prior task experience is often labeled "knowledge transfer" (e.g., Argote & Ingram, 2000) or "vicarious learning" (Bandura, 1977) because it represents the influence of knowledge acquired by learning from one team to another. For instance, a team might be interested in learning about the strategies, practices, and technologies of other teams or organizations (e.g., Sahal, 1982; Szulanski, 2000). Similarly, in our work, we define indirect prior task experience as the learning that occurs when a group observes another team practice on a similar or related task.

A FRAMEWORK FOR THE IMPACT OF PRIOR TASK EXPERIENCE ON TEAM CREATIVITY

Our proposed model is summarized in Fig. 1. As shown in the figure, we argue that prior task experience at the team level influences team creativity. We suggest that this relationship is explained in part by the development of TMS within the team. We propose that the prior task experience–TMS link is moderated by team characteristics such as communication and identity, while the TMS–creativity link is moderated by task characteristics such as uncertainty and interdependence. We also predict that the moderating effects of team characteristics on the relationship between prior experience and TMS will differ for different types of prior task experience within a team.

In discussing our proposed model, we first introduce the effects of different types of prior task experience on team creativity and describe the

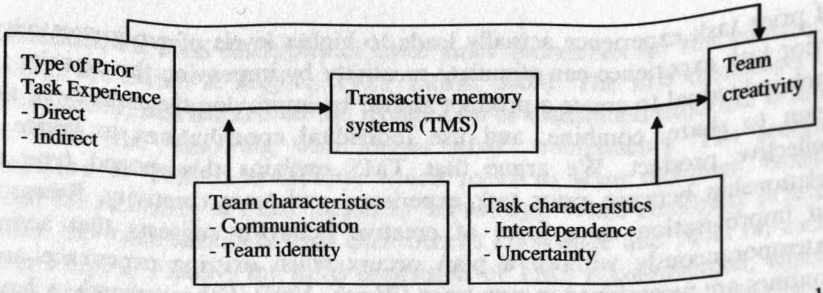

Fig. 1. Learning from Experience and Group Creativity: Theoretical Framework.

mediating role of TMS. Second, we discuss the moderating effects of team characteristics on the relationship between prior task experience and the development of TMS. Finally, we present the moderating factors of the relationship between the use of TMS and group creativity.

Prior Task Experience and Team Creativity

Teams typically have a high level of prior task experience when a new task or problem represents familiar territory for the team or when the task is recognized as a well-developed competency within the team. Task experience can be acquired in different ways: either directly, by working together with other team members on the task (direct prior task experience), or indirectly, by watching another team practice and work on it (indirect prior task experience).

Prior research has suggested that change becomes more difficult as experience or knowledge in a particular domain increases. Levitt and March (1988) refer to this effect as a competency trap, Leonard-Barton (1992) calls it "core rigidity," and Dickson (1992) calls it "routine rigidity." These scholars have suggested that prior task experience in the form of well-developed practices and capabilities can be detrimental to group innovation or group creativity because team members with prior task experience may be locked into old routines and thus be less likely to deviate from well-known practices. This detrimental effect might be even stronger when prior task experience was acquired directly rather than indirectly (by observing another group) because team members gained experience by working together on the task and learning about it.

Although this body of research suggests a negative effect of prior task experience on group creativity, an alternative possibility is that a higher level

of prior task experience actually leads to higher levels of group creativity. Prior task experience can stimulate creativity by improving the capacity of each individual to create a product and/or by improving the capacity of the team to share, combine, and use individual contributions to create a collective product. We argue that TMS explains this second type of relationship between prior task experience and team creativity. Research on improvisation as a form of creative behavior suggests that acting extemporaneously without a plan occurs when existing experience and routines are recombined in new ways (Weick, 1993). Other researchers have highlighted the importance of prior knowledge and experience as a source of original solutions and novel activities (Holland, 1975). Prior task experience may channel the ideation process into productive routes and prevent the generation of far-fetched ideas. It can also help in evaluating alternative ideas and selecting the best one to use or recommend (Goldenberg, Mazursky, & Solomon, 1999). Similarly, research by Amabile and her colleagues suggests that expertise is necessary for creativity. Because expertise is acquired through experience, Amabile's work suggests that prior task experience leads to higher levels of creativity compared to no prior task experience. Taken together, these findings suggest that prior task experience, especially when direct, enhances creativity within groups. We thus propose that:

Proposition 1a. Prior task experience leads to higher levels of group creativity.

Proposition 1b. Direct prior task experience leads to higher levels of group creativity as compared to indirect prior task experience.

The Mediating Role of Transactive Memory Systems

As we noted above, we suggest that the development and use of TMS explains part of the relationship between learning from experience and group creativity. The construct of TMS was initially proposed by Wegner (1987), who defined it as the cooperative division of labor for learning, remembering, and communicating team knowledge (e.g., Hollingshead, 1998a, 1998b; Lewis, 2003; Wegner, 1987). Due to this division of labor, a team has a system for distributing and retrieving knowledge based on members' specific areas of expertise (Hinsz, Tindale, & Vollrath, 1997). Thus, in addition to their own knowledge, teams with well-developed TMS have access to the knowledge of other team members.

Research on TMS distinguishes three main dimensions for this construct (Liang, Moreland, & Argote, 1995; Lewis, 2003). The first dimension is *specialization*, which refers to the recognition of distributed expertise within the team (the "knowing who knows what" component). The second dimension of TMS is *credibility*, which refers to team members' beliefs about the reliability of other members' knowledge. When credibility is high within the team, members trust each other's knowledge and build on each other's inputs. Finally, the third dimension of TMS is *coordination*, which refers to the ability of team members to combine their activities effectively. Coordination requires verbal and nonverbal exchange of information (Hollingshead, 1998b). When team members share the same language and mental models, they can better describe, explain, and predict the behavior of their teammates and effectively perform their task (Mathieu, Heffner, Goodwin, Salas & Cannon-Bowers, 2000).

We suggest that having the opportunity to directly experience a task will stimulate the development of TMS in teams because members within the team have the opportunity to gain expertise on the task as well as knowledge about who is good at which aspect of the task (McGrath & Argote, 2001). TMS development requires the effective sharing of expertise-related information within the team (Lewis, 2003). In teams with direct prior task experience, team members' ability and willingness to actively share their expertise with other team members will be enhanced. The deeper understanding of the task as well as the shared language and mental models developed while working on the task will foster the development of TMS.

Direct experience gives people deep experience with a task, thus allowing them to better understand the task. This knowledge enhances team members' ability to quickly specialize and contribute to new tasks in useful ways. Having deeper experience with the task helps team members divide cognitive labor and make better assignments to specialized knowledge roles. When working together on the same task, team members are likely to develop knowledge about the other team members as well as a shared language, or a task-related jargon, that allows them to communicate their expertise more effectively and conveys tacit knowledge that is unique to the team (Weber & Camerer, 2003). Shared language and knowledge about the task will allow members to recognize their expertise and confidently share information about it and about the task with others. Such knowledge and information sharing will also increase members' ability to clearly direct information to appropriate team members and enhance their teammates' ability to coordinate with one another. Thus, prior task experience will enable team members to develop TMS by promoting deep task understanding, shared

language, and knowledge of who knows what. Direct prior task experience, as compared to indirect prior task experience, will enable team members to benefit more from the development of a deeper understanding of the task, a better ability to specialize, and more developed shared language. Therefore, we propose:

Proposition 2a. Prior task experience positively influences TMS.

Proposition 2b. Direct prior task experience leads to stronger TMS than indirect prior task experience.

Prior research on groups has robustly demonstrated a link between TMS and team performance (e.g., Austin, 2003; Lewis, 2003; Liang et al., 1995). Building on this body of work, we argue that TMS represents the cognitive mechanism through which direct prior task experience influences group creativity (Gino et al., 2009). Developing TMS will help team members correctly identify where the expertise reside within the team. Suck knowledge, in turn, will help team members specialize and delegate tasks based on members' expertise.

Assignment based on specialization allows each member to attend to relevant information and encode it in memory, thus freeing up each members to concentrate on their assignments. This improvement in information processing might result in higher levels of creativity within the team, since members do not need to waste cognitive resources by encoding information relevant to subtasks to which other members are assigned. Knowledge of who knows and does what may also help create new products by enabling team members to combine members' expertise in new ways.

Credibility, the second component of TMS, is also likely to enhance team creativity. When members trust each other's knowledge, they can build on each other's inputs. Building on each other's input may lead to "collective creativity," or creative insights resulting from interactions among team members that are more than the sum of individual creative contributions (Hargadon & Bechky, 2006). Finally, coordination, the third component of TMS, is likely to ease interactions and understanding among team members and reduce possible conflicts that were found to hinder creativity (Lovelace, Shapiro, & Weingart, 2001). Therefore, we propose:

Proposition 3. The development and use of TMS positively influence team creativity.

As suggested earlier, through the development of TMS, team members share, coordinate, and efficiently encode information gathered through

direct prior task experience. This deep understanding of specific aspects of a task and team members' abilities is an important antecedent of team creativity, given the impact of each member's expertise on creative behavior (Amabile, 2000; Rietzschel, Nijstad, & Stroebe, 2007). This reasoning leads us to the following proposition:

Proposition 4. The development and use of TMS mediate the relationship between direct prior task experience and team creativity.

The Moderating Effects of Team Characteristics

Our theoretical framework (depicted in Fig. 1) draws on the input–process–output framework of work in groups (or I–P–O model, see Steiner, 1972; McGrath, 1984; Ilgen, Hollenbeck, Johnson, & Jundt, 2005). According to this classic framework, the nature of team performance is expressed in terms of a system in which inputs lead to processes that in turn lead to outcomes. We extend this framework by introducing moderators in the relationship between prior task experience (input) and group creativity (outcome). We focus on two main sets of moderators, namely task characteristics and team characteristics, because the features of the task a team is asked to perform and the features of the team itself are the main characteristics defining the team context.

There are obviously many characteristics of teams that might affect the relationship between prior task experience and TMS. Drawing on theories and prior research on learning, creativity, and TMS, we focus on communication and identity as the most relevant team characteristics for our framework. We predict differential effects of these team characteristics on the relationship between prior task experience and the development of TMS. We make different predictions about the moderating effect of communication on TMS: when teams learn from direct experience, communication can interfere with the development of TMS. Conversely, when teams learn from indirect experience, communication complements the development of TMS. Finally, we make different predictions about the effects of identity. In teams with direct prior task experience, identity is beneficial, while in teams with indirect prior task experience, identity might be detrimental for the development of TMS.

Communication

Communication allows for the sharing of information and ideas. Research in management and organization science shows that team members must have a

high level of interpersonal communication to succeed in interdependent and uncertain tasks (e.g., Pelz & Andrews, 1966; Thompson, 1967; Van de Ven, Delbecq, & Koenig, 1976). Communication may, however, interfere with the development of implicit coordination mechanisms and tacit knowledge during learning from direct experience, and thus may reduce the benefits of direct prior task experience. In a laboratory experiment, Hollingshead (1998b) examined the impact of communication during learning on collective recall. She showed that dating couples recalled more words than a couple of strangers when they did not communicate during the process of learning the words. She argued that communication detracted from the implicit interaction systems that couples had developed during their common experiences, disrupting the implicit procedures of their interactions and division of responsibilities. Strangers, on the other hand, recalled more words when they communicated during learning. They needed to exchange information in order to better understand who knows what and to divide responsibilities. Thus, communication affected the way knowledge was learned and encoded in TMS.

Similarly, in teams with direct prior task experience, communication might interfere in the process of developing TMS. As team members interact to perform a task, they develop shared task mental models that lead to the development of implicit coordination mechanisms (Wittenbaum, Vaughan, & Stasser, 1998). Shared task mental models increase implicit coordination and reduce the need for coordination through communication (Espinosa, Lerch, & Kraut, 2004; Rico, Sánchez-Manzanares, Gil, & Gibson, 2008). Moreover, communication can reduce the use of implicit coordination mechanisms and interfere with assigning roles to team members according to their expertise. Therefore, we suggest that communication can harm the development of TMS in teams with direct prior task experience.

In contrast, teams that learn from the experience of others need to communicate in order to adapt this experience to their context. The greater the difference between the context of the observing team and the context of the observed team, the greater the need is to adapt the new knowledge acquired by observing others (Argote, 1999). Bresman (forthcoming) found that learning from indirect experience does not improve performance in teams where the indirect experience is applied without further elaboration. Thus, communication allows for the development of stronger TMS in teams engaged in learning from indirect experience.

We propose that team members with direct prior task experience working together may be less able to develop TMS when they communicate. On the other hand, like strangers, team members with indirect prior task experience

working together may develop better TMS when they communicate. Thus, we propose:

Proposition 5a. The positive effect of direct prior task experience on TMS is attenuated as communication increases within teams.

Proposition 5b. The positive effect of indirect prior task experience on TMS is enhanced as communication increases within teams.

Team Identity

Social identity has been defined as the extent to which group members share a self-conception that specifies features of a self-inclusive social category that causes them to identify themselves with the group (Tajfel, 1978; Tajfel & Turner, 1986). Social identity is expected to have a critical impact on team creativity due to its influence on the integration of diverse perspectives. Normally, such integration is difficult to achieve in team or group settings because differences between people on a number of dimensions (e.g., gender or ethnicity) lead them to hold biases and stereotypes toward one another (Van Knippenberg & Ellemers, 2003). To a large extent, these biases and stereotypes arise from our deeply rooted functional identities (Ashforth & Mael, 1989; Tajfel, 1982). Unless these identities are replaced by a sense of team identity, it may be difficult for team members to discover critical, novel linkages among diverse perspectives. Social identity research suggests that the adverse effect of individual identities can be mitigated if team members overcome group biases and stereotypes against one another and develop a strong sense of team identity (Brewer & Miller, 1984; Sethi, 2000).

From a cognitive perspective, in a team with a strong identity, this process occurs as individual boundaries become subsumed by an inclusive, team-based boundary in the minds of members that reduces the adverse effect of functional identities and orientations (Brewer & Miller, 1984). A strong identity enhances the perception of similarities among members and leads to psychological acceptance of other group members and their work methods, thereby reducing the adverse effects of biases and stereotypes (Ashforth & Mael, 1989; Sherif & Sherif, 1969). In other words, team members can develop a feeling of psychological ownership of their project that enhances cooperative behaviors and motivation (Pierce, Rubenfeld & Morgan, 1991). Consistent with this view, Kane, Argote, and Levine (2005) found that team members are more likely to learn from members who share their social identity than from members who do not share their social identity.

By contrast, a weak team identity will be characterized by retention of individual identities, biases, and stereotypes that can lead members to overlook or reject the information and perspectives of other members (Maltz & Kohli, 1996). Consequently, team members will be unable to effectively integrate the information and perspectives that different members bring to the table (Jaworski & Kohli, 1993; Slater & Narver, 1995). As such, teams with a weak identity are less likely to discover complex and novel linkages among the different pockets of knowledge and expertise possessed by individual group members. Therefore, we propose:

Proposition 6a. The positive effect of direct prior task experience on TMS is enhanced as social identity increases within teams.

When teams learn from other teams, social identity can actually hinder the use of the experience of others. High social identity may lead to intergroup competition and in-group favoritism (Fein & Spencer, 1997; Tajfel, 1978). Team members who have a strong identity will be motivated to view their own experience as valuable and to reject the experience of other groups. Moreover, high social identity may increase the effect of the "not invented here" syndrome discussed in the knowledge transfer literature (Katz & Allen, 1982). The social identity may lead to the rejection of the knowledge of other teams and thus reduce knowledge transfer (Argote, 1999). In an experiment, Kane et al. (2005) showed that the teams did not take into consideration the knowledge of newcomers with a different social identity. Consistent with these findings and reasoning, we suggest that social identity moderates the effect of indirect prior task experience on the development and use of TMS within teams. Specifically, we propose:

Proposition 6b. The positive effect of indirect prior task experience on TMS is attenuated as social identity increases within teams.

The Moderating Role of Task Characteristics

The creativity process is influenced not only by features of the team, but also by the specific characteristics of the task the team is facing. Indeed, task characteristics are related to the knowledge members possess regarding what is required to perform well on a certain task and the degree to which they are able to combine the knowledge and information of each member (Gladstein, 1984). Prior theoretical work on task design has proposed that two characteristics are particularly relevant: task interdependence and task

uncertainty (Lindley, Brass, & Thomas, 1995; Saavendra, Earley, & Van Dyne, 1993). We thus focus on these two features as potential moderators of the relationship between TMS and group creativity.

Task Interdependence

A structural feature of the task, task interdependence, determines the nature of the instrumental relations that exist between team members. When a task is interdependent, team members must share or exchange information, materials, or expertise in order to achieve the desired output or performance (Cummings, 1978). As a task becomes more complex and members require each other's assistance and information to perform the job, task interdependence increases (Wageman, 1995). When tasks are interdependent, the need for a smooth interaction among team members increases due to a higher demand for communication, coordination, and cooperation within the group (Thibaut & Kelley, 1959; Salanick & Pfeffer, 1977; Saavendra et al., 1993). Thus, when task interdependence is high, teams benefit more from TMS than when interdependence is low. When task interdependence is low, the need for the effective cognitive division of labor, collaboration in combining inputs, and smooth coordination is reduced, as is the need to share knowledge about what is required for task completion (Wageman, 1995). The beneficial effects of TMS on creativity are thus likely to increase as task interdependence increases because team members have a deep knowledge and understanding of the specific requirements of the task. We thus propose that:

Proposition 7. The positive effect of TMS on team creativity is enhanced as task interdependence increases within teams.

Task Uncertainty

In their task-uncertainty framework, Gist and Mitchell (1992) define task uncertainty based on the level of knowledge concerning the link between performing task strategies or practices and obtaining the desired outcome. When task uncertainty is low, team members know that if they carry out certain strategies, they will achieve the desired outcome. When task uncertainty is high, team members do not possess this knowledge.

Applying these ideas to our framework, when group members are not confident that certain practices will improve team creativity, they will need to seek advice from other team members. Knowing which member knows what becomes especially beneficial when team members need advice from other members about how to approach an uncertain task. Teams with TMS that face such tasks may be more likely to use each member's expertise

successfully to generate creative solutions and ideas. But when task uncertainty is low, team members will be more confident about how to use their prior task experience to generate new ideas, and thus may not need as much interaction with other team members. When the task is not inherently uncertain, the likelihood of actually achieving high levels of group creativity on the task depends less on the use of TMS. In support of this prediction, using an empirically grounded simulation, Ren, Carley, and Argote (2006) showed that TMS was more beneficial to groups in volatile environments than to groups in stable environments. Therefore, we propose:

Proposition 8. The positive effects of TMS on team creativity are enhanced as task uncertainty increases within teams.

DISCUSSION AND DIRECTIONS FOR FUTURE RESEARCH

Teams are an increasingly significant work unit in modern organizations, and, as such, they are also integral to the development of innovative products and services. Nonetheless, most research on creativity thus far has focused on the individual level (Agrell & Gustafson, 1996; Kurzberg & Amabile, 2001). Investigating the effect of prior task experience on creativity at the individual level fails to fully capture the creativity phenomenon at the team level, in that creativity is not restricted to a burst of individual inventive thinking (Agrell & Gustafson, 1996; West & Wallace, 1991). In this chapter, we investigate the influence of prior task experience on creativity at the team level and contribute to both the team creativity and the team learning literatures.

We suggested that one important factor that influences group creativity is the level of experience on the task that a team acquired prior to working on the task. We distinguished between two different types of prior task experience, namely indirect and direct prior task experience. Our framework also includes TMS as a mediator in the relationship between prior task experience and group creativity. We argued that the development and use of TMS allows for the optimal use and combination of individual inputs in the group idea generation process. Thus, it represents the main mechanism through which learning from prior task experience affects team creativity. By focusing on the role of TMS in explaining the relationship between prior task experience and team creativity, our theoretical framework departs from

prior research which mainly focused on TMS and convergent outcomes and examines instead TMS and *divergent* outcomes such as creativity.

We also elaborated on task and team characteristics that moderate the relationship between prior experience and TMS and the relationship between TMS and creativity. As we argued, the relationship between prior task experience and TMS may be moderated by team communication and shared identity. We proposed that communication and identity have different effects on the relationship between prior task experience and creativity depending on the type of prior task experience considered. Thus, our proposed framework and propositions help reconcile existing findings on the effect of experience on creativity. Indeed, one possible explanation for the mixed findings on the effects of experience on creativity concerns the type of prior experience. As mentioned earlier, teams may learn directly from their own experience or indirectly from the experience of others (Argote & Todorova, 2007). Direct experience fosters the creation of tacit knowledge that is unique, less transferable, and that can lead to new understandings and ideas (Argote et al., 2003). Thus, direct experience may stimulate the development of radically new products, while indirect experience can lead to more incremental improvements. Our theoretical framework is consistent with this explanation. Offering another way to reconcile mixed evidence from prior research on experience and creativity, we theorize on the moderating effects of task interdependence and uncertainty on the relationship between TMS and team creativity.

The framework presented in this chapter offers several ideas and testable propositions for future research. Future research is warranted to examine the validity of our framework using both experimental and field methods. In addition, future research could explore how teams gain experience and individuals experience interacts with team experience. In our framework, we assumed that teams gain prior task experience together. But in contemporary organizations, teams are often formed on a project basis and must work on creative tasks without previous experience working together. In this case, team members come together to work on a task but have no experience relevant to its completion. This happens quite often in settings such as project management in both the software and film industries, where teams are assembled to deal with new tasks on a regular basis.

Another important direction for future research is the study of the ongoing relationship between prior task experience and team creativity. Over time, the effects depicted in Fig. 1 may change.[2] It could be that team members need to reach a certain level of familiarity and comfort with a task before they are able to look at it through a creativity and innovation lens. When a

team first approaches a task, members may concentrate their efforts on understanding the features of the task and the knowledge required to perform well on it. Once they have reached a certain level of familiarity and comfort, team members may be better equipped to generate new ideas and solutions that will increase group creativity. Prior task experience, especially when acquired directly, may help team members speed up through the initial phase of gaining familiarity and comfort with task execution. By contrast, lack of prior experience on the task will render the first phase particularly important for the team and is likely to slow down the creativity process. Yet it is also possible that, over time, the positive effect of prior task experience on team creativity will be attenuated. For instance, successful experience in performing a task was found to enhance the number of generated ideas but hinder their radicalness (Audia & Goncalo, 2007). However, after working together for long periods, teams, like individuals, may limit their search scope to proven solutions and familiar routes, ending up with incremental rather than radical innovation. Alternatively, team members lacking direct experience in a training phase may not catch up with those having direct experience. Research has shown that when presented with a task, team members focus their efforts on performing and do not invest in developing the task strategies that may improve their long-term performance (Hackman, Brousseau, & Weiss, 1976). According to logic, team members in the indirect experience condition would focus on performing and not develop the sort of specialized knowledge structures or TMS that would benefit their performance in the long run. Future research investigating how time affects the relationship between prior task experience and group creativity is needed. Such research may identify important insights on the boundary conditions of the influence of prior task experience on team creativity.

Our propositions may have important practical implications. Over the past decade, an increasing number of U.S. companies have transferred production and jobs abroad, with the goal of importing products and services back into the United States. This phenomenon, known as offshoring, has been driven primarily by firms' desire to reduce labor costs. Our propositions suggest that this practice may have hidden costs. The benefits of cost reduction may indeed be outweighed by a loss in the ability to innovate.

CONCLUSIONS

Our goal in this chapter was to propose a theoretical framework for the effects of different types of prior task experience on creativity at the group

level. With this framework, the chapter integrates literatures on learning from experience and creativity. It also extends current understanding of (1) the effects of types of prior task experience (direct vs. indirect experience) on team creativity and (2) the team and task characteristics that can change whether and how much teams facing creativity tasks will benefit from direct and indirect prior task experience. We believe that our theoretical framework addresses prior inconsistent findings concerning the effects of team experience on team creativity while also providing interesting ideas for future research. We hope that our framework stimulates empirical research on the important question of how and when experience affects creativity.

NOTES

1. Some research in the management literature uses the labels "teams" and "groups" interchangeably; other research differentiates between the two terms. The term "group" has a more general meaning than the term "team" and does not necessitate the presence of an organizational setting. In this chapter, we use the terms "team creativity" and "group creativity" interchangeably because this terminology does not affect our proposed model.
2. We thank Gregory Northcraft for suggesting this interesting avenue for future research.

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