THE EFFCT OF CONFORMISTS AND ATTENTIVE-TO-DETAIL MEMBERS ON TEAM INNOVATION: RECONCILING THE INNOVATION PARADOX

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THE EFFECT OF CONFORMIST AND ATTENTIVE-TO-DETAIL MEMBERS ON TEAM INNOVATION: RECONCILING THE INNOVATION PARADOX

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To resolve "the innovation paradox," we examined whether cognitive styles associated with idea implementation (i.e., conformity and attention to detail) have an influence on team radical innovation that goes above and beyond the contribution of creative members. We also examined mediating team processes. Using data on 41 teams in an R&D company, we found that including creative and conformist members on a team enhanced team radical innovation, whereas including attentive-to-detail members hindered it. Creative members enhanced task conflict and hindered team adherence to standards. In contrast, conformists reduced task conflict, and conformists and attentive-to-detail members enhanced team adherence to standards. Team potency mediated the effect of the cognitive styles on innovation.

Many organizations today face intense pressures to innovate to meet customer requirements and especially to produce radical innovations that will draw the market spotlight and market share to them. Innovation refers to the *generation* of new ideas and their *implementation* into new products, processes, and procedures that are designed to be useful (Amabile, 2000; West & Anderson, 1996). Innovation can vary from an incremental extension of current organizational capabilities to a radical one (Benner & Tushman, 2002). Radical innovation that deviates significantly from existing products, processes, or procedures involves higher degrees of risk and uncertainty and, potentially, extreme success (Taylor & Greve, 2006). Yet many radical innovations fail, mainly because innovators do not take into account practical matters of implementation and disregard market and organizational constraints (Goldenberg, Lehmann & Mazursky, 2001; Levitt, 2002).

To successfully innovate and deal with the complexity of new technologies and information, organizations increasingly rely on teams whose members have different knowledge, skills, and perspectives (Lovelace, Shapiro, & Weingart, 2001). The configuration of members' attributes in a team (i.e., the proportions of members with different attributes) may influence team radical innovation because it affects the knowledge, skills, and effort team members apply to their task (Bell, 2007; Kozlowski & Klein, 2000). To date, very little is known about the link between the configuration of members' personal attributes and team innovation. Most studies that have tested the effect of team configuration on team creativity or innovation have focused on overt demographic variables, such as education and functional background, age, and organizational tenure (e.g., Hulsheger, Anderson, & Salgado, 2009; Lovelace et al., 2001). Although demographic differences have been shown to influence team performance, underlying psychological characteristics such as personality attributes have been found to be better predictors of team performance over time (Bell, 2007; Harrison, Price, Gavin, & Florey, 2002). The few studies that have examined the effect of personal attributes on team innovation have emphasized those associated with idea generation (Taggar, 2001, 2002; West & Anderson, 1996) and put less emphasis on those required for idea implementation.

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The personal attributes associated with idea generation (e.g., creativity) have been shown to have no effect or even a negative effect on performance outcomes related to idea implementation (Keller & Holland, 1978; Miron, Erez, & Naveh, 2004). This finding is not surprising given the contradictory requirements inherent in the innovation process. Idea generation requires out-of-the-box thinking, exploration, risk taking, and tolerance of mistakes. Idea implementation, in contrast, happens within organizational constraints. It requires promoting an idea through accepted channels, prototyping, testing, and integrating the innovation into an organization (West, 2002). Thus, although teams dominated by creative members can produce many creative ideas (Taggar, 2001), whether they can successfully implement their ideas is questionable. This contradiction inherent in organizational innovation can be labeled "the innovation paradox."

Accordingly, we examined team composition with respect to the proportion of members with each of the three cognitive styles associated with idea generation and implementation. Specifically, we focused on the cognitive styles of *creativity*, *conformity to rule and group,* and *attention to detail* found to predict idea generation and implementation behaviors of individuals and teams (Miron et al., 2004; Shroder, 1989; Taggar, 2001). Prior research has demonstrated that heterogeneity in team members' cognitive styles is associated with higher levels of innovation and lower levels of satisfaction (Basadur & Head, 2001; Bilton, 2007). However, this research did not examine the contribution of the proportion of team members having each style to team innovation, the mediating team processes that explain the effect of team configuration on team innovation, and the team configuration associated with the highest level of radical innovation. To bridge this gap in the literature, we tested the effects of the three cognitive styles on radical innovation in R&D and manufacturing teams. We also tested for possible mediating team processes that explain the effects of the presence of members with different styles on team innovation and identified the team configuration associated with the highest levels of radical innovation.

COGNITIVE STYLES AND TEAM RADICAL INNOVATION

A cognitive style is an individual's stable and preferred cognitive strategy for acquiring, processing, maintaining, and using knowledge for problem solving (Chan, 1996; Shalley, Zhou, & Oldham, 2004). It reflects the form rather than the content of activity and explains differences in how people learn, relate to others, and innovate (Hayes & Allinson, 1994; Scott & Bruce, 1994; Shalley et al., 2004). Because we were interested in team members' problem-solving approaches, we examined cognitive styles rather than personality variables.

Team members with dissimilar cognitive styles differ in their focus on idea generation versus idea implementation (Kirton, 1989; Miron et al., 2004). Creative team members tend to identify problems, reframe them, and come up with many original solutions. Nonetheless, they are less attentive to these solutions' utility. They initiate changes and prefer to invent new solutions over improving and implementing working ones (Leifer, O'Connor, & Rice, 2001; Levitt, 2002). In contrast to creative members, conformists seek consensus and function best when complying with the rules and groups with which they work. They tend to generate ideas that are more likely to be accepted by their group and organization (Goncalo & Staw, 2006; Miron et al., 2004). Attentive-to-detail members are systematic, precise, reliable, and carefully attentive to the implementation of their ideas (Goldshmith, 1989). They have low tolerance of mistakes and can develop ideas into reliable processes and products (Kirton, 1989; Miron et al., 2004).

Although some scholars have aggregated these three cognitive styles into one continuum with two poles (e.g., Kirton, 1976), numerous others have confirmed a three-factor structure, suggesting that three different styles exist (e.g., Loo & Shiomi, 1997; Payne, 1987; Taylor, 1989a, 1989b). Drawing on Kirton's work (1979), in prior research (Miron et al., 2004) we showed that the three cognitive styles of creativity (which is similar to Kirton's "originality"), conformity to rule and group, and attention to detail (which is similar to Kirton's efficiency), are three distinct constructs that differ in their effect on individual innovation and quality performance outcomes: Creativity was positively associated with innovation but negatively associated with performance quality; conformity was negatively associated with innovation but positively associated with performance quality; and attention to detail was positively associated with performance quality but had no correlation with innovation. The three styles also correlated differently with personality variables such as intolerance of ambiguity, need for clarity, self-esteem (Keller & Holland, 1978), assertiveness, conscientiousness, emotional stability (Kirton & De Ciantis, 1986), and arousal-seeking tendency (Goldshmith, 1989). In principle, people can score high on measures of more than one style; however, such cases are rare, as people tend to have a strong preference for one style over the others (Payne, 1987; Taylor, 1989a, 1989b). The three styles are stable over time and are not affected by training programs (Bobic, Davis, & Cunningham, 1999; Chan, 1996; Goldshmith, 1989; Mudd, 1996).

Creative team members. The ability to innovate depends on *creativity*—the ability and tendency to generate novel and appropriate ideas (Cummings & Oldham, 1997). Highly creative individuals are assertive, independent in their judgment, risk taking, and self-confident (Barron & Harrington, 1981). These traits allow them to deviate from their groups and propose breakthrough ideas that may not be readily accepted (Goncalo & Staw, 2006; Nemeth, 1997). By focusing on generating ideas and revealing new problems and solutions, creative members provide their teams with diverse knowledge and a large pool of ideas from which to choose (Taggar, 2001, 2002). Having more creative members on a team increases the likelihood of identifying problems, triggering thinking in new directions, and generating a variety of new ideas (Tagger, 2001; Zhou, 2003) and, as a result, of making a radical innovation. Therefore,

Hypothesis 1. The proportion of creative members on a team has a positive relationship with radical innovation.

Conformist team members. Conformity to rules and group, reflecting a person's tendency to perform within given constraints when solving a problem (Kirton, 1976; Miron et al., 2004) and promoting group unity (Kaplan, Brooks-Shesler, King, & Zaccaro, 2009), is commonly perceived as detrimental to individual creativity (Goncalo & Staw, 2006). As members of teams, however, conformists may contribute to innovation. Conformists have an important role in preserving group norms and the structure essential for group functioning and productivity (Kirton, 1976). Moreover, their high group dependence helps maintain group cohesion and harmony (Kirton & De Ciantis, 1986). A supportive group environment increases team members' tendency to take risks and share ideas, resulting in higher team creativity and innovation (Edmondson, 1999; Shalley et al., 2004). Conformists also enhance team coordination and information exchange, because they try to synchronize their behaviors with those of their teammates (Kaplan et al., 2009). Team coordination and information exchange have been found to enhance team performance and innovation (Gino, Argote, Miron-Spektor, & Todorova, 2010).

Conformists are especially needed at the implementation stage. Because of their "bureaucratic savvy," conformists can help protect novel ideas from an organization's formal and informal "corporate immune systems" and contribute to the ideas' successful adoption (Allen, 1965; Glynn, 1996). Conformists' effects on idea generation are less clear, because research findings have been inconsistent. Recent studies have suggested that conformity is beneficial for innovation when team members conform to norms of open expression and outward dissent. Goncalo and Duguid (2011) found, for example, that a strongly individualistic norm that encourages expression of dissenting views enhances team creativity more than a weak individualistic norm. Further, Tierney, Farmer, and Graen (1999) showed that team members who scored low on creativity are more likely to conform to a creative norm, and Zhou (2003) found that, compared to members who scored high on creativity, they were influenced by the presence of creative coworkers and developmental feedback. Therefore, conformist members may strengthen team norms and provide the structure and supportive environment needed for innovation (Brown & Eisenhardt, 1998; Edmondson, 1999).

Nevertheless, conformists are usually not the catalyst of radical ideas. They are likely to initiate incremental improvements rather than radical changes (Shroder, 1989) and are less likely to go up against a group consensus (Kirton & De Ciantis, 1986). To enhance radical innovation, however, team members need to raise nonstandard ideas and push them, even at the risk of challenging other team members (Janssen, 2003). Additionally, high levels of conformity may restrict idea generation because they suppress deviations from acceptable norms and standards (Goncalo & Staw, 2006) and may lead to a premature consensus (De Dreu & West, 2001). Therefore, we suggest that the contribution of conformist members to innovation may be positive but limited. In other words, having more conformists on a team enhances radical innovation up to a point, yet beyond that point having additional conformist team members does not enhance radical innovation any further. Thus,

Hypothesis 2. The proportion of conformist team members has a positive relationship with radical innovation, but this association diminishes as the proportion rises.

Attentive-to-detail team members. Attentive-to-detail members are thorough, precise, and methodical (Kirton, 1989; Miron et al., 2004). They can contribute to team innovation by thoroughly examining all ideas, selecting promising ones, and assuring that they are developed into reliable products that meet customer requirements (Kirton, 1976). They are, however, intolerant of mistakes and are likely to reject radical ideas involving high uncertainty (Kirton, 1989). Intolerance of mistakes has been shown to hinder creative thinking. For example, using several creativity tasks, researchers found that the fear of making errors combined with a high need for structure hindered creativity (Livne-Tarandach, Erez, & Erev, 2004; Reitzschel, De Dreu, & Nijstad, 2007). Similarly, an inflexible team environment in which risk taking is not allowed and team members are punished for making mistakes impedes innovation and learning (Edmondson, 1999). Organizational units that emphasized attention to detail were less innovative than units that did not emphasize this value (Miron-Spektor, Erez, & Naveh, 2007). In a similar vein, having more attentive-to-detail members on a team may speed up the team's tendency to systematically analyze problems and reject breakthrough ideas that cannot be tested using existing knowledge and tools. This tendency may complicate work and hinder the team's ability to deal with ambiguous situations and initiate and respond to change (Katz-Navon, Naveh, & Stern, 2005), and, accordingly, it disrupts radical innovation.

Adding attentive-to-detail members to a team is expected to hinder team innovation, yet a significant drop in innovation is expected when these members gain enough power to influence their team's norm. If present in high proportions, attentive-to-detail members can form a coalition (Kanter, 1997; Stewart, Fulmer, & Barrick, 2005) and shift the team's focus toward meeting specifications at the expense of pursuing risky solutions. After they gain enough power to influence their team, however, the negative effect of attentive-to-detail members on innovation is expected to stabilize. Research on majority influence suggests that increasing the size of a majority beyond a certain proportion does not increase its influence. For example, the difference in innovation levels between teams with one and three attentive-to-detail members is expected to be larger than the difference in innovation levels between teams with eight and ten attentive-to-detail members (Nemeth & Goncalo, 2005). Accordingly, we suggest that having attentive-to-detail members on a team hinders radical innovation, but only up to a certain point. Beyond that point, having additional attentive-to-detail members does not hinder radical innovation any further. Therefore,

Hypothesis 3. The proportion of attentive-to-detail members has a negative relationship with radical innovation, but this association diminishes as the proportion rises.

Mediating Team Processes

Drawing on a recent meta-analysis of team innovation predictors (Hulsheger et al., 2009) and on major reviews of group performance and the innovation literature (Campion, Medsker, & Higgs, 1993; Kaplan et al., 2009; West, 2002; West & Anderson, 1996), we focused on three mediating team processes that have been found to affect team innovation and are likely to be affected by the inclusion of members with different styles. Specifically, we focused on the processes of task conflict (De Dreu & Weingart, 2003; Hulshelger et al., 2009; Kaplan et al., 2009), team potency (Campion et al., 1993; Gully, Incalcaterra, Joshi, & Beaubien, 2002; Kaplan et al., 2009), and team adherence to standards (Gilson, Mathieu, Shalley, & Ruddy, 2005).

Task conflict. Task conflict results from tensions between team members, revolving around allocation of resources, procedures, and task interpretation (De Dreu & Weingart, 2003; Jehn, 1995). Most teams are likely to experience conflicts as a result of differences in viewpoints, ideas, and opinions during the innovation process (Kaplan et al., 2009). Creative members are likely to provoke task conflicts as they are independent thinkers, even when team members, and will defend their positions against the group's opinion, if need be (Cummings & Oldham, 1997). Indeed, Janssen (2003) showed that creative employees are likely to experience conflicts with coworkers. Conformists, in contrast, rarely disagree with a group, and they often change their actions and way of thinking in response to perceived group pressure (Kaplan et al., 2009). Therefore, they enhance solidarity and efficiency in reaching a common goal (Kirton, 1976) and are likely to deter task conflict. The effect of attentive-to-detail members on task conflict is less clear. On the one hand, being "steady plodders" who painstakingly go through the little details of a task and adhere to specifications (Kirton, 1976), attentive-to-detail members may hold their teams back from making any change and cause frustration. Their resistance to premature ideas and their fear of making mistakes hamper psychological safety (Edmondson, 1999) and engender conflict. On the other hand, their tendency to work according to instructions may prevent misinterpretation of task issues, contribute to coordination, and reduce task conflict (Kirton, 1989). Thus, although creative members enhance task conflict and conformists hinder task conflict, attentive-to-detail members can have both positive and negative effects on task conflicts, which may counteract each other. Thus, we do not offer a prediction for the proportion of attentive-to-detail members.

Task conflict increases team members' tendency to scrutinize task issues and to process task-relevant information. It improves the quality of decisions and fosters learning and development of new insights that enhance team innovation (De Dreu & Weingart, 2003; Nemeth & Goncalo, 2005). Task conflict allows team members to voice their opinions and come up with new ideas and approaches (Jehn, 1995), which in turn enhance creativity (George & Zhou, 2001). Whereas De Dreu and Weingart (2003) showed that the general effect of task conflict on team performance was negative, others have claimed that task conflict may be beneficial for team performance in nonroutine tasks that have high degrees of uncertainty and require new solutions and procedures (e.g., Jehn, 1995). Indeed, several studies have documented the positive association between task conflict and team innovation (e.g., Pelled, Eisenhardt, & Xin, 1999). Therefore, we suggest that task conflict is positively related to radical team innovation and mediates the effect of cognitive styles on such innovation.

Hypothesis 4a. The proportion of creative members on a team has a positive relationship with task conflict, and the proportion of conformist members has a negative relationship with task conflict; having more creative members and fewer conformists enhances task conflict.

Hypothesis 4b. Task conflict has a positive relationship with radical innovation.

Hypothesis 4c. Task conflict mediates the relationships between the proportions of creative and conformist team members and team radical innovation.

Team potency. Team potency refers to team members' generalized belief about the capabilities of their team for addressing tasks and contexts in general (Ford, 1996; Gully et al., 2002) and reflects team spirit (Campion et al., 1993). Potency is related to "team efficacy" (Bandura, 1997), as both constructs address beliefs about team capability. However, potency refers to a broader sense of the team's abilities, and efficacy relates to a team's belief that it can successfully perform a specific task (Gully et al., 2002). Potency and efficacy may exhibit different relationships with team innovation. For example, members of an R&D team may believe that they can generate novel and useful ideas and thus have high team creative efficacy (Shin & Zhou, 2007; Tierney & Farmer, 2002), but they might not believe that they can also effectively develop the ideas and implement them while adhering to organizational and customer constraints, and thus they have low team potency (Gully et al., 2002).

Team potency develops as team members gain experience working together and realize the potential contribution of each individual member to team performance (Baer, Oldham, Jacobsohn, & Hollingshead, 2008; Tasa, Taggar, & Seijts, 2007). Furthermore, potency has to do with the team members' beliefs and expectations that they can work together to achieve their common performance goals (Shin & Zhou, 2007), and it largely depends on team members' willingness to conform to their group (Kaplan et al., 2009). Hence, conformist members are expected to enhance team potency. To maintain their self-worth and the positive opinions of their group, conformists are likely to align their behaviors with those of their teammates, increasing team cohesion and cooperation (De Dreu & West, 2001; Kaplan et al., 2009). Increased team cohesion enhances team members' beliefs in their ability to work together toward a common goal (Gibson & Earley, 2007; Lee, Tinsley, & Bobko, 2002). Attentive-to-detail members, in contrast, are not willing to forego perfection and are afraid of making mistakes. They are the ones that pay attention to the warnings and possible incompatibilities with standards and procedures and, therefore, may impede their team's confidence in its ability to successfully complete its task (Naveh, 2007). Thus, we predict that the proportion of attentive-to-detail members relates negatively to team potency.

The effect of creative members on potency can work both ways. Creative members can improve a team's confidence in its ability to solve problems and thus may enhance team potency (Tasa et al., 2007). However, as independent thinkers, creative members are also likely to increase disagreements and disrupt team cohesion and team potency (Cummings & Oldham, 1997; Janssen, 2003). Creative members have been described as "corporate malcontents" who constantly complain that their team is reluctant to adopt new ideas and introduce change (Levitt, 2002: 141). Moreover, they often find it difficult to work within existing paradigms and organizational constraints and tend to pass onto others the responsibility for implementing their ideas (Levitt, 2002). Therefore, we predict that although conformist members enhance team potency, attentive-to-detail members hinder it, and creative members have both positive and negative effects on potency that counterbalance each other.

A group's belief in its capability has been found to be a powerful predictor of team performance. For example, Campion et al. (1993) found potency to be the strongest predictor of team effectiveness out of 19 work group characteristics. In a meta-analysis, Gully et al. (2002) estimated the relationship (ρ) between a group's belief in its capability and performance as .41. Given these findings, team potency is expected to enhance innovation because it increases members' confidence in their team's ability to meet new challenges and tolerate ambiguous and uncertain situations (Campion et al., 1993; Gully et al., 2002). Teams with higher potency levels invest more effort and resources when performing a task and are better able to persist in the face of obstacles and difficulties than those with low potency levels (Bandura, 1997). However, teams with high potency tend to progress quickly towards closure and be easily satisfied with mediocre ideas. In a series of studies, Whyte and colleagues showed that a strong belief in one's capability reduces the tendency to identify possibilities of failure (Tasa & Whyte, 2005; Whyte & Saks, 2007; Whyte, Saks, & Hook, 1997). In a similar vein, Audia and Goncalo (2007) found that success increases the tendency to generate incremental ideas rather than radical ideas and to exploit familiar knowledge at the expense of exploring new arenas. Therefore, we expect the positive effect of potency on innovation to weaken as the level of potency increases. In addition, we expect potency to mediate the nonlinear effects of the proportions of conformist and attentive-to-detail members on team radical innovation. We conjectured that:

Hypothesis 5a. The proportion of conformist team members has a positive relationship with team potency, and the proportion of attentive-to-detail members has a negative relationship with team potency; more conformist and fewer attentive-to-detail members on a team enhances team potency.

Hypothesis 5b. Team potency has a positive relationship with radical innovation, but this association diminishes as potency increases.

Hypothesis 5c. Team potency mediates the relationships between the proportions of conformist and attentive-to-detail team members and radical innovation.

Adherence to standards. Adherence to standards refers to the extent to which team members work according to specifications and standards and monitor their work, detect mistakes, and improve quality (Gilson et al., 2005). The extent to which a team adheres to standards may depend on its configuration (Kirton, 1989). Creative employees are commonly described as those who seek to bend and break the rules (Cummings & Oldham, 1997; Levitt, 2002). For example, teams of creative members in a team-building seminar generated imaginative solutions to a given problem that did not conform to the guidelines (McHale & Flegg, 1986). Having more attentive-to-detail members on a team is likely to increase the attention paid to specifications. A larger number of members who conform to organizational rules and norms may increase the extent to which their team conforms to standards. Thus, although creative members are likely to hinder adherence to standards, conformist and attentive-to-detail members are likely to enhance it.

Research has demonstrated that adherence to standards helps in managing complexity, minimizes ambiguity, avoids costly mistakes, and ensures that work strategies are followed (Gilson et al., 2005). However, it has less positive effects on radical innovation. Standardized organizational routines hinder radical innovation because they minimize variance and flexibility and thwart change inherent in radical innovation (Benner & Tushman, 2002). Accordingly, we suggest that adherence to standards explains the effect of creative, conformist, and attentive-to-detail members on radical innovation. Specifically,

Hypothesis 6a. The proportion of creative members on a team has a negative relationship with team adherence to standards, and the proportions of conformist and attentive-to-detail members have a positive relationship with team adherence to standards; having fewer creative members and more conformist and attentive-to-detail members on the team enhances team adherence to standards.

Hypothesis 6b. Team adherence to standards has a negative relationship with radical innovation.

Hypothesis 6c. Team adherence to standards mediates the relationships between the proportions of creative, attentive-to-detail, and conformist members and radical innovation.

Together, the mediation effects of task conflict, team potency, and adherence to standards suggest that creative members have a positive effect on innovation through their positive effect on task conflict and negative effect on adherence to standards. Although more conformist members increases adherence to standards and reduces beneficial task conflict, it also leads to higher team potency. We expect the latter effect to be strongest, so that the overall effect of more conformist members is positive. Finally, attentive-to-detail members hinder innovation because they decrease team potency and enhance adherence to standards.

Overall Configuration of the Three Styles

We are also interested in exploring how the overall configuration of teams with respect to the three cognitive styles relates to radical innovation. Although we do not offer a formal hypothesis, in view of the logic that we have presented, we expect that innovation is likely to be highest for teams with a high proportion of creative members, a moderate to high proportion of conformist members, and a low proportion of attentive-to-detail members. In other words, we suggest that innovation reflects not just the presence of a high number of creative team members, but an optimal configuration of the three styles considered together.

METHODS

Sample

Data were collected in a large company operating in the Israeli defense industry that develops and manufactures advanced technologies in the fields of microelectronics, communications, acoustics, and electromagnetism. It focuses on state-of-the-art solutions to meet the most challenging markets and client demands by combining interdisciplinary knowledge and technologies into sophisticated and complex systems. The organization has been a major pioneer in its field, advancing new ideas and technologies for more than 30 years with remarkable success. Since this organization operates in the defense industry, the products it develops and manufactures have to meet rigorous quality standards and specifications.

We collected data on 20 R&D teams (331 participants) and 21 manufacturing teams (137 participants). Both the R&D and manufacturing teams engage in long-term projects, consisting of various tasks and processes. The R&D teams vary in their core areas of engineering expertise, which include computer engineering, physics, and mechanical engineering. The manufacturing teams operate mostly in small workshops dealing with small-scale production lines, each of which requires new manufacturing solutions.

Table 1 provides the characteristics of the R&D and manufacturing teams that participated in this study.

Measures

Cognitive style. We measured the three cognitive styles using 12 items (Kirton, 1976; Taylor, 1989a) from our earlier research (Miron et al., 2004), adapted to our current research context. *Creativity*, *conformity to rules and group*, and *attention to detail* were assessed on a scale ranging from 1, "strongly disagree," to 7, "strongly agree." Participants indicated how easy or difficult it would be for them to behave consistently over a long period of time in ways described by 12 statements. Example statements for creativity are "I have a lot of creative ideas" and "I prefer tasks that enable me to think creatively"; examples for conformity are "I try not to oppose team members" and "I adapt myself to the system"; and for attention to detail: "I am thorough when solving problems" and "I address small details needed to perform the task." We

TABLE 1
Sample Characteristics

Variable	R&D	Manufacturing
Sample size	20 teams (331 participants)	21 teams (137 participants)
Team size	Mean = 16, s.d. = 6	Mean = 7, s.d. = 5
Gender	79% men	84% men
Age	Mean = 39, s.d. = 11	Mean = 42, s.d. = 10
Organizational tenure	Mean = 11, s.d. = 10	Mean = 15, s.d. = 10
Team tenure	Mean = 7, s.d. = 8	Mean = 6, s.d. = 6
Education	3% high school graduates, 22% technicians, 46% B.A./B.Sc. degrees, 20% M.A./M.Sc. degrees, 9% Ph.D. degrees	28% high school graduates, 55% technicians, 11% B.A./B.Sc. degrees, 5% M.A./M.Sc. degrees, 1% Ph.D. degrees
Response rate[a]	85%	81%
Average proportion of creative members	21%	17%
Average proportion of conformist members	14%	33%
Average proportion of attentive-to-detail members	15%	31%

[a] The response rate does not include interns and newcomers who joined a team shortly before the data were collected. These members had no opportunity to affect team innovation and thus were not included in our sample. To assure that the response rate did not distort our results, we repeated the analyses, dropping the teams with response rates lower than 85 percent, and found similar results.

averaged each set of four items to form scales measuring creativity (α = .88), conformity to rules and group (α = .74), and attention to detail (α = .84).

To compute the proportion of members who scored high on each of the three cognitive styles (Baer et al., 2008; Barry & Stewart, 1997; Taggar, 2001; West & Anderson, 1996), we first standardized each cognitive style across the entire sample and all teams. To maintain research consistency, we used the top 20 percent as the cutoff point, a level similar to that employed in prior team innovation research to identify members who scored high on each cognitive style. People who exceeded the 20 percent distribution cutoff point were considered high scorers on a specific style. We then computed the proportion of team members who scored high on each cognitive style, in each team (Baer et al., 2008; Barry & Stewart, 1997; Taggar, 2001; West & Anderson, 1996). To avoid same-source bias, we excluded the team managers, who evaluated the team's innovative performance, from the above analyses.

We conducted a sensitivity test by repeating our analyses using the top 30 percent as our cutoff (cf. Baer et al., 2008; Barry & Stewart, 1997; Taggar, 2001). We found that the pattern of effects remained quite similar using the different points, with the most significant results occurring at 20 percent.

Radical innovation. To measure radical innovation, we adopted an index already used in the studied organization, the Bonen scale (Darel, Bonen, & Myersdorf, 1993), which is similar to other radical innovation scales (Dewar & Dutton, 1986; Gatignon, Tushman, Smith, & Anderson, 2002; Subramaniam & Youndt, 2005). R&D team managers were asked to divide 100 points among different levels of innovation, allocating the greater numbers of points to the levels that better described their team's activity. The levels were (1) duplicating existing technology, (2) modifying existing technology, (3) pioneering new products using technologies that were used for other products in other organizations but were totally new in this organization, and (4) developing breakthrough technologies based on fundamentally new concepts or principles.

We modified the R&D innovation measure to fit the manufacturing context by focusing on radically innovative processes, the most prevalent type of radical innovation in manufacturing (Damanpour, 1991). The four levels of the scale were (1) duplicating existing processes, (2) improving and incrementally modifying the existing process while using technology and knowledge already existing in the organization, (3) introducing methods and instruments that were not used for the products manufactured in this organization, but were being used elsewhere for other purposes, and (4) developing something completely new—a breakthrough in the methods and tools used for production process management.

Point assignment scales in which evaluators are asked to allocate 100 points to different values or organizational characteristics according to their relative dominance effectively hinder social desirability bias (Arnold & Feldman, 1981; Ravlin & Meglino, 1987). In addition, studies that collected both supervisor evaluations and objective measures such as number of new products and number of patents have shown that these two types of measures are significantly correlated (e.g., Scott & Bruce, 1994; Zhou, 2003).

Radical innovation was calculated in two ways. The first measure consisted of the sum of points allocated to levels 3 and 4, representing radical innovation that diverged from the organization's existing technical trajectory (Dewar & Dutton, 1986; Gatignon et al., 2002). The second measure consisted of weighted scores for each level, ranging from 1 for the lowest level to 4 for the highest level of innovation. The total innovation score consisted of the sum of all four scores on all four levels weighted by their relative weights (Bobko, Roth, & Buster, 2007; Robinson & Morley, 2007).

Mediators. We measured all mediators using a response scale ranging from 1, "strongly disagree," to 7, "strongly agree." We measured *potency* using three items developed by Campion et al. (1993). An example item is "Members of my team have great confidence that the team can perform effectively" (α = .79). We used three items developed by Jehn (1995) to measure *task conflict.* An example item is "People on my team disagree about the work being done" (α = .81). We developed five items that were based on Gilson et al. (2005) and used these to measure *team adherence to standards.* An example item is "My team adheres to specifications and standards" (α = .86). Potency, task conflict, and adherence to standards scales exhibited sufficient interrater agreement (median r_{wg} = .94, .88, .95, respectively) (James, 1982). Intraclass correlations were also adequate (ICC1 = .10, .11, .20 and ICC2 = .57, .59, .75, respectively [Bliese, 2000]), justifying aggregation of the responses to the team level.

Control variables. We controlled for *team size* (number of team members) and for *organizational function* ("R&D" = 0, "manufacturing" = 1).

Procedures

The study involved two data collection phases. First, to learn about the meaning and importance of team innovation and the factors influencing it, we conducted a series of structured interviews. We interviewed 20 R&D employees and managers and 8 employees and managers from the manufacturing plant. In addition, we interviewed the company's CEO and the senior human resource manager. Each interview lasted between 30 minutes to an hour. The interviews, conducted on site at the organization, included guided visits to the different organizational units and explanations about the innovative products and processes developed and implemented by the different teams. These visits and interviews allowed us to gain a deeper understanding of how the organization's employees and managers perceived innovation. Following the interviews, we designed and administered the research survey.

The R&D team members filled out the questionnaire during their weekly team meetings. The manufacturing team members filled out the questionnaire at special meetings when two to four teams convened. The team managers evaluated their teams in a separate meeting.

RESULTS

Examples of beliefs held by managers and employees in the organization concerning the characteristics of creative employees, the source of innovation and the importance of teamwork for idea generation and implementation appear in Appendix A. The interviews supported our theory that highly creative members are perceived as essential for team innovation. However, they were also perceived as individuals who tend to focus on idea generation and invest less effort in implementing their ideas. Therefore, according to the interviewees, they should be teamed with employees who can complement them and promote the implantation of ideas in the organization.

Construct Validation

Confirmatory factor analysis at the individual level served to validate the three-factor structure of creativity, attention to detail, and conformity, yielding an acceptable fit level ($\chi^2 = 235.5$, $df = 51$, goodness-of-fit index [GFI] = .93, comparative fit index [CFI] = .93, root-mean-square error of approximation [RMSEA] = .07). The three-factor model yielded a significantly better fit than a two-factor model in which conformity and attention to detail were collapsed into one factor (two-factor model: $\chi^2 = 508.72$, $df = 53$, GFI = .84, CFI = .83, RMSEA = .12; $\Delta\chi^2 = 273.22$, $df = 1$, $p < .001$), and a better fit than a model in which the three cognitive styles were collapsed into one factor (one-factor model: $\chi^2 = 1{,}547.77$, $df = 54$, GFI = .61, CFI = .45, RMSEA = .25; $\Delta\chi^2 = 1{,}312.27$, $df = 2$, $p < .001$). Item loadings were significant ($p < .01$).

At the individual level, we found positive correlations between creativity and attention to detail ($r = .23$, $p < .001$) and between conformity and attention to detail ($r = .47$, $p < .001$). The results did not show a significant correlation between creativity and conformity ($r = .06$, n.s.). These findings suggest that creativity, conformity, and attention to detail are three distinct constructs.

In addition, only 3.1 percent of the participants scored high on all three styles, and less than 7.4 percent excelled in two of the three styles.

Descriptive Statistics

Table 2 summarizes the means, standard deviations, and correlations among the research variables at the team level.

The two radical innovation measures were highly correlated ($r = .97$) and yielded similar results. We report the analysis using the innovation measure composed of the sum of points allocated to levels 3 and 4 of the innovation index.

Hypothesis Testing

To test Hypotheses 1–6, we implemented hierarchical regression analysis. We used a bootstrapping approach, because regression analysis imposes distributional assumptions that often cannot be satisfied in small samples. Drawing on 1,000 random samples (Efron & Tibshirani, 1993), we estimated the effects of our research variables on team innovation.

We found no significant relationship between team size ($b = -0.58$, s.e. = .51, n.s.), organizational function (R&D vs. manufacturing; $b = -11.45$, s.e. = 7.35, n.s.), and radical innovation ($F[2, 38] = 1.19$, n.s.). We tested all our models once with these control variables and once without them and found that in none of the cases did organizational function and team size have a significant effect on innovation or significantly increase the model's explained variance. Therefore, to enhance model parsimony we excluded them from our models (Table 3; Bacharach, Bamberger, & Vashdi, 2005).

Table 3 includes the linear effects of the three cognitive styles and the nonlinear effects of the proportion of conformist and attentive-to-detail members. In support of Hypothesis 1, the proportion of creative members had a positive relationship with radical innovation when attention to detail and conformity were included in the regression

TABLE 2
Means, Standard Deviations, and Correlations[a]

Variable	Mean	s.d.	1	2	3	4	5	6	7	8
Control variable										
1. Organizational function	1.51	0.50								
2. Team size	11.74	7.32	−.64**							
Team configuration										
3. Proportion–Creativity	18.96	12.90	−.15	.07						
4. Proportion–Conformity	28.30	24.77	.56**	−.35*	−.23					
5. Proportion–Attention-to-detail	24.31	19.87	.51**	−.22	.32*	.61**				
Team characteristics										
6. Potency	5.60	0.52	.40**	−.36**	−.09	.45**	.39*			
7. Task conflict	4.03	0.55	−.07	.02	.30*	−.33*	−.19	−.19		
8. Adherence to standards	5.16	0.81	.65**	−.20	−.27†	.65**	.48**	.33*	−.26	
9. *Team innovation level*	43.61	18.53	−.16	−.03	.16	−.17	−.26†	−.02	.15	−.30*

[a] $n = 41$.
† $p < .10$
* $p < .05$
** $p < .01$

equation. As predicted in Hypothesis 2, the proportion of conformists had a positive nonlinear effect on radical innovation. This relationship is depicted in Figure 1. We further analyzed this effect by evaluating simple slopes (Aiken & West, 1991). We estimated slopes at three proportions of conformists: the mean proportion and one standard deviation below and above it. Results showed that the slope was positive and significant for one standard deviation below the mean proportion ($b = 0.83$, $t_{37} = 2.67$, $p < .05$), only marginally significant for the mean ($b = 0.34$, $t_{37} = 1.83$, $p < .1$) and not significant for one standard deviation above the mean ($b = -0.15$, $t_{37} < 1$, n.s.). The positive relationship between the proportion of conformists and radical innovation was attenuated at higher proportions of conformists, thus supporting Hypothesis 2.

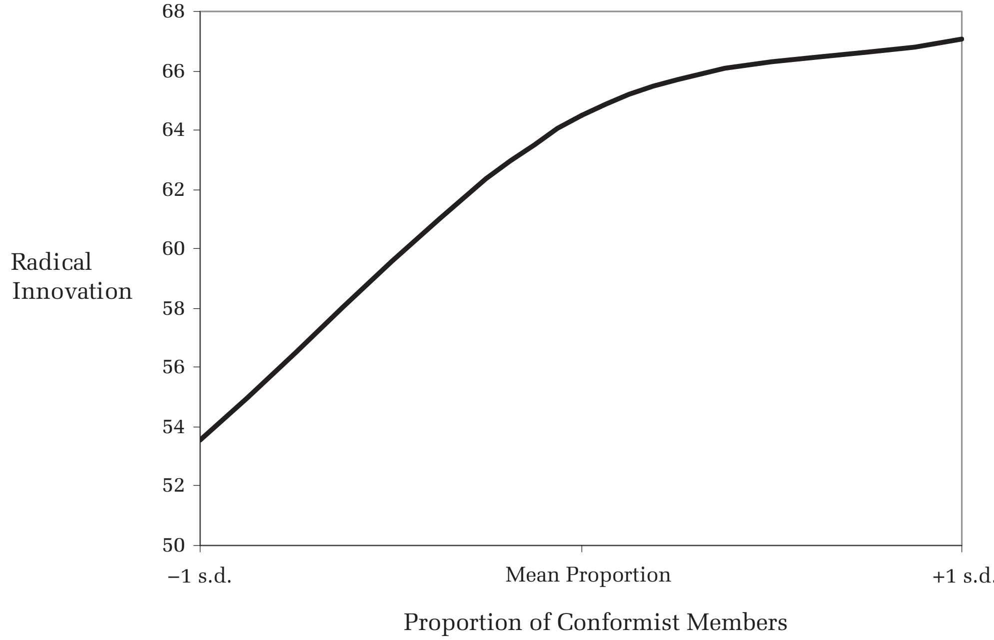
In support of Hypothesis 3, the proportion of attentive-to-detail members had a significant effect on team innovation, and the squared term of the proportion of attentive-to-detail members also influenced innovation. This relationship is plotted in Figure 2. We further analyzed this effect by evaluating simple slopes (Aiken & West, 1991). We estimated slopes at three proportions of attentive-to-detail members: the mean proportion and one standard deviation below and above it. Results showed that the slope was negative and significant for one standard deviation below the mean propor-

TABLE 3
Regression Analysis of Radical Innovation and Cognitive Styles[a]

Outcome Variable	Predictor Variable	Estimate[b]	Bootstrap s.e.	R^2	ΔR^2
Team innovation					
Model 1	Creativity	0.54*	0.22		
	Conformity	0.17	0.13		
	Attention to detail	−0.49**	0.18		
				.16	
Model 2	Creativity	0.62**	0.20		
	Conformity	0.91*	0.42		
	Attention to detail	−1.48***	0.40		
	Conformity squared	−0.01†	0.01		
	Attention to detail squared	0.02**	0.01		
				.32	.16*

[a] $n = 41$.
[b] Values are unstandardized beta coefficients.
† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$

FIGURE 1
Relationship between the Proportion of Conformist Members and Team Radical Innovation



tion ($b = -1.33$, $t_{37} = -2.98$, $p < .001$); it was weaker for the mean proportion ($b = -0.66$, $t_{37} = -3.01$, $p < .001$). The slope was insignificant for one standard deviation above the mean proportion ($b = .02$, $t_{37} < 1$, n.s.). The negative relationship between the proportion of attentive-to-detail members and radical innovation did not significantly increase between the mean and the high proportions of attentive-to-detail members.

To test the mediating effects of team processes, we conducted a series of regression analyses (Baron & Kenny, 1986), summarized in Table 4.

In support of Hypothesis 4a, the proportion of creative members was positively related and the

FIGURE 2
Relationship between the Proportion of Attentive-to-Detail Members and Team Radical Innovation

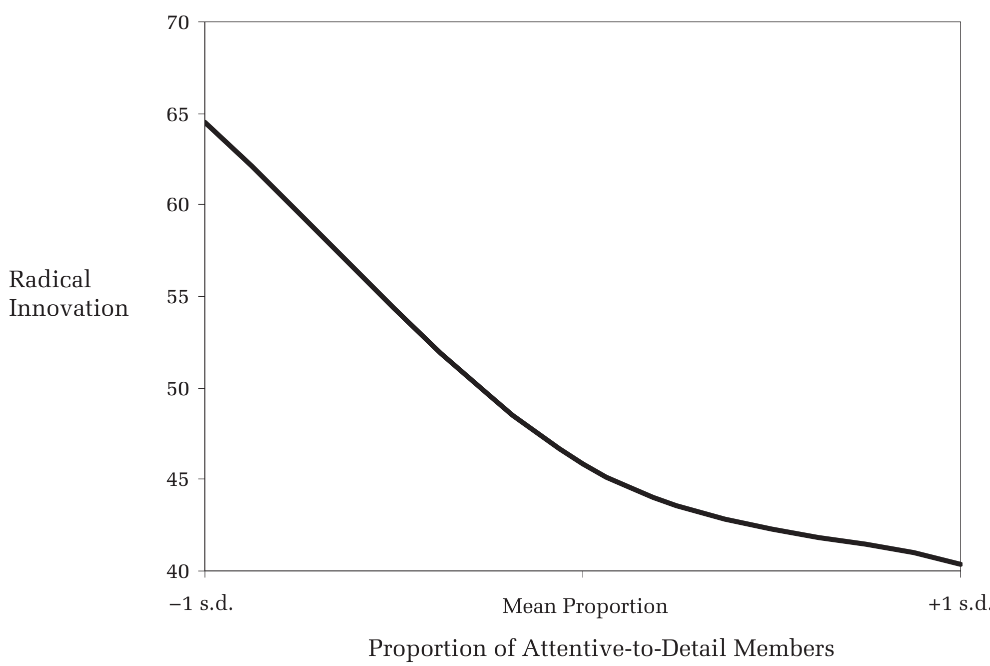


TABLE 4
Mediation Analysis of Team Processes[a]

Hypothesis	Outcome Variable	Predictor Variable	Estimate[b]	Bootstrap s.e.	R^2	ΔR^2
4a	Task conflict	Creativity	0.01*	0.01	.09	
		Conformity	−0.01*	0.01	.11	
		Attention to detail	−0.01	0.01	.04	
4b	Team innovation	Task conflict	5.04	6.29	.02	
5a	Potency	Creativity	−0.00	0.01	.01	
		Conformity	0.01**	0.00	.20	
		Attention to detail	0.10**	0.04	.15	
5b	Team innovation	Potency	−3.30	5.88		
		Potency squared	−20.07**	8.54	.16	
5c	Team innovation	Creativity	0.79***	0.16		
		Conformity	0.54	0.42		
		Attention to detail	−1.49***	0.39		
		Conformity squared	−0.01	0.01		
		Attention to detail squared	0.02*	0.01	.32	
		Potency	4.91	5.65		
		Potency squared	−18.12*	7.52	.47	.15**
6a	Adherence to standards	Creativity	−0.02†	0.01	.07	
		Conformity	0.02**	0.00	.42	
		Attention to detail	0.02**	0.00	.22	
6b	Team innovation	Adherence to standards	−6.94*	3.53	.09	
6c	Team innovation	Creativity	0.56*	0.23		
		Conformity	0.96*	0.44		
		Attention to detail	−1.38**	0.49		
		Conformity squared	−0.01†	0.01		
		Attention to detail squared	0.02*	0.01	.32	
		Adherence to standards	−3.31	4.92	.33	.01

[a] $n = 41$.
[b] Values are unstandardized beta coefficients.
† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$

proportion of conformists was negatively related to task conflict. The proportion of attentive-to-detail members was not related to task conflict. Contrary to our prediction in Hypothesis 4b, task conflict had no effect on radical innovation. Thus, although creative members enhanced task conflict and conformist members hindered it, task conflict did not explain their effect on radical innovation. Thus, Hypothesis 4c was not supported.

Hypothesis 5a was partly supported. In line with the hypothesis, the proportion of conformists was positively related to team potency, whereas the proportion of creative members was not; however, unlike our prediction, the proportion of attentive-to-detail members was positively associated with team potency. Potency had a nonlinear relationship with team innovation. We estimated slopes at three levels of potency: the mean and one standard deviation below and above the mean (Aiken & West, 1991). Results showed that the slope was positive and significant for one standard deviation below the mean ($b = 204.92$, $t_{37} = 49.91$, $p < .001$). The slope was negative and significant for the mean ($b = -3.3$, $t_{37} = -6.36$, $p < .001$) and became significantly negative for one standard deviation above the mean ($b = -211.52$, $t_{37} = 53.97$, $p < .001$), thus partially supporting Hypothesis 5b. Potency mediated only the relationship between the proportion of conformists and team radical innovation. When potency was added to the model (Table 4), the relationship between the proportion of conformist members and team radical innovation became insignificant ($Z = 1.67$, $p < .05$, one-tailed [Sobel, 1982]), partly supporting Hypothesis 5c.

In line with Hypothesis 6a, we found that the proportion of creative members was negatively related to team adherence to standards, and the proportions of conformists and attentive-to-detail members were positively related to team adherence to standards. In support of Hypothesis 6b, adherence to standards had a negative relationship with radical innovation. However, adherence to standards did not mediate the effect of the cognitive styles on radical innovation. When radical innovation was regressed on cognitive style and adherence to standards, the latter became insignificant, Thus, Hypothesis 6c was not supported.

Additional analyses. To deepen our understanding of how the different team configurations affect radical innovation, we employed a configuration analysis (Fiss, 2007; Ragin, 2000). The configuration approach rests on the premise that different patterns of attributes exhibit different features and lead to different outcomes. A configuration analysis therefore allowed us to identify which overall configurations of the three styles are better or worse for radical innovation.

To classify teams into different configurations, we first specified qualitative anchors for the proportions of members who were low versus high or moderate-to-high on each style and then classified each team into one of eight possible configurations (Ragin, 2000). Specifically, through our theory and regression findings we identified the median proportion as a cutoff point for distinguishing between teams with a low or high proportion of creative members. Teams in which the proportion of creative members was less than 20 percent were classified as having a low proportion. Similarly, to classify the teams as having either low or moderate-to-high proportions of conformists and attentive-to-detail members, respectively, we identified the proportion at the 33 percentile as the cutoff. Teams with proportions lower than this (11.7% for attentive-to-detail members and 11.1% for conformist members) were classified having low proportions of these members.

Sensitivity tests using 40 and 60 percent cutoffs for the proportion of creative members and 25 and 45 percent cutoffs for the proportions of conformists and attentive-to-detail members yielded similar findings. In all of these analyses, configuration 5 yielded the highest radical innovation (with mean innovation ranging from 60 to 69). The configuration of low proportions of creative and conformists members and a moderate-to-high proportion of attentive-to-detail members was the only one that demonstrated inconsistent innovation levels when we used different cutoff points and the only one that included only one team using the 33 percent point. For this reason, and on the basis of Ragin's (2000) rule of thumb for minimal configuration size, we omitted this configuration from Table 5.

The configurations and their scores on radical innovation, potency, task conflict, and adherence to standards appear in Table 5.

To identify configurations that scored significantly higher or lower on team innovation and team processes than the average score of all other configurations (Fiss, 2007; Roscigno & Hodson, 2004), we created a dummy variable for each configuration wherein 1 represents teams included in the configuration. Then, using regression and bootstrapping analyses (Efron & Tibshirani, 1993), we examined whether the averages on team innovation and team processes for each configuration significantly differed from the average for the teams that were not included in that configuration. We repeated these analyses using *t*-tests in which we treated each of the configurations as an independent variable (using the dummy variable described above) and treated team innovation and team processes as the dependent variables. Findings, which were similar, are reported in Table 5. We found that the best-performing configuration in terms of radi-

TABLE 5
Means of Radical Innovation and Team Processes for Different Configurations[a, b]

Configuration Number	*n*	Proportion of Creative Members	Proportion of Attentive-to-Detail Members	Proportion of Conformist Members	Innovative Performance	Potency	Task Conflict	Adherence to Standards
1	4	Low	Low	Low	40.00	5.45	4.24	4.82*
2	6	Low	Low	Moderate/high	50.00	5.28*	4.30†	5.19
3	9	Low	Moderate/high	Moderate/high	28.89***	5.81†	3.83	5.84***
4	2	High	Low	Low	47.50	4.91*	4.39*	4.28*
5[c]	2	High	Low	Moderate/high	65.00**	5.40*	4.17	4.71*
6	3	High	Moderate/high	Low	48.33	5.54	5.09*	5.02
7	14	High	Moderate/high	Moderate/high	45.57	5.78	3.70*	5.14

[a] A table with all possible configurations can be requested from the first author.
[b] The *p*-values denote a statistical difference between a configuration's mean and the mean of all other teams that were not included in the configuration.
[c] The configuration includes one team from R&D and one from manufacturing.
† $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$

cal innovation (mean = 65; s.d. = 7.10; configuration 5, Table 5) comprised 22 percent creative members, 16 percent conformists, and 11 percent attentive-to-detail members. We compared the level of radical innovation of teams with a low proportion of attentive-to-detail members with the radical innovation level of teams with no attentive-to-detail members at all and found no significant difference ($t_{12} = 1.87$, n.s.). Thus, having one or two attentive-to-detail members (11%) on a team did not harm innovation. In the teams with the configuration in which innovation was highest, the levels of potency and team adherence to standards were lower than the average for teams with other configurations, but the most innovative teams did not differ from this average in their level of task conflict. In contrast, teams dominated by creative members—that is, those with a high proportion of creative members and low proportions of conformists and attentive-to-detail members (configuration 4)—did not have levels of innovation that were higher than the average among the other configurations, and the configuration 4 teams had higher task conflict and lower potency and adherence to standards than the average among the other configurations. Teams dominated by attentive-to-detail members and conformists and having a low proportion of creative members (configuration 3) had the lowest innovative performance. These teams demonstrated the highest levels of potency and adherence to standards. Interestingly, the highest levels of task conflict were found in teams comprising high proportions of creative members and low proportions of conformists (configurations 4 and 6).

DISCUSSION

This study identifies the contribution of members with cognitive styles associated with idea implementation (i.e., conformists and attentive-to-detail members) to team radical innovation, in addition to the contribution of creative members. It is in keeping with prior theory and research that we have shown that creative team members are essential for team radical innovation. Nonetheless, we are the first to show that conformist members additionally contribute to team innovation, going above and beyond the contribution of creative members. Attentive-to-detail members, in contrast, negatively influenced team radical innovation in our study. In addition, we found that the proportions of the various cognitive styles influenced task conflict, team potency, and team adherence to standards. Yet only team potency mediated the effect of cognitive styles on team innovation.

Our findings point to a number of new and potentially important advances for research and practice. In keeping with previous findings (Taggar, 2001; West & Anderson, 1996), we found that having more creative members on a team improved team innovation. Creative members generate radical ideas and contribute to the emergence of a group norm that supports dissenting views and creativity. However, we also revealed that creative members tend to initiate task conflicts and to not adhere to standards. Therefore, although excelling in generating new ideas (Taggar, 2001), teams dominated by creative members may be less effective in implementing their ideas. Our configuration analysis supported this argument, showing that teams dominated by creative members with a low representation of conformists and attentive-to-detail members expressed low confidence in their ability to efficiently implement their ideas. Adding conformist members to a team of creative members is likely to increase team potency.

In line with our prediction, attentive-to-detail members interfered with a group's idea generation process. A drop in radical innovation was observed when attentive-to-detail members reached a certain proportion, one that presumably allowed them to influence team norms (Kanter, 1997; Stewart et al., 2005). Team members who do not compromise on perfection, focus on details, and urge their team to meet stringent standards may hold the team back from taking risks and from sometimes cutting corners in order to innovate. Douglas Bowman, a former visual designer at Google who recently quit his job, explained:

> When a company is filled with engineers, it turns to engineering to solve problems. Reduce each decision to a simple logic problem. Remove all subjectivity and just look at the data. . . . [For example] a team at Google couldn't decide between two blues, so they're testing 41 shades between each blue to see which one performs better. I had a recent debate over whether a border should be 3, 4 or 5 pixels wide, and was asked to prove my case. . . . That data eventually becomes a crutch for every decision, paralyzing the company and preventing it from making any daring design decisions. (Bowman, 2009)

Conformity has traditionally been viewed as contradictory to creativity, which requires deviating from normative thinking. Most prior research, however, has lumped conformity together with attention to detail (e.g., Chan, 1996; Kirton, 1976; Mudd, 1996), masking the different contributions of these styles to innovation. By disentangling the two, we were able to demonstrate the positive effect of conformity on team innovation. Conformists hindered task conflict, enhanced adherence to standards, and strengthened their team's belief in its effectiveness (i.e., team potency). These processes help maintain team norms and provide a team with the structure needed for innovation (Brown & Eisenhardt, 1998). Our findings are in line with studies showing that when structure is accompanied with high rather than low tolerance of mistakes, it is beneficial for creativity (Livne-Tarandach et al., 2004; Rietzchel et al., 2007).

As hypothesized, team potency mediated the effect of conformists on team innovation. Conformist members contribute to team innovation because they strengthen group harmony and cohesion and contribute to their team's confidence in its ability to successfully accomplish its performance goals. However, our findings only partially supported our mediating hypotheses of adherence to standards and task conflict. As we theorized, creative members hindered adherence to standards, but attentive-to-detail and conformist members enhanced it. This adherence, in turn, hindered team radical innovation. However, adherence to standards did not mediate the effect of cognitive styles on team radical innovation. The effect of adherence to standards on innovation depends perhaps on whether a team also endorses creativity. Teams that adhered to standards and had a strongly creativity-supportive environment had higher levels of customer satisfaction than teams that focused on either creativity or standard adherence (Gilson et al., 2005). Similarly, we found that in teams dominated by creative members, conformist members and a few attentive-to-detail members provided the required structure and ensured that creative ideas were successfully implemented. However, in teams with high emphasis on adherence to standards and low emphasis on creativity (as in the case of teams dominated by attentive-to-detail and conformist members), radical innovation suffered.

As we anticipated, creative members enhanced task conflict, which conformist members attenuated. We were not, however, able to show that task conflict influences team innovation. Possibly, in the context of radical innovation, task conflict serves as a double-edged sword, and the team's increased tension and reduced cooperation counterbalance the positive effects of task conflict and addressing task-related doubts (Beersma & De Dreu, 2005; De Dreu & Weingart, 2003). The relationship of task conflict and innovation may also depend on the way teams manage their conflicts. Research has shown that teams that communicated task-related doubts in a collaborative fashion were more likely to benefit from having task conflicts than teams that did not (Lovelace et al., 2001).

The configuration of the most innovative teams consisted of a high proportion of creative members, a moderate-to-high proportion of conformists, and a low proportion of attentive-to-detail members. Interestingly, these teams were more innovative than those in which the three styles were proportionally similar (e.g., configuration 7, Table 5), which may suffer from social categorization biases and conflicts and be less likely to develop a shared identity and intrateam communication (Bacharach et al., 2005; Earley & Mosakowski, 2000). Further, perhaps because attentive-to-detail and conformist members have more similar problem-solving approaches (Keller & Holland, 1978), in balanced teams they may form a dominant coalition that outweighs creative members.

Our findings contribute to the team structure and team innovation literature. Most studies that have tested the effect of team configuration on team creativity or innovation have focused on surface-level variables, such as education, functional background, age, and organizational tenure (e.g., Lovelace et al., 2001). Extending this line of research, we focused on deep-level variables (i.e., cognitive styles) that are less readily apparent (Bell, 2007) but are more crucial for information exchange, communication, and team cohesion than surface-level differences (Harrison et al., 2002; Ziebro & Northcraft, 2009). Indeed, we found that the proportion of team members with a given style influenced team processes and explained innovative team behavior.

The few studies that have tested the effect of cognitive styles on team innovation have focused on the influence of heterogeneity in team members' cognitive styles (Basadur & Head, 2001; Bilton, 2007). We are the first to identify the unique contribution of members with different styles to team processes and team radical innovation. By doing so, we followed the call, voiced by various researchers (e.g., Payne, 1987; Scott & Bruce, 1994; Taylor, 1989a, 1989b), to use the underlying constructs composing the Kirton Adaption-Innovation Inventory (KAI; Kirton, 1976) as distinct constructs. Using a confirmatory factor analysis, we found that the three styles represent different constructs and that only rarely do people excel in all three styles (only 3.1 percent of our sample). Given the different effects each style has on team processes and team innovation, we see great merit in unpacking the KAI and using the three substyles instead of their aggregation. Moreover, the cognitive style literature has traditionally centered on the individual level. Because idea generation and implementation involve substantially different routines and focus, individuals either find it difficult or lack the motivation to excel in both (Scott & Bruce, 1994). In teams, these tasks can be delegated to the different members according to their preference or expertise, and both can be achieved simultaneously.

To the best of our knowledge, this study is the first to adopt a configurational approach and to examine the effect of team configuration on team innovation. We showed that the contributions of different styles are distinctly different and that their configuration, in terms of the proportions of team members who score high or low on each, influences the level of team innovation. The preferable configuration for radical innovation includes members that contribute to both idea generation and implementation processes.

Limitations and Future Research

Future research may improve on the approach of the present study. First, although cognitive styles are stable personal characteristics (Kirton, 1976) that are relatively unlikely to be influenced by team configuration or innovation, use of a longitudinal design would provide more direct evidence of causality than our current design of the present study. Second, our innovation measure was based on managers' evaluations of teams' radical innovation. Future research might support the present findings by using multiple measures of radical innovation, including objective measures. Third, our naturalistic sample has merits but also a few limitations. For example, it did not include teams solely composed of members with one style (i.e., creative, conformist, or attentive-to-detail). To a certain degree, all of our teams were heterogeneous. However, some were more homogeneous than others. Furthermore, team size ranged from 3 members to 30 members, with a median of 11. Within this range, team size had no significant effect on team innovation, yet future research should perhaps use equally sized teams. The fact that all the teams were from the same organization helped us avoid potentially confounding factors, such as type of industry, resources, and markets. Team configuration may vary depending on these factors. Most prior research has tested radical innovation in R&D settings; we examined the effect of team configuration on radical innovation in both R&D and manufacturing teams and found that the correlation structure among the different variables was similar in both organizational functions. Furthermore, we found disproportionate numbers of teams in the different configurations, observing only two teams in the most innovative configuration. Although our configuration analysis findings were consistent with the regression findings, future research may want to use a larger number of teams, enabling more teams to be classified under each configuration. In addition, research conducted in different organizations and industries would strengthen the generalizability or reveal the boundary conditions of our findings.

Fourth, the study's results did not support all the mediation hypotheses. We were able to show some effects of creative, conformist, and attentive-to-detail members on task conflict, team potency, and adherence to standards. However, only potency explained the effect of conformists on team radical innovation. The other mediation hypotheses were not supported. Other team processes that we did not consider, such as team psychological safety (Edmondson, 1999), participation (De Dreu & West, 2001; West & Anderson, 1996), commitment, and support of innovation (George & Zhou, 2001), may account for the effect of team configuration on innovation. Team processes may also shape the relationship between the cognitive styles and team innovation (Baer et al., 2008). Future research can further contribute to understanding of the team dynamic that explains the effects of the cognitive styles on team innovation.

Lastly, it is important to note that none of the three styles is considered preferable per se. It is the fit among configuration of cognitive styles, task, and work environment that determines performance (Scott & Bruce, 1994). We focused on radical innovation, but many organizations encourage both radical and incremental innovation (Benner & Tushman, 2002) as well as quality and efficiency performance outcomes (Miron et al., 2004). In view of prior research (Kirton, 1976) and our findings, we speculate that teams dominated by conformists and attentive-to-detail members will focus on incremental rather than radical innovation and on improving quality and efficiency. Future research should test this prediction.

Practical Implications

With recent failures of R&D teams to meet their objectives in regard to product characteristics, quality, and timetable, organizations have started to integrate quality and reliability engineers, who are assumed to be high on conformity and attention to detail, into R&D teams. However, their contribution to innovation is being questioned by R&D managers because they increase formality and rule adherence (Naveh, 2007). Our study suggests that, although attentive-to-detail members negatively impact radical innovation, the contribution of conformist members can be valuable. To enhance radical innovation, our study suggests that managers should assign employees to a team not just on the basis of their expertise or their expected individual contribution to the team; rather, managers should take into consideration the team configuration as explored in this study. Specifically, managers should set up teams that have a significant number of creative members, to form an innovative team culture; a large number of conformists, to contribute to team harmony, reduce conflict, and increase team potency; and no more than a few attentive-to-detail members, given their low tolerance of risk and mistakes.

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APPENDIX A
Preliminary Qualitative Data: Beliefs about Creative Employees and Innovative Teams

"There aren't many innovators. They [creative people] tend to avoid detailed work. They bring the idea to a certain feasibility level; the rest is done by engineers who turn the idea into a product. At the individual level, there is a trade-off." (senior manager, R&D)

"Innovators are absent minded. They are always looking for a new idea and then move on to the next idea. . . . They throw ideas up into the air and then you have to 'polish' their ideas." (manager, manufacturing)

"Not all innovators are able to complete a project. Some innovators are not aware of this. They can convince others that their idea will work, but to turn it into a product on their own—impossible. This is why it is important to give them the credit, and let somebody else lead the process at the engineering stage." (employee, R&D)

"We try to assign tasks according to people' attributes. . . . We work in teams, not everybody needs to do all the work. There are people who are good at the initial conceptual design. . . . These people have to be at the center of the innovation, without them nothing will happen." (research manager, R&D)

"I have employees who explore new things under the table, as if I am unaware. . . . I have two of them . . . they are full of ideas and desire to do unconventional things. Sometimes I have to argue with them, in order to make them follow the rules." (manager, R&D)

"The innovator is not used to thinking in manufacturing terms. We need to connect the innovators with people who are close to manufacturing." (research manager, R&D)

"I have two technicians; one is the opposite of the other. If I ask myself, whom should I choose—the answer is not clear. They get along very well. The more conformist employee does everything accurately, on time and according to requirements. He will not initiate much, but I can count on him to always do his best. The other employee always comes up with new ideas. He is hasty in a way that sometimes concerns me. I am afraid he will do something wrong. The organization needs both." (manager, R&D)

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