

Innovation and Conflict Management in Work Teams: The Effects of Team Identification and Task and Relationship Conflict

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Abstract

The current study attempted to elucidate the mechanisms whereby constructive-cooperative conflict management (integrating) fosters innovation in work teams. The proposed conceptual model postulated that the positive function of integrating in precipitating innovation is motivated by prosocial team atmosphere as manifested in team identity, the team's capacity to mitigate the adverse impact of relationship conflict and its capability to maximize the potential gains of task conflict. Specifically, it was hypothesized: (a) integrating would predict innovation. (b) Team identity would be positively related to integrating, and that integrating would mediate the positive relationship between team identity and team innovation. (c) Task conflict would be positively related to integrating whereas relationship conflict would be negatively related to integrating. This research embraced a team-level perspective and analysis. Seventy-seven intact work teams from high-technology companies participated in the study. The findings, by and large, supported the proposed conceptual model, especially the contention that teams' proclivities with respect to conflict management play a pivotal role in their capacity to function in an innovative manner. A team's integrating pattern meaningfully predicted team innovation. The mediating effect of the integrating strategy on the relationship between team

identity and team innovation was also demonstrated. Finally, relationship conflict was negatively associated with a team's integrating pattern, while the positive association of task conflict with the cooperative strategy was marginally significant.

Current organizations face a highly competitive and dynamic environment, which necessitate flexibility and fast adaptation to new situations and changing contexts. Hence, innovation has become a vital asset in order to ensure organizational sustainability (DeDreu, 2006; Jansenn, Van de Vliert, & West, 2004; West, 2002; West & Hirst, 2003). In an effort to attain innovation, organizations often resort to collaborative work arrangements, particularly work teams.

Innovation in a team setting has been defined as: "the intentional introduction and application within a team, of ideas, processes, products or procedures new to the team, designed to significantly benefit the individual, the team, the organization, or wider society" (West & Wallace, 1991, p. 303). The concept of innovation emphasizes the element of deliberate effort by team members and the application aspect which distinguishes it from sporadic creativity of talented individuals (Amabile, Conti, Coon, Lazenby, & Herron, 1996). Innovation generally emerges as an outcome of continuous interaction processes within a team (West & Hirst, 2003).

Conflict constitutes one of the central processes associated with the teams' internal dynamics (Tjosvold, 2006; West & Hirst, 2003). Hence understanding the mechanisms underlying innovation requires a thorough examination of this phenomenon. Research on the effects of conflict on innovation in work teams addressed by and large the relationships between the prevalence of conflict and innovation, however, empirical investigations addressing the function of conflict management processes in team innovation, have been scarce (DeDreu, 2006; Nemeth, Personnaz, Personnaz, & Goncalo, 2004). The current study intended to fill in this gap. Specifically, it attempted to expand the knowledge base and understanding with respect to the mechanisms whereby constructive-cooperative conflict management patterns foster innovation in work teams. The conceptual model tested in this research postulated that the positive function of constructive-cooperative conflict handling mode in precipitating innovation is motivated by supportive team atmosphere as manifested in team identity. Furthermore, it posited that constructive conflict management, which then facilitates innovation, stems from the team's capacity to mitigate the adverse impact of relationship conflict and its capability to maximize the potential gains of task conflict. Figure 1 schematically depicts the conceptual model tested in the current study.

The following sections explicate in detailed fashion the proposed model.

The Role of Constructive Conflict Management in Team Innovation

Conflict constitutes an inevitable and commonplace element in the dynamics of organizational work teams (Alper, Tjosvold, & Law, 2000; DeDreu, 2006; Desivilya & Eizen,

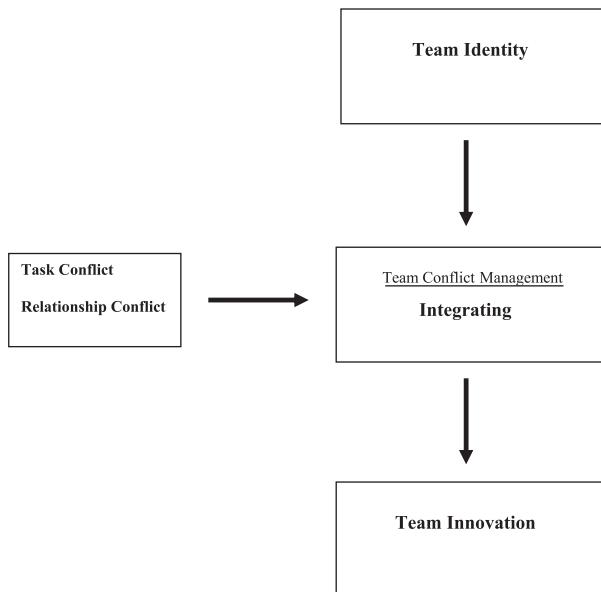


Figure 1. The Study Model.

2005; Desivilya & Yagil, 2005; Tjosvold, 2006). De Dreu and Weingart (2003) define intragroup conflict as a process emanating from interpersonal tensions among team members owing to real or perceived disparities. Members of work groups within organizations experience and manage conflict with their counterparts on an everyday basis.

Work teams as increasingly popular organizational structures serve to improve quality, increase efficiency and ensure organizational sustainability (Tomlinson, 2005; Vangen & Huxham, 2003a). We embrace the fundamental assumption, advanced by conflict and organization scholars that effectiveness of work teams, including their capacity for innovation, stems to a large extent from the quality of their internal relationships (Ama-bile et al., 2001; Ayoko, Härtel, & Callan, 2002; Chen, Liu, & Tjosvold, 2005; Moham-med & Angell, 2004). Team members' approach and the actual ways they handle internal conflicts have a considerable impact on the attributes of their internal bonds. Moreover, modes of handling disagreements in work teams constitute critical deter-minants of conflict outcomes (DeDreu, 2006; Hinds & Mortenson, 2005; Jehn & Bender-sky, 2003). Hence, thorough understanding of orientations, approaches and actual conflict management behaviors in work teams deems essential.

In an attempt to elucidate the dynamics of conflict in work teams, we first delineate several prevailing conceptual frameworks analyzing conflict management stressing their application in research on work teams. Conflict management refers to behaviors team members employ to deal with their real and perceived differences, some relating to emotionally driven conflicts (relationship conflicts) while others addressing the more substantive elements of their discords (task conflicts).

Most studies on interpersonal conflict-management have adopted the *Dual Concern Model* originally proposed by Blake and Mouton (1964), later adopted with some modifications by several scholars (Pruitt & Rubin, 1986; Rahim, 1983; Thomas, 1976). The basic tenet of this model postulates that the conflict-management mode employed by an individual emanates from two underlying motives: concern for self and concern for the other party. The strength of each of these two motivational orientations according to conflict scholars may vary as a function of the particular conflict situation, with differing emphases on each of the two concerns yielding five major conflict-management patterns: (a) Dominating (high concern for self and low concern for the other), reflected in attempts to persuade the other side to accept one's position; (b) Obliging (low concern for self and high concern for the other), manifested in behaviors such as acquiescence with the other; (c) Avoiding (low concern for self and low concern for the other) that is evading confrontation of the conflict issues; (d) Integrating (high concern for self and high concern for the other), reflected in searching mutually beneficial alternatives for solution; (e) Compromising (moderate concern for self and moderate concern for the other), manifested in behaviors such as seeking and proposing mid-way solutions.

The current study embraced the *Dual Concern Model* as the conceptual framework of conflict management patterns, while incorporating the distinction between constructive and destructive dispute handling (Ayoko et al., 2002; Desivilya & Eizen, 2005; Rusbult, 1993; Tjosvold, Poon, & Zi-you, 2005). The constructiveness-destructiveness dimension of conflict approach pertains to the potential outcome of conflict management behavior, namely whether it is constructive or destructive to the relationship (Deutsch, 1973) between the parties (group members). Constructive conflict management processes reflect cooperative and pro-social behavior, aimed at preserving relationships. In contrast, destructive conflict management actions denote antisocial, competitive behavior that is potentially disruptive to the relationship or that reduces the odds of repairing the bonds. The current study focuses on the constructive conflict management processes, which subsume cooperative ways of handling conflicts, termed in the *Dual Concern Model* "integrating" or "problem-solving."

Our choice to concentrate on the constructive-cooperative modes of conflict management stems from our intention to explain the mechanisms underlying functional conflicts in work teams; namely, discords which despite their dividing and stressful aspects can contribute to team effectiveness, and especially to innovation. Effective team-work has been conceptualized as a process which fosters internal interactions by means of mutually helpful communication, coordination and cooperation designed to facilitate successful completion of tasks and development of high quality relationships among team members.

Accordingly, Tjosvold (2006) has argued that conflict can provide motivation for engaging intra-team discords, and that competent management of these internal conflicts, despite transient disruption, strengthens relationships among team members. This researcher showed in several studies (e.g., Chen et al., 2005; Tjosvold et al., 2005) that confidence in a team's relationships and faith in its capability to manage conflicts, both

from the managers and members' perspectives, contributed to team effectiveness, including innovation.

Thus, the usefulness of conflicts for work teams depends to a large extent on team members' motivational orientation, in particular on the strength of their concern about the team's internal relations. Team members who aspire to sustain positive internal relations are motivated to promote mutual understanding, build intra group trust and the ability to work together at present and in the future. In other words, they exhibit a prosocial motivation towards their team.

Such an orientation in turn enhances constructive-cooperative actions while dealing with internal conflicts: exchanging information with respect to needs and interests, voicing diverse opinions and attempting to gain mutual understanding of these differences, surfacing problems, viewing them from a variety of angles and perspectives, searching for solutions which satisfy all team members' concerns and coordinating members' behaviors. Conceivably, the positive effect of the constructive-cooperative patterns of conflict management on team innovation stems from prosocial motivation coupled with effective utilization of cognitive resources (Chen et al., 2005; Cornish, Zittoun, & Gillespie, 2007; DeDreu, 2006; Gratton, 2005). Effective use of cognitive resources means that team members are capable of learning, developing insights and deep understanding. Such a cognitive advantage can be materialized due to team members' prosocial motivation, driving them to thoroughly analyze joint problems thus enhancing the odds of searching together and finding novel ideas and solutions which are mutually beneficial.

In line with this contention, DeDreu (2006) showed that moderate levels of task conflict in work teams which were managed by collaborative problem solving fostered innovation.

Based on prior theorizing and empirical research we proposed the following hypothesis:

Hypothesis 1: A team's integrating pattern of conflict management will be positively related to the team's innovation.

The Contribution of Team Identity to Constructive Conflict Management

In an attempt to discern the mechanisms underlying the positive effect of constructive-cooperative conflict management pattern of integrating on team innovation, we draw on theories linking the nature of team atmosphere or climate with team effectiveness (Cunningham & Chelladurai, 2004; Lembke & Wilson, 1998; Tyler & Blader, 2003; West & Hirst, 2003). Team climate constitutes a broad, overarching concept. Our research model explicates one of the main factors, which determines the nature of team climate: *team-identity*. This is a group-level concept derived from the construct of team-identification.

Applying Henry, Arrow, and Carini's (1999) three-dimensional model, team-identification is construed as a cognitive, emotional and behavioral bond between an individual

and a team. Team-identification constitutes a special type of social identification, reflecting the degree to which individual team members experience a sense of “oneness” with a particular organizationally based team (Gundlach, Zivnuska, & Stoner, 2006). According to the social identity theory (Hogg & Terry, 2000; van Knippenberg & van Schie, 2000) the need for self-definition and pursuit of a sense of meaning provide the primary impetus for the process of identification. Strong identification with one’s team contributes to team members’ capability to attain self-construal and a sense of meaning. Team-identification is an individual-level construct representing the extent to which an individual member identifies with the team. Lembke and Wilson (1998) introduced the term *team-identity*, purporting to a group level construct; namely, the collective level of team-identification emerging across all members of the team. Thus, the group level construct of *team-identity* is driven by the individual level construct of team-identification (Gundlach et al., 2006).

A collective sense of team-identity, a sense of “togetherness” and “oneness,” promotes the members’ tendencies to act on behalf of the team; namely, develops an internal prosocial orientation (e.g., Haslam, 2001; Wegge & Haslam, 2003). Such an intra-team prosocial climate in turn serves as a framework for organizing and coordinating team members’ behavior (e.g., Cunningham & Chelladurai, 2004; Haslam, 2001; Hinds & Mortenson, 2005; Wegge & Haslam, 2003). Strong team identity actively motivates team members to share skills, information, knowledge and other resources with each other, behaviors which are likely to enhance the team’s welfare and joint outcomes (Riketta & van Dick, 2005; Stevens & Campion, 1994). In other words, team-identity creates the very motivational conditions which increase the odds for intra-team cooperative interactions (Tyler & Blader, 2003).

Previous research on work teams provided support for the line of reasoning presented above. It indicated that prosocial orientation engendered by team-identity, fostered intra-team cooperation in general and also in conflict situations—encouraging team members to embrace constructive-cooperative patterns of managing internal discords (Amabile et al., 2001; Desivilya & Eizen, 2005; Hinds & Mortenson, 2005).

Additional evidence concerning positive links between strong team- identity and cooperative inclinations emerged from the domain of social dilemmas. The findings have indicated that a person with a higher sense of group-identity was more likely to select cooperative alternatives, that is, to cooperate with other group members, in contrast to individuals with a lower sense of group-identity (De Cremer, 2001). In a similar vein, Rusbult (1993) found that individuals who felt highly committed to their relationships tended to exhibit constructive responses to crisis in interpersonal relationships.

Based on our conceptual framing and prior research, we postulated that strong team-identity promotes prosocial team orientation, an atmosphere engendering cooperative motivation; namely, a desire to seek constructive-cooperative ways such as integrating to deal with internal disputes. Accordingly we hypothesized:

Hypothesis 2: Team-identity will be positively associated with a team’s integrating pattern of conflict management.

The Mediating Function of Constructive Conflict Management in the Relationships Between Team-Identity and Team-Innovation

Beyond the contribution of team-identity to constructive-cooperative conflict management, previous research has suggested that a prosocial atmosphere directly affects team-innovation. It allows team members to openly discuss their views concerning group goals, tasks and missions, promotes creativity, learning and innovation (Amabile et al., 2001; Standifer & Bluedorn, 2006; Swan & Scarbrough, 2005; West & Hirst, 2003). Indeed, Zárraga and Bonache (2005) showed that high-care team-atmosphere, entailing mutual trust and active empathy enhanced knowledge transfer and knowledge creation.

The research findings, cited in previous sections, imply that team-identity sets the stage for team-innovation by inducing a prosocial atmosphere, encouraging team members to act on behalf of the team. However, we argue that the prosocial orientation (reflected in team-identity) can manifest its effects on the outcome of team-innovation only if it actually mobilizes the team members to employ integrating behaviors to manage internal discords. Thus, the constructive-cooperative conflict management pattern of integrating constitutes a crucial component in the conceptual causal chain, linking team-identity with team-innovation. A team's actual integrating behaviors utilize the advantages—such as tolerance for divergence, openness to others' ideas, willingness to share information, knowledge and skills—provided by prosocial team-orientation, as expressed in team-identity. These gains then carry over to generation of novel and innovative outcomes. Thus, we hypothesize:

Hypothesis 3: A team's integrating conflict-management pattern will mediate the effect of team-identity on team-innovation.

Relationship and Task Conflicts in Teams and Constructive Conflict Management

In addition to an aspect of team-climate as reflected in team-identity, the nature and prevalence of intra-team conflicts can shape the patterns whereby these disputes are managed, which in turn influence the team's capacity for innovation and learning.

Team members' interactions in work teams involve both social and mission-related aspects. Hence, conflict processes may touch upon task and relationship issues. Accordingly, Jehn (1997) distinguished between relationship (or affective) and task (or cognitive) conflict and developed separate definitions of these two concepts.

Relationship conflict refers to an awareness of interpersonal incompatibilities, reflecting interpersonal frictions; tensions; clash of personalities; and disagreements about personal values, taste, and interpersonal styles. This type of conflict is associated with the emotional aspects of interpersonal relations in work teams. Task conflict pertains to an awareness of differences in opinions and perspectives with respect to the work team's tasks, entailing divergent perceptions concerning distribution of resources, work procedures, and policies. In contrast with the emotionally driven relationship conflict, this type of intra-team discord is embedded in the substantive elements of teams' tasks.

Several studies examined the association between these two conflict types and conflict management patterns in work teams. For example, Rentsch and Zelno (2003) studied intra-team dynamics in work groups, where members perform complex, unstructured tasks such as strategic decision making. According to their theoretical perspective, team members' interpretations of their counterparts' action-related intentions markedly influence conflict behavior in work teams.

Rentsch and Zelno (2003) argued that greater correspondence among team members' interpretations of action intentions (especially about positive team orientation) fosters more effective and efficient conflict management interactions. Such congruent cognitions enhance mutual understanding among team members, encourage convergent and inclusive communication, and foster successful coordination. Consequently, divergent views about work procedures and other work-related issues (task conflict) will most likely be considered as legitimate disagreements, which need to be addressed in a cooperative manner, seeking mutually acceptable solutions.

Conversely, if team members' perceptions reveal incongruent views of action-related intentions, such as when some of them erroneously construe task conflict as relationship conflict (e.g., interpret constructive criticism directed at them as personal attacks), they will be less likely to adopt constructive conflict management strategy.

Beyond incidental use of contentious tactics, inaccurate and incongruent cognitions of team members can incite destructive conflict course. This is especially likely when team members repeatedly misattribute the others' behaviors and view them as interfering with the team's goals and norms. Such destructive escalatory dynamics discourages intra-team information exchange and increases the likelihood of power struggles. By contrast, constructive dynamics of handling intra-team conflicts is more likely to develop when team members hold congruent perceptions about the positive value of openness and constructive controversy in promoting the group's goals. In the latter case, they tend to treat internal discords as task conflicts rather than emotionally colored personal incompatibilities. Task conflicts, unlike their relationship counterpart, encourage cooperative strategic choice designed to foster attainment of work team goals and strengthen the internal bonds among team members.

DeDreu (2006) and Desivilya and Yagil (2005) research provide some support to Rentsch and Zelno's (2003) arguments with regard to the relationships between the type of conflict and the ways it is managed. Empirical evidence derived from these studies indicated that relationship conflict mitigates the use cooperative strategies such as integrating. Conversely, task conflict appears to be linked with the constructive-cooperative intra-team strategic choice of integrating.

We therefore hypothesized:

Hypothesis 4: Task conflict will be positively associated with the integrating pattern of a team's conflict management whereas relationship conflict will be negatively associated with the integrating pattern.

In sum, this study examined the pivotal role of a team's conflict management patterns for its capacity to function in an innovative manner. We have posited that the internal group dynamics frames the outcomes eventually attained by a work team. The

current research focuses on the conflict management tendencies element of this internal dynamics. The patterns whereby team members handle internal disputes are nourished by the nature of the team-atmosphere, as reflected in team-identity, setting the stage for prosocial motivational orientation within the team. This orientation precipitates the choice of constructive-cooperative conflict management patterns. Task conflict also fosters the choice and use of the constructive-cooperative ways of handling internal disputes, underscoring the cognitive aspects of this strategy, notably effective information processing. The motivational and cognitive elements in tandem help to realize the potential of integrating in eliciting team-innovation.

This research embraced a team-level perspective, treating each variable as indicating the team's predominant patterns of reality construal and its main behavioral tendencies (Kuhn & Poole, 2000). In order to assess in a meaningful way elements associated with a team-identity, the prevalence of actual task and relationship conflicts and conflict management patterns, it is essential to involve in research intact teams. Thus, in contrast with most studies on conflict management in teams, which were conducted on ad hoc groups (notably students), the current investigation employed intact work teams whose members belong to the same real work group and maintain continuous, long-term relationships (Desivilya & Eizen, 2005; Desivilya & Yagil, 2005; Farmer & Roth, 1998).

Method

Participants and Procedure

Seventy-seven research and development teams were recruited to participate in the study, from different high-technology companies, which are specializing in telecommunication, computer software, computer hardware, and semi-conductors. To ensure that each team provided a setting appropriate for this study, a pre-assessment interview was held with each team leader, all of whom stated that all team members interacted regularly to achieve shared goals. They also depended on one another for knowledge and effort by means of several permanent structures such as scheduled staff meetings, "brown bag" lunch meetings, and joint refresher workshops. To be included in the final sample at least three members had to complete a questionnaire, and the team leader had to complete a separate questionnaire. Team size ranged from three to six members, average of 4.4 ($SD = .83$). The sample consisted of 339 employees and their corresponding 77 leaders. All participants were men (a vast majority were Jewish), with average age was 33.19 years ($SD = 3.46$). Average job tenure was 7.89 years ($SD = 3.74$). All participants had at least a Bachelor's degree, 43% in computer sciences and the rest in electronics; 14% of the participants had a Master's degree.

Prior to data collection, several steps were taken to address ethical concerns and to ensure members' commitment to the study. First, managers received a letter describing the aim of the research as a study of teamwork in organizations, and assuring that our concern was not with specific employees but with the team. This secured confidentiality and presumably fostered the employees' cooperation. Managers were encouraged to

approach the researchers for any clarifications and questions. Next, the research assistants visited each of the selected teams, presented the purpose of the study and distributed the questionnaires to team members. The written instructions accompanying the scales included a brief explanation that the purpose of the study was understanding teamwork in organizations. To assure anonymity, employees were asked to place their completed questionnaire in a sealed envelope. The questionnaires were distributed to employees as follows: team members' questionnaires consisted of measures of a team's conflict management patterns, measures of conflict types (task and relationship conflict) and team-identity. These measures were aggregated to the team level of analysis. Leaders' data included a measure of a team-innovation. Each participant was asked to provide demographic information.

Measures

Team-Identity

Team-identity represents the collective level of team- identification occurring across all members of the team, which is driven by aggregating the individual level construct of team-identification. Team-identity was measured by the twelve 7-point Likert-type inventory (7 = strongly agree, to 1 = strongly disagree), developed by Henry et al. (1999) (e.g., "I think of this team as part of who I am"). The internal consistency reliability (Cronbach's alpha) was .92.

Conflict Types

Task and relationship conflict were measured by the refined version (Pearson, Ensley, & Amason, 2002) of the Intragroup Conflict Scale developed by Jehn (1992, 1994). The instrument comprises two dimensions: relationship (affective) conflict, measured by three items (anger, personal friction, and tension), and task (cognitive) conflict, also measured by three items (disagreements about ideas, differences of opinion, and the need to settle disagreements). Respondents rated on a 5-point Likert type scales the frequency of each type of conflict in their respective work team. The internal consistency reliability (Cronbach's alpha) was .75 and .80 for task and relationship conflict, respectively.

Conflict Management Patterns

Rahim's (1983) organizational conflict inventory form C (ROCI-II), worded for the team level, was used to assess the typical interaction pattern a team enacts when members manage internal discords and disagreements. The ROCI-II was originally designed to measure five orthogonal dimensions of conflict-management patterns, but for our purposes only one subscale—integrating—was applied. The integrating scale (seven items) assesses the extent to which team members adopt a cooperative pattern in managing intra-team conflicts designed to reach a solution that satisfies the concerns of all parties (e.g., "Team members try to bring all our concerns out in the open so that the issues can be resolved in best possible way"). Each team member was requested to indicate how the team usually deals with disputes occurring within the team on a five-point

Likert scale (1 = strongly disagree and 5 = strongly agree). The internal consistency reliability for the integrating scale was .83.

Team-Innovation

A four-item scale adapted from West and Wallace (1991) was employed to assess team innovation. The items reflected the extent to which the team leader viewed the team as innovative in the following job domains: work objectives, work procedures, working methods and content areas of the job, such as “initiation of new work procedures.” The team leader rated each of the four innovation items on a five-point Likert-type scales (ranging from 1 = very few innovations were made to 5 = a great deal of innovations were made). The internal consistency reliability (Cronbach’s alpha) of the innovation measure was .86.

Control Variables

Team size and task interdependence were included as control variables because previous research has indicated their effects on team processes and outcomes (Brewer & Kramer, 1986; Keller, 2001; Moye & Langfred, 2004). *Team size* was the total number of team members reported by the team leader. *Task interdependence* is defined as the extent to which an individual team member needs information, materials, and support from other team members to be able to carry out his or her job (van der Vegt, van de Vliet, & Oosterhof, 2003); it was measured by means of a three-item scale developed adapted from van der Vegt et al. (2003) (e.g., “The team members depend on one another in terms of information and materials necessary to perform the tasks”). The team leaders rated each statement on a five-point Likert scale (1 = strongly disagree, to 5 = strongly agree). Internal consistency reliability was .92.

Level of Analysis

The unit of analysis in the present study was the team. Hence, team’s innovation, frequency of team meetings, task interdependence and time size were measured at the team level by means of the team leader’s report. A team’s conflict management patterns of integrating and team- identification were an aggregate of individual team members’ responses to the team-level of analysis.

Thus, it was critical to demonstrate high within-team agreement to justify using the team average as an indicator of a team-level variable (r_{wg} : James, Demaree, & Wolf, 1993). A value of .70 or above is suggested as a “good” amount of within-group inter-rater agreement (James et al., 1993). In the current study, all scales exceeded this level. The values were .88, .87, .84, and .85, respectively for team-identification, task conflict, relationship conflict and team’s conflict management pattern of integrating. Values are given in Table 1 in the column r_{wg} . In addition, in team-level analyses, the aggregation of individual responses into a team score treats team members as judges rating their environment. Therefore, inter-member agreement must be evidenced for a construct to be considered a team-level variable (Bliese & Halverson, 1996).

Table 1

Descriptive Statistics, Reliabilities, and Intercorrelation Matrix for the Study Variables

	<i>M</i> (<i>SD</i>)	<i>r</i> _{wg}	1	2	3	4	5	6	7
1. Task interdependence	3.62 (.73)	—							
2. Team size	4.40 (.87)	—	-.03						
3. Relationship conflict	1.90 (.29)	.84	-.08	-.13					
4. Task conflict	2.83 (.29)	.87	.04	.19	-.09				
5. Team identity	3.98 (.31)	.88	.24*	-.08	-.09	.04			
6. Integrating	4.10 (.26)	.85	.10	-.07	-.35**	.18	.64**		
7. Innovation	3.76 (.65)	—	.04	.18	-.10	.03	.23*	.27*	

n = 77; (*SD*) – standard deviation; **p* < .05; ***p* < .01.

The within-group agreement was estimated by two measures: ICC(1) which provides an estimate of the reliability of an individual respondent's rating and answers the question: To what extent can variability in the measure be predicted by group membership? ICC(2) estimates the reliability of mean differences across teams (between group variance) and answers the question: How reliable are the group means within a sample (Bliese & Halverson, 1996). As indicated by James (1982), ICC(1) generally ranges from 0 to .50 with a median of .12. There are however no definite guidelines for determining acceptable values. Values were as follows: ICC(1) = .12; ICC(2) = .61 for team- identification; ICC(1) = .14; ICC(2) = .59 for task conflict; ICC(1) = .12; ICC(2) = .64 for relationship conflict; ICC(1) = .14; ICC(2) = .53 for conflict management pattern of integrating. As indicated by Bliese (2000), ICC(1) generally ranges from 0 to .50 with a median of .12. All scales slightly exceeded the median score.

Results

The first set of analyses included Pearson correlations followed by multiple regressions to test the research hypotheses. In each of the regression analyses, the control

Table 2

Results of Regression of Team Innovation on Team Integrating

Team innovation					
Step variables	<i>β</i>	<i>SE</i>	Δ Adjusted <i>R</i> ²	ΔF	<i>df</i>
Step 1: Control variables			.008	1.32	2
Team size	.18	(.08)			
Task interdependence	.05	(.10)			
Step 2: Team Integrating			0.7	6.27*	1
Team size	.20	(.08)			
Task interdependence	-.01	(.09)			
Integrating	.28*	(.28)			

n = 77; **p* < .05; ***p* < .01.

Table 3

Results of Regressions of Integrating on Team Identity and on Relationship Conflict and Task Conflict

Team integrating					
Step variables	β	SE	Δ Adjusted R^2	ΔF	df
Step 1: Control variables			-.01	.52	2
Team Size	-.07	(.03)			
Task Interdependence	.09	(.04)			
Step 2: Predictors			.49	25.60***	3
Team size	-.09	(.03)			
Task interdependence	-.08	(.03)			
Team identity	.62* **	(.07)			
Relationship conflict	-.29**	(.07)			
Task conflict	.15^	(.07)			

N=77; * $p < .1$, $p < .05$; ** $p < .01$, *** $p < .001$.

variables—team size and task interdependence—were entered at the first step. The mediating processes were then tested, using the multiple regression procedure suggested by Baron and Kenny (1986). Again, the control variables were entered at the first step.

Table 1 presents the means, standard deviations, reliabilities, and intercorrelations matrix among the study variables.

Table 2 displays the regression of team innovation on the integrating pattern of conflict management.

As can be seen in the table, integrating is positively and significantly related to team-innovation ($\beta = .278$, $p < .05$), thereby confirming Hypothesis 1. After controlling for team size and task interdependence, which account for a negligible percentage of variance in team innovation, integrating explains nearly 8% of this variance ($\Delta F = 6.28$; $p < .05$).

Table 3 presents the regressions of integrating on team-identity and on relationship conflict and task conflict. The control variables' (team size and task interdependence) contribution to the explanation of variance in integrating is negligible, while the three predictors (team-identity, relationship conflict and task conflict) account for 51% of the variance in the conflict management pattern of integrating ($\Delta F = 25.59$; $p < .001$). In addition, the results show that team-identity is positively and significantly related to integrating ($\beta = .62$, $p < .001$), hence supporting Hypothesis 2. Hypothesis 4 was partially confirmed: as expected, relationship conflict was negatively associated with integrating ($\beta = -.293$, $p < .01$). However, the positive relationship of task conflict with integrating was only marginally significant ($\beta = .15$, $p = .079$).

Finally, we examined Hypothesis 3, postulating a mediating effect of the integrating pattern of conflict management on the relationship between team-identity and innovation. Testing of mediation followed Baron and Kenny's (1986) guidelines: (1) Attempting to demonstrate that *the antecedent is related to the consequence*. Thus, team-innovation was regressed on team-identity. In line with this first condition the antecedent variable,

Table 4

Results of Hierarchical Regression Analyses for Predicting Integrating Pattern of Conflict Management as a Mediator of Team Innovation

Team innovation					
Step variables	β	SE	Δ Adjusted R^2	ΔF	df
Step 1: control variables			.008	1.32	2
Team size	0.18	(.09)			
Task interdependence	0.05	(.10)			
Step 2: mediating variable			.07	6.27*	1
Team size	0.2	(.08)			
Task interdependence	0.02	(.10)			
Integrating	0.28*	(.28)			
Step 3: main effects			.07	.64	1
Team size	0.2	(.08)			
Task interdependence	0	(.10)			
Integrating	0.2	(.36)			
Team identity	0.12	(.31)			

n = 77; **p* < .05; ***p* < .01, ****p* < .001.

team-identity, is significantly related to the outcome variable, team-innovation ($\beta = .253$, $p < .05$). (2) Showing that *the antecedent is related to the mediator*, hence, integrating was regressed on team-identity. As required by the second condition, the antecedent variable, team-identity is significantly related to the mediator, the integrating pattern of conflict management ($\beta = .656$, $p < .001$). (3) Demonstrating that *the relationship between the antecedent and the consequence is eliminated when the mediator is controlled for*. To examine this possibility, we conducted a hierarchical regression analysis, while controlling for the conflict management pattern of integrating. The control variables were entered in the first step, followed by integrating in step 2 and finally team-identity was entered at step 3. The results of this regression analysis are displayed in Table 4. As can be seen in the table, in line with the third condition, the results of a hierarchical regression have demonstrated that the relationship between the antecedent variable, team-identity, and the outcome variable, team-innovation was eliminated while controlling for the effect of the integrating pattern of conflict management. Hence, each of the three conditions of mediation according to Baron and Kenny's (1986) guidelines was fulfilled, thereby confirming Hypothesis 3: the integrating pattern of a team's conflict management mediates the relationship between team-identity and team-innovation.

Discussion

Scholars in the organizational arena have underscored the advantage of collaborative teams in attaining innovative outcomes and in production of complex knowledge (Gratton, 2005; Tomlinson, 2005; Vangen & Huxham, 2003a). This potential merit of a work group presumably stems from its internal dynamics, especially the team's capacity to

coordinate and integrate knowledge and resources possessed by individual team members (Standifer & Bluedorn, 2006; Swan & Scarbrough, 2005). Constructive conflict management constitutes one of the central processes associated with teams' coordination capability (Amabile et al., 2001; Tjosvold, 2006; West & Hirst, 2003). Thus, gaining a grasp on the precursors of innovation necessitates illuminating the phenomenon of a team's conflict management dynamics.

The current study was aimed to shed more light and extend the knowledge base on innovation in work teams, focusing on the dynamics of conflict management in intact high-technology work teams. We have examined the contribution of conflict handling patterns to innovation, postulating that the constructive-cooperative pattern of integrating would foster innovation. The study also sought to discern the antecedents of conflict management approaches promoting innovation, explicating the role of a team-climate characteristic—team-identity—and of task and relationship conflict. Such a combination of variables has not been previously tested in tandem in intact work teams. This research embraced a team-level perspective, treating each variable as indicating the team's predominant patterns of reality construal and its main behavioral tendencies (Kuhn & Poole, 2000).

Our findings corroborate previous research, indicating that the integrating pattern of a team's conflict management meaningfully predicted the outcome of team-innovation (Chen et al., 2005; Cornish et al., 2007; DeDreu, 2006; Gratton, 2005; Tjosvold, 2006). The current study lends further support to the contention that teams' proclivities with respect to conflict management play a pivotal role in their capacity to function in an innovative manner. The internal group dynamics frames the outcomes eventually attained by a work team (DeDreu, 2006; Hinds & Mortenson, 2005; Jehn & Bendersky, 2003). Furthermore, in accordance with our hypotheses, the patterns whereby team members handle internal disputes are nourished by the nature of the team motivational orientation as reflected in team-identity. In line with previous research (De Cremer, 2001; Desivilya & Eizen, 2005; Rusbult, 1993; Tyler & Blader, 2003), the results showed a significant and positive relationship between team-identity and the integrating pattern of a team's conflict management.

The findings also support the hypothesized mediating effect of the constructive-cooperative conflict management pattern (integrating) embraced by a team on the relationship between team-identity and team-innovation. Thus, the current study substantiates the argument that positive team-identity, developed by team members serves as a framework for organizing and coordinating behavior (Cunningham & Chelladurai, 2004; Haslam, 2001; Hinds & Mortenson, 2005; Wegge & Haslam, 2003). Positive team-identity actively motivates team members to share skills and resources with each other (Riketta & van Dick, 2005; Stevens & Campion, 1994), a tendency highly conducive to intra-team cooperative interactions which in turn promote innovative team outcomes.

Although prior research demonstrated direct links between the team-atmosphere (intra-team trust and team identification) and effective learning and innovation (Amabile et al., 2001; Standifer & Bluedorn, 2006; Swan & Scarbrough, 2005; West & Hirst, 2003; Zárraga & Bonache, 2005), our findings lend greater credence to the tenet

that constructive conflict management processes play a central role in producing such outcomes (Tjosvold, 2006).

The results of the current study also partially supported our hypothesis postulating that relationship conflict would mitigate the use of cooperative strategies whereas task conflict would foster the cooperative intra-team strategic choice. Akin to prior findings, relationship conflict was negatively associated with the integrating pattern of a team's conflict management pattern (Amabile et al., 2001; Rentsch & Zelno, 2003). The relationship between task conflict and integrating was only marginally significant, alluding to the positive link indicated in previous research (Amabile et al., 2001; DeDreu, 2006; Rentsch & Zelno, 2003). Divergent perceptions about work-related issues (task conflict) tend to be viewed as legitimate disagreements, which need to be handled in a cooperative manner so as to attain mutually acceptable solutions. Conversely, if team members interpret critical attitudes directed at them or discordant opinions of their counterparts as personal attacks (relationship conflict), they will be less likely to adopt constructive conflict management strategy. Such unfavorable attributions of team members' intentions discourage intra-team information exchange and increase the likelihood of power struggles. Indeed, our findings clearly demonstrated the obstructing force of relationship conflict on constructive conflict management in work teams.

Further research is needed to ascertain the potential positive contribution of task conflict to collaborative handling of internal discords in work teams. As suggested by Rentsch and Zelno (2003), constructive dynamics of handling intra-team conflicts is more likely to develop when team members hold congruent perceptions about the positive value of openness and constructive controversy in promoting the group's goals. In addition, cooperative tendencies can be related to team members' preferences of team-work in contrast with favoring individualized work arrangements. As indicated by Mohammed and Angell's (2004) findings, such a team orientation has moderated the destructive influence of relationship conflict in work teams.

In sum, the current study contributes to the body of knowledge on conflict management dynamics and innovation in work teams in several ways: (a) it underscores the centrality of a team's constructive conflict management pattern in promoting innovation both directly as well as by transporting the benevolent influence of a positive team-identity; (b) indicating the impediment of relationship conflict on cooperative conflict handling in work teams and hinting the positive role of task conflict on internal collaboration; (c) supplementing the research base derived from field studies—intact rather than ad hoc “experimental” work teams, and; (d) evaluating conflict management dynamics using a team-level analysis.

Notwithstanding the merits of this study, several limitations should also be noted. First, the cross-sectional feature of the study does not allow a conclusive interpretation of our findings' causal direction. Conceivably, the causal order could be reversed. Attaining innovative outcomes, as evaluated by the team leaders and fed back to the team could spur cooperative tendencies, while these in turn promoting a positive team-climate reflected in enhanced team-identity. Moreover, reciprocal causality cannot be ruled out. Future research needs to employ longitudinal designs in more controlled

settings (but studying intact teams) to further validate the causal inferences suggested in the current study (Moye & Langfred, 2004).

Second, the data were largely self-reported by the team members, hence potentially subject to bias. This aspect of the study does not differ from previous work (e.g., Tjosvold et al., 2003). It is noteworthy that recent research suggests that self-reported data are not as limited as was previously believed and that people often accurately perceive their social environment (Alper et al., 2000). In addition, in the current study, the likelihood of common method variance was low because the criterion variable (team-innovation) was obtained from a different source (team leader) (Podsakoff & Organ, 1986).

Future research should use other sources and methods for evaluating team outcomes such as innovation (Lovelace, Shapiro, & Weingart, 2001; Oldham & Cummings, 1996), as well as conflict management patterns, team-identity and types of conflicts. Qualitative research, using direct observations and in-depth interviews could yield additional insights concerning the intricacies of teams' internal dynamics, especially discerning the conceptual links among a team—climate, the types of conflict, the ways they are managed and their ramifications on creativity, production of usable knowledge and innovation (Amabile et al., 2001; Ayoko et al., 2002; Standifer & Bluedorn, 2006; Swan & Scarbrough, 2005).

Third, the extent of generalizability of the present findings should be examined in other cultural contexts and in more diverse teams (gender-mixed, heterogeneous teams in terms of ethnic origin). Previous studies have demonstrated that taking into account the role of other team-related variables such as individualism-collectivism, gender and other sources of diversity carry significant implications for team-identity processes and for team outcomes (Ayoko et al., 2002; Gundlach et al., 2006; Mohammed & Angell, 2004).

Finally, the present study provides some practical considerations. Developing effective ways of managing conflict may have a marked benevolent effect on teams' capacity to function in an innovative fashion. Organizational teams that tend to employ cooperative approaches to conflict, as suggested by our findings, presumably would be capable of generating new knowledge and novel outcomes. Accordingly, training, especially for teams evincing poor integrating conflict management skills, deems extremely important in fostering the use of a cooperative approach (Tjosvold, 2006).

The results indicate that team-identity serves as a key mechanism engendering cooperative motivation, conducive to adoption of constructive conflict management patterns. One of the major managerial practices to promote team-identity could be to increase team members' opportunity to participate in decision-making processes. Active participation in decision-making enhances involvement, commitment, and a sense of belonging, which lead to a higher level of team-identification (Tyler & Blader, 2003).

The findings have also showed the obstructing influence of relationship conflict on a team's tendency for constructive conflict management. To mitigate such destructive impact team leaders could encourage team meetings, allowing to voice members' individual concerns and thereby enhancing the congruency in attributions of other members' intentions (Rentsch & Zelno, 2003).

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