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Small Group Research 2011 42: 127 originally published online 13 December 2010
DOI: 10.1177/1046496410389194

The online version of this article can be found at:
http://sgr.sagepub.com/content/42/2/127

Published by:
SAGE
http://www.sagepublications.com

Small Group Research
42(2) 127–176

DOI: 10.1177/1046496410389194
http://sgr.sagepub.com

Conflict in Small Groups: The Meaning and Consequences of Process Conflict

Kristin J. Behfar[1], Elizabeth A. Mannix[2], Randall S. Peterson[3], and William M. Trochim[2]

Abstract

Through three studies of interacting small groups, we aimed to better understand the meaning and consequences of process conflict. Study 1 was an exploratory analysis of qualitative data that helped us to identify the unique dimensions of process conflict to more clearly distinguish it from task and relationship conflict. Study 2 used a broader sampling of participants to (a) demonstrate why process conflict has been difficult to discriminate from task conflict in many conflict scales, and (b) develop a two-factor Process Conflict Scale that effectively distinguishes process from task conflict. Study 3 used this new scale to examine the relationship between process conflict and group viability (group performance, satisfaction, and effective group process). The results showed that process conflict negatively affects group performance, member satisfaction, and group coordination.

Keywords

small group process, intragroup conflict, process conflict

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Intragroup conflict was initially categorized by theorists into two and then later into three types—task, relationship, and finally process conflict (Amason & Sapienza, 1997; Cosier & Rose, 1977; Guetzkow & Gyr, 1954; Jehn, 1995, 1997; Pelled, 1996; Pinkley, 1990; Wall & Nolan, 1986). However, this tripartite classification of conflict has often been reduced by researchers and scholars to a simple distinction between task and relationship conflict. Task conflict is an awareness of differences in viewpoints and opinions about the group's task, whereas relationship conflict is interpersonal animosity, tension, or annoyance among members (Amason & Sapienza, 1997; Guetzkow & Gyr, 1954; Jehn, 1995, 1997; Priem & Price, 1991; Wall & Nolan, 1986). This task versus person distinction presents a convenient contrast. For example, task conflict is often categorized as cognitive and relationship conflict is often categorized as affective. But several scholars have argued that such a contrast may be an oversimplification (Jehn, 1995, 1997; Jehn, Greer, Levine, & Szulanski, 2008; Korsgaard, Jeong, Mahony, & Pitariu, 2008; Mooney, Holahan, & Amason, 2007; Weingart, Bear, & Todorova, 2009). Why? First, all conflicts seem to contain some degree of emotionality, challenging the idea that relationship conflict alone captures the affective influence of conflict on teams (Jehn, 1995, 1997; Jehn et al., 2008). Second, the contrast excludes a clear specification of the consequences resulting from the more logistical aspects of teamwork. A cornerstone of theorizing about the effectiveness of groups is process coordination (Hackman, 1990; McGrath, 1964; Steiner, 1972; Wittenbaum, Vaughan, & Strasser, 1998), which is exactly the aspect of intragroup conflict that the process conflict construct was intended to capture (Jehn & Bendersky, 2003).

Process conflict, or "disagreements about assignments of duties and resources" (Jehn, 1997, p. 540), represents how well groups are managing two important types of coordination activities: decisions about how to manage the logistical accomplishment of the task (task strategy) and decisions about how to coordinate people in accomplishing the task (Benne & Sheats, 1948; Hackman & Morris, 1975; Homans, 1950; Kabanoff, 1991; Marks, Mathieu, & Zaccaro, 2001; McGrath, 1964). Groups often experience conflicts about task strategies, such as how to distribute work and how to handle logistical and temporal tensions involving scheduling and work flow (Blount & Janicik, 2000; Blount, Mannix, & Neale, 2004; Gevers, Rutte, & van Eerde, 2006; Janicik & Bartel, 2003; Wittenbaum et al., 1998). And groups often experience conflict about how to handle people who do not complete their assignments on time, free ride, or do not perform duties as expected or agreed. All of these behaviors can result in perceived inequities and process losses (Steiner, 1972). The most recent research investigating the consequences

of such conflicts has shown that they decrease group performance and member satisfaction and increase the amount of negative emotion that group members feel (Behfar, Peterson, Mannix, & Trochim, 2008; Greer & Jehn, 2007; Greer, Jehn, & Mannix, 2008; Jehn et al., 2008; Tekleab, Quigley, & Tesluk, 2009).

Despite the critical role that process conflict can play in group effectiveness, it has often been omitted from studies of intragroup conflict. One reason for this has been measurement problems, ultimately leading to conceptual issues. Process conflict has been difficult to distinguish empirically from task conflict and is often highly correlated with relationship conflict (see Jehn, 1997; Jehn & Mannix, 2001; Korsgaard et al., 2008). Across studies, for example, process and task conflict are commonly correlated between .44 and .90, and process and relationship conflict are correlated between .60 and .93 (e.g., Greer et al., 2008; Jehn & Chatman, 2000; Jehn & Mannix, 2001; Vodosek, 2007).

Another reason why process conflict receives less attention than it should is that the definitions used in research on task and process conflict are inconsistent. Studies that exclude process conflict tend to define task conflict as including decisions about group procedures and the distribution of resources (De Dreu, 2006; De Dreu & Weingart, 2003; Pelled, Eisenhardt, & Xin, 1999), whereas studies that include process conflict clearly separate such procedural decisions from the divergent thinking and debate associated with task conflict (Greer et al., 2008; Jehn, 1997; Karn, 2008; Kurtzberg & Mueller, 2005; Matsuo, 2006). In addition, the few studies that have examined process conflict have produced mixed results regarding the effects of such conflict on performance. For example, some studies have shown a negative influence of process conflict on team outcomes, such as decreased perceptions of creativity and innovativeness (Kurtzberg & Mueller, 2005; Matsuo, 2006), increased anger, animosity, negative attitudes toward the group (Greer & Jehn, 2007; Jehn, 1997; Jordan, Lawrence, & Troth, 2006; Passos & Caetano, 2005), and lower productivity (Jehn, Northcraft, & Neale, 1999). Yet other studies have shown a positive influence of process conflict on performance. There is evidence, for example, that process conflict can prompt group members to ask for help, clarify roles, revisit assumptions about the use of resources, set and plan for deadlines and timelines, and allocate work more effectively (e.g., Jehn & Bendersky, 2003; Jehn & Mannix, 2001; Karn, 2008; Tuckman, 1965). Finally, recent research has begun to reveal more complex relationships among process, task, and relationship conflict, suggesting that it may be important to consider when each type of conflict occurs and how (if) it is resolved. Greer et al. (2008) found, for example, that early process conflicts

created and/or increased dysfunctional task and relationship conflicts, but this cycle was broken when groups were able to resolve those early process conflicts (see also Behfar et al., 2008; Jehn, 1997; Jehn & Bendersky, 2003; Kuhn & Poole, 2000). Given the myriad effects of process conflict, seemingly positive and negative, short term and long term, more research is clearly needed to clarify its causes and consequences.

We present three studies to achieve this goal. Study 1 utilized an inductive and qualitative methodology (concept mapping) to compare participants' views of conflict with the traditional three-pronged typology. Based on the findings from Study 1, Studies 2, and 3 aimed to test the discriminant and predictive ability (respectively) of a new measure of intragroup process conflict.

Study 1: An Exploration of Conflict Types in Small Groups

The goal of Study 1 was to better understand the reasons why the distinctions among task, relationship, and process conflict are so often blurred. Why hasn't process conflict been distinguished more reliably from task conflict and relationship conflict by researchers? Jehn's original qualitative study, which identified process conflict as a distinct form of conflict, used participants' tree diagrams (1997) to demonstrate that conflict involving responsibilities, disruptions to team work, and scheduling issues were considered by participants to be distinct from both task and relationship conflict. This separation is both intuitive and important, given the demands for groups to manage their processes. In conjunction with Jehn's original work, more recent research has suggested another reason to better understand process conflict: unresolved process conflict can transform into more harmful conflict. Taken together, inconsistencies in the literature around process conflict point to a better need to understand the mechanisms through which process conflict affects teams.

Procedure and Measures

The research sample of team members consisted of the entire 1st year class of 252 MBA students at an U.S. east coast business school. Students were randomly assigned to 67 teams, each containing 4 or 5 members. Team members worked together intensely throughout the autumn term in all of their core courses, including management and organizations, statistics, and accounting. The average age of the students in the class was 29 years; about 27% of them were female; 5% were underrepresented minority students; and

34% were born outside the United States. Team members were entirely responsible for deciding how to get their work done, and they were jointly responsible for the outcome of the team (every member received the same grade for team projects, which accounted for at least 40% of a student's grade in each course).

To capture team conflict experiences, participants were asked the following open-ended question: "What types of disagreements or conflicts arose in your core team this term?" This question was purposely broad to elicit comments about any type of conflict. Answers to the question provided the basis for later quantitative analyses. The open-ended question was included as part of a longer paper-based survey administered at the end of the term. That survey contained questions asking the students to rate many aspects of their team experiences. Our final sample contained 225 students, for a response rate of 89.3%.

Data Analysis

The purpose of analyzing the qualitative responses was to determine whether (a) task, relationship, and process conflict are distinct, as experienced by individuals in actual teams (rather than imposed by the questions that researchers ask) and (b) participants' conflict experiences are consistent with current theorizing about conflict types. To maximize the potential for theory building, participants' responses were first analyzed using an inductive participant-based text analysis technique called concept mapping (Jackson & Trochim, 2002; Trochim, 1989). Then, the responses were examined again, and rated, by experts on intragroup conflict.

Concept mapping is an unrestricted sort-based methodology that combines exploratory statistical analysis with human judgment to produce clusters of similar thematic categories, using multidimensional scaling and cluster analysis (Novak, 1998; Trochim, 1989). We chose this method because the research objective was to explore how well participants' conflict experiences align with how scholars currently theorize about conflict constructs. In this way, we hoped to better understand why the constructs have been so highly correlated in previous studies. Therefore, a method that forced responses to fit any a priori category scheme (e.g., the traditional three-pronged typology) was judged to introduce an unacceptable level of researcher bias. The concept mapping method also produces a visual representation, or map, of similarities/differences among different examples of intragroup conflict, which allowed us to develop ideas about how various types of conflict might be interrelated in the minds of team members. This analysis was conducted at the individual level

of analysis. That is, we did not restrict inclusion of units from our analysis based on whether team members shared the perception of a type of conflict. We were interested in generating the widest variety of conflict experiences possible for this inductive stage of our research. In Studies 2 and 3, we addressed the intragroup agreement question.

Concept mapping analysis. Concept mapping can be viewed as a participatory content analysis that involves five steps: (a) determining the units of analysis, (b) sorting of those units by participants, (c) multidimensional scaling analysis of the sorting results, (d) cluster analysis (participants choose the final cluster solution), and (e) labeling by participants of the final cluster solution. A detailed description of concept mapping can be found in Jackson and Trochim (2002).

The respondents' answers to the open-ended question were typically in the form of a short paragraph. To create smaller and more detailed units of analysis, we separated every respondent's answers into single statements that each contained just one idea about conflict. This process was carried out for the entire data set, producing a total set of 235 statements about conflict (an average of 1or 2 statements per individual). These statements probably described the participants' most salient conflict experiences, rather than every single conflict that they had experienced (Geer, 1991).

The second step, a card sort analysis of the statements, was done by 20 MBA students enrolled in a full-time program at a different university with similar core course requirements. These students were reasonable proxies (Jackson & Trochim, 2002) for the original survey respondents because they took the same courses in their core curriculum and also worked in teams across all of their classes. The sorters were blind to the purpose of the study and worked individually to sort the 235 statements into piles of similar statements. There was no limit to the number of piles they could create. They were asked to give each pile a name. The only restriction was that they could not create a miscellaneous pile—if the sorters thought that a particular statement did not belong with any of the others, then they were instructed to leave it in its own pile. The sorters completed their sorting with no time limits (most of them took about an hour), in their location of choice, and were allowed to take breaks. Sorters were not allowed to talk to each other about the task until they had completed and returned their sorting materials. Each sorter was paid US$50.00 for his or her work.

The next step was to run a multidimensional scaling analysis on the sorting results to create a map of conceptual similarity among the statements, a map that visually displayed the similarity judgments of the sorters. A 235 × 235 binary square matrix (rows and columns represent conflict statements)

for each individual sorter was created, producing 20 total matrices. Cell values in each matrix represented whether or not (a 1 or 0) a pair of statements was sorted by a particular coder into the same pile. These individual matrices were then aggregated by adding together all 20 of the individual matrices. As such, the minimum value for any pair of statements was zero (no sorters put the two statements together) and the maximum value was 20 (all of the sorters put the statements together). From the aggregated matrices, multidimensional scaling created coordinate estimates (the x and y values for each point on a two-dimensional map of the distances among the statements) based on the aggregate sorts of the 20 sorters. A two-dimensional solution was chosen because it provides the most useful and interpretable foundation for a cluster analysis (Kruskal & Wish, 1978). Although the analysis could have been run with more dimensions, the goal of concept mapping is to produce a relational map of statements—rather than exploring and interpreting different dimensional solutions in the data (Kane & Trochim, 2007). A two-dimensional solution is customary because the key insights are derived by the relative distances among the points, and a two-dimensional solution provides greater ease of interpretation between relative distances (Jackson & Trochim, 2002; Kruskal & Wish, 1978; Trochim, 1989).

The final cluster analysis and labeling of solutions were performed jointly by two additional MBA students enrolled in the same program and university as the sorters. The researchers did not participate in this step to preserve the participant point of view. These two students worked together to make decisions about how many clusters captured the content of the data and what to name each cluster. They were blind to the purpose of this analysis—they did not know that their final solution would be compared to an academic framework. They made their final decisions by looking at the output of the hierarchical agglomerative cluster analysis (the cluster dendogram). This output showed the merging of statements into clusters, beginning with each statement in its own cluster and ending with all statements in the same cluster. They discussed whether or not the contents of clusters merging at each solution were conceptually similar enough to merge. The researchers did not facilitate or participate in such discussions. The two students' decision about the final number of conceptual clusters, as well as the labels for those clusters, represented a final solution for the data. The results, therefore, reflect how the participants themselves interpreted and organized conflict experiences.

Expert data rating. To evaluate how well the participant-driven results from our qualitative concept mapping analysis align with the judgment of academic experts, we recruited a group of 24 faculty members and PhD students in management, social psychology, and industrial labor and relations

departments at several universities to rate a randomly chosen subset of the 235 conflict statements. These experts, all of whom generously donated their time to our project, thus faced a manageable task, one that typically required only about 30 min. The experts were given the definitions for each type of conflict commonly used in the literature (Jehn, 1997) even though they were usually familiar with these definitions already. They were then asked to evaluate each statement three times, using a rating scale that ranged from 1 (*not at all related*) to 9 (*completely related*), to indicate how much the statement reflected task, relationship, and process conflict (see Hinkin & Tracey, 1999). To avoid forcing the raters to make distinctions between conflicts, each subset of statements was randomized and placed on three different pages: one page for the relationship conflict ratings, one page for the task conflict ratings, and one page for the process conflict ratings. The interrater reliability of these ratings was assessed using Cronbach's alpha, yielding results of $\alpha = .84$ for task conflict, $\alpha = .79$ for relationship conflict, and $\alpha = .75$ for process conflict. Thus the ratings were made reliably.

Study 1 Results

Concept mapping Analysis. The concept mapping analysis produced seven clusters, which are presented in Figure 1. The clusters were (a) overt/dominant individual behavior causing group friction, (b) subtle/passive individual behavior causing group friction, (c) equality of workload distribution/equality of effort, (d) time management and scheduling expectations, (e) lack of communication in a respectful or effective manner, (f) different approach and methodology in solving issues, and (g) difference of ideas and difference in opinions. These clusters represented the participant-driven categorization of their conflict experiences. In this initial, inductive stage of our research, we are not proposing these seven categories as a new conflict coding scheme. Instead, we view the spatial relationships among the clusters as a useful way to demonstrate similarities and dissimilarities between participant and expert classifications of conflict.

When interpreting these results, keep in mind that each conflict statement generated by the participants is a point within a cluster on the map. Clusters that are farther apart on the map contain, in general, statements that were sorted together less often than those that are closer together. It is also important to note that in concept mapping, the position of the clusters on the map (i.e., top, bottom, right, or left) is not meaningful; only the distances (spatial relationships) among them are interpretable. The proximity of the clusters represents how similar the statements in them were judged to be. For example,

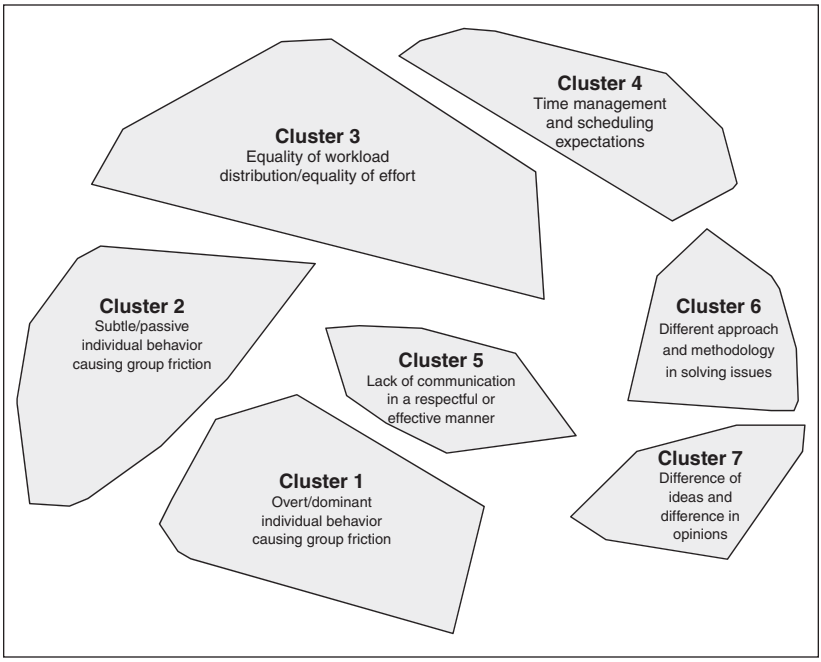

Figure 1. Participant generated conflict classification based on the concept mapping analysis done in for Study 1

Cluster 6 (different approach and methodology in solving issues) and Cluster 7 (difference of ideas and difference in opinions) are close together on the map, indicating that statements in those clusters were often sorted together and thus judged by our participants to be conceptually similar. Finally, the shape and size of a cluster generally is not interpretable. For example, the size of a cluster does not represent the number of statements in that cluster. Although larger clusters do signify that there is more distance among the statements contained within them, this is not a heuristic that should be used for interpreting the results. Conclusions should only be drawn from the content of the clusters and their proximity to each other. Representative statements from each cluster are presented in Table 1. Perhaps most significantly, the qualitative data also provided useful material for generating new scale items, which were later used in Study 2.

Expert rating analysis. We compared the average expert ratings of each statement for task, relationship, and process conflict within each cluster. The results are summarized in Table 2. One-way ANOVA tests were used to

Table 1. Examples of Conflict Statements in Each Cluster as Classified by MBA Participants in Study 1

Cluster name	Example statements
Cluster 1	
Overt/dominant individual behavior causing group friction	• "Dominant personality not listening to others" • "One person always having to be right. This person sometimes oppressive" • "One member cannot listen to others' ideas and worse, wrote up the final case without incorporating others' ideas. Too self-centered" • "Inability of some people to manage inclusion" • "The one individual thought they were correct and our views were not appropriate"
Cluster 2	
Subtle/passive individual behavior causing group friction	• "Youngest member of the team did not have enough maturity to discuss ideas" • "Some people were too informal—excuses were stress, personal problems, or whatever" • "One member was very uncomfortable expressing themselves and so channeled that frustration into argumentative behavior" • "Expressing dissatisfaction with the team to people outside the team"
Cluster 3	
Equality of workload distribution/equality of effort	• "Some difficulty in getting people to take ownership. Conflict about commitment" • "There were clear conflicts regarding quality and efforts of our work" • "Conflict on work allocation. Workload was never evenly distributed" • "Conflicts regarding teams members showing up late or not showing up at all"

(continued)

Table 1. (continued)

Cluster name	Example statements
	• "Not all members felt that everyone was always mentally there" • "There was some conflict on perceived amount of work done by each member"
Cluster 4	
Time management and scheduling expectations	• "We often had vastly different ideas about timing and amount of work needed" • "Conflict on length of time to spend on projects. Some were satisfied at a point and others wanted to go on for sometimes 6 more hours more" • "Some of the members are too busy to have enough meetings" • "Conflict about punctuality" • "Timelines not met"
Cluster 5	
Lack of communication in a respectful or effective manner	• "Emotional attachment to ideas, even wording on papers" • "Disagree with ideas, but then not offer alternative. This can be frustrating" • "Interruptions of ideas" • "The majority of the time was spent on determining how to convince one or more members to the ideas" • "Some cultural issues regarding interpersonal dealings, (i.e., the 'American' way of using conflict to get to a solution is more difficult for some cultures)"
Cluster 6	
Different approach and methodology in solving issues	• "Opinions about how to deal with cases, how to address issues, define issues, solutions and so on" • "Conflict on the procedure of discussion" • "Conflict about what constituted an analysis versus what was simply a retelling of the case"

(continued)

Table 1. (continued)

Cluster name	Example statements
	• "Conflict mainly about personal writing styles" • "Conflict on best way of solving a problem"
Cluster 7 Difference of ideas and difference in opinions	• "Differences of opinion" • "Conflicts in opinions and different perspectives" • "Disagreement over solutions to cases" • "There were differences of opinion with regard to how to structure our arguments" • "Difference in opinions concerning the analysis of the case"

assess whether mean ratings for each of the conflict types within each cluster were significantly different from each other. Of the seven clusters, four contained statements that were rated by the experts as predominantly representing one type of conflict. Cluster 1 (overt/dominant individual behavior causing group friction) and Cluster 2 (subtle/passive individual behavior causing group friction) were both classified by our raters as relationship conflict. Cluster 4 (time management and scheduling expectations) was classified as process conflict. Finally, Cluster 7 (difference of ideas and difference in opinions) was classified as task conflict.

The remaining three clusters, however, contained statements that were not considered to be distinctly different from one another by either the participants or the expert raters. For example, the experts did not distinguish between task and process conflict for statements in Cluster 6 (different approach and methodology in solving issues). This problem was also apparent in the close proximity of this cluster to Cluster 7 (difference of ideas and difference in opinions). The proximity of these clusters indicates that the participants often sorted these statements together. So, a generalized difference of opinion about the work itself (task conflict) may not be easily distinguished from differences in opinion about how to do the work, which is theoretically a process conflict issue.

The experts, as well as the participants, also had trouble classifying the statements in Cluster 5 (lack of communication in a respectful or effective manner"). There, the overall ANOVA was nonsignificant, indicating that the

Table 2. Bonferroni Comparisons for Expert Ratings of Conflict-Type for Each Participant-Generated Cluster

Participant-generated cluster (cluster names from Figure 1)	Overall cluster average for each conflict type			Bonferroni comparisons between conflict types	Mean rating difference	*SE*	95%CI	
	T	R	P				Lower bound	Upper bound
Cluster 1								
Overt/dominant individual behavior causing group friction				Task vs. process	−1.08	0.68	−2.76	0.61
				Relationship vs. process	2.28*	0.68	0.59	3.96
$F(2, 59) = 12.48$, $p = .00$	3.05	6.40	4.13	Task vs. relationship	−3.35*	0.68	−5.03	−1.66
Cluster 2								
Subtle/passive individual behavior causing group friction				Task vs. process	−1.53*	0.58	−2.95	−0.11
				Relationship vs. process	1.87*	0.58	0.45	3.29
$F(2, 92) = 17.15$, $p = .00$	2.95	6.35	4.48	Task vs. relationship	−3.40*	0.58	−4.82	−1.98
Cluster 3								
Equality of workload distribution/ equality of effort				Task vs. process	−4.91*	0.80	−6.86	−2.97
				Relationship vs. process	−3.60	0.80	−5.54	−1.66
$F(2, 104) = 20.32$, $p = .00$	2.87	4.19	6.89	Task vs. relationship	−1.31	0.80	−3.26	0.63
Cluster 4								
Time management and scheduling expectations				Task vs. process	−5.56*	0.43	−6.61	−4.51
				Relationship vs. process	−5.98*	0.43	−7.03	−4.93
$F(2, 74) = 120.48$, $p = .00$	2.66	2.24	8.22	Task vs. relationship	0.42	0.43	−6.61	−4.51
Cluster 5								
Lack of communication in a respectful or effective manner				Task vs. process	−1.97	1.75	−6.32	2.39
				Relationship vs. process	−0.84	1.75	−5.20	3.51
$F(2, 47) = .64$, $p = .53$	4.44	5.56	4.44	Task vs. relationship	−1.13	1.75	−5.48	3.23

(continued)

Table 2. (continued)

Participant-generated cluster (cluster names from Figure 1)	Overall cluster average for each conflict type			Bonferroni comparisons between conflict types	Mean rating difference	*SE*	95%CI	
	T	R	P				Lower bound	Upper bound
Cluster 6								
Different approach and methodology in solving issues				Task vs. process	0.640	0.48	–0.53	1.82
				Relationship vs. process	–3.17*	0.48	–4.34	–2.00
$F(2, 113) = 36.01$, $p = .00$	5.84	2.03	5.20	Task vs. relationship	3.82*	0.48	2.64	4.98
Cluster 7								
Difference of ideas and difference in opinions				Task vs. process	5.81*	0.25	5.22	6.41
				Relationship vs. process	0.110	0.25	–0.48	0.71
$F(2, 209) = 365.28$, $p = .00$	8.26	2.56	2.45	Task vs. relationship	5.70*	0.25	5.11	6.30

Note: T = task conflict; R = relationship conflict, P= process conflict. * indicates that the mean difference is significant at the .05 level.

experts could not clearly distinguish among the three types of conflict in that cluster. Participants also had a difficult time classifying these statements, as evidenced by its position in the middle of the map; in concept mapping, statements in the middle of a map are those that were sorted most randomly, thereby pulling them to the middle (Kane & Trochim, 2007). A close examination of the content in this cluster reminded us of recent research suggesting that conflict types can easily transform and intermingle when they are emotionally charged (Greer et al., 2008). This highlights the need to better understand the underlying structure of process conflict. One statement in this cluster, for example, described the frustration of having to spend all of a team's time trying to convince one member of the validity of the team's decision. In this case, there was tension about the process (how to spend time and coordinate member's contributions), the task (the individual's opinion versus the group opinion), and feelings among members (the frustration generated by an individual's behavior).

Finally, this blurring among conflict types was also reflected in Cluster 3 (equality of workload distribution/equality of effort). Although the expert ratings were higher for process conflict in this cluster, they did not differ

significantly from their ratings for relationship conflict. This lack of distinction was characterized by statements about free riding, lack of follow through, and low-quality output from members, all of which caused frustration for the team. Process conflict, whether it was about how to spend team time/resources or about free riding/contributions, seemed to invoke perceptions of injustice, which often produce feelings of frustration and annoyance (Colquitt, Conlon, Wesson, Porter, & Ng, 2002; Greenberg & Folger, 1983; Korsgaard, Schweiger, & Sapienza, 1995; Tyler, 1989). So, although the statements in this cluster clearly represented challenges involving the process of coordinating the group, it is understandable how the unfairness and frustration that such conflict provoke could also be interpreted as relationship conflict, because it involves the people-side of resource coordination.

Study 1 Discussion

The findings from this initial study provided important insights into participants' views of conflict. Clearly, there was reasonable consistency with Jehn's original three-pronged typology—participants spontaneously distinguished among task, relationship, and process conflict, as defined by experts on intragroup conflict. Out of the seven clusters generated, four were rated by experts in ways that seemed to match existing definitions of interpersonal friction (relationship conflict), differences of opinion about the work itself (task conflict), or conflict about coordinating responsibilities (process conflict; Jehn, 1995, 1997).

Three clusters that were not easy to classify may explain why process conflict has been difficult to distinguish from task and relationship conflict. The results of our concept mapping analysis and the expert ratings both help to explain why. First, expert ratings of statements in Cluster 6 (different approach in methodology and solving issues) did not significantly distinguish between process and task conflict. The participants also saw few conceptual distinctions between the content of this cluster and that of Cluster 7 (difference of ideas and difference in opinions) as indicated by the close proximity of these clusters on the concept map. However, the other two clusters related to process conflict, namely, Cluster 3 (equality of workload/effort) and Cluster 4 (time management/scheduling) were further apart on the map and rated as significantly different from task conflict by experts. The Process Conflict Scale most often cited in intragroup conflict studies is a three-item scale (Shah & Jehn, 1993) that asks respondents (a) "To what extent did you disagree about the way to do things in your work group?" (b) "How much disagreement was there about procedures in your work group?" and (c) "How

frequently were there disagreements about who should do what in your work group?" Our concept mapping results and expert ratings suggest that these items tap into the least distinctive aspect of process conflict (see Cluster 6, different approach in methodology and solving issues). A widely used Task Conflict Scale (Jehn, 1995) also asks respondents about more generalized differences of opinion: (a) "How much conflict about the work you do is there in your work unit?" (b) "To what extent are there differences of opinion in your work unit?" (c) "How often do people in your work unit disagree about opinions regarding the work being done?" and (d) "How frequently are there conflicts about ideas in your work unit?" As demonstrated by the results of Study 1, there was not a clear distinction between conflict about the process of doing work and conflict involving ideas about the work itself. This suggests that the elements of process conflict that are actually distinct from task conflict may not be captured in a Process Conflict Scale commonly used in the literature (e.g., Shah & Jehn, 1993). Our findings suggest that the discriminant validity of this scale could be improved by also reflecting the categories contained in the two (more unique) process conflict clusters, namely, Cluster 3 (equality of workload/effort) and Cluster 4 (time management/scheduling).

These results also help to explain why process, task, and relationship conflict have been highly correlated in past research (De Dreu & Weingart, 2003; Jehn & Mannix, 2001; Simons & Peterson, 2000). This is perhaps best exemplified by the difficulty that both participants and experts had in clearly classifying statements in the second nondistinct cluster, namely, Cluster 5 (lack of communication in a respectful or effective manner). The statements in this cluster described emotional attachment to ideas, having to take a group break because of emotional outbursts and spending too much group time trying to convince dissenting members to change their opinions. All of these experiences are examples of frustrating disruptions in the process of task discussion. This cluster represents examples of a comingling in practice of all three types of conflict. However, in both our study and in Jehn's original qualitative study (1997), participants did clearly create distinct categories of relationship conflict. In our study, these categories were represented by Cluster 1 (overt/dominant individual behavior) and Cluster 2 (subtle/passive individual behavior). In Jehn's (1997) article, tree diagram labels such as *don't like the person*, *bad attitudes*, and *petty bullshit* mirror the same ideas contained in these relationship conflict clusters. Previous research has also found that team members are able to make this distinction (Weingart, 1992). So, why do team members not only view relationship conflict as distinct from task and process

conflict but also respond to scales measuring these constructs in ways that produce high correlations among them?

We believe that this happens for at least two reasons. First, our study suggests that the construct validity of the process scale should be improved to more clearly separate two sorts of process-related conflicts, namely, conflicts about logistical/timing coordination and conflicts about inconsistent member contributions. And both of these must also be separated more clearly from task conflict. Second, and equally important, it may be that perceptions of unfairness caused by the unique aspects of process conflict (e.g., wasting time, truancy, free riding) naturally transform into interpersonal animosity and affect the emotional nature of team discussion (e.g., Behfar et al., 2008; Greer & Jehn, 2007). That is, interpersonal dislike or irritation may result from interactions, disruptions, or perceived unfairness caused by other members' behavior in deciding how to coordinate team resources or make final decisions. This is consistent with recent research showing that a group's history can have a large influence on how group conflicts are perceived (Bendersky & Hays, IN PRESS; Greer et al., 2008). Indeed, Jehn's (1997) original propositions included the idea that the context around a conflict, such as the conflict's intensity, resolvability, and importance, were important predictors of the conflict's effects and that teams whose norms kept task discussions from getting personal were the most effective teams (Jehn et al., 2008). For example, the degree to which teams can engage in genuine and respectful task debate is contingent on their ability to separate the people from the problem, eliminating emotion-provoking conflict about their process (Behfar et al., 2008; Bies, 1987; Colquitt et al., 2002; DeChurch & Marks, 2001; De Dreu, 1997; De Dreu, 2006; De Dreu & VanVianen, 2001; Greer & Jehn, 2007; Tekleab et al., 2009). Alternatively, a team with a history of status disagreements may perceive any type of task conflict as a form of disrespect—team members cannot separate in their minds getting down to work versus disliking other members (Bendersky & Hayes, IN PRESS; Simons & Peterson, 2000). This tendency toward experiencing multiple conflicts simultaneously, or even toward conflict spirals—and the demonstration that process conflict is often the initiating cause of such spirals (cf. Arrow, McGrath, & Berdahl, 2000; Lindsley, Brass, & Thomas, 1995; Peterson & Behfar, 2003)—makes it particularly important that conflict scale items reflect the mechanisms that drive predictions about conflict.

Our next step was thus to more cleanly measure the differences among types of process coordination conflicts, task debate, and interpersonal animosity. In Study 2, we built on the results from Study 1 to revise the current

intragroup conflict scale items from the Jehn (1995) Task Conflict Scale and the Shah and Jehn (1993) Process Conflict Scale, and to determine how these revisions might change the factor structure underlying the traditional three-pronged conflict typology. Specifically, Study 1 demonstrated that there are likely to be distinct dimensions of process conflict that are not currently included in existing scales, as represented by the coordination conflict in our Cluster 3 (equality of workload distribution/equality of effort) and Cluster 4 (time management and scheduling expectations). In Study 2, we used structured interviews, two large pilot samples, and two additional samples to conduct scale development. This process included (a) generating scale content, (b) pilot testing and refining original scale items, (c) determining the scale's internal consistency, and (d) and demonstrating the scale's validity (DeVellis, 1991).

Study 2: Process Conflict Measurement

The goal of Study 2 was to revise and/or generate scale items to capture the more unique aspects of intragroup process conflict, as suggested by the data from Study 1. We started with the widely used Task, Relationship, and Process Conflict Scales developed by Jehn and colleagues (Jehn, 1995, 1997; Pearson, Ensley, & Amazon, 2002; Shah & Jehn, 1993). After examining the content of the concept map clusters from Study 1, we generated five revised items for task and relationship conflict and 10 new items (available from the authors) for process conflict.

Revisions to the existing Task Conflict Scale reflected the extent to which group members debate diverging ideas, discuss pros and cons of alternatives, and consider the merits of different opinions about their task. These revisions were consistent with the notion that task conflict should reflect ongoing discussions of alternative ideas about the group's task (e.g., Guetzkow & Gyr, 1954; Jehn, 1995, 1997; McGrath, 1991). Task conflict has been conceptualized as conflict about ends and process conflict has been conceptualized as conflict about means, but we wanted to clarify that task conflict can also involve debate and divergent thinking about task work. Strong norms establishing such activities have been associated with better decision making and utilization of expertise (e.g., DeChurch & Marks, 2001; Jehn, 1995, 1997; Nemeth, Brown, & Rogers, 2001; Nemeth, Connell, Rogers, & Brown, 2001). So, a group with low task conflict is not discussing different members' viewpoints on a regular basis, whereas a group with high task conflict consistently makes this part of its work.

For process conflict, we generated 10 items about conflict caused by (a) time management, (b) the distribution of work and responsibility, and (c) how the team decided to approach its work. These items reflect the concept mapping from Study 1 and are also conceptually consistent with the qualitative findings from Jehn's original (1997) study. For relationship conflict, we revised five items involving both overt and perceived emotional disagreement and interaction. The goal was to capture the degree to which behaviors such as treating people badly, getting personal, and incompatible personalities were experienced in the team.

Pilot Testing

Item refinement. We first approached three expert academic colleagues at other universities; all of them were doing intragroup conflict research themselves. We asked them to examine our questionnaire items for clarity and relevance to task, relationship, and process conflict. We then conducted a pilot test of these items, along with items from Jehn's (1995) task and relationship conflict scales and Shah and Jehn's (1993) process conflict scale. A questionnaire containing all of this material was administered to 256 management graduate students, all members of four-person teams (64 of them) that had worked over a 10-week period in several core courses during the 1st year of a program at an east coast university. (This sample was similar to the one used in Study 1.) The paper-and-pencil, anonymous questionnaire pilot survey was administered in weeks 5 and 9 of the core management and organizations course, after all of the groups had completed and submitted two case analyses. Items were randomly ordered on these questionnaires. The students were given 1 week to complete the questionnaires. They were asked to rate each item on a Likert-type scale ranging from 1 (*none/not at all*) to 9 (*always/totally*), keeping in mind how often the type of conflict described by the item occurred in their group. One hundred and seventy-eight respondents completed the questionnaire, for a response rate of 78%. To assess the psychometric properties of the scale at the group level, we required at least half the members of each team to respond at both time periods. Forty-three teams were thus included in the final analysis. The responses of participants from included and excluded teams did not differ.

To analyze the data, we examined the interitem correlations at both time periods, conducted exploratory factor analyses, and held structured interviews with 10 original survey respondents and the same three experts in group research. Confirming the results of Study 1, the results demonstrate

two reasons why existing conflict constructs have been so highly correlated and nondiscriminant in the past: (a) semantic nuances of certain words confound item clarity, and (b) participants experienced confusion regarding the underlying reason, or source, of the conflict described in some of the items.

Semantic nuances confounding item clarity. Our structured interviews revealed important insights about how several words in the questionnaire items, words that are also used in the current conflict scales, might cause problems in measuring intragroup conflict constructs. First, respondents reacted strongly to the word "conflict." They believed that the word has strong negative connotations, and so they preferred more subtle words, such as "tension" or "disagreements," to describe conflict. The word "conflict" created inconsistencies in the way participants rated items and responded to the anchors on the Likert-type scales. For example, respondents rated items containing the word "conflict" lower (e.g., indicating that the experiences described were less frequent) than items containing the word "disagreements."

Second, in the process conflict items, words such as "delegation," "distribution," and "responsibility" uniformly invoked judgments about fairness regarding how task assignments were made and how well members upheld their responsibilities. These questions tended to be highly correlated with relationship conflict because high levels of conflict about responsibility (and fairness) were associated with social loafing and thus with anger and increased tension among members (Greenberg & Folger, 1983).

Finally, the words "method" and "approach" in the process conflict items were considered difficult to interpret and thus the items containing these words were closely correlated with task conflict. Respondents in our interviews told us they were unsure if the word "method" in the process conflict items referred to differences in opinions about process-related activities such as deciding on an editing process, or if the word referred to differences about how to go about discussing work (e.g., which ideas to include). Similarly, many participants equated the word "approach" with differences about how to produce a case solution (i.e., task conflict). Some participants, however, equated the word "approach" with more procedural issues, such as dividing work.

Confusion regarding the underlying reason for conflict. Some of the process conflict items in our questionnaire did not clearly specify the source of conflict, and this ultimately caused considerable variation in how these items were interpreted. For example, the item "To what extent do your team's members disagree about how much time to spend in meetings" was problematic because tension arose from differences in opinion about how much time

was necessary or optimal for the team to spend in meetings to accomplish its task, rather than from more routine frustrations that members might have about spending time in meetings. Our revised item was intended to capture when time-related expectations for meeting length created tension. For example, this might occur when some members prefer to spend a lot of discussion time in meetings, whereas other members prefer to only use meetings to coordinate activities. Because such items were meant to measure when such differences of opinion caused problems for the team (versus when they did not), they were appropriately revised to identify a specific source of tension. In another item, rather than asking if team members arrive late for meetings, our revised item reflected the degree to which there were ongoing problems caused by members arriving late to meetings.

Some of our relationship conflict items did not improve the divergent and convergent validity of relationship conflict when compared to Jehn's original items. Our revised items correlated with the other intragroup conflict constructs more strongly than did Jehn's original items, and our revised items also did not separate as clearly as Jehn's items did when submitted to a factor analysis. Jehn's original four items clearly converged with each other (the lowest interitem correlation was .70) and diverged from the other items (the maximum between construct item correlation was .42) in a multitrait, multimethod matrix (Campbell & Fiske, 1959); had higher internal consistency as assessed by Cronbach's alpha (Cronbach, 1951); and had within-construct factor loadings above .60, with between-construct cross-loadings less than .40. So, Jehn's original relationship conflict items were retained.

As a result of our review, problematic questionnaire items were revised and tested again a year later in a sample of 264 people (66 four-person MBA teams) at the same U.S. east coast university, working under the same circumstances as before. The new items are reported in Table 3. One hundred and eighty-two respondents completed a new questionnaire that included the revised items, as well as Jehn's (1995) intragroup conflict items, with a response rate of 69%. Again, we required at least half the members of each team to respond to include their responses in our analyses. As a result, 46 teams were included in the analyses.

The next step in assessing our revised items was to assess scale reliability and validity (DeVellis, 1991). Whereas intragroup conflict is a group-level construct, the perceptions of team conflict are held by individuals in the team with similar team experiences. As such, we first conducted scale reliability and validity analyses at the individual level and then aggregated to the group level of analysis to test our hypotheses.

Table 3. Exploratory Factor Analysis of Pilot Test Conflict Items From Study 2.

	Component			
	1	2	3	4
	Process-coordination conflict			
Scale items	Relationship conflict	Task conflict	Logistical conflict	Contribution conflict
How much friction is there among members of your team?	**.83**	.08	.19	.20
How much are personality conflicts evident in your team?	**.86**	.02	.07	.17
How much tension is there among members of your team?	**.84**	.03	.17	.29
How much emotional conflict is there among members of your team?	**.83**	–.02	.24	.25
To what extent does your team argue the pros and cons of different opinions?	.04	**.87**	–.05	.09
How often do your team members discuss evidence for alternative viewpoints?	–.01	**.82**	–.01	.12
How frequently do members of your team engage in debate about different opinions or ideas?	.05	**.89**	–.06	.05
How frequently do your team members disagree about the optimal amount of time to spend on different parts of teamwork?	.17	.03	**.84**	.16
How frequently do your team members disagree about the optimal amount of time to spend in meetings?	.15	–.08/	**.90**	.16

(continued)

Table 3. (continued)

	Component			
	1	2	3	4
	Process-coordination conflict			
How often do members of your team disagree about who should do what?	.18	–.09	**.79**	.07
How often is there tension in your team caused by member(s) not performing as well as expected?	.42	.08	.09	**.82**
To what extent is there tension in your team caused by member(s) not completing their assignment(s) on time?	.22	.18	.21	**.87**
How much tension is there in your team caused by member(s) arriving late to team meetings?	.25	.10	.16	**.90**

Dimensionality

Because the results of Study 1 indicated distinct dimensions of process conflict, our next step was to determine the number of factors underlying the revised set of conflict items. Exploratory factor analysis at this stage of scale construction is appropriate to demonstrate how well items load across different factors, not just on their hypothesized factors (Gorsuch, 1997; Hurley et al., 1997). A principal components factor analysis with oblique rotation was used. Eigen values greater than 1.00 were taken as evidence that factors existed. An oblique rotation method was chosen because of the considerable theoretical and empirical evidence that different intragroup conflict constructs are correlated with one another (see De Dreu & Weingart, 2003; Korsgaard et al., 2008; Simons & Peterson, 2000). As such, oblique rotation produces a more accurate representation of the simple structure in the data (Fabrigar, Wegener, MacCallum, & Strahan, 1999; Gorsuch, 1997). The results of the analyses produced a four-factor structure, as shown in Table 3. Items

that demonstrated within-construct factor loadings above .60 and between-construct cross-loadings below were selected .40 (see Hair, Anderson, Tatham, & Black, 1998).

The four factors accounted for 79.8% of the variance. Factor 1 was consistent with relationship conflict (interpersonal animosity and tension among members) and Factor 2 was consistent with task conflict (discussing and debating opinions about the content of the work). Factors 3 and 4 represented the distinction (suggested by Study 1) between two aspects of process conflict, namely, coordinating group strategy and experiencing logistical issues, such as how to spend time and resources, and coordinating individual members' contributions. For example, Factor 3 items involved conflicts over how to best coordinate the resource side of group work, including issues of timing and work distribution and the creation of task strategies (Blount & Janicik, 2000; Blount et al., 2004; Hackman, 1990; Janicik & Bartel, 2003; Kabanoff, 1985). Factor 4 items represented conflict about coordinating the people side of group work, including member contributions (or lack thereof), and disruptive behaviors (e.g., lack of preparation or free riding) that cause process losses (Benne & Sheats, 1948; Hackman & Morris, 1975; McGrath, 1964; Steiner, 1972). So, Factor 3 was labeled logistical conflict, defined as conflict about how to most effectively organize and utilize group resources to accomplish a task. Factor 4 was labeled contribution conflict, defined as conflict about member contributions (or lack thereof) that disrupts group process. Both logistical and contribution conflict are related to process coordination, yet they represent distinct aspects of process conflict, originally defined as "disagreements about assignments of duties and resources" (Jehn, 1997, p. 540).

Internal Consistency

Cronbach's alpha was calculated for each of the four subscales: relationship conflict, task conflict, logistical conflict, and contribution conflict. Each subscale demonstrated good reliability: $\alpha = .91$ for relationship conflict; $\alpha = .83$ for task conflict, $\alpha = .84$ for logistical conflict; $\alpha = .92$ for contribution conflict. The item-total correlations for each subscale were above .62, demonstrating an appropriately strong relationship between the items and their respective subscales. These results suggested that no deletions from the scales were necessary.

To assess the appropriateness of aggregating individual responses to the team level, the within-group agreement index, r_{wg} (James, Demaree, & Wolf, 1984), and two intraclass correlation coefficients, ICC(1) and ICC(2), were calculated. The r_{wg} index ranges from 0 to 1, where values closer to 1 signify

greater within-group agreement. Klein et al. (2000) recommend a value of $r_{wg} > .7$ to justify aggregating to the group level. ICC(1) is also used to determine if aggregation is warranted, and typically has much lower values (a value > .12 is generally considered acceptable (James, 1982). ICC(2) is a measure of the reliability of each group member's rating compared to the group unit mean (ideal values > .7). Results for the four subscales, as shown in Table 4, met the criteria for aggregation. (James et al., 1984; Klein et al., 2000; and James, 1982)

Testing refined items in additional samples. To examine and further verify our results in larger and more diverse samples, all of the items were tested in two new and different populations. We administered a questionnaire that included the revised task and process coordination conflict items, in addition to the original task, process, and relationship conflict items developed by Jehn and her colleagues (Jehn, 1995, 1997), to samples drawn from both populations. Each sample consisted of full-time, working managers enrolled in a part-time, executive MBA program at a large university (one in Europe and the other in the United States). The questionnaire was administered after approximately 2 months of group work in both samples. As before, all items were rated on 9-point Likert-type scales.

Sample 1. Sample 1 consisted of 299 students at a large U.S. west coast business school. These students had been working together in groups for about 2 months. Each of the 51 groups contained 4 to 6 persons. Group membership was determined by the geographical proximity of members' residences. About 91% of the students who were asked to participate agreed to do so. The average age of these students was 30 years, about 30% of them were female, and they had from 4 to 10 years of managerial experience.

Sample 2. Sample 2 consisted of 586 students at a large, European business school. These students had also been working together in groups for about 2 months. Each of the 94 groups contained 5 to 7 persons. Group membership was guided by the principle of maximizing diversity in functional expertise and geographic origin. About 97% of the students who were asked to participate agreed to do so. The average age of these students was 32 years, about 24% of them were female, and they had 4 to 20 years of managerial experience. About 36% of the students were from countries outside of the European Union; 29 nationalities were represented in all.

Dimensionality. We performed confirmatory factor analysis (CFA) testing our four-factor model (including relationship, task, logistical, and contribution conflict items as separate factors) compared to a one-factor (all the items together) and three-factor model (including relationship and task conflict as separate factors, with the two process coordination conflicts considered as one factor). In both samples (see Table 5), the CFA for our 4-factor model

Table 4. Descriptive Statistics for Study 2 Samples

							Group level interscale correlations					
	M	*SD*	α	r_{wg}	ICC(1)	ICC(2)	1	2	3	4	5	6
Study 2, Pilot test sample												
1. Task conflict (Jehn, 1995)	4.75	1.34	.76	.84	.22	.45	1					
2. Relationship conflict (Jehn, 1995)	3.13	1.45	.96	.74	.62	.83	.60*	1				
3. Process conflict (Shah & Jehn, 1993)	3.18	1.39	.74	.83	.25	.49	.62*	.68*	1			
4. Task conflict (revised)	6.72	.83	.92	.95	.55	.79	.08	.05	.04	1		
5. Logistical conflict	3.43	1.40	.92	.78	.64	.84	.60*	.60*	.76*	.03	1	
6. Contribution conflict	2.54	1.64	.92	.85	.78	.91	.28*	.49*	.42*	.02	.37*	1
Study 2, Sample 1												
1. Task conflict (Jehn, 1995)	2.71	.48	.64	.89	.22	.59	1					
2. Relationship conflict (Jehn, 1995)	1.51	.23	.76	.87	.31	.70	.07	1				
3. Process conflict (Shah & Jehn, 1993)	2.40	.36	.57	.89	.09	.33	.56*	.04	1			
4. Task conflict (revised)	4.31	.83	.96	.92	.48	.83	.19*	.13*	–.01	1		
5. Logistical conflict	2.40	.56	.89	.90	.38	.75	–.07	.49*	–.05	.00	1	
6. Contribution conflict	1.92	.49	.87	.88	.34	.72	.06	.47*	.01	.13*	.38*	1
Study 2, Sample 2												
1. Task conflict (Jehn, 1995)	3.87	1.14	.87	.79	.17	.55	1					
2. Relationship conflict (Jehn, 1995)	2.14	.46	.89	.77	.32	.75	.05	1				
3. Process conflict (Shah & Jehn, 1993)	2.53	1.26	.70	.79	.11	.43	.59*	.07	1			
4. Task conflict (revised)	4.85	.58	.92	.88	.23	.66	.16	–.42*	–.02	1		
5. Logistical conflict	2.97	.69	.92	.74	.43	.82	–.10	.54*	.05	–.19	1	
6. Contribution conflict	2.14	.82	.90	.71	.54	.88	–.07	.46*	.03	–.29*	.28*	1

Note: * denotes that the correlation is significant at the .05 level.

had a better fit than the more traditional three-factor model (i.e., task, relationship, and process conflict) and the basic one-factor model. In Sample 1, the four-factor model had an acceptable fit, χ^2 (59, n = 299) = 80.29, $p < .05$, RMSEA = .08, CFI = .95, IFI = .95). In Sample 2, the results also showed an

Table 5. Fit Indices for Confirmatory Factor Analyses for Study 2

Study and model	χ^2	*df*	RMSEA	CFI	IFI	$\Delta\chi^2$	*df*
Study 2, Sample 1							
N = 299 members, 51 teams							
Hypothesized 4-factor model	80.29	59	.08	.95	.95		
One-factor	369.37	65	.31	.31	.33	298.08	6
Three-factor (task, relationship, process)	147.20	62	.17	.81	.81	66.91	3
Study 2, Sample 2							
N = 586, 94 teams							
Hypothesized 4-factor model	79.90	59	.06	.98	.98		
One-factor	648.12	65	.31	.34	.35	586.22	6
Three-factor (task, relationship, process)	314.71	62	.21	.71	.72	234.81	3

Note: For all χ^2, $p < .05$, RMSEA = root means square error of approximation; CFI = comparative fit index; IFI = incremental fit index.

appropriate fit for that model, χ^2 (59, $n = 586$) = 79.90, $p < .05$, RMSEA = .06, CFI = .98, IFI = .98). Item loadings in the four-factor model were all significant and above .69 on their respective factors. This suggests that two dimensions of process conflict, as suggested by Study 1 and tested in Study 2, are both theoretically and empirically supported.

Internal consistency. Cronbach's alpha was calculated for each of the four subscales. Each subscale demonstrated good reliability, as shown in Table 4. The item-total correlations for each subscale were above .62, demonstrating an appropriately strong relationship between the items and their respective subscales. To assess the appropriateness of aggregating to the team level, the within-group agreement index, r_{wg} (James et al., 1984) and two intraclass correlation coefficients, ICC(1) and ICC(2), were calculated. Results for the four subscales met the criteria for aggregation, as shown in Table 4.

Discriminate validity from existing conflict scales. Finally, we examined the group-level correlations among the four subscales, and with existing task and process conflict scales, based on responses in both Samples 1 and 2. The results (see Table 4) suggested that use of the two new process conflict subscales may be advantageous. First, there was a significant correlation between the Shah and Jehn (1993) process conflict scale and the Jehn (1995) task conflict scale in the pilot sample ($r = .62$, $p < .05$) and in the samples that followed (sample 1: $r = .56$, $p < .05$; sample 2: $r = .59$, $p < .05$). Our slightly revised task conflict scale was not as strongly correlated (although in the case

of contribution conflict, there was a significant negative correlation in sample 2) with either process-related subscale in any of the studies (pilot sample: logistical $r = .03$, *ns*; contribution $r = .02$, *ns*; sample 1: logistical $r = -.00$, *ns*; contribution $r = .13$, $p < .05$; sample 2: logistical = −.19, *ns*; contribution $r = -.29$, $p < .05$).

Second, and consistent with previous research on intragroup conflict, the existing relationship conflict scale (Jehn, 1995) was significantly correlated with both new process conflict scales: pilot sample: (logistical = .60, $p < .05$; contribution $r = .49$, $p < .05$); sample 1: (logistical = .49, $p < .05$; contribution $r = .47$, $p < .05$); sample 2: (logistical = .54, $p < .05$; contribution $r = .46$, $p < .05$). Although these correlations do not provide much support for the improved discriminant validity of our new process conflict scales (from relationship conflict), they do offer some insight into why this happens. These correlations probably reflect the fact that the items in the relationship conflict scale and both of the process conflict subscales ask about recurring "tension" and "friction." Whereas the relationship conflict scale is a catchall for any tension or friction among members, the inclusion of such words in the process conflict items is critical to distinguish when process-related behaviors are conflict-provoking versus normative—an insight derived from our interviews with participants. In addition, the high correlation between relationship conflict and process conflict also reflects the fact that as group members work on a task, disruptive behaviors can be the source of relationship conflict (cf., Greer & Jehn, 2007). Although relationship conflict was not the focus of our research, the improved clarity of the process conflict scale suggests that a closer look at the meaning of relationship conflict may be warranted in the future.

Study 2 Discussion

Study 1 demonstrated that participants and experts can differentiate between logistical issues (e.g., the time management and scheduling expectations cluster) and contribution issues (e.g., the equity of workload distribution/equality of effort cluster). The results of Study 2 showed that reliable and valid scales can be created to measure that distinction. This distinction allows us to see that relationship conflict has a potentially stronger link to both types of process conflict than it does to task conflict (see Greer & Jehn, 2007 for a direct test and confirmation of this claim). This suggests that either type of process conflict might readily transform into relationship conflict, because of the disruptive potential of behaviors that generate process conflict (e.g., Bies, 1987; Colquitt et al., 2002). Finally, by modifying the task conflict scale, so that it no longer asks for generalized opinions about

work, task conflict is no longer strongly correlated with process or relationship conflict and thus can be more easily distinguished as the extent to which teams debate and consider alternatives about the work itself.

Study 1 clarified why it may be difficult to separate the discussion of a task from the discussion of logistics related to how to do the task. The results of Study 2 suggested that refined measurement of logistical and contribution conflict makes the process conflict construct more accurate, so that it picks up where there is tension about group process, versus more generalized debate about the group's work. Certainly, all types of conflict have the potential to be correlated in practice and recent research suggests that conflict management, not conflict type, strongly determines the extent to which this happens (Behfar et al., 2008; DeChurch & Marks, 2001; De Dreu, 1997; Greer et al., 2008; Tekleab et al., 2009). However, the four-scale categorization of conflict (relationship conflict, task conflict, logistical conflict, and contribution conflict) is internally consistent, has reasonable discriminant validity, and yet is still parsimonious for researchers and simple for participants.

In Study 3, we built on the results from Studies 1 and 2 to demonstrate the validity of the various conflict scales for predicting group outcomes with a sample of full-time, working managers. This allowed us to further diversify our sampling and strengthen the generalizability of our findings.

Study 3: The Effect of Process Conflict on Group Functioning

Previous research suggests that intragroup conflict affects performance, including member satisfaction, commitment, and the group's ability to sustain itself (De Dreu & Weingart, 2003; Hackman & Morris, 1975; Jehn, 1995, 1997). This combination of factors is what Hackman has called *group viability* something that allows a group to be functional over the long run. In Study 3, we tested the predictive validity of our newly developed process conflict scales (relative to scales measuring task and relationship conflict) for the various components of group viability. A secondary goal of the study was to build theory about the relationships among the different types of conflict.

Previous research suggests that performance feedback and group history have a strong effect on the way members perceive and evaluate group processes (e.g., Guzzo, Wagner, MacGuire, Herr, & Hawley, 1986; Kluger & DeNisi, 1996; Staw, Sandelands, & Dutton, 1981). We thus chose a sample of newly formed groups. We recognize that it is nearly impossible to completely disentangle the types of conflict in practice and to hypothesize about them separately

from one another. However, to more clearly build theory about the different types of conflict, we focused on theorizing about the direct, rather than the indirect, effects of group conflict on group viability. We wanted to develop clear predictions for each type of conflict, with an emphasis on process conflict.

Process Conflict

We propose that the logistical and contribution aspects of process conflict can affect team viability in different ways. Existing group theory strongly suggests that process conflict concerning logistical issues (in particular) should have a direct, negative effect on team performance (Hackman, 1990; Janicik & Bartel, 2003; Steiner, 1972). Logistical conflict arises from disagreements about how to most effectively organize and utilize group resources to accomplish a task. This includes assigning member responsibilities and deciding how to best use the group's time and resources. All of these activities are essential to the articulation of work strategies and thus are bedrocks of good team decision making (Hackman, 1987; Kabanoff, 1985). Research suggests that groups that carefully consider all of their options, discuss time expectations, and diagnose potential problems prior to beginning work, are more successful than groups that do not do these things (Hirokawa, 1983; Janicik & Bartel, 2003; Moreland & Levine, 1992; Porter & Lilly, 1996). When members disagree about how to do their work, that has the potential to (a) distract the team's attention from actually doing the work, (b) make it less clear what actions need to be taken to accomplish the work, and (c) decrease goal clarity and member coordination (cf., Jehn & Chatman, 2000). If group members experience conflict about such matters, then they are less likely to find an optimal fit between member resources and task requirements (Greer & Jehn, 2007; Janicik & Bartel, 2003; Jehn & Bendersky, 2003; Jehn et al., 1999; Kabanoff, 1985). Therefore, we propose that high levels of logistical conflict will have a negative effect on group performance:

> *Hypothesis 1:* Logistical conflict will have a negative association with two group outcomes, namely, (a) the ability to coordinate work effectively and (b) performance.

Whereas conflict over logistical coordination is predicted to impede group performance by suppressing a team's ability to coordinate the interdependence of its members (Deutsch, 1973), we predict that contribution conflict will affect the psychosocial aspects of teamwork, such as member satisfaction

and commitment to the group (see Greer & Jehn, 2007). Logistical conflict is about task-related differences, but contribution conflict is about people-related differences. In practice, these two types of conflict may become interrelated, but we believe that the distinction is useful in explaining the effects that different types of process conflict can have on team outcomes.

Contribution conflict does disrupt the planned process for getting work done, because groups must compensate for members who free ride or otherwise fail to meet expectations. However, many groups that experience such behaviors continue to perform well (e.g., Behfar et al., 2008; Deutsch, 1969; Smith & Berg, 1987). We propose that contribution conflict is detrimental to team viability because the behaviors that cause it (e.g., free riding) have the potential to be interpreted as disrespect or unfairness by team members (Bies, 1987; Lind & Tyler, 1988). For example, if a team member does not arrive to a meeting on time, then other members may interpret that behavior as disrespectful. This does not necessarily affect team performance, but it can create negative evaluations in the minds of team members who are more prompt (Guzzo et al., 1986). And if a team member does not complete as much work as the team expects, then that places an unfair burden on others, who must either reassign the work or do it themselves. Again, other team members are likely to find ways to get the work done, but they may well feel dissatisfied or resentful as a result (Behfar et al., 2008). In either example, team members must deal with the frustration that accompanies such procedural disruptions (Colquitt et al., 2002; Lind & Tyler, 1988). High levels of contribution conflict thus reflect unsatisfactory exchanges for group members, exchanges that involve unfavorable comparisons between what they put into the group and what they get out of it (Lawler, Thye, & Yoon, 2000). Their satisfaction with and commitment to the group is thus likely to decline (Korsgaard et al., 1995; Porter & Lilly, 1996; Saavedra & Van Dyne, 1999). This type of process conflict could potentially impede the coordination of task work and ultimately harm group performance as a result. In most cases, groups are able to overcome these problems or implicitly coordinate around them (Wittenbaum et al., 1998) by creating strategies that address the contribution conflicts that produce them (Behfar et al., 2008; Deutsch, 1969; Greer et al., 2008). The negative affect that stems from this type of conflict, however, tends to weaken members' enthusiasm for and commitment to the group (Desivilya & Yagil, 2005; Greer & Jehn, 2007). Therefore, our prediction was as follows:

Hypothesis 2: Contribution conflict will be negatively associated with group satisfaction.

Task Conflict

Task conflict is an awareness of differences in viewpoints regarding the group's task (Amason & Sapienza, 1997; Jehn, 1995). It includes such behaviors as discussing pros and cons, considering alternative courses of action, or evaluating how conflicting evidence fits with the group's decisions (Amason, 1996; Jehn, 1995). Task conflict has specifically been proposed as a key source of divergent thinking, encouraging the use of unique information, and the pooling of resources. As a result, the synthesis that emerges from task conflict is generally believed to be superior to the individual perspectives themselves (Mason & Mitroff, 1981; Schweiger, Sandberg & Rechner, 1989; Schwenk, 1990). However, a recent meta-analysis reported a strong negative correlation between task conflict and both team performance and member satisfaction (De Dreu & Weingart, 2003).

This negative relationship may be a result of discriminant validity problems with the widely used task conflict scale (Jehn, 1995) as demonstrated by Studies 1 and 2. But we would like to highlight a more basic and as yet underemphasized role that discussion and debate (task conflict) can play in contributing to group viability. We have argued (see Hypothesis 1) that logistical conflict can significantly alter a group's ability to synthesize different viewpoints (see Behfar et al., 2008; DeChurch & Marks, 2001; Greer et al., 2008; for a similar conclusion). Perhaps task conflict is the mechanism by which members become psychologically engaged in a group's task. That is, although logistical coordination diminishes performance and coordination, task conflict is the vehicle by which alternatives are generated, awareness of solutions is raised, and individual voices are heard (Bies & Shapiro, 1988; Greer & Jehn, 2007). Such outcomes should serve to engage individual team members in what the team is doing, if only by encouraging members to revise their own opinions.

Some of the earliest work on task conflict, for example, found that teams experiencing greater conflict tended to behave in ways that promoted consensus, such as showing more consideration of individual members' expertise and different opinions (Guetzkow & Gyr, 1954). A large body of more recent research also supports the idea that task conflict stimulates involved information seeking, improves individual members' ability to foresee problems, and leads members to think about problems more carefully (Eisenhardt, Kahwajy, & Bourgeois, 1997; Gruenfeld, 1995; Hirokawa, 1988; Mason & Mitroff, 1981; Nemeth, 1992; Nemeth, Connell et al., 2001; Schweiger & Sandberg, 1989; Schwenk, 1990; and see Jehn & Bendersky, 2003 for a review). Research from the voice literature also suggests that task conflict can create

stronger affective commitment to a task—members feel that their opinions are being fairly considered and they understand how group decisions incorporate ideas from different members, so they are more likely to remain sincerely engaged in, and committed to, the group's task (Folger, 1977; Nemeth, Brown, et al., 2001; Nemeth, Connell, et al., 2001; Peterson, 1999). Finally, Deutsch's (1975) classic work on interdependence in groups suggests that debate and the thorough vetting of ideas can help group members to feel that they are working toward the same end. As a result, members have more positive attitudes toward one another. Given all of this, we propose that higher levels of task conflict will stimulate members' engagement in and commitment to the group's task. However, we do not propose that task conflict has a direct effect on either performance or satisfaction, as has been theorized by others. Rather, it seems likely that task conflict's effect on performance is moderated by other factors, such as whether the task is routine. Task conflict over relatively obvious issues does not benefit teams as much as it does for teams who have novel or challenging task that requires integration of new insights (see Jehn, 1995). We also emphasize that task conflict does not necessarily increase member satisfaction, as previous research has found (Behfar et al., 2008). Our prediction was as follows:

Hypothesis 3: Task conflict will be positively associated with group commitment to its task.

Relationship Conflict

Finally, relationship conflict is defined as an awareness of interpersonal incompatibilities, including feelings of tension and friction (Jehn, 1995; Simons & Peterson, 2000). Relationship conflict is probably the most difficult sort of group conflict to clearly separate from the others, both in theory and in practice. Interpersonal friction is highly associated with negative emotion and strongly reflects a group's climate and operating norms. Thus it often occurs at a less conscious level than cognitive processing (Barsade, 2002). In fact, relationship conflict is often so highly negatively correlated with such outcomes as satisfaction, commitment, and coordination that it is more predictive of those outcomes (and of performance) than either task or process conflict (Korsgaard et al., 2008). Research findings regarding this effect indicate that the anxiety produced by interpersonal animosity may inhibit cognitive functioning (Roseman, Wiest, & Swartz, 1994; Staw et al., 1981) as well as distract team members from the task, causing them to work less effectively and produce suboptimal products (Argyris, 1962; Kelley,

1979). So, although relationship conflict may be manifested differently across teams (Thomas, 1976; Wall & Callister, 1995; Walton, 1987), its effects on team outcomes are almost always negative (Jehn, 1995, 1997; Jehn & Chatman, 2000; Thomas, 1976).

Whereas the associations between relationship conflict and team outcomes are clear, the origins and link of relationship conflict to task and process conflict are less understood. Recent research has begun to explain the high correlation that relationship conflict typically has with task and process conflict, demonstrating that relationship conflict is often a consequence rather than a cause of badly managed task or process conflicts (DeChurch & Marks, 2001; De Dreu, 1997; De Dreu, 2007; Greer & Jehn, 2007; Janssen, Van De Vliert, & Veenstra, 1999; Peterson & Behfar, 2003). The management of team conflict, especially process conflict, can affect how negative emotions are manifested and their perceived severity (Behfar et al., 2008; Greer et al., 2008; Jehn, 1997). Given all of this, it seems reasonable to hypothesize (and previous research bears out) that relationship conflict will have negative associations with all aspects of team functioning.

Hypothesis 4: Relationship conflict will be negatively associated with (a) performance, (b) satisfaction, (c) task commitment, and (d) coordination in groups.

Study 3 Method

Sample. We used a sample of 53 intact work groups, containing 281 individuals, all of whom were full-time, working managers enrolled in a part-time executive MBA program. The groups contained 4 to 6 persons each, assigned by the school administration on the basis of geographical proximity. Our study took place in the first quarter of the students' program. The average age of participants was 30 years, 30% of them were female, and their managerial experience ranged from 4 to 10 years. These groups of full-time, working students were a realistic proxy for organizational teams, because of their members' ongoing managerial responsibilities, teamwork experience, and time commitments outside of school. Conflicts about process issues, such as members' responsibilities and the use of group time, were important to the work and personal lives of these busy students.

Measures. Group performance was assessed using a group grade from a written group case analysis. Grades were assigned by the professor (an author on this article) using a single-blind procedure (cover pages with identifying information were removed prior to grading). All student papers were graded

using a set of criteria agreed upon by three separate instructors of the same course. Scores were reported as percentages (out of 100 points). The mean score was 86.80%, with a median of 87.50%, and a range of 75% to 97%.

Team conflict, satisfaction, coordination, and commitment were measured using Likert-type rated items administered on a questionnaire to team members after approximately 2 months of in-class and out-of-class teamwork. The questionnaire was administered in their organizational behavior class after completing their out-of-class case write-up exam as a group, but prior to receiving feedback about their performance. This was done to ensure that member responses on the viability measures (satisfaction, commitment, etc.) reflected actual group processes, rather than satisfaction with their group's performance. Because surveys were completed during the week the professor did the grading, the professor did not have access to the survey data, either prior to or during the grading period.

The team conflict items included Jehn's (1995) relationship conflict items and the task conflict and process conflict items generated from our Study 2. Satisfaction was measured with five items adapted from Peterson (1997). These items asked participants how satisfied they were while working with their group, how much they liked other group members, to what extent the other people in their group were friendly, if they would like to work with their group again in the future, and how satisfied they thought other members were with the group. Group task commitment was measured with a two-item scale asking members the extent to which they liked or enjoyed working on their group's project and how committed they were to that project (cf. Swaab & Postmes, 2005). Group coordination was measured using the coordination dimension from Lewis' (2003) transactive memory scale. These items included how much the group had to backtrack and start over, how much confusion there was in the group about how to accomplish work, and whether the group worked in a coordinated fashion.

Cronbach's alpha reliability coefficients were used to assess scale reliability. To assess the appropriateness of aggregating to the team level, the within-groups agreement index, r_{wg} (James et al., 1984), and two intraclass correlation coefficients, ICC(1) and ICC(2), were calculated for each scale. These statistics are presented in Table 6. There was significantly more agreement within groups than between groups, and so aggregated scores were deemed appropriate. All scores were aggregated to the team level by calculating the mean group score.

Analysis and results. In testing our predictions, task, relationship, and both forms of process conflict (logistical and contribution) were used as independent variables. Group grade, task commitment, satisfaction, and coordination were the dependent variables. To assess whether multicollinearity was a

Table 6. Descriptive Statistics for Study 3

	M	*SD*	α	r_{wg}	ICC(1)	ICC(2)	1	2	3	4	5	6	7	8
1. Logistical conflict	2.50	.86	.93	.88	.45	.81	1							
2. Contribution conflict	2.18	.94	.94	.83	.36	.75	.63**	1						
3. Task conflict (revised)	5.32	.73	.93	.93	.51	.84	–.05	–.34*	1					
4. Relationship conflict (Jehn, 1995)	2.24	.94	.95	.82	.37	.76	.45**	.64**	–.29*	1				
5. Team grade	86.8	5.2	n/a	n/a	n/a	n/a	–.39**	–.06	–.13	.10	1			
6. Task commitment	6.1	.76	.87	.93	.53	.87	–.37**	–.60**	.44**	–.66**	–.01	1		
7. Team coordination	5.2	.84	.77	.83	.32	.72	–.56**	–.51**	.10	–.64**	.03	.43**	1	
8. Team satisfaction	5.8	.76	.93	.86	.29	.65	–.47**	–.72**	.35*	–.81**	–.04	.65**	.54**	1

Note: *$p < .05$, **$p < .01$.

problem, we looked at three collinearity indices. First, we examined the Variance Inflation Index (VIF). The recommended cutoff for that index (see Kleinbaum, Kupper, Muller, & Nizam, 1997) is 10. The largest VIF in our analysis was only 2.00. We then examined the Collinearity Index (CI) and the Variance Proportions for the four conflict types. It is recommended that the Collinearity Index be lower than 30.00. Our highest CI was 26.50, below the recommended cutoff. Taken together, these results all suggested that multicollinearity did not significantly influence our results.

The results of the regression analyses are shown in Table 7. They largely supported our predictions. Consistent with Hypothesis 1, logistical conflict was the only type of conflict that was negatively associated with group performance (team grade). It was also significantly associated with lower team coordination. Consistent with Hypothesis 2, contribution conflict was negatively associated with group satisfaction. Consistent with Hypothesis 3, task conflict was positively associated with task commitment. Finally, in partial support of Hypothesis 4, relationship conflict was negatively associated with all of the dependent measures, except for performance (team grade).

Study 3 Discussion

Our results indicated that, as predicted, a multifaceted approach to process conflict measurement and outcome measurement is critical to understanding

Table 7. Results of Multivariate Regression Analysis for Study 3 Predictions

	Team grade			Team coordination			Task commitment			Team satisfaction		
	β	*SE*	*t*	β	*SE*	*t*	β	*SE*	*t*	β	*SE*	*t*
Logistical conflict	−3.6**	1.0	−3.59	−.34**	.13	−2.58	−.02	.11	−.21	−.02	.09	−.02
Contribution conflict	.69	1.09	.63	.02	.14	.11	−.18	.13	−1.44	−.30**	.11	−2.75
Task conflict	−.30	.97	−.31	−.07	.13	−.55	.25*	.11	2.23	.08	.10	.85
Relationship conflict	1.53	.92	1.66	−.47**	.12	−3.88	−.35**	.11	−3.35	−.54**	.09	−5.92

Note: $R^2 = .26$. *$p < .05$. **$p < .01$.

the effects of intragroup conflict on team processes and performance. In this study, we predicted that different types of conflict would have distinguishable effects on different aspects of team viability (performance, coordination, team satisfaction, and task commitment. As predicted, task conflict and logistical-coordination conflict affected the more task-related aspects of group viability. Logistical conflict affected performance and coordination, whereas task conflict affected task commitment. In contrast, contribution conflict affected the more people-related or psychosocial aspects of viability, such as member satisfaction. Relationship conflict had a negative effect on all aspects of group viability except performance.

One of the main theoretical gains provided by these results was to clarify the mechanisms by which different types of process conflict affect team functioning. Logistical conflict indicates a lack of temporal and resource alignment, which is critically detrimental to group performance. If there is no agreement among group members about the allocation of time and resources, then group coordination as well as performance is diminished (e.g., also see Blount & Janicik, 2000; Janicik & Bartel, 2003). In fact, when previous studies found a positive influence of process conflict on team performance, it was probably because process conflicts specifically prompted the team to be more deliberate about planning for how to use time and resources. For example, such groups put clearer parameters around work roles, discussed how resources could be used more effectively, and planned proactively around temporal milestones, such as deadlines (e.g., Janicik & Bartel, 2003; Jehn & Bendersky, 2003; Jehn & Mannix, 2001; Karn, 2008; Tuckman, 1965).

In contrast, when previous studies have reported a negative influence of process conflict on team performance, this effect was usually attributed to increased anger, animosity, and negative attitudes toward the group (Greer &

Jehn, 2007; Jehn, 1997; Jordan et al., 2006; Passos & Caetano, 2005). This raises two points. First, in our study, contribution conflict negatively affected group satisfaction. Relationship conflict, which is by definition anger and animosity among members, also had a negative effect on satisfaction—but neither contribution nor relationship conflict predicted lower performance. This suggests that it is not necessarily anger and animosity that affect performance, but rather the negative affect that is often associated with logistical issues.

Second, contribution conflict highlights an important mechanism through which anger and animosity can be generated. When group members believe that procedures are not fair, because some people are not pulling their weight, they become less satisfied with their group experience (Jehn & Chatman, 2000; Lind & Tyler, 1988). However, some groups can function well in the short term, even if their members are unhappy (see Behfar et al., 2008), which is probably why relationship conflict did not have a negative effect on performance in our study. The finding that relationship conflict had negative associations with other outcomes was not surprising, given previous theoretical and empirical work (e.g., see De Dreu & Weingart, 2003 and Jehn & Bendersky, 2003 for relevant reviews).

Finally, task conflict was associated with higher task commitment in our study, although not with better task performance. This result is in line with theorizing about task conflict that predicts the benefits of voice for increasing member commitment and satisfaction (Simons, Pelled, & Smith, 1999; Simons & Peterson, 2000). Our results suggest that the process of being heard does increase members' commitment to team tasks (e.g., Tjosvold & Tyosvold, 1994).

Overall Discussion

Theoretical and Empirical Implications

Our results have several implications for theorizing about, and studying group conflict (particularly process conflict). First and foremost is the message that although many researchers emphasize task and relationship conflict, process conflict is also important and thus should be included more often. This is important for several reasons. First, our results from Study 1 clearly indicated the prevalence and diversity of process conflict in groups. Our teams, whether they were students or full-time managers, Americans or Europeans, homogenous or diverse, understood and often experienced process conflict. Second, group process issues, such as how to accomplish and divide work, how to schedule and spend time, and how to solve problems,

are all factors in team viability and thus have direct effects on performance (e.g., Hackman & Baetz, 1990).

A third implication of our work is that the measurement of process conflict can be improved by including items that capture its two distinct aspects. This distinction is consistent with the current task versus person dichotomy that dominates the intragroup conflict literature (Marks et al., 2001). Making this distinction should significantly improve the discriminant and predictive validity of the process conflict construct and clarify its impact on team outcomes. Previously used process conflict items asked respondents the extent to which they had disagreements about who should do what, whether teammates disagreed about task responsibilities, and if there were disagreements about resource allocation. These are clearly useful questions, but they do not have the necessary depth and specificity. To understand which particular mechanisms are responsible for specific outcomes, more nuanced scale items, such as the ones that we have presented here, are needed.

Fourth, Studies 1 and 2 suggest that modifying scale items in line with team members' perceptions of conflict may improve the predictive validity of the entire set of conflict scales. For example, the previous task conflict items, although useful and predictive, have a fairly general focus, and some persistent weaknesses. The amended task conflict items developed in Study 2 are different, in that they ask about more specific behaviors. Based on this amended scale, our results suggest the task and process conflict can have differential effects on the various components of group viability

Finally, our results suggest that we need to develop a more dynamic theoretical perspective about the relationship between conflict types when predicting the consequences of conflict on team viability outcomes. The high correlations between process and relationship conflict in our studies confirm Jehn's (1997) original suggestion that all conflict types (not just relationship conflict) contain some degree of emotion. Given that process conflict has the potential to generate negative affect and transform into relationship conflict (Greer & Jehn, 2007), it is important to better explicate the meaning of relationship conflict, and when it is a cause rather than consequence of other types of conflict. For example, our studies suggest that relationship conflict could potentially be a consequence of process conflict. When group members disrupt work by not showing up on time or being unprepared, conflict about how much time to allot to different tasks, and how much time to spend in meetings indicate how much members value each other's resources and priorities (Lind & Tyler, 1988) and may lead to negative interpersonal attributions (Guzzo et al., 1986). If members do not feel that their own priorities about getting work

done are aligned with those of the group, then it is understandable that interpersonal tension might arise. So, although relationship and process conflict subscales share some common variance, our results indicate that they represent separate factors. Future research can investigate the role of emotionality in conflict episodes, to better understand the nature of the relationship between conflict types (e.g., Jehn et al., 2008; Weingart et al., 2009).

Limitations

As with any research, there are limitations to our studies. They all had a cross-sectional design, for example, which did not allow us to explore the effects of conflict over time. Group longevity, and a group's stage in its life cycle, might lead groups to have different conflict experiences. And newly formed groups may have more negative reactions to process conflict than groups that have faced and resolved such conflict in the past (cf. Peterson & Behfar, 2003).

Recent research also suggests that conflict and its consequences can be tempered or exacerbated by the effectiveness of the conflict resolution tactics that teams employ (Behfar et al., 2008; DeChurch & Marks, 2001; De Dreu, 1997; Greer et al., 2008; Tekleab et al., 2009). Different modes of conflict management may be essential for preventing the spillover of task and process conflict into relationship conflict (Jehn & Chatman, 2000). In our third study, we found that relationship conflict does not have a negative effect on performance when logistical, contribution, and task conflict are taken into account. This result suggests an interesting avenue for better understanding the influence of negative emotions on teams, something that several scholars have already begun to investigate (Greer & Jehn, 2007; Weingart et al., 2009).

Group design, or how closely the group under study is managed by an authority (e.g., a traditional team vs. a self-managing team), will also likely affect the types of conflict that groups experience. For example, typical process decisions made by team managers or leaders include delegating tasks and responsibilities, setting goals and deadlines, creating schedules, monitoring progress toward goals, dealing with conflicts, and making final decisions about controversial issues (Edelmann, 1993; Pondy, 1967; Wall & Callister, 1995). Many groups are autonomous (or semiautonomous) in terms of making these kinds of decisions. In such groups, some level of process conflict seems inevitable because there is no legitimate authority to enforce process rules or prevent process conflicts. Whether or not the intervention of a leader (or any legitimate authority) to resolve intragroup conflicts affects group performance is an issue that has received very little research attention to date.

For example, recent research on virtual teams suggests that logistical and contribution process conflict are particularly important to resolve in geographically dispersed teams where the potential for conflict escalation is greater due to decreased social cues and spontaneous opportunities for members to exchange duties or carry the work load of others if necessary (Hinds & Bailey, 2003). We believe, however, that addressing such issues has been made easier by our work here, work that clarifies the construct of process conflict.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the authorship and/or publication of this article.

Funding

The authors received no financial support for the research and/or authorship of this article.

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