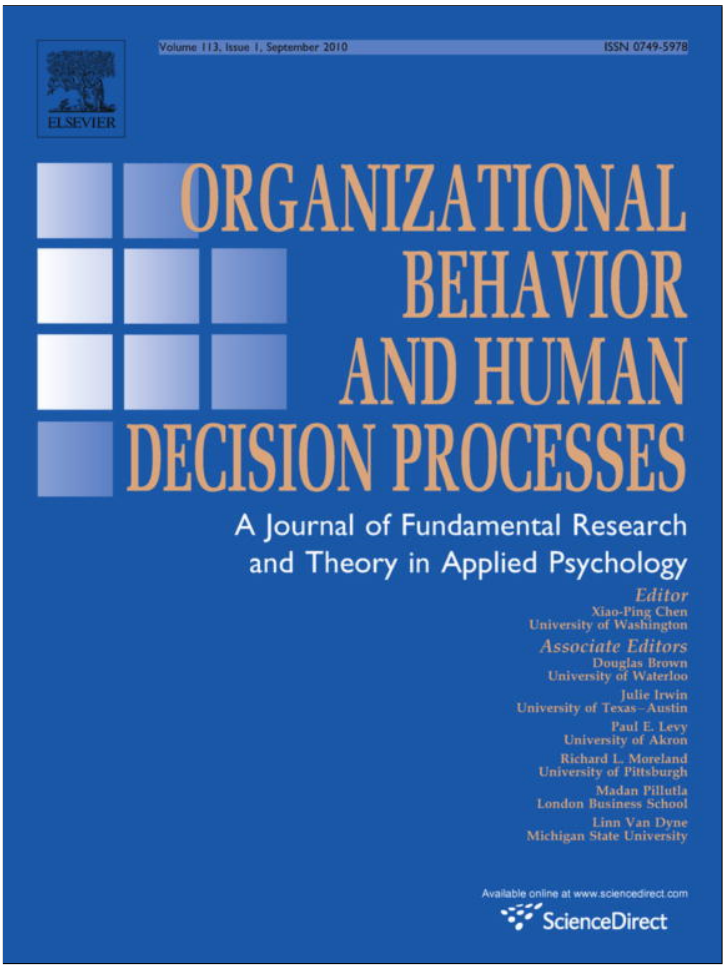

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Can confidence come too soon? Collective efficacy, conflict and group performance over time

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ABSTRACT

Groups with a strong sense of collective efficacy set more challenging goals, persist in the face of difficulty, and are ultimately more likely to succeed than groups who do not share this belief. Given the many advantages that may accrue to groups who are confident, it would be logical to advise groups to build a high level of collective efficacy as early as possible. However, we draw on Whyte's (1998) theory of collective efficacy and groupthink, to predict that when confidence emerges at a high level toward the beginning of a group's existence, group members may be less likely to engage in process conflict; a form of conflict that may be beneficial in the early phase of a group project. We found support for this prediction in two longitudinal studies of classroom project teams.

Introduction

Collective efficacy, defined as a group's shared belief that it can execute a task successfully, is fundamental to group motivation, performance, and effectiveness (Bandura, 1997; Gully, Incalcaterra, Joshi, & Beaubien, 2002). With a strong sense of collective efficacy, groups set more challenging goals, persist in the face of difficulty, and are ultimately more likely to succeed (Bandura, 2000). Given the many advantages that may accrue to groups who are confident, it might be logical to advise groups to build a high level of collective efficacy as early as possible. After all, groups who set more difficult goals at the beginning of a project, and have the confidence necessary to overcome challenges that arise over time, should be more likely to ultimately achieve success.

As logical as this advice sounds, however, there may be a significant downside to high levels of early collective efficacy that has not been considered in current research. Drawing on and extending Whyte's (1998) theory of collective efficacy and groupthink, we propose that high levels of collective efficacy may attenuate certain forms of conflict that are beneficial for group performance. We focus specifically on process conflict, an important but understudied form of conflict related to controversies over *how* a group should go about completing a shared task (Jehn, 1995, 1997). Although process conflict was first identified more than a decade ago, there was not enough research on it to be included in De Dreu and Weingart's (2003) meta-analysis and relatively little is known about the antecedents and consequences of process conflict over time (Jehn & Mannix, 2001). Here we suggest that reduced process conflict might be particularly problematic in the early stages of a group project at which time consequential, long-term, strategic decisions are made regarding the division of labor, task deadlines and other issues related to the process of working as a group (Gersick, 1988; Hackman, 1987; Jehn & Mannix, 2001). Therefore, in this paper we investigate the antecedents and consequences of early collective efficacy, that is, collective efficacy assessed prior to the mid-point of a group project (Gersick, 1988).

We begin by tracing the origins of early collective efficacy and propose that group members use surface level diversity in the early stages of a group project as an easily observable cue to predict the likelihood that their group will succeed (Harrison, Price, & Bell, 1998). We then theorize that high levels of early collective efficacy may constrain a group's ability to fully consider conflicting strategies or procedures for completing tasks (Audia, Locke, & Smith, 2001; Kets de Vries & Miller, 1984; Vancouver & Kendall, 2006) and that the failure to engage in these procedural conflicts may, in turn, be detrimental to subsequent group performance (Jehn & Mannix, 2001). We tested these predictions in two longitudinal studies of classroom project teams.

The antecedents and consequences of collective efficacy beliefs

Collective efficacy is defined as group members' shared belief that they can execute a specific task successfully (Bandura, 1997). This construct was first proposed by Bandura as a direct extension of self-efficacy to larger aggregations such as groups

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and organizations (Bandura, 1986). Research has demonstrated that groups may share a belief in their ability to perform a task, therefore collective efficacy has typically been examined at the group level of analysis (Gibson, Randel, & Earley, 2000). Collective efficacy is related to, but distinct from group potency, because the latter reflects more generalized beliefs about a group's capability across tasks and situations (Guzzo, Yost, Campbell, & Shea, 1993). The existing literature on collective efficacy converges on the conclusion that groups who are confident in their ability to succeed are more effective than those who doubt themselves (Bandura, 1997, 2000; Gully et al., 2002). For instance, a recent meta-analysis showed that collective efficacy has a strong positive relationship with group performance ($r = .35$) (Stajkovic, Lee, & Nyberg, 2009) replicating the results of an earlier meta-analysis (Gully et al., 2002).

Given the importance of collective efficacy for group performance, recent research has investigated the antecedents of collective efficacy (e.g., Tasa, Taggar, & Seijts, 2007) and the related construct of group potency (Lester, Meglino, & Korsgaard, 2002). At the individual level, efficacy may emerge as the result of vicarious experience, verbal persuasion, or enactive mastery experience (Bandura, 1997). At the group level, research has focused almost exclusively on the role of enactive mastery experience in which confidence builds over time as groups receive feedback about their performance on a particular task (Gibson & Earley, 2007; Gist & Mitchell, 1992; Lester et al., 2002; Marks, Mathieu, & Zaccaro, 2001; Tasa et al., 2007). In-groups, enactive mastery experiences may build through a series of performance episodes, defined as "distinguishable periods of time over which performance accrues and feedback is available (Marks et al., 2001, p. 359; Mathieu & Button, 1992). Therefore, the relationship between past performance and collective efficacy is recursive—the receipt of positive feedback on challenging tasks leads to stronger efficacy beliefs, which in turn lead to greater success (Gist & Mitchell, 1992).

From the perspective of performance episodes (Marks et al., 2001), a focus on the emergence and effects of collective efficacy in the later stages of groups' development is appropriate because groups need time to receive and assimilate feedback about their performance (Gibson & Earley, 2007). It is probably for this reason that longitudinal studies have measured collective efficacy only after groups have received explicit performance feedback (e.g., Tasa et al., 2007) or have completed tasks that provide the basis for a preliminary assessment of performance (e.g. Lester et al., 2002).

Yet, this does not preclude high levels of collective efficacy beliefs emerging in the early stages of a project, even in the absence of performance feedback; indeed we consider the possibility that they do. For example, project teams can be convened for a specific purpose and their performance cycles may begin and end before tasks are completed or any objective feedback is available (Ericksen & Dyer, 2004; Keller, 2001). Moreover, anecdotal evidence suggests that project teams may begin with high levels of collective efficacy (Whyte, 1998). However, in order to predict levels of early collective efficacy, it may be useful to consider factors that might give rise to strong efficacy beliefs *other* than discrete performance episodes.

Surface-level demographic diversity as an antecedent to early collective efficacy

In any investigation of groups over time, the question of what distinguishes "early" from "late" in a group's interaction is important (Mannix & Jehn, 2004). Perhaps the simplest way to distinguish the early from the late stage is simply by the mid-point of the allotted time: The early stage occurs prior to the mid-point and the late stage occurs after the mid-point. Indeed, groups undergo a critical transition at the mid-point during which time they may stop work, notice that the deadline is near and complete tasks at a more urgent pace (Gersick, 1988, 1989). In other words, although the dynamic passage of time is a continuous experience, there are certain events that may distinguish an "early" from a "late" phase (McGrath, Arrow, & Berdahl, 2000).

According to Tuckman's (1965) model, groups go through an initial forming stage in which they get to know each other, test inter-personal boundaries and orient themselves to the task. During the early phase, effective teams may also reach explicit agreements about how the group will work together to complete tasks in a timely manner (Mathieu & Rapp, 2009). The development of these agreements may prompt the group to clarify important issues such as group members' roles and responsibilities as well as their task related abilities and work styles (Mathieu & Rapp, 2009). If such agreements are reached during the early formative stage, they can facilitate subsequent collective action (Mathieu & Rapp, 2009). In other words, during the early stages groups may be concerned primarily with planning for the future while in the later stage they may focus more intently on task execution as the deadline nears (Okhuysen & Waller, 2002). Distinguishing between these stages is important because the consequences of a high level of collective efficacy in the early stage may be quite different from the later stage given the different types of activities that may take place at each point in time. However, we know very little about the antecedents and consequences of collective efficacy at the early stage of a group's development.

There is evidence that collective efficacy beliefs emerge over time as a result of performance feedback, but there may be other inputs into the process of developing collective efficacy beliefs, particularly in the early stages of a project. For instance, collective efficacy may be influenced by characteristics of the group itself such as the knowledge, skills and abilities of other group members (Gibson & Earley, 2007). But such characteristics might not have much of an immediate impact because some time must pass in order for the group to learn its teammates' expertise (Harrison, Price, Gavin, & Florey, 2002; Harrison et al., 1998). Here we investigate surface level diversity (Harrison et al., 1998; Jackson, Mary, & Whitney, 1995; Riordan, 2000) as an important cue that is unique to groups and may contribute to the level of collective efficacy in the early stages of a project. surface level diversity may be particularly important when thinking about the earliest stages of a group's interaction because these characteristics are by definition what people bring to the group right from the start (Mannix & Jehn, 2004). We argue that the surface level characteristics of other group members provide salient and easily observable information (Mannix & Neale, 2005) that may, in turn, have an immediate influence on perceptions of group capability. In other words, people may have implicit theories about the consequences of diversity for group performance that they bring with them into team settings and these implicit beliefs may influence feelings of confidence in the group.

Diversity has been defined as "the distribution of differences among the members of a unit with respect to a common attribute, X" (Harrison & Klein, 2007, p. 1199). Beyond this very general definition, researchers have further distinguished between *surface* level diversity which refers to differences among team members on overt demographic characteristics, and *deep* level diversity which refers to differences among team members on underlying psychological characteristics such as personalities, values and attitudes (Harrison et al., 1998; Milliken & Martins, 1996). Harrison and his colleagues have shown that surface level diversity has negative effects on teams' social integration in the early stages of a project, but that over time these effects diminish as team members interact with each other (Harrison et al., 2002). Surface level differences are particularly consequential when a group has just formed, because

upon entering a team, members have very little information on which to predict how others will behave (Allport, 1954). To reduce this uncertainty, people use demographic characteristics such as race, gender or age to form social categories that allow them to predict the likely thoughts, attitudes and behaviors of others (Fiske, 2002). It is assumed that people who share our social category must also share our underlying attitudes and beliefs (McPherson, Smith-Lovin, & Cook, 2001) and perceptions of similarity may emerge soon after a group is formed (Zellmer-Bruhn, Maloney, Bhappu, & Salvador, 2008).

In homogeneous groups, the relative absence of surface level differences may have initially positive effects because people like and are attracted to similar others (Byrne, 1971; Newcomb, 1943) and because in-group members are perceived to be more honest and cooperative than members of an out-group (Brewer, 1979; Tajfel, 1982). Conversely, in heterogeneous groups, dissimilar group members may underestimate each other's likely task performance, anticipate less cooperation and interpret behavior in a way that confirms these expectations (Chatman & Flynn, 2001; Flynn & Chatman, 2003; Flynn, Chatman, & Spataro, 2001).

There is research showing that surface level diversity may have a fairly immediate impact on factors that are important to group functioning such as cooperative work norms (Chatman & Flynn, 2001) and expectations of work style similarity (Zellmer-Bruhn et al., 2008) but almost no research has yet linked surface level diversity to group-level beliefs such as collective efficacy (van Knippenberg & Schippers, 2007; but see Sargent & Sue-Chan (2001) for an exception). Recent research suggests that perceived teamwork behaviors such as the ability to coordinate activities contribute to a team's level of collective efficacy (Tasa et al., 2007). In addition, initial levels of communication and cooperation in-groups are positively related to levels of group potency over time (Lester et al., 2002). Because people have implicit theories about the causes of group performance in which factors like cooperation and cohesion are believed to facilitate group effectiveness (Guzzo, Wagner, MacGuire, Herr, & Hawley, 1986; Peterson & Behfar, 2003; Staw, 1975), initially awkward or difficult interactions between demographically different people (Zellmer-Bruhn et al., 2008) may result in lower confidence in the early stages of a project. Therefore, we predict the following:

Hypothesis 1. surface level diversity will be negatively associated with early collective efficacy.

Early collective efficacy, process conflict and group performance

The level of early collective efficacy in-groups is important for two reasons. First, any effects of collective efficacy in the early stages of a group project may set in motion a path-dependent chain of events that are difficult to reverse or undo (Ericksen & Dyer, 2004). Second, since early perceptions may not always be based on objective performance feedback, it is possible they may not necessarily have positive effects. Indeed, Whyte (1998) raised the provocative possibility that collective efficacy may have negative consequences by connecting exaggerated collective efficacy beliefs to the emergence of groupthink. According to Whyte (1998), collective efficacy can reach levels that reduce, not facilitate group performance (Tasa & Whyte, 2005) at least in part because members who have a high degree of confidence in the judgments of their group are less likely to search for and consider decision alternatives.

High levels of collective efficacy may be particularly problematic in the early phases of a group project because excessive confidence may lead to tunnel vision regarding different long-term strategies or procedures that groups can use to approach complex tasks. Overconfidence has been shown to reduce vigilance on preparatory tasks that demand forethought and planning (Vancouver & Kendall, 2006) and engender a reluctance to consult with, or listen to peers (Hiller & Hambrick, 2005; Kets De Vries & Miller, 1984). Groups that initially overestimate their ability (Moore & Healy, 2008) may be disinclined to devote excessive resources to tasks that they would otherwise complete successfully (Vancouver & Kendall, 2006). This is why strong efficacy beliefs can lead to rigid persistence with strategies that have outlived their usefulness (Audia et al., 2001), decreased motivation to explore beyond proven solutions (Audia & Goncalo, 2007) and less vigilant decision making (Tasa & Whyte, 2005). When individual group members are less confident in the correctness of the group's decision, they are more motivated to process available alternatives deeply and deliberately (De Dreu, Nijstad, & van Knippenberg, 2008). In contrast, overconfident groups are less likely to plan ahead and to anticipate problems in advance than groups who have some doubt over the likelihood of success (Bandura & Locke, 2003). An implication of this stream of research is that exaggerated levels of early collective efficacy may actually be detrimental to group performance. Consequently, based on this research, we hypothesize the following:

Hypothesis 2. Early collective efficacy will be negatively related to subsequent group performance.

Whyte's (1998) framework suggests that collective efficacy might encourage groupthink because groups may reach premature closure on tasks that would benefit from the open discussion of conflicting alternatives (Janis, 1971; Whyte, 1998). Although there are different forms of conflict that may each influence group performance in different ways (Jehn, 1995), current research has not yet specified exactly which type of conflict might be reduced in overconfident groups. In this paper, we focus specifically on the relation between collective efficacy and *process* conflict, which refers to controversies over *how* a group should go about completing a shared task (Jehn, 1995, 1997). Process conflict focuses on strategic and logistical issues such as scheduling deadlines and the division of labor (Greer & Jehn, 2007; Jehn & Bendersky, 2003). Process conflict is distinguished in theory from *relationship* conflict which refers to inter-personal incompatibilities among group members, including personality differences, and *task* conflict which refers to disagreements among group members about the content of the task being performed (Jehn & Mannix, 2001).

Of the three types of conflict, process conflict may be most consequential in the early stages of a project because it is in the early stages that important, long-term decisions are made regarding procedural issues such as the division of labor, the creation of deadlines and the like (Gersick, 1988). An early discussion of alternative strategies may lead to conflict if people advocate seemingly incompatible perspectives on logistical issues (Boulding, 1963), but these conflicts may also uncover new and potentially useful approaches about *how* work should be completed (Weingart, 1992). If overconfident groups are not vigilant enough to pro-actively explore alternative approaches for completing tasks (Vancouver & Kendall, 2006), then they may experience less early process conflict because they are not initially aware of the variance in perspectives that exist surrounding these procedural issues. Therefore, we predict the following:

Hypothesis 3. Early collective efficacy will be negatively associated with early process conflict.

Reduced process conflict in the early stages of a group project may, in turn, have negative consequences for group performance. In contrast to relationship and task conflict, process conflict is the most recent type to be identified, and relatively little longitudinal research has been conducted to identify its antecedents and consequences for group performance (Greer, Jehn, & Mannix, 2008; Jehn & Mannix, 2001). Initial research proposed that process

conflict might be useful because it facilitates the sorting of people into tasks whose requirements suit their abilities (e.g., Jehn & Bendersky, 2003; Jehn, Northcraft, & Neaie, 1999). Subsequent research, however, has failed to substantiate the purported benefits of process conflict, leading some researchers to argue that process conflict is in fact uniformly negative (e.g. Greer & Jehn, 2007).

Yet it is possible that the effects of process conflict, positive or negative, may depend on when it emerges. For instance, Jehn and Mannix (2001) adopted a longitudinal perspective and theorized that groups are most likely to realize the benefits of process conflict near the beginning of a project. They predicted that if groups engage in and resolve conflicts related to the process of how their task will be completed in the early stages of a project, then they will be better able to agree on procedural details, thus permitting more time to discuss substantive issues related to the task itself (Gersick, 1988; Jehn & Mannix, 2001). Important conflicts at the beginning of a project related to administrative decisions about task assignments and deadlines should be resolved early, in order for groups to have sufficient time to discuss task-related issues necessary to produce high quality work (Jehn, 1995; Jehn & Mannix, 2001). For these reasons, Jehn and Mannix (2001) predicted that *early* process conflict should facilitate group performance.

The results of their longitudinal study, however, seemed to contradict this prediction. They found that process conflict in high performing groups steadily increased over time from early, to middle, to late stages, and that process conflict in low performing groups was significantly higher in the early and late stages relative to the middle stage (Jehn & Mannix, 2001). Because high performing groups had lower levels of early process conflict relative to the mid-point, and simultaneously, low performing groups had higher levels of early process conflict relative to the mid-point, Jehn and Mannix (2001) inferred that early process conflict is probably detrimental to group performance.

These results are intriguing, but we think that the relationship between process conflict and group performance over time warrants further investigation. The primary focus in Jehn and Mannix's (2001) study was on tracing changes in the pattern of conflict over time; specifically, how levels of conflict from one time point to the next differ depending on whether groups' performance is high or low, as determined by a median split. This data analytic approach, however, does not directly address the two questions we are most concerned with here: (1) Is process conflict in a given time point predictive of performance when all of the variance in the dependent variable (e.g., group performance) is considered (MacCallum, Zhang, Preacher, & Rucker, 2002)? and (2) does early process conflict have an independent effect on group performance even after process conflict in the later stages is controlled for?

With these questions in mind, we assert that the predictions made by Jehn and Mannix (2001) regarding *early* process conflict are on target conceptually, but may require an alternative empirical test in which the effects of *late* process conflict are controlled. Since process conflict should be uniquely advantageous toward the beginning of a project when groups are in the planning stage and can benefit from the exploration of alternative strategies for completing the task (Gersick, 1988), we expect that the positive association between early process conflict and group performance should hold when controlling for the effects of process conflict at later points in time. Therefore, we predict:

Hypothesis 4. Early process conflict is positively associated with group performance.

Collective efficacy and process conflict near task completion

Although our primary focus in this paper is on the antecedents and consequences of *early* collective efficacy, we also hypothesized that collective efficacy and process conflict assessed toward the end of a project would each have a direct impact on group performance. In the case of collective efficacy, past research leads to a very clear prediction that collective efficacy assessed toward the end of a project should facilitate success. Even if a group has not yet received explicit feedback, its estimates of collective efficacy will be based on a longer history of working together, and a clearer perspective on the quality of its product as its deadline draws near (Mischel & Northcraft, 1997). In a meta-analysis of research on collective efficacy, the vast majority of which was cross-sectional, Gully and his colleagues (2002) found a significant, positive and linear relationship between collective efficacy and group performance. More recent longitudinal research supports the link between group performance and collective efficacy assessed near the deadline (Tasa et al., 2007). We expect to replicate these results in our study, therefore we hypothesize the following:

Hypothesis 5. Late collective efficacy will be positively associated with group performance.

Unlike collective efficacy, there is not yet a clear consensus on the consequences of late process conflict and group performance, making any directional hypothesis highly speculative. On the one hand, it is possible that elevated levels of process conflict toward the end of a project are the inevitable by-product of approaching a task deadline as groups make last minute decisions in their push to get their work finished on time (Jehn & Mannix, 2001). For instance, Jehn and Mannix (2001) found that in high performing groups, process conflict increased steadily over time, reaching its highest level near the deadline.

On the other hand, there is more recent evidence to suggest that process conflict toward the end of a project may not be so benign. The reasons given for the negative effects of process conflict largely revolve around the notion that disagreements over procedural issues can easily be taken personally and instigate more destructive relationship conflicts over time (Greer & Jehn, 2007; Jehn & Bendersky, 2003). For instance, in a recent study in which all three types of conflict were measured at the beginning, middle, and end of a group project, it was found that early process conflict instigated task and relationship conflict so that by the end of a project the three types of conflict were intertwined (Greer et al., 2008). Moreover, conflict resolution strategies were found to be ineffective for reducing the link between process and relationship conflict late in a group's duration, again suggesting that by the end of a project these two types of conflict are difficult to separate (Greer et al., 2008).

It is possible process conflict near a deadline may reflect a reversal of decisions that were made earlier, which may make such conflicts feel more like personal attacks (Greer & Jehn, 2007). For instance, a recent study showed that consistently low performing groups were reactive in the sense that they avoided or ignored process issues until they were forced to rotate responsibilities to correct earlier problems (Behfar, Peterson, Mannix, & Trochim, 2008). As Greer and Jehn (2007) point out, to be assigned a task that is later revoked may provoke outrage if the decision is perceived to be unjust or if an unfair judgment of competence is implied (Bies, 1987). Consequently, process conflict may be more easily separated from the other types of conflict, particularly relationship conflict, early in groups' existence, but become less separable over time. The gradual convergence of process and relationship conflict over time would suggest that, unlike early process conflict, *late* process conflict may be emotional and distracting. Therefore, we predict the following:

Hypothesis 6. Late process conflict will be negatively associated with group performance.

Preliminary study

Method

Study overview

As an initial investigation of the effects of collective efficacy on group performance over time, we conducted a study of project teams in which we measured collective efficacy at two points in time; once near the beginning of a project and once near the end of a project. The study was conducted in an undergraduate course in organizational behavior, in which the students participated in a major team project during the course of a 15-week semester. Students were *randomly* assigned to project teams by the course instructor in week 5 of the semester. One week prior to the assignment of teams, participants completed a questionnaire containing basic demographic information. Three weeks after the teams began work on their projects (Week 8 of the semester; time 1), participants completed a measure of collective efficacy regarding their team's ability to successfully complete the team project. Seven weeks later, during the last week of the semester prior to turning in the group project (Week 15 of the semester, time 2), measures of collective efficacy were completed again.

Sample and procedure

One hundred and sixty-seven undergraduate students from the course participated in this study. Men comprised 53% of the sample. Asians constituted 48% of the sample, Caucasians 35%, Mexicans or Hispanics 4%, and African Americans 4%. There were a total of 42 teams, and most teams consisted of four members. Five teams had only three members and two teams had five members.

Measures

Control variables. Data on several demographic variables were collected early in the semester, before students were assigned to teams. A variable indicating the percentage of males in each group and a variable indicating the percentage of each group who identified themselves as "Asian" were included in each regression equation since collectivism predicts both collective efficacy (Gibson, 2003) and group performance (Wagner, 1995). We also controlled for the size of each group in order to account for potential process losses that may occur in larger groups (Price, Harrison, & Gavin, 2006; Steiner, 1972). Finally, we controlled for students' average level of personal interest in the course (on a scale of 1–4, with 4 = *very interested*) and their average level of actual job experience (in number of months) since such factors could also affect both their level of collective efficacy and their eventual performance.

Collective efficacy. Collective efficacy was measured using a five-item scale based on the Collective Efficacy Beliefs Scale (Riggs & Knight, 1994). The items were rated on a five-point scale, ranging from 1 = *strongly disagree* to 5 = *strongly agree*. Collective-efficacy scores were calculated by averaging across the five items (alpha = .85 at time 1 and alpha = .80 at time 2), moreover, groups demonstrated high agreement, as indicated by measures of within-group agreement (r_{WG} = .94, ICC(1) = .56 at time 1, and r_{WG} = .92, ICC(1) = .54 at time 2). High scores of collective efficacy indicate a belief in the team's ability to do well on the project.

Group performance. Each group of students was required to produce a final written report, detailing their findings. The course instructor graded the papers on a scale of 0–100 points (M = 93.33, SD = 4.20). Each group handed in one paper, and all members received the same grade. The course instructor did not know the purpose or hypotheses of our study.

Results and discussion

We used hierarchical regression to test our hypotheses. Demographic controls were entered in the first step, controls for motivation and experience were entered in the second step, and collective efficacy was entered in the third step. Table 1 presents the means, standard deviations and inter-correlations among all variables at the group level.

We predicted that early collective efficacy would be negatively associated with final group performance and that late collective efficacy will be positively associated with group performance. As we expected, collective efficacy at time 1 was negatively associated with the group project grades (β = −.35, p < .05), however at time 2, collective efficacy was positively associated with the group project grades (β = .40, p < .05) (see Table 2). The results therefore provided preliminary evidence that early collective efficacy is detrimental to group performance.

The main study

Method

Study overview

Following the procedure used in the preliminary study, we surveyed teams who were working on a major team project during the course of a 15-week semester. Students were randomly assigned to project teams by the course instructor in week 7 of the semester. Survey data were collected at five different points in time. One week prior to the assignment of teams, participants completed a questionnaire containing basic demographic information (time 0). Two weeks later, participants completed measures of collective efficacy and intra-group conflict (time 1). Subsequent surveys were completed at approximately one week intervals and the last survey was completed at the end of the semester during the week the final project was submitted (times 2–5). The groups did not receive any

Table 1
Descriptive and agreement statistics and pairwise Pearson correlations across time.

Variable	Mean	SD	α	rWG	ICC(1)	1	2	3	4	5	6	7
1. Group performance	93.33	4.20	na	na	na							
2. Collective efficacy (Time 1)	3.85	0.59	0.85	0.94	0.56	0.08						
3. Collective efficacy (Time 2)	3.83	0.69	0.80	0.92	0.54	0.03*	0.67***					
4. Group size	3.98	0.35	na	na	na	−0.26*	−0.16	−0.03				
5. Percent male	0.47	0.22	na	na	na	0.32**	0.22	0.19	−0.17			
6. Percent Asian	0.47	0.24	na	na	na	−0.28*	−0.05	−0.08	0.06	0.21		
7. Personal interest	2.07	0.33	na	na	na	0.39**	0.09	0.1	0.08	0.34**	0.03	
8. Full time work experience (months)	18.75	19.97	na	na	na	−0.17	−0.018	−0.09	0.24	−0.15	−0.21	0.05

* p < .10.
** p < .05.
*** p < .01.

Table 2
Results of hierarchical regression equation predicting group performance[a].

Group size	−0.23*
Gender composition	−0.35**
Percent Asian	0.2
R^2 Δ	0.26***
Average personal interest	0.35**
Work experience	−0.2
R^2 Δ	0.13**
Collective efficacy time 1	−0.35**
Collective efficacy time 2	0.4**
R^2 Δ	0.09*
R^2	0.49
Overall F	4.58**
df	7.34

[a] Entries represent standardized coefficients.
* $p < .10$.
** $p < .05$.
*** $p < .01$.

feedback about their project prior to turning in the final paper. At each survey collection, participants completed the questionnaire independently and returned it directly to the researchers.

Project description

The team project was worth 40% of the students' grade and the students took these projects very seriously because they could lead to summer internships or job offers at the organizations they chose to study. Each team project involved choosing a topic within organizational behavior (e.g. job satisfaction, employee motivation, leadership) and then examining that topic within the context of an actual organization. The task was complex and involved multiple steps, including the selection of an organization to study, establishing a contact person, selecting a particular issue to study, gathering relevant information about the organization, analyzing the problem and suggesting a solution in a final group term paper. Groups were only required to hand in their final project and did not receive any feedback, nor did they submit any preliminary assignments before the final project deadline.

Sample and procedure

Two hundred sixty-two undergraduate students from the course participated in this study. Males comprised 53% of the sample. Asians constituted 15% of the sample, Caucasians 66%, Mexicans or Hispanics 9%, and African Americans 6%. Participants were randomly assigned to teams, resulting in a total of 72 teams, and most teams consisted of four members. We included team data when we had responses from at least two members for each time period. The group assignment was identical to the one used in the preliminary study (see detailed description p. 17). As in the preliminary study, students were told at the beginning of the semester, that their research participation was voluntary, anonymous, and that the information they provided would not be made available to their instructor. All students agreed to participate in the study.

Measures

Our measures of collective efficacy and intra-group conflict were computed by aggregating data gathered at the individual level (Kozlowski & Klein, 2000). We calculated two indicators of within-group agreement: r_{WG} (James, Demaree, & Wolf, 1993) and intra-class correlation coefficient, ICC (1) (James, 1982). Following previous research (Kozlowski & Klein, 2000), we adopted a cutoff of .70 for r_{WG} and a cutoff of .20 for ICC (1) scores. All of our measures exceeded the cutoffs; see Table 3 for group agreement statistics for collective efficacy and intra-group conflict across time points.

Collective efficacy. Following recommendations made by Bandura (1997) and the procedures used in previous research (e.g., Tasa et al., 2007), we measured levels of collective efficacy by providing each member of the group with nine performance benchmarks, specifically, to earn 100%, 98%, 96%, 94%, 92%, 90%, 85%, 80%, 75% (e.g., "How confident are you that your group will earn a 94% on the final project?"). The level of collective efficacy was operationalized as the sum of the rating scores across the nine performance levels. The ratings were made on a continuous 100-point scale (0 = *not at all certain*; 100 = *absolutely certain*).

Process conflict. Following previous research (e.g., Jehn & Mannix, 2001; Shah & Jehn, 1993) we measured process conflict on a three-item scale, "How often are there disagreements about who should do what, in your work group?", "How much conflict is there in your work group about task responsibilities?", and, "How much conflict is there about the division of labor in your work group?" The alpha reliabilities for this scale were acceptable at all five time points (see Table 3).

Other types of intra-group conflict. To demonstrate that process conflict is empirically distinct from the other two types of conflict during the critical early stages of the group project, we measured task conflict and relationship conflict on three-item scales (c.f., Jehn & Mannix, 2001) that were reliable across all five time points (see Table 3); the items were therefore averaged together to form two measures, one for task conflict, and another for relationship conflict. A sample item from the task conflict scale is, "How much conflict of ideas is there in your work group?", and a sample item from the relationship conflict scale is, "How much relationship tension is there in your workgroup?"

Surface level diversity. Since our theoretical arguments regarding initial interactions between members of diverse project teams relied on theories of social categorization, we studied a surface-level demographic characteristic that represents task-unrelated, social category diversity (Harrison & Klein, 2007; Milliken & Martins, 1996). Specifically, we operationalized surface level diversity in this study as ethno-racial diversity because it has been shown to be one of the most visible, salient, and ubiquitous demographic categories within work groups (Mannix & Neale, 2005; Van Knippenberg & Schippers, 2007). Respondents placed a check next to the category that best reflected their race/ethnicity: African-American/Black, European-American/White, Native American, Asian-American/Asian, East Indian, Hispanic/Latino/Chicano, and Other. Consistent with the recommendations of Harrison and Klein (2007), surface level diversity was measured by adding the squared proportions of each ethno-racial category that comprise a group, and subtracting that number from one (c.f., Blau, 1977).

Group performance. Each group of students was required to produce a final written report, detailing their findings. The course instructor graded the papers on a scale of 0–100 points ($M = 92.58$, $SD = 3.57$). Each group handed in one paper, and all members received the same grade. The course instructor did not know the purpose or hypotheses of our study.

Factor analysis of conflict items

It was once assumed that task and relationship conflict are both conceptually and empirically distinct, however, a recent meta-analysis suggests that these two forms of conflict are in fact highly correlated (De Dreu & Weingart, 2003). Given the relative paucity of research on process conflict, this form of conflict was not included in the meta-analysis by De Dreu and Weingart (2003). Nevertheless, there might be reasonable concern over whether process conflict is also highly correlated and hence empirically indistin-

Table 3
Descriptive and agreement statistics and pairwise pearson correlations across time 3[a,b,c].

Variable	Mean	SD	α	rwG	ICCC(1)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1. Group performance	92.58	3.57	na	na	na																						
2. Collective efficacy (time 1)	746.49	106.92	na	0.74	0.32	−0.03																					
3. Collective efficacy (time 2)	754.58	124.23	na	0.78	0.28	0.12	0.81																				
4. Collective efficacy (time 3)	766.78	136.52	na	0.81	0.40	0.14	0.47	0.88																			
5. Collective efficacy (time 4)	767.83	117.83	na	0.79	0.30	0.07	0.71	0.85	0.92																		
6. Collective efficacy (time 5)	784.61	125.54	na	0.83	0.32	0.25	0.64	0.80	0.83	0.83																	
7. Process conflict (time 1)	1.55	0.37	0.81	0.79	0.56	−0.02	−0.04	0.07	0.19	0.08	0.16																
8. Process conflict (time 2)	1.48	0.37	0.86	0.72	0.64	0.30	−0.19	−0.08	−0.12	−0.13	0.01	0.47															
9. Process conflict (time 3)	1.57	0.48	0.84	0.72	0.71	−0.07	−0.09	0.06	0.08	0.01	−0.06	0.38	0.51														
10. Process conflict (time 4)	1.57	0.48	0.90	0.72	0.78	0.01	−0.06	0.04	0.02	−0.02	−0.03	0.42	0.59	0.73													
11. Process conflict (time 5)	1.56	0.52	0.93	0.70	0.86	−0.11	−0.05	0.07	0.09	0.03	−0.08	0.37	0.57	0.54	0.74												
12. Task conflict (time 1)	1.96	0.55	0.85	0.69	0.70	−0.15	−0.06	0.02	0.09	−0.04	−0.18	0.41	0.39	0.51	0.53	0.53											
13. Task conflict (time 2)	1.89	0.46	0.82	0.69	0.56	0.07	−0.08	−0.11	−0.15	−0.21	−0.29	0.27	0.42	0.43	0.53	0.49	0.69										
14. Task conflict (time 3)	1.88	0.48	0.83	0.76	0.74	−0.07	−0.01	−0.09	0.02	−0.16	−0.19	0.25	0.43	0.65	0.58	0.47	0.63	0.64									
15. Task conflict (time 4)	1.86	0.47	0.88	0.69	0.71	0.04	−0.05	0.04	−0.06	−0.12	−0.12	0.35	0.49	0.53	0.65	0.57	0.68	0.71	0.77								
16. Task conflict (time 5)	1.94	0.54	0.86	0.66	0.80	0.03	−0.06	−0.06	−0.08	−0.15	−0.21	0.23	0.44	0.45	0.61	0.70	0.58	0.70	0.62	0.73							
17. Relationship conflict (time 1)	1.39	0.53	0.82	0.79	0.72	−0.11	−0.07	0.01	−0.03	0.02	0.06	0.39	0.36	0.35	0.38	0.36	0.47	0.26	0.24	0.24	0.38						
l8. Relationship conflict (time 2)	1.31	0.35	0.82	0.78	0.63	0.23	−0.01	−0.01	−0.01	−0.08	0.01	0.38	0.58	0.43	0.55	0.52	0.47	0.66	0.54	0.55	0.55	0.46					
19. Relationship conflict (time 3)	1.39	0.46	0.81	0.83	0.74	−0.14	0.06	0.03	−0.25	−0.02	−0.03	0.20	0.47	0.61	0.59	0.49	0.34	0.45	0.42	0.60	0.40	0.34	0.52				
20. Relationship conflict (time 4)	1.40	0.43	0.86	0.82	0.74	−0.12	−0.11	−0.01	−0.09	−0.14	−0.13	0.39	0.56	0.73	0.73	0.63	0.55	0.59	0.59	0.69	0.57	0.37	0.58	0.81			
21. Relationship conflict (time 5)	1.51	0.55	0.84	0.76	0.69	−0.23	−0.20	−0.21	−0.19	−0.20	−0.32	0.36	0.48	0.59	0.72	0.74	0.57	0.59	0.53	0.59	0.68	0.43	0.52	0.61	0.79		
22. Surface level diversity	0.44	0.18	na	na	na	−0.12	−0.19	−0.22	−0.05	−0.10	−0.08	0.04	0.24	0.21	0.09	0.02	0.06	−0.10	−0.07	−0.06	−0.12	0.01	0.06	0.03	0.04	−0.04	
23. Individual performance	32.88	2.29	na	na	na	0.14	−0.07	−0.06	0.08	−0.04	−0.17	−0.02	−0.03	−0.10	−0.08	0.01	0.02	0.04	0.00	−0.06	0.04	−0.03	−0.07	−0.20	−0.10	0.06	0.03

[a] Correlations larger than.13 are significant at the 5 percent level. Correlations larger than .38 are significant at the 1 percent level.
[b] Agreement statistics are not reported for group performance and Surface level diversity because these variables are calculated at the group level.
[c] Cronbach alphas are not reported for collective efficacy because the items that comprise collective efficacy are summed, not averaged.

Table 4
Results of confirmatory factor analysis for relationship, task, and process conflict at times l–5.

Fit statistic	Time 1	Time 2	Time 3	Time 4	Time 5
Y^2 (df = 24)	43.76**	48.94**	24.64	39.09*	51.04***
CFI	0.951	0.975	0.999	0.976	0.962
RMSEA	0.107	0.120	0.019	0.093	0.125

* $p < .05$.
** $p < .01$.
*** $p < .001$.

guishable from the other two forms (Behfar, Mannix, Peterson, & Trochim, 2008). Therefore, we thought it appropriate to verify the separability of all three forms of conflict in our data. As illustrated in Table 4, confirmatory factor analyses carried out at each time point provide evidence for three distinct forms of conflict.

Results

Means, standard deviations and correlations for all study variables at all time points are listed in Table 3. Preliminary analyses showed that demographic characteristics such as the average age ($r = -.01$, *ns*), average year in school ($r = -.02$, *ns*) and the percentage of males in the group ($r = -.01$, *ns*) were not significantly correlated with group performance, therefore we did not include them as control variables.

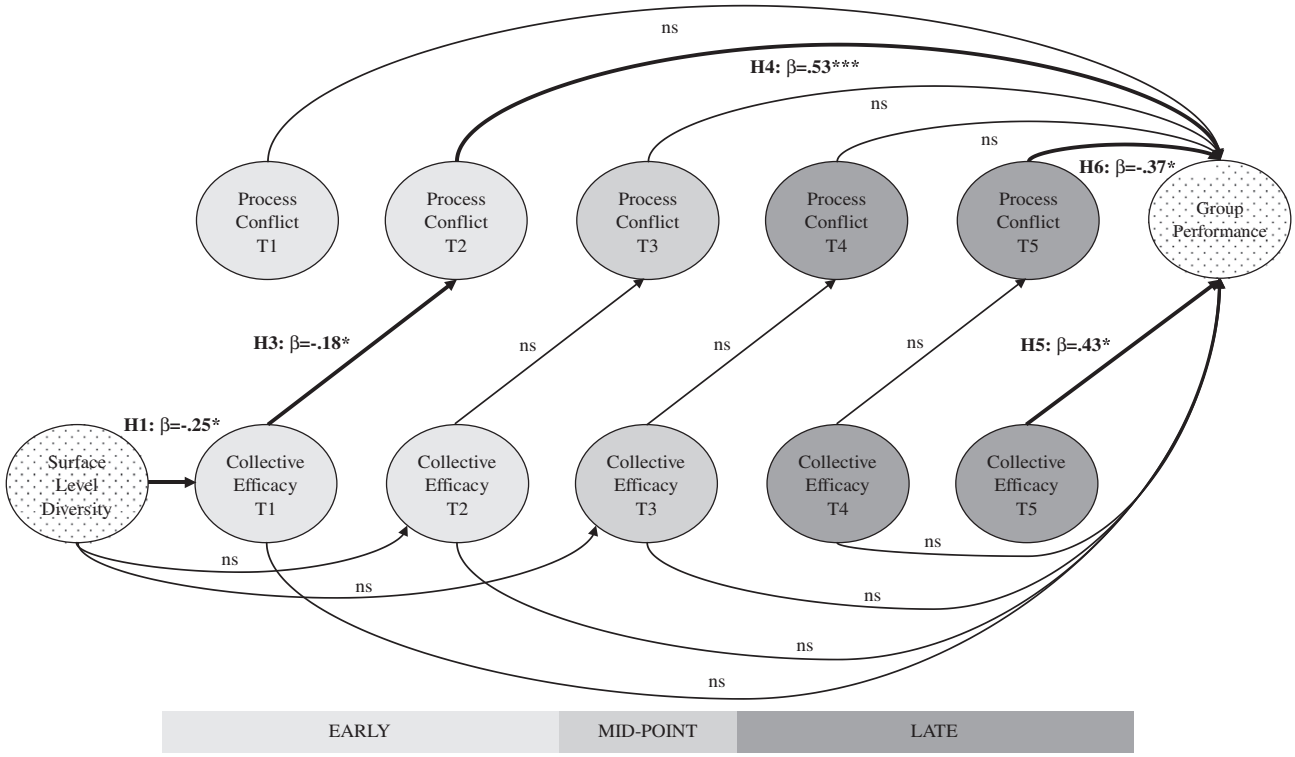
Hypothesis tests

We tested our hypotheses using path analysis. We took advantage of our longitudinal study design to test our temporal predictions by conducting lagged analyses. Because this approach controls for autocorrelation, these analyses allowed us to investigate the relationship between, for instance, collective efficacy at a given time point and process conflict at the next time point while controlling for the effect of the next time point's level of collective efficacy (see Fig. 1). The model demonstrated excellent fit with the data ($\chi^2(37) = 44.25$; CFI = .986; RMSEA = .052). The CFI exceeds the standard recommended by Hu and Bentler (1999) and the RMSEA is lower than the criterion suggested by Brown and Cudeck (1993). All hypothesis tests described below are two-tailed.

In Hypothesis 1, we predicted that surface level diversity would be negatively associated with early collective efficacy. This prediction was supported by a statistically significant path from surface level diversity to collective efficacy at time 1 ($\beta = -.25$, $p < .05$). The paths from surface level diversity to collective efficacy at times 2 and 3 were not significant (time 2: $\beta = -.07$, *ns*; time 3: $\beta = -.14$, *ns*) suggesting that, consistent with past research, the effects of surface level diversity were fairly immediate but disappeared before the mid-point of the group project.

In Hypothesis 3, we predicted that early collective efficacy would be negatively associated with early process conflict. This hypothesis was supported by a statistically significant path from collective efficacy at time 1 to process conflict at time 2 ($\beta = -.18$, $p < .05$). Furthermore, the relationship between collective efficacy and process conflict emerged exclusively during the early stages of the group project. Early collective efficacy was not associated with process conflict at the mid-point ($\beta = -.03$, *ns*), further, collective efficacy at the mid-point was not associated with late process conflict (time 4) ($\beta = -.04$, *ns*), nor was late collective efficacy (time 4) associated with late process conflict (time 5) ($\beta = .03$, *ns*).

In Hypothesis 4, we predicted that early process conflict would be positively associated with subsequent group performance. This hypothesis was supported by a statistically significant path from process conflict at time 2 to group performance ($\beta = .53$, $p < .001$).



a All of the reported paths are standardized coefficients. Bold arrows indicate paths that are significant.

Fig. 1. Path analysis linking surface level diversity, collective efficacy, process conflict and group performance over time. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

The positive relationship between process conflict and group performance did not emerge at time 3 ($\beta = -.18$, *ns*) or time 4 ($\beta = .19$, *ns*).

Cumulatively, the above hypotheses, together with the results of the path analysis, indicate that early collective efficacy influences group performance through process conflict. This is consistent with mediation which can be implied by a theoretical chain or model that has at least three "waves" of variables, with one wave intervening between the other two. The Sobel (1982) test, is one of a set of procedures that MacKinnon, Lockwood, Hoffman, West, and Sheets (2002) recommend to check for mediation. As expected, a Sobel (1982) test revealed a fully mediated relationship between collective efficacy at time 1 and group performance through process conflict at time 2 ($z = -3.54$, $p < .01$).[1]

In Hypothesis 5, we predicted that late collective efficacy would be positively associated with group performance. This prediction was supported by a statistically significant link between collective efficacy at time 5 and group performance ($\beta = .43$, $p < .05$). Finally, in Hypothesis 6, we predicted that late process conflict would be negatively associated with group performance. This prediction was supported by a significant path from process conflict at time 5 to group performance ($\beta = -.37$, $p < .05$).

Supplementary analyses

We conducted additional analyses to address two potential alternative explanations to our results. First, the relation between collective efficacy at time 1 and process conflict at time 2 may be driven by one of the other two types of conflict at time 1. To address this possibility, we conducted an additional path analysis controlling for task and relationship conflict at time 1. All of our results remained significant in the model, yet the paths from task conflict at time 1 and relationship conflict at time 1 to process conflict at time 2 were not significant (task conflict: $\beta = .14$, *ns*; relationship conflict: $\beta = .01$, *ns*). Furthermore, by adding task and relationship conflict at time 1, model fit did not improve, in fact, the fit statistics fell below the traditionally accepted cut-off points ($\chi^2(62) = 123.42$; CFI = .892; RMSEA = .117).

Second, we predicted that early collective efficacy should be especially consequential for process conflict, because process conflict requires some degree of forethought and planning (Jehn & Bendersky, 2003; Vancouver & Kendall, 2006). Yet it is possible that early collective efficacy might reduce other types of conflict in addition to process conflict. Our relatively small sample size did not allow us to investigate the effects of all three types of conflict at all five time points simultaneously. Instead, we conducted two additional path analyses with process conflict at all time points replaced first with relationship conflict at all time points,

[1] The direct path from collective efficacy at time 1 to group performance was not significant. This is to be expected, however, since the presumed mediator (process conflict) was included in the path analysis. Therefore, we conducted a separate linear regression to investigate whether, when controlling for late collective efficacy (time 5), early collective efficacy (time 1) would be negatively associated with group performance when process conflict at time 2 is excluded. We also wanted to rule out two additional alternative explanations for the hypothesized effect. First, that individual performance might account for the relationship between early collective efficacy and group performance since individual performance influences both collective efficacy (Tasa et al., 2007) and group performance (Guzzo & Dickson, 1996). Individual performance was measured by averaging each group member's midterm grade since that grade was received while they were working on the group project. Second, it is possible that one of the other forms of conflict, not collective efficacy might explain the influence of early collective efficacy and group performance. The results were not consistent with these alternative explanations and showed that collective efficacy at time 1 was negatively related to performance ($\beta = -.33$, $p < .05$) and collective efficacy at time 5 was positively related to performance ($\beta = .47$, $p < .01$), Model $R^2 = .36$, $F(3, 65) = 12.01$, $p < .01$; $R^2\Delta = .10$, $p < .01$, $F(2, 62) = 5.27$, $p < .01$. The controls were entered in the first step and only individual performance was significant, ($\beta = .50$, $p < .01$). These results replicate the preliminary study and provide additional support for Hypothesis 2.

and second with task conflict at all time points. The results of both models support our focus on process conflict. Collective efficacy at time 1 did not predict either relationship conflict at time 2 ($\beta = -.03$, *ns*) or task conflict at time 2 ($\beta = -.12$, *ns*). Overall, the models displayed strong fit (relationship conflict: $\chi^2(37) = 58.68$; CFI = .961; RMSEA = .09; task conflict: $\chi^2(37) = 40.04$; CFI = .995; RMSEA = .034), as we would expect given research has shown that both relationship and task conflict influence group performance (De Dreu & Weingart, 2003; Jehn & Mannix, 2001).

General discussion

Numerous studies have documented the benefits of collective efficacy for group processes and performance (Gully et al., 2002). In light of this research, it would be reasonable to advise groups to build a strong sense of collective efficacy as early as possible to be sure they set more difficult goals, overcome obstacles and ultimately achieve success (Bandura, 2000). As logical as this advice sounds, however, there is very little longitudinal research on the antecedents and consequences of *early* collective efficacy. Moreover, it is possible that collective efficacy might suppress the consideration of alternatives (Whyte, 1998) which would, in turn, have particularly detrimental consequences in the early stages of a project; at which time critical long-term strategic decisions are debated and ultimately made about *how* the group should go about completing shared tasks (Gersick, 1988).

The results of two longitudinal studies support this perspective and raise the provocative possibility that collective efficacy may have unintended negative consequences. Specifically, the timing of the emergence of collective efficacy in-groups may be an important factor to consider. When collective efficacy is "premature" by emerging at high levels too soon, it may actually suppress beneficial forms of conflict that are required in the early stages of a project to make long-term strategic decisions. Therefore, it may be important to not only manage the amount of collective efficacy, since excessive levels of confidence may be detrimental (Tasa & Whyte, 2005), but to consider when collective efficacy emerges over time.

One limitation of both studies is that, because it was conducted in classroom project teams, the results might not generalize to groups working in organizational settings who have a longer history of past interactions and who may work on several different types of tasks. Our findings might also only apply to certain types of complex cognitive tasks, given that the team project required students to pose questions, collect information, and synthesize the information into a final report. Therefore, it is not possible to generalize to groups working on physical endurance tasks, such as sports teams, which have been an important population in research on collective efficacy (e.g., Feltz & Lirgg, 1998; Hodges & Carron, 1992; Watson, Chemers, & Preisser, 2001). Aside from these limitations, however, our results also have a number of theoretical and practical implications which we discuss below.

Theoretical implications

Our results are consistent with Whyte's (1998) framework linking collective efficacy to groupthink, but we also extended it in two important ways. First, we theorized that, because overconfidence can be particularly problematic on tasks that benefit from long-term planning (Vancouver & Kendall, 2006), then any negative consequences of collective efficacy are probably most likely to emerge toward the beginning of a group project. Existing research has shown that collective efficacy can reduce decision making vigilance when it reaches levels that are excessive or exceed actual capability (Tasa & Whyte, 2005) but our research calls attention to the timing of *when* collective efficacy emerges. Confidence that comes too soon is problematic while confidence near a task deadline may facilitate group performance.

Second, an implication of Whyte's (1998) theory is that collective efficacy might suppress conflict, but current research has not specified exactly which form of conflict might be dampened in overconfident groups. We found that early collective efficacy reduces early process conflict in particular, possibly because such conflicts require foresight about how a group should go about completing its tasks (Audia et al., 2001; Vancouver & Kendall, 2006). Overconfident groups may put off those discussions because they are reluctant to devote too much time and effort to tasks they feel almost assured of completing successfully (Moore & Healy, 2008). The motivation to consider alternative strategies may be higher in-groups who do not feel quite so certain about their probability of success.

We do not, however, think that it would be advisable to lower a group's confidence to counteract this problem. Instead, it may be more effective to encourage debate around issues relating to the process of getting work done using techniques such as dialectical inquiry (Schweiger, Sandberg, & Ragan, 1986) or by encouraging conflict either by instructions (Nemeth, Personnaz, Personnaz, & Goncalo, 2004) or by building shared norms that permit the expression of alternative viewpoints (Goncalo & Staw, 2006; Postmes, Spears, & Cihangir, 2001). Our results inform such strategies by identifying both the form of conflict that might be unduly suppressed and the period of time during which such conflicts might not emerge, but should, if the group is to perform effectively. Groups must also worry, however, about letting potentially useful and moderate amounts of conflict escalate to the point of becoming unmanageable. Recent research suggests that there should also be methods for conflict resolution to prevent early process conflict from becoming destructive and emotional over time (Greer et al., 2008; Behfar, Mannix, et al., 2008; Behfar, Peterson, et al., 2008).

The results also contribute to the small but growing body of research on the relationship between process conflict and group performance (Greer & Jehn, 2007; Jehn & Bendersky, 2003). Past research has theorized that process conflict may be beneficial for group performance by facilitating the sorting of people into tasks to which they are most suited (Jehn & Bendersky, 2003; Jehn et al., 1999). Jehn and Mannix (2001) made a similar prediction but they reasoned that these benefits might be most likely to emerge toward the beginning of a group project because it is at that point when long-term decisions are made regarding logistical issues such as the division of labor (Gersick, 1988). So far, however, these purported benefits of process conflict have not been verified empirically (Jehn & Mannix, 2001). Our results, however, did support these predictions. We found that early process conflict was positively associated with group performance, while process conflict near the task deadline was negatively associated with group performance. One reason for the discrepancy between our findings and those reported by Jehn and Mannix (2001) may simply be due to differences in our analytical approach; we controlled for process conflict at the middle and at the end of the groups' interaction and we also measured performance as a continuous variable as opposed to conducting a median split.

Given the consequences of early collective efficacy for group processes and performance, our results suggesting that collective efficacy beliefs may initially emerge as a result of surface-level demographic heterogeneity are also important. Existing research has linked surface level diversity to a number of important group outcomes, but has not focused on the emergence of shared beliefs such as collective efficacy (Van Knippenberg & Schippers, 2007). Our findings suggest that the diversity of a group may either trigger assumptions about group members' ability to work well together and succeed or may actually cause a lack of cohesion or

awkward interactions that people may assume should diminish group performance (Peterson & Behfar, 2003; Staw, 1975). However, consistent with existing research on the consequences of surface level diversity (e.g. Harrison et al., 1998), the relationship between diversity and collective efficacy disappeared by the midpoint of the project, probably because increased contact gave the group more information on which to base judgments of confidence (Harrison et al., 1998; Mischel & Northcraft, 1997). Therefore, we would also predict that diversity and collective efficacy are most likely to be negatively correlated in-groups that have no prior history of working together (Peterson & Behfar, 2003).

In light of our results and the theory of performance episodes (Marks et al., 2001), there may be two routes through which groups form collective efficacy beliefs. The first has been well documented in existing research (Bandura, 1997; Tasa et al., 2007), and suggests that groups use objective feedback to estimate their likely future performance. The second, suggested by our results, is that groups may also use cues that are unrelated to their history of past performance. We would expect that the first route is more characteristic of groups who have worked together before, on tasks for which there are clear measures of performance and that such assessments may take more time to emerge since groups need time to process external feedback (Gibson & Earley, 2007).

The second route is probably more characteristic of groups who meet for the first time to work on tasks for which feedback is not immediately available or ambiguous (Ericksen & Dyer, 2004), and these assessments of capability may emerge relatively quickly. These two routes to the formation of collective efficacy beliefs may be similar in a number of important ways to dual process models in social psychology more generally (Smith & DeCoster, 2000) and suggest that groups may also form collective efficacy beliefs through either a conscious and effortful process of making inferences over a relatively extended period of time, or through a relatively effortless reliance on well learned associations (Petty & Cacioppo, 1986). Future research might explore other factors like diversity that are not related to feedback, but may also lead to the formation of collective efficacy beliefs. It would also be interesting to know, at the minimum, how much time groups need to form these shared assessments, especially in light of research on "thin slices" of individual behavior suggesting that accurate predictions of future performance may be based on observations as short as 15 s (Ambady & Rosenthal, 1993).

Avenues for future research

There are also a number of interesting issues that remain for future research. First, future work might investigate the mechanism that explains why process conflict is useful in the early stages but detrimental in the later stages of a project. One reason may be that such conflicts are less likely to be taken personally in the early stages of a project before people have had time to get to know each other; but they may elicit more negative emotion near a deadline when people feel time pressure and there is a longer history of interaction (Jehn, 1995). Process conflicts over the division of labor might be a case in point. Conflicts over "who does what?" may not elicit much emotion early on because people may attribute such misunderstandings to the fact that the members of the group have not yet had a chance to really get to know each other. Furthermore, one might assume in the early stages that, over time, group members will come to appreciate each member's potential to make a unique contribution—at which point members may be more likely to get the assignment that they want (Goncalo & Duguid, 2008). Such conflicts may be taken more personally, however, toward the end of the project if they reflect a reversal of decisions that were made earlier (Bies, 1987; Greer & Jehn, 2007). In other words, the group assumed that one person was qualified to take on a particular task but they changed their mind and renewed conflicts over the division of labor ensue; but at this point they will engender more negative affect (Greer & Jehn, 2007).

Future research might also investigate these nuances, possibly with a more precise measure of process conflict that more explicitly differentiates between conflicts over task-coordination (what needs to get done and when) and people-coordination (who does what) since the latter may be more likely to become emotional over time (Behfar, Mannix, et al., 2008; Behfar, Peterson, et al., 2008). Another distinction that might be important is conflict over longer-term strategic decisions such as task deadlines, as opposed to more short-term logistical issues such as the division labor. Each of these types of process conflict may have different effects on group performance at different points in time. Finally, it would be useful to compare process conflict to other variables that have been included in studies of collective efficacy such as cooperation and communication (Lester et al., 2002). We suspect that the extent to which the group enjoys talking to each-other and finds it easy to work together might be the opposite of relationship, not process conflict since both seem to hinge on whether or not group members like each-other.

It would also be interesting to examine how the effect of collective efficacy might change, if groups are provided periodic performance feedback. In line with research on self-efficacy (Stone, 1994), we suspect that groups with high collective efficacy that receive positive feedback are unlikely to increase their effort and attention to task performance strategies. For instance, Bandura and Jourden (1991) found that individuals who receive positive feedback and have high efficacy become more complacent. After all, in the presence of positive feedback, there is little motivation to change task strategies (Podsakoff & Farh, 1989; Taylor, Fisher, & Ilgen, 1984). Groups with high collective efficacy may be equally complacent after receiving negative feedback, considering people with high efficacy dismiss negative feedback (Nease, Mudgett, & Quiñones, 1999) or make self-serving attributions such as attributing negative feedback to bad luck (Silver, Mitchell, & Gist, 1995). In contrast, members with low efficacy make self-effacing attributions by attributing negative feedback to lack of ability (Silver et al., 1995). On one hand, this is adaptive because members who attribute negative feedback to lack of ability develop new task strategies to better apply their skills (Sujan, 1986). On the other hand, however, members in-groups with low efficacy that receive negative feedback may despair of performing their task well and slacken their efforts (Silver et al., 1995).

The consequences of collective efficacy for group performance might also be mediated by the network structure of the group. Recent research has investigated the effect of teams' network structure on outcomes such as viability and performance (for a review, see Balkundi & Harrison, 2006). As an example, dense ties among group members promote mutual consensus and lack of disagreement that undermine performance (Krackhardt, 1999). Might groups with high collective efficacy develop stronger and denser ties than groups with low collective efficacy? Certainly groups with high collective efficacy are very cohesive (Bandura, 2000) and report being more comfortable with each other and find it easy and enjoyable to work together (Lester et al., 2002). This kind of atmosphere may be indicative of dense ties among group members (Reagans & McEvily, 2003). However, groups with high collective efficacy may also be prone to overlook information that would otherwise be acquired by seeking ties with external individuals or groups (Granovetter, 1973). Indeed, groups with high collective efficacy might limit their information search (Whyte, 1998). Hence the double-edge sword of collective efficacy in-groups: It may be problematic when it interferes with the group's ability to form external ties, but it may also be beneficial because dense ties contribute to the development of trust (Krackhardt, 1992; Williams, 2001).

Conclusion

In conclusion, the dominant view that collective efficacy facilitates group performance may require modification, taking into account the more nuanced view that feelings of collective efficacy may be too strong or emerge too soon. This emerging view of collective efficacy and group performance raises a complex set of trade-offs between feelings of confidence and group harmony on the one hand, and the need for accuracy and productive conflict on the other hand. Only when collective efficacy is evaluated for both its costs and its benefits over time can people make informed decisions about how to manage these trade-offs.

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Appendix

Process. conflict items

1. How often are there disagreements about who should do what, in your work group?
2. How much conflict is there in your work group about task responsibilities?
3. How much conflict is there about the division of labor in your work group?

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