Journal of Organizational Behavior
J. Organiz. Behav. **25**, 1015–1039 (2004)
Published online in Wiley InterScience (www.interscience.wiley.com). **DOI**: 10.1002/job.293

Surface- and deep-level diversity in workgroups: examining the moderating effects of team orientation and team process on relationship conflict

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Summary The increased use of teams in organizations, coupled with an increasingly diverse workforce, strongly suggests that we should learn more about how team diversity affects functioning and performance. The purpose of this study was to explore the differential impact of surface-level diversity (gender, ethnicity), deep-level diversity (time urgency, extraversion), and two moderating variables (team orientation, team process) on relationship conflict over time. Hypotheses were tested by tracking 45 student project teams in a longitudinal design. Results revealed that team orientation and team process moderated the diversity–conflict link. Specifically, team orientation helped to neutralize the negative effects of surface-level (gender) diversity on relationship conflict. In a similar manner, team processes worked to weaken the deleterious effects of deep-level diversity (time urgency) on relationship conflict. In addition, relationship conflict resulted in lower perceived performance by team members. Copyright © 2004 John Wiley & Sons, Ltd.

Introduction

Prompted by the increasing presence of women and minorities in the workforce (e.g., Heneman, Judge, & Heneman, 1999; Offerman & Gowing, 1990), as well as the shift to team-based structures in organizations (e.g., Lawler, Mohrman, & Ledford, 1995), both managers and researchers have developed a strong interest in surface-level diversity in group contexts. Surface-level or demographic diversity refers to the extent to which a unit is heterogeneous on characteristics such as age, gender, ethnicity, functional background, and organizational tenure (Lawrence, 1997; Tsui, Egan, & Xin, 1995). In addition to the surface-level composition of the group, deep-level diversity, or differences with respect to attitudes, personality, and values, has also been investigated (e.g., Barrick, Stewart, Neubert, & Mount, 1998; Jehn, Chadwick, & Thatcher, 1997; Harrison, Price, Gavin, & Florey, 2002).

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Received 10 March 2003
Revised 9 May 2003
Accepted 8 July 2004

The dynamics of diversity are especially salient in teams, where the level of face-to-face interaction is high, and members must often rely on one another to perform their tasks effectively. Indeed, empirical research in organizational and laboratory settings suggests that both surface- and deep-level diversity make a difference for group outcomes and significantly affect the experiences of the individuals within a team (e.g., Harrison et al., 2002; Jackson & Ruderman, 1995; Milliken & Martins, 1996). Nevertheless, results are far from conclusive, and there is still much to learn about which individual differences relate to group dynamics and under what conditions (e.g., Tsui et al., 1995; Williams & O'Reilly, 1998).

Diverse work teams include members who can be identified as belonging to distinct groups, and they have been found to function differently from homogeneous teams (e.g., Jackson, May, & Whitney, 1995; Milliken & Martins, 1996; Williams & O'Reilly, 1998). Conflict is a common outcome when members of different groups interact. Specifically, recent studies have found conflict to be a particularly robust mediator between diversity and performance (e.g., Jehn, Northcraft, & Neale, 1999; Pelled, Eisenhardt, & Xin, 1999). Although various types of conflict have been examined (e.g., Amason, 1996; De Dreu & Weingart, 2003), surface-level diversity has been primarily linked to relationship conflict (Jehn et al., 1997, 1999; Pelled, 1996b; Thatcher, Jehn, & Chadwick, 1998). Therefore, relationship conflict, which focuses on personality differences, tension, animosity, and annoyance among individuals (e.g., Amason, 1996; Pelled et al., 1999), will be the criterion of interest in the present study.

In the present study, business student teams worked on unique process improvement projects sponsored by local businesses. As such, each student team simulated a newly formed, industry-based quality improvement task force with a limited time frame of 15 weeks. The sections below describe the theoretical framework, the constructs selected, and the hypotheses.

Theoretical framework

Several theories have been utilized to explain the negative outcomes of team diversity. According to social identity (Tajfel, 1978) and self-categorization (Turner, 1982) theories, people define and differentiate themselves in terms of group memberships. Categorization processes may be triggered when members are dissimilar, resulting in the tendency for individuals to evaluate members of other subgroups more negatively than members of their own subgroup (e.g., Brewer, 1979; Turner, 1982). As members are motivated to maintain their social identities, they exhibit a favorable bias towards others who appear to have similar characteristics (Tajfel & Turner, 1986; Turner & Haslam, 2001). Another theoretical approach that has been used by diversity researchers is the similarity–attraction paradigm (Bryne, 1971), which suggests that people prefer similarity in their interactions. Individuals are attracted to similar others because they envision that their own values and beliefs will be reinforced. Social identity, self-categorization, and similarity–attraction theories lead to the same general prediction: high diversity teams will tend to have less positive attitudes toward each other, which may translate into conflict among team members.

Although these theories have been primarily used in reference to surface-level diversity, they are also applicable to deep-level diversity in that underlying attributes between people in terms of values and personalities can also be the basis of categorization or similarity–attraction (e.g., Harrison et al., 2002; Tsui, Eagan, & O'Reilly, 1992). This is especially true when considering relationships over time. Although initial categorizations may be based on overt, demographic characteristics, perceptions may change when knowledge of psychological characteristics is obtained (Bryne, 1971). According to the contact hypothesis, stereotypes based on overt features are replaced by more accurate knowledge as members spend more time together (Amir, 1969). Recent empirical research found that surface-level

differences (e.g., gender, ethnicity) became less important and deep-level features became more important as groups continued to interact over time (e.g., Harrison, Price, & Bell, 1998; Harrison et al., 2002; Pelled et al., 1999).

Although the theories reviewed predict that team diversity is likely to result in competitive behavior and conflict, empirical research has found mixed results. In reviewing 40 years of research, Williams and O'Reilly (1998) concluded that there were no consistent main effects of demographic diversity on performance. In response, they suggested increasing the complexity of how diversity is conceptualized to integrate more intervening variables, types of diversity, and moderators. The present study incorporates these recommendations in several ways. For example, the effects of two aspects of surface-level diversity (gender, ethnicity) and two aspects of deep-level diversity (time urgency, extraversion) are examined on relationship conflict. Whereas most diversity studies consider either surface-level (e.g., Pelled, 1996b; Pelled et al., 1999) *or* deep-level heterogeneity (e.g., Barrick et al., 1998; Neuman & Wright, 1999), there is a need for research to simultaneously examine several of the dimensions of heterogeneity that characterize intact teams (Jackson, 1992; Kozlowski & Bell, 2003). In addition, two moderators (team orientation, team processes) are examined, and relationships are explored over time. As behavior is a function of both internal and external forces, team orientation represents the individual, psychological context, and team processes represent the social, situational context. Therefore, the current research makes substantive and methodological contributions by expanding the range of diversity dimensions previously considered, exploring potentially pervasive moderators, and adopting a longitudinal design.

Surface-level diversity, relationship conflict, and the moderating effect of team orientation

Diversity is an umbrella term for the extent to which members of a team are dissimilar (heterogeneous) with respect to individual-level characteristics (Jackson, 1992). Described as demographic (Williams & O'Reilly, 1998), visible (Pelled, 1996a), or readily detectable (Milliken & Martins, 1996), surface-level diversity typically includes age, gender, ethnicity, functional background, and organizational tenure (Harrison et al., 2002; Lawrence, 1997; Tsui et al., 1995). Although individuals can categorize themselves in many different ways, it is difficult to deny demographic attributes. Because research on person perception has established that gender and race/ethnicity are heavily relied on in forming initial perceptions of others (McCann, Ostrom, Tyner, & Mitchell, 1985; Taylor, Fiske, Etcoff, & Ruderman, 1978), these were the two types of surface-level diversity examined.

Pelled (1996a) proposed that the more visible a particular type of diversity, the stronger its association with relationship conflict. Within a workgroup, therefore, a person's demographic distinctiveness may result in feelings of hostility or animosity toward other group members. Indeed, empirical research has found heterogeneity on gender (e.g., Pelled, 1996b; Jehn et al., 1997, 1999; Thatcher et al., 1998) and ethnicity (e.g., Pelled et al., 1999) to increase relationship conflict. These relationships have been established at both the individual and group levels of analysis, as well as in organizational and student teams (e.g., Jehn et al., 1997, 1999; Pelled, 1996b; Pelled et al., 1999; Thatcher et al., 1998).

Team orientation

Given that surface-level diversity is a reality for organizations and an important value in society (Tsui et al., 1995), it is worth exploring the factors that would assist in counteracting these negative effects on group functioning. The current research proposes that team orientation may moderate the effects of surface-level diversity on relationship conflict. Existing research on conflict has investigated

contextual moderators, including the routineness of the task, levels of interdependence, conflict norms, and group longevity (e.g., Jehn, 1995; Jehn et al., 1999; Pelled et al., 1999; Thatcher et al., 1998). However, attitudes toward teamwork have generally not been examined as moderators of team-level effects nor in relation to the diversity–conflict linkage.

Team orientation refers to an individual's propensity for functioning as part of a team and the degree to which individuals prefer to work in group settings for task accomplishment (Driskell & Salas, 1992). The construct is not team or task-specific, but refers to a general tendency to be comfortable in team settings, to exhibit interest in learning from others, and to have confidence in the productivity of the team. Conceptually, authors have referred to team orientation as a preference that is less stable than personality traits, but more stable than mere transitory states (Wageman, 1995). That is, team orientation is generally viewed as stable enough to affect how individuals respond to a particular situation, but can be changed over time through experience (Eby & Dobbins, 1997; Wageman, 1995). Hackman (1987) identified preference for group work as an integral aspect of teamwork, and organizations have begun to use an individual's willingness and enthusiasm to work in groups as a selection criterion (Eby & Dobbins, 1997; Stevens & Campion, 1994).

Intragroup differences in sex and ethnicity may engender less of the animosity and annoyance characteristic of relationship conflict if members value working in teams and have a high preference for group work. When team orientation is high, the negative effects of categorization and demographic distinctiveness may be less likely to occur, and members may exhibit a greater commitment to work through differences. Previous research has found preference for group work to be positively related to group member satisfaction (Shaw, Duffy, & Stark, 2000), which is negatively related to relationship conflict (e.g., Jehn, 1995; Jehn et al., 1997; Thatcher et al., 1998). Based on this rationale, the following is proposed:

> *Hypothesis 1*: Team orientation will moderate the relationship between surface-level diversity (gender, ethnicity) and relationship conflict such that surface-level diversity will be less likely to result in relationship conflict when team orientation is higher than when it is lower.

Deep-level diversity, relationship conflict, and the moderating effect of team processes

Although the majority of team diversity research has focused on demographic characteristics (e.g., Milliken & Martins, 1996; Tsui et al., 1995; Williams & O'Reilly, 1998), researchers are beginning to assess intra-group differences in ability, personality, attitudes, and values (e.g., Barrick et al., 1998; Jackson & Ruderman, 1995; Jehn et al., 1997; Harrison et al., 2002; Tziner & Eden, 1985). In comparison to observable diversity, these characteristics are considered deep-level (Harrison et al., 1998), underlying (Milliken & Martins, 1996), and psychological (Jackson & Ruderman, 1995).

In addition to visibility, Pelled (1996a) proposed job relatedness as an important dimension of diversity variables. The important issue here is whether the attribute relates to the fundamental purposes of the team. Extending Pelled's (1996a) work beyond surface-level diversity to deep-level diversity, we propose that time urgency and extraversion are relevant to the task performed by the current study sample. The student teams under investigation are task forces in McGrath's (1984) typology of groups in that they have ad hoc membership, narrowly defined goals, regular deadlines, and a limited lifetime. Time urgency is clearly salient in academic and work environments that are laden with schedules, deadlines, and specific performance episodes. In addition, extraversion has been found to be especially important in work settings requiring social interaction (Barrick & Mount, 1991). Below, time urgency and extraversion are discussed in turn.

Time urgency

Existing deep-level diversity research has primarily focused on Big Five personality traits (e.g., Neuman, Wagner, & Christiansen, 1999), cognitive ability (e.g., Tziner & Eden, 1985), values (Jehn et al., 1997, 1999), or work-related attitudes (Harrison et al., 2002). Nevertheless, there are many other types of heterogeneity that can exist in a team, and there is a need to consider a wider range of diversity dimensions (e.g., Jackson et al., 1995). Therefore, this paper makes a contribution to the literature by examining time urgency as a type of deep-level diversity. In addition, because Waller, Conte, Gibson, and Carpenter (2001) have called for researchers to examine the impact of time urgency on group outcomes other than deadline adherence, this study investigates conflict as the criterion variable of interest.

Time urgency is an individual difference variable relating to perceptions of deadlines, time awareness, and the rate at which tasks must be performed (e.g. Landy, Rastegary, Thayer, & Colvin, 1991; Rastegary & Landy, 1993). It is the single most significant trait of Type A behavior and is the only behavior evident in all Type As (Friedman & Rosenman, 1974). Time-urgent people are more aware of and concerned about the passage of time, often feeling rushed (Conte, Landy, & Mathieu, 1995; Landy et al., 1991) or harassed by time limits (Wright, 1974). Providing evidence that time urgency is a stable attribute, Landy et al. (1991) reported test–retest reliabilities in the 0.90 range, and Conte et al. (1995) demonstrated that different raters are able to agree about an individual's time urgency. In addition, time urgency has been shown to predict health and performance outcomes (Bluedorn, Kaufman, & Lane, 1992; Conte, Mathieu, & Landy, 1998).

Team members may differ significantly from one another in the degree to which they concern themselves with the passage of time, control deadlines, and prioritize tasks (Conte et al., 1995; Waller et al., 2001). Time-urgent individuals are chronically hurried and preoccupied with deadlines, as well as tend to schedule more activities than can comfortably fit into the available time. For example, a study by Waller, Giambatista, and Zellmer-Bruhn (1999) found that time-urgent individuals tended to impose strict schedules on their teams, pushing members to focus on one task at a time and issuing constant warnings about the time remaining to complete tasks. In contrast, non-time-urgent individuals underestimate the passage of time and are less attentive about remaining time resources (Waller et al., 2001). Whereas time-urgent group members would prefer to work on a project right away, non-time-urgent members may wait until the last minute to begin. Therefore, the mix of time-urgent and non-time-urgent individuals within a team may generate misunderstandings and significant amounts of relationship conflict, especially in a context of time pressure and deadlines. According to Waller et al. (2001), 'differences in deadline perceptions among team members might inhibit the ability of teams to develop a shared understanding of time resources and coordinate activities to finish work on time' (p. 587). Additionally, 'synchrony in group members' expectations about deadlines may be critical to groups' abilities to accomplish successful transitions in their work' (Gersick, 1989, p. 305). Based on this rationale, the following was proposed:

> *Hypothesis 2*: Teams with higher diversity on time urgency will experience higher relationship conflict than teams with lower diversity on time urgency.

Extraversion

As the Five-Factor Model provides a comprehensive framework from which to examine personality (Barrick & Mount, 1991; Costa & McCrae, 1992), the recent work on team composition in the psychology literature has measured selected dimensions from this robust taxonomy. It should be noted that much of this research examines the aggregate *mean* level of traits (e.g., Neuman & Wright, 1999; Waung & Brice, 1998), as opposed to *variability* within groups, which is of interest in this study. However, of the research focusing on personality *diversity*, extraversion has received the most attention and

the most consistent findings (Barry & Stewart, 1997; Neuman et al., 1999). Therefore, it was examined in the present study.

Extraversion refers to the tendency to be sociable, assertive, active, and talkative (Costa & McCrae, 1992). Because extraverts are likely to be active participants in group discussions (Littlepage, Schmidt, Whisler, & Frost, 1995), a team consisting of primarily low-extraversion members may result in inadequate levels of intra-team communication. On the other extreme, however, too many extraverts within the group may also be disadvantageous because of the propensity to pursue social interactions at the expense of task demands. Indeed, Driskell, Hogan, and Salas (1987) suggested that technical tasks requiring less social interaction will be disrupted by high levels of extraversion. Therefore, a moderate number of extraverts within the team may be the most effective distribution. Supporting this reasoning, Barry and Stewart (1997) found that the proportion of high-extraversion group members was curvilinearly related to group performance, with groups having 20–40 per cent high-extraversion members outperforming groups with either fewer or more of such members. Similarly, Neuman et al. (1999) also found that diversity in team member extraversion was positively related to team performance in a field setting. Therefore, extraversion was selected as a type of deep-level diversity to be measured.

The extraversion research discussed above examines *performance* as the criterion of interest. However, the relationship between variability on extraversion and *conflict* has not received adequate empirical attention in the teams literature. Extraverted people tend to be dominant and assertive (Costa & McCrae, 1992), which requires the complementary role of submissive and introverted for group dynamics to operate smoothly. Research on member status in groups indicates that conflict can occur when there are too many dominant individuals (Mazur, 1973). In contrast, a team that consists of both high- and low-extraversion members may experience low levels of relationship conflict because roles are compatible, with some members being outgoing and talkative, while other members are more reserved and reticent (Neuman et al., 1999).

Thus far, the proposed effects of diversity have rested on the assumptions in the social identity, self-categorization, and similarity–attraction paradigms by predicting that higher diversity will result in increased relationship conflict. However, we do depart from these theories when predicting that diversity in extraversion will result in less relationship conflict. The emerging conceptual framework in the team composition literature suggests that the effects of particular forms of diversity will depend on several factors, including the type of variable being assessed, the outcomes studied, the type of aggregation method used, and the nature of the team task (e.g., Argote & McGrath, 1993; Barrick et al., 1998; Jackson et al., 1995). Moynihan and Peterson (2001) recently proposed the configuration approach as a theoretical framework to explain the nature of member personality effects on team outcomes. The configuration approach assumes that the internal fit of individual members with each other predicts team outcomes and suggests that whether homogeneity or heterogeneity is preferable depends on the specific personality trait in question. Because it allows for a deep examination into team internal dynamics and how individual members interact with each other, the current study will draw from the configuration framework in examining the effects of extraversion on relationship conflict. Therefore, the following is proposed:

Hypothesis 3: Teams with higher diversity on extraversion will experience lower relationship conflict than teams with lower diversity on extraversion.

Team processes

Given that individual differences are ubiquitous in teams and that these differences may produce dysfunctional levels of conflict, it is of interest to consider the factors that would assist in counteracting these potential negative effects. The current research proposes that team processes may moderate the effects of deep-level diversity on relationship conflict. Although normally treated as mediators,

Weingart (1997) points out that considering processes as moderators can enhance understanding of team dynamics. Existing research on deep-level diversity has investigated the moderating effect of task characteristics (e.g., Jehn, 1995; Jehn et al., 1999) and time spent in collaboration (e.g., Harrison et al., 2002), but team processes have not traditionally been examined as moderators of the diversity–conflict linkage. Team processes capture the types of interaction that occur between team members during goal accomplishment (Marks, Mathieu, & Zaccaro, 2001) and the synergistic combination of individual efforts to collective outcomes (Kozlowski & Bell, 2003).

Whereas we hypothesized that attitudes concerning teamwork would moderate the relationship between surface-level diversity (gender, ethnicity) and relationship conflict (Hypothesis 1), we propose that deep-level diversity (time urgency, extraversion) requires more of an active intervention in order to resolve the conflicts generated. That is, whether deep-level diversity is debilitating to the team may depend on the presence of counter-mechanisms such as effective team processes. According to De Dreu and Weingart (2003), 'when relationship conflicts emerge, team performance and team member satisfaction are at risk, and strategies to mitigate and eliminate relationship conflict are needed' (p. 748).

Depending on the leadership, cooperation, and communication operating in the group, procedures and norms that weaken or strengthen the consequences of diversity may result. For example, effective leadership aids in establishing and maintaining conditions that are favorable for high-performing groups, including diagnosing group deficiencies, taking remedial action to amend deficiencies, and creating a supportive context (Hackman & Walton, 1986). In addition, successful communication and cooperation aid taskwork as well as teamwork. Specifically, cooperation involves supportive and integrative actions that assist the team in enhancing interpersonal relationships and successful task accomplishment (Tjosvold, West, & Smith, 2003). Cooperation is especially important when interdependence is high (Deutsch, 1973), and communication is generally viewed as a means to enable cooperation (Kozlowski & Bell, 2003). We expected that effective team processes would encourage workgroups to take corrective actions for managing personality differences and facilitate conflict management by encouraging group members to develop strategies to overcome problems.

Hypothesis 4: Team processes (leadership, coordination, communication) will moderate the relationship between deep-level diversity and conflict such that:

A. Higher diversity on time urgency within the team will be less likely to result in relationship conflict when the occurrence of effective team processes is rated more frequent than less frequent.

B. Lower diversity on extraversion within the team will be less likely to result in relationship conflict when the occurrence of effective team processes is rated more frequent than less frequent.

Effects over time

According to Marks et al. (2001), inadequate attention has been given to the dimension of time in teams research. Indeed, most of the existing studies examining conflict have been cross-sectional (e.g., Jehn et al., 1999; Pelled, 1996b; Pelled et al., 1999), so no causal inferences could be drawn. Nevertheless, 'conflict must be examined as a dynamic process, rather than as a static event' (Jehn & Mannix, 2001, p. 247). Following the call for 'future research to take a longitudinal perspective and examine the consequences of conflict at various moments in the life cycle of organizational teams' (De Dreu & Van Vianen, 2001, p. 323), relationship conflict was examined at two points in time in the present study.

Different types of diversity may be important at different stages of a group's development. According to the contact hypothesis (Amir, 1969), there is less of a tendency to categorize and stereotype

based on superficial attributes as members get to know one another. With time, more frequent and meaningful interactions among group members are possible, allowing for larger samples of behavior to be observed and deeper-level similarities to be discovered. Providing empirical support for these ideas, Harrison et al. (1998) found that the initial negative influence of gender diversity on cohesiveness was neutralized as group members spent time together. In contrast, the impact of deeper-level diversity (member differences in overall job satisfaction) was strengthened as group tenure increased. In a follow-up study, these effects were replicated in that the negative impact of perceived surface-level diversity on team social integration diminished, but the effect of perceived deep-level diversity grew (Harrison et al., 2002). Similarly, Pelled et al. (1999) found that the effects of demographic diversity on group conflict weakened with greater group tenure.

Hypothesis 5a: From Time 1 to Time 2, surface-level diversity (gender, ethnicity) effects on relationship conflict will decrease.

Hypothesis 5b: From Time 1 to Time 2, deep-level diversity (time urgency, extraversion) effects on relationship conflict will increase.

Organizational Context

The Course

Data were collected from seven quality management courses offered through the College of Business Administration of a large public university. The quality management course was designed to familiarize students with the concepts and practice of Total Quality Management (TQM). TQM is a systems approach to management that aims to increase value to customers by designing and continuously improving organizational processes and systems. The course was organized around a series of in-depth readings and cases, which were meant to illustrate various quality and TQM issues within real-world settings. The course objectives included defining quality, formulating an individual quality philosophy, identifying methods for measuring and improving quality, and developing team-working, problem-solving, and communications skills. In addition, a key goal was to provide practical, hands-on experience with a quality improvement effort.

Three courses consisted of senior-level undergraduates, and four courses consisted of MBA and Quality and Manufacturing Management (QMM) graduate students. All courses included in data collection were taught by the same instructor and maintained the same basic content and structure.

The Team Task

Each semester, teams were assigned a unique, semester-long, process-related problem. Project sponsors included university businesses (e.g., bookstore, press, ice-skating rink, inn), local industry (e.g., manufacturing, extraction, and service organizations), government (e.g., local borough, Council of Governments), or non-profit organizations (e.g., church). Examples of projects included critically evaluating and developing recommendations for the improvement of: the final inspection and testing process for Coming Asahi Video; the incoming orders processing at the university bookstore; the land development review process for the planning commission of the local town borough;

and the canvassing process for the Unitarian Universalist Church Fellowship. Specific team tasks included conducting flowcharting processes, surveying and interviewing employees, benchmarking best-practice organizations, applying quality tools to collect data to understand problem processes, researching potential improvement options, and sometimes implementing ideas. Each team was required to apply a standard process improvement (IMPROVE) model (see article for description).

Students completed a team charter near the beginning of each semester, in which they developed a mission statement, a series of ground rules for how they would work together as a team, a list of team member skills, and project goals. Gantt and Radar charts were included as part of this effort, and the document had to be expanded and resubmitted throughout the semester to update the project status. In addition, all team members had to sign off on each version of the team charter. A written team report and a professional team presentation were also required team deliverables. Project sponsors were part of the audience for the presentation and reviewed the team's written work to decide whether to implement team recommendations. Team project grades reflected company sponsor feedback, and consisted of a composite score made up of two team charters, the final report, and the oral team presentation.

The Student Teams

There were approximately 30 per cent of international students in the graduate program, and a much lower percentage in the undergraduate courses. Given the importance of teamwork for successful completion of the project, students received significant team building and team training near the beginning of the semester (e.g., skills necessary to be good team players; tools and techniques for keeping teams focused and productive, conflict resolution models). Nevertheless, there was variability both in how well teams worked together and project quality. Typical team-related problems included someone trying to dominate the team, lack of effort and commitment by some members, different approaches to work, and different definitions of quality work.

The Course Instructor

The teaching philosophy of the instructor was to encourage critical, strategic thinking, and problem solving. The nature of the course required constant contact with students in order to keep a finger on the pulse of the teams and to detect problems as early as possible. An emphasis was placed on getting all team members to communicate their needs and expectations as well as developing a strategy to work effectively.

The Course Environment

Because of the challenging nature of both industry-sponsored as well as team-based work, the course proved stressful for many students, especially towards the end of the semester. Students had to complete a large project with real consequences (e.g., project grades, company sponsors reviewing student recommendations) within a limited, 15-week time frame in addition to their other courses. The MBA and QMM programs were extremely high stress, as graduate students were generally more competitive as well as invested in project results and had significant demands imposed upon them from other classes and instructors.

Time

The data were collected during four consecutive semesters (excluding summers) from the fall of 1998 through the spring of 2000.

Method

Study context

Data for the study were collected from 206 students comprising 45 teams across seven quality management courses of a large public research university located in the mid-Atlantic region of the United States. All seven courses (three undergraduate and four MBA) were taught by the same instructor and maintained the same basic material content, team task, and team structure. The data was collected during four consecutive semesters (excluding summers) from the fall of 1998 through the spring of 2000.

Each course required a wide range of team-related activities both in and out of the classroom, thus providing frequent opportunities for team interaction. Because team members were held mutually accountable for outcomes (grades) and remained intact for the duration of the 15-week semester, they approximate realistic, but newly established teams. The basis for team formation was primarily random, with some intervention by the course instructor to ensure demographic distribution. Each course supported between five and eight teams, depending on student enrollment. Total team size varied from three to six individuals, with an average of 4.6 students per team.

Participants

Participants included upper-level undergraduates ($n = 103$, 21 teams) and graduate business students ($n = 103$, 24 teams). The mean age of these students was 24.5, and their average level of full-time work experience was 3.53 years. Seventy-six per cent of the students were male, and 73.2 per cent were Caucasian, with the remaining students being African American (6.8 per cent), Hispanic (5.8 per cent), Asian (12.6 per cent), and other ethnicities (3 per cent).

Team task

Two to three weeks into the semester, each team received a unique process improvement project in which organizational sponsors identified problematic processes within their organization that were not yet scheduled for improvement internally. Project sponsors included university businesses, industry, government, or non-profit organizations. Student teams were charged with systematically and critically evaluating the organization's processes in order to determine ways to improve efficiency and effectiveness. Therefore, student teams simulated industry-based quality improvement work teams.

Each team was required to apply the same standard, university-based process improvement ('IMPROVE') model as a framework for process evaluation. The 'IMPROVE' model requires the following steps: (1) identify a process for improvement; (2) map the critical process; (3) prepare an analysis of current process performance; (4) research and develop possible solutions to current process problems; (5) organize and implement process improvements; (6) verify and document the results of the improved process; and (7) evaluate and plan for continuous process improvement. The first step was primarily completed by the course instructor together with the project sponsor and involved negotiations for mutually beneficial projects that were appropriate and similar in terms of both scope and basic content. The next three 'IMPROVE' steps (i.e. 'MPR') were primarily the responsibility of the student teams. Teams were required to map the current process, describe their plans for preparing an analysis of process performance, and develop possible solutions for the assigned process. Because

project sponsors determined which recommendations they would adopt, the final three 'IMPROVE' steps (i.e. 'OVE') were primarily their responsibility.

Strong efforts were made by the course instructor to equalize the difficulty of the projects. First, they all had to be doable within a semester. Second, they all had to identify an input–transformation–output process. Third, the seven-step 'IMPROVE' model had to be applied, and all projects were graded against this model. These parameters reduced some of the variance in sponsor assignments, as projects that did not meet these criteria were eliminated from consideration.

Procedure

Team members completed survey instruments at three different times over the course of nearly 4 months. During the first 2 weeks of the semester and before students began to interact (Time 1), each student completed an initial survey that measured the individual difference variables of interest in this study (extraversion, time urgency, and team orientation), as well as basic demographic information (e.g., gender, ethnicity). During the 8th week or midpoint of the semester (Time 2), students completed a self-report measure of conflict, as well as a peer evaluation of individual members' leadership, cooperation, and communication. These measures were also filled out during the 14th week (Time 3).

Measures

Surface-level diversity

Blau's (1977) index was used to indicate diversity on self-reported measures of gender and ethnicity (e.g., Harrison et al., 1998, 2002; Bantel & Jackson, 1989; Jackson et al., 1991). This index ranges from 0 (completely homogeneous) to a theoretical high of 1 (completely heterogeneous).

Deep-level diversity

Extraversion was measured with the 12-item short form of the five-factor inventory (NEO-FFI; Costa & McCrae, 1992). Respondents used a five-point Likert scale ranging from strongly disagree/definitely false to strongly agree/definitely true. The current study found a Cronbach's alpha of 0.79 at the individual level.

Time urgency was measured with a 28-item Likert scale adapted from Landy et al. (1991), which describes a person's behavior with respect to the usage of time. Item responses were coded on a five-point scale ranging from strongly disagree to strongly agree. Items were combined into a single scale, with a Cronbach's alpha of 0.83 at the individual level. In order to capture group-level diversity, the standard deviation of the extraversion and time urgency scale scores was computed (e.g., Barrick et al., 1998; Neuman et al., 1999).

Relationship conflict

Relationship conflict was measured using items from the Intragroup Conflict Scale developed by Jehn (1995), with an alpha of 0.90 at Time 1 and 0.92 at Time 2. Conflict items were rated on a five-point Likert scale anchored by 1 = 'none' and 5 = 'a lot.' Group-level indices were formed by averaging individual-level indices of relationship conflict.

Moderators

Team orientation was measured using a 21-item scale developed by Mathieu and Marks (unpublished MS, 1998). Whereas prior studies have examined preference for group work as part of the cultural

orientation of individual/collectivism (e.g., Chatman & Barsade, 1995; Earley, 1993), the present research utilized a measure more specific to workgroup situations. Sample items include: 'All else being equal, teams are more productive than the same people would be working alone;' 'I generally prefer to work alone than with others' (reverse scored); and 'I find that other people often have interesting contributions that I might not have thought of myself.' Item responses were coded on a five-point Likert scale ranging from strongly disagree to strongly agree. As a factor analysis revealed that these items loaded on to a single factor, they were combined into a scale with a Cronbach's alpha of 0.93.

The *process measure* that we utilized was a combination of communication, cooperation, and leadership variables. Researchers have argued for the importance of examining multiple dimensions of team processes as opposed to focusing on one aspect alone. For example, Kozlowski and Bell (2003) state, 'the central issue in team processes concerns the synergistic combination of individual contributions to team effectiveness . . . focusing solely on communication type and amount in the absence of attention to coordination and cooperation is incomplete' (p. 354). Therefore, rather than select one aspect of team process, we chose to examine multiple variables together. Specifically, we used a peer evaluation measure developed by Dansky (1996) in which students were asked to indicate the extent to which individual team members exhibited leadership, cooperation, and communication behaviors. Leadership was defined in terms of providing structure by initiating, clarifying, and summarizing; sensing and expressing group feelings and moods; drawing out relevant information, and emphasizing results by working on methods. Cooperation was defined in terms of encouraging the participation of all members, working in consensus with the group, looking for middle ground, and treating each other with respect. Communication was described in terms of using constructive feedback, sharing personal feelings with the team, encouraging others to express their feelings, and involving all members in discussions. Students made one rating for each dimension, summarizing their impressions across these various behaviors for each student in their team on a scale ranging from 0 (does not exhibit these characteristics at all) to 4 (always exhibits these characteristics). Ratings for each student were combined by averaging all team-mate input. Self-ratings are often inflated (Mount, 1984); therefore, only peer ratings were included in the analyses. Because a factor analysis revealed that these items loaded on to one factor, leadership, cooperation, and communication ratings were combined into a scale with an alpha of 0.71 at Time 1 and 0.75 at Time 2. Individual scales were aggregated to the group level by mean.

Results

Preliminary analyses

Prior to aggregating individual-level scores to the group level by mean, it was necessary to assess whether each group exhibited adequate within-group agreement for variables conceptualized at the group level of analysis (George & Bettenhausen, 1990). Intraclass correlations (ICC) were calculated, which measure interrater reliability or the consistency of responses among raters (James, 1982). ICC(1) reflects the extent of within- versus between-group variability, and ICC(2) provides an estimate of the reliability of the group means (Bliese, 2000). The ICC(1) values for relationship conflict were 0.54 for Time 1 and 0.43 for Time 2. The ICC(2) values were 0.85 and 0.77 for Times 1 and 2, respectively. The ICC(1) values for team process were 0.27 for Time 1 and 0.41 for Time 2. ICC(2) values were 0.63 and 0.76 for Times 1 and 2, respectively. All values were significant ($p < 0.001$) and support the use of the average scores as team measures.

Control variables

Group size was examined as a control variable because larger teams have the potential for more heterogeneity (e.g., Jackson et al., 1991), and size may influence group outcomes (e.g., Steiner, 1972). In addition, as the sample included both undergraduate and graduate students, class type was included as a control. The proportion of males and Caucasians in the groups was also controlled to ensure that diversity effects were not merely a proxy for simpler relationships. As group average scores on diversity measures can be confounded with within-group standard deviations (Bedeian & Mossholder, 2000), group means on extraversion and time urgency were also included as control variables. In addition, because it is necessary to control for the main effect of the moderating variable (e.g., Baron & Kenny, 1986), team orientation and process were included in the equations as well.

Tests of hypotheses

All analyses were conducted at the group level. Table 1 provides the means, standard deviations, and correlations for all study variables. Moderated hierarchical regression analyses with relationship conflict as the dependent variable for Times 1 and 2 are reported in Tables 2 and 3, respectively. Step 1 of the analyses includes only control variables. Step 2 includes surface- and deep-level diversity, and Step 3 includes hypothesized interactions. The interaction term variables were mean centered to reduce potential multicollinearity effects (Aiken & West, 1991; Jaccard, Wan, & Turisi, 1990).

Hypothesis 1 predicted that team orientation would moderate the relationship between surface-level diversity and relationship conflict. As shown in Table 2, a marginally significant gender diversity by team orientation interaction emerged for conflict at Time 1 (beta $= -0.19$, $p = 0.07$). Because it is commonly noted that interaction effects have small effect sizes and their tests of significance frequently suffer from low power, some authors have recommended that significance levels be relaxed to $p < 0.10$ for interaction terms (e.g., McClelland & Judd, 1993; Sauley & Bedeian, 1989). Therefore, Figure 1 illustrates the interaction by showing the slopes of regression lines linking gender diversity to relationship conflict under conditions of high and low team orientation (i.e., at one standard deviation above and below the mean; Aiken & West, 1991). When team orientation is high, increased gender heterogeneity results in lower relationship conflict than when team orientation is low. A simple slope analysis (Aiken & West, 1991) revealed that gender diversity positively predicts relationship conflict when team orientation is low (beta $= 0.52$, $p < 0.01$), but the relationship between gender diversity and conflict is in the negative direction when team orientation is high (beta $= -0.42$, $p < 0.10$). Thus, Hypothesis 1 was supported for gender, but not ethnicity.

According to Hypotheses 2 and 3, teams with higher diversity on time urgency and extraversion would experience higher and lower relationship conflict, respectively. As shown in Table 2, the main effects were not significant for time urgency (beta $= 0.19$, $p > 0.05$) or extraversion (beta $= 0.11$, $p > 0.05$). Therefore, neither Hypothesis 2 nor Hypothesis 3 was supported.

Hypothesis 4 predicted that team processes would moderate the relationship between deep-level diversity and conflict. As shown in Table 2, interactions with team orientation and process accounted for an additional 10 per cent of the variance in conflict ($F_{4,28} = 3.49$, $p < 0.05$). Collectively, control variables, main effects, and interactions accounted for 80 per cent of the variance in conflict at Time 1. Results revealed a significant time urgency diversity by process interaction (beta $= -0.37$, $p < 0.01$) for Time 1. Figure 2 illustrates that when the occurrence of effective team processes is more frequent within the team, higher time urgency diversity produces lower relationship conflict than when the occurrence of effective team processes is less frequent. A simple slope analysis revealed that time urgency diversity positively predicts relationship conflict for groups lower on the team process distribution (beta $= 0.60$, $p < 0.001$), but does not predict relationship conflict for groups higher on the team

Table 1. Descriptive statistics and intercorrelations at the team level

Variable	Means	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Control variables																			
1. Team size	4.58	0.84	1.00																
2. Class type	0.53	0.50	−0.37*	1.00															
3. Proportion of males	0.76	0.19	0.12	−0.02	1.00														
4. Proportion of whites	0.73	0.25	0.07	−0.36*	0.32*	1.00													
5. Mean extraversion	3.66	0.24	−0.24	0.21	−0.16	−0.15	1.00												
6. Mean time urgency	3.30	0.19	−0.09	0.20	0.03	0.03	0.52**	1.00											
Surface-level diversity																			
7. Gender (Blau's Index)	0.29	0.18	0.17	−0.15	−0.59**	0.12	0.23	0.01	1.00										
8. Ethnicity (Blau's Index)	0.32	0.24	0.19	0.33*	0.07	−0.74**	0.16	0.08	0.02	1.00									
Deep-level diversity																			
9. SD extraversion	0.48	0.19	0.04	−0.07	−0.21	0.05	−0.11	0.03	0.03	−0.13	1.00								
10. SD time urgency	0.39	0.18	0.08	−0.01	−0.01	0.15	0.19	0.23	0.17	−0.01	0.26	1.00							
Moderators																			
11. Team orientation	3.54	0.29	−0.01	0.18	−0.11	−0.03	0.30*	0.07	0.23	0.03	0.04	−0.29	1.00						
12. Process, Time 1	2.35	0.24	−0.22	−0.14	−0.13	0.13	−0.05	−0.03	−0.01	−0.24	0.30*	−0.09	0.24	1.00					
13. Process, Time 2	2.47	0.28	−0.34*	−0.02	−0.11	0.19	0.01	0.13	−0.03	−0.33*	0.17	−0.17	0.26	0.72**	1.00				
Dependent variables																			
14. Relationship conflict, Time 1	1.84	0.58	0.09	0.20	0.04	−0.04	0.20	0.16	0.11	0.15	−0.08	0.38**	−0.26	−0.75**	−0.59**	1.00			
15. Relationship conflict, Time 2	1.90	0.62	0.07	0.22	0.05	−0.13	0.15	0.04	0.10	0.27	−0.03	0.26	−0.06	−0.50**	−0.72**	0.65**	1.00		
16. Perceived performance	3.12	0.53	0.18	0.13	−0.28	−0.09	−0.06	−0.01	0.18	0.05	0.06	−0.10	0.09	0.31*	0.41**	−0.25	−0.30*	1.00	
17. Team project scores	26.81	1.26	−0.20	0.40**	−0.15	−0.27	−0.11	0.11	−0.01	0.14	−0.08	0.01	−0.11	−0.18	−0.04	0.12	0.20	0.12	1.0

**$p < 0.01$; *$p < 0.05$.

Note: $N = 45$ teams; SD = standard deviation; Class Type (0 = undergraduate; 1 = graduate).

Table 2. Hierarchical regression analyses for testing moderating effects of surface- and deep-level diversity on relationship conflict at Time 1

	Model		
Independent variables	1	2	3
Controls			
Team size	0.05	−0.01	0.05
Class type	0.18	0.15	0.09
Proportion of males	−0.10	0.05	0.55+
Proportion of whites	0.17	0.00	−0.59+
Mean time urgency	0.02	−0.00	0.12
Mean extraversion	0.21	0.14	−0.04
Team orientation (TO)	−0.20	−0.12	−0.04
Process, Time 1 (LD1)	−0.69**	−0.72**	−0.59**
Surface- and deep-level diversity			
Gender (Blau's Index)		0.10	0.46+
Ethnicity (Blau's Index)		−0.08	−0.48
SD time urgency		0.22+	0.19
SD extraversion		0.10	0.11
Interactions			
Gender × Team orientation			−0.19+
Ethnicity × Team orientation			0.02
SD time urgency × Process, Time 1			−0.37**
SD Extraversion × Process, Time 1			0.10
R^2	0.64	0.69	0.80
F	7.89**	6.04**	6.81**
$R^{2\ \text{increment}}$		0.06	0.10*

$^{**}p < 0.01$; $^{*}p < 0.05$; $+p < 0.10$.
Note: Entries are beta weights; $N = 45$ teams; SD = standard deviation; Class type (0 = undergraduate; 1 = graduate).

process distribution (beta = −0.10, $p > 0.05$). Consequently, Hypothesis 4a was fully supported, but Hypothesis 4b was not supported.

Surface-level diversity effects on conflict were expected to decrease over time, whereas deep-level diversity effects were expected to increase. As shown in Table 3, the absence of any significant gender and ethnicity effects on relationship conflict at Time 2 is consistent with predictions, but the parallel absence of significant time urgency and extraversion effects is not consistent with predictions. In addition, the pattern of correlations between surface- and deep-level diversity variables and relationship conflict from Time 1 to Time 2 are generally not in the hypothesized direction. Using the t-statistic with $n - 3$ degrees of freedom recommended by Cohen and Cohen (1983), the difference between correlations over time was also not significant. Therefore, neither Hypothesis 5a nor Hypothesis 5b was supported.

Ancillary analyses: demographic faultlines

Group composition research has primarily focused on one surface-level characteristic at a time, examining variation across group members (e.g., Harrison et al., 2002; Jehn et al., 1999). However, recent theory suggests that demographic studies should examine multiple identities simultaneously by considering the hypothetical dividing lines (faultlines) that may split a group into subgroups (Lau & Murnighan, 1998). The advantage of faultline theory is that it combines multiple demographic characteristics, taking into account the fact that individuals have multiple identities simultaneously

Table 3. Hierarchical regression analyses for testing moderating effects of surface- and deep-level diversity on relationship conflict at Time 2

	Model		
Independent variables	1	2	3
Controls			
Team size	−0.16	−0.23	−0.22
Class type	0.14	0.11	0.13
Proportion of males	−0.04	0.02	0.16
Proportion of whites	0.11	0.12	−0.06
Mean time urgency	0.09	0.07	0.11
Mean extraversion	0.02	−0.03	−0.09
Team orientation (TO)	0.12	0.15	0.14
Process, Time 2 (LD2)	−0.84**	−0.82**	−0.77**
Surface- and deep-level diversity			
Gender (Blau's Index)		0.07	0.20
Ethnicity (Blau's Index)		0.10	−0.02
SD Time Urgency		0.13	0.12
SD Extraversion		0.09	0.09
Interactions			
Gender × Team orientation			−0.01
Ethnicity × Team orientation			−0.08
SD time urgency × Process, Time 2			−0.11
SD extraversion × Process, Time 2			0.05
R^2	0.61	0.64	0.65
F	6.96**	4.78**	3.31**
$R^{2\ \text{increment}}$		0.03	0.01

**$p < 0.01$.
Note: Entries are beta weights; $N = 45$ teams; SD = standard deviation; Class Type (0 = undergraduate; 1 = graduate).

(e.g., Hispanic female) rather than one at a time (e.g., female) (Lau & Murnighan, 1998; Thatcher, Jehn, & Zanutto, 2003).

In order to investigate whether the faultline model would uncover effects not revealed by the diversity model, we examined member alignment across both gender and ethnicity in each of the groups in the study sample. Out of 45 teams, there were four cases in which the demographic alignment was consistent with faultline theory, and in each case the team comprised one female (either Asian or Hispanic) and three to five Caucasian males. In addition to a low sample size of four teams, it should

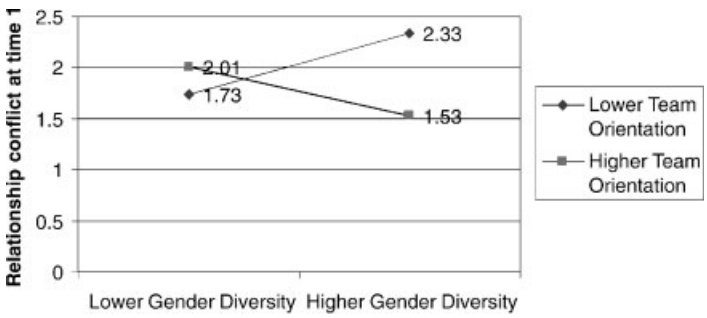

Figure 1. Interaction between team orientation and gender diversity on relationship conflict

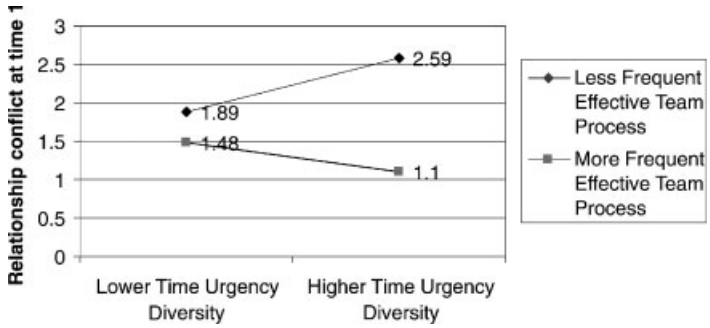

Figure 2. Interaction between team process and time urgency diversity on relationship conflict

be noted that these instances are technically not faultlines since the resulting subgroups would require at least two members (Thatcher et al., 2003). Lau and Murnighan (1998) point out that moderate levels of diversity increase the likelihood of faultlines, whereas minimum and maximum diversity make the development of faultlines unlikely. An examination of the race and gender breakdown in study teams revealed mostly high or low diversity. Therefore, faultline theory could not be adequately tested in this sample.

Ancillary analyses: performance effects

Although the focus of this study was the diversity–conflict linkage, we also examined the conflict–performance linkage. Applying the popular Input–Process–Outcome framework of the group literature (e.g., McGrath, 1984), the relationship conflict triggered by a group's surface- and deep-level diversity may, in turn, affect the performance of the group. However, previous empirical results have been somewhat mixed. For example, a meta-analysis of relationship conflict as the independent variable and team effectiveness as the dependent variable found that a conservative approach (using the smallest value of multiple measures of team effectiveness) yielded an average correlation of -0.08 and a liberal approach (using the highest values of multiple measures of team effectiveness) yielded an average correlation of -0.27 across 10 studies (De Dreu & Van Vianen, 2001). The results of a more recent meta-analysis by De Dreu and Weingart (2003) revealed that although six studies found positive correlations between relationship conflict and team performance, the average corrected correlation was significantly negative (-0.22).

The two measures of team performance utilized in the current study included perceived group performance and team project scores. During the last week of the semester, *perceived group performance* was measured as members' responses to the following question: 'Please rate your team's performance overall.' The scale ranged from 0 (unacceptable team performance) to 4 (excellent team performance) and was behaviorally anchored. For example, unacceptable team performance was described thus: 'Team is not functioning; team members are never prepared for meetings; some members are doing all of the work; some members never participate.' In contrast, excellent team performance was described thus: 'Team is performing beyond expectations; perfect meeting attendance and preparation; workload is evenly divided throughout the team; high participation.' Individual ratings were aggregated to the group level by mean (mean $r_{wg} = 0.84$, 87.8 per cent of teams over 0.70).

Each completed *team project* consisted of two team charters, a final report, and an oral team presentation, which were summed together to form a composite score. Individuals in each team received the same grade. The team project constituted a total of 30 per cent of the class grade, making the team

Table 4. Hierarchical regression analyses for testing the effects of relationship conflict at Time 2 on perceived overall performance

	Model	
Independent variables	1	2
Controls		
Team size	0.29	0.36*
Class type	0.08	0.20
Mean GPA	0.25	0.25
Predictor		
Relationship conflict Time 2		−0.40**
R^2	0.12	0.26
F	1.80	3.59*
R^2 increment		0.14*

**$p < 0.01$; *$p < 0.05$.
Note: Entries are beta weights; $N = 45$ teams; Class type (0 = undergraduate; 1 = graduate).

activities important for academic success. All written reports were graded by the course instructor for professionalism of the writing style (40 per cent of grade) and content (60 per cent of grade). As project sponsors also reviewed the team's written work and decided whether to implement team recommendations, their feedback was factored into the instructor's grading. For the final team presentation of the process improvement project, an audience of instructors, project sponsors, classmates, and special guests scored the presentations on both style and content. To guard against bias, the course instructor was not aware of how students had scored on any of the predictor measures.

Perceived and objective performance were both examined as dependent variables in regressions, which controlled for team size and ability (operationalized as self-reports of GPA, which were aggregated to the team level by mean). As shown in Tables 4 and 5, relationship conflict at Time 2 negatively predicted perceived overall performance (beta = −0.40, $p < 0.01$), but was not significantly related to team project scores (beta = 0.13, n.s.).

Table 5. Hierarchical regression analyses for testing the effects of relationship conflict at Time 2 on team project scores

	Model	
Independent variables	1	2
Controls		
Team size	−0.03	−0.05
Class type	0.13	0.09
Mean GPA	0.43*	0.43*
Predictor		
Relationship conflict, Time 2		0.13
R^2	0.28	0.29
F	5.24**	4.15**
R^2 increment		0.01

**$p < 0.01$; *$p < 0.05$.
Note: Entries are beta weights; $N = 45$ teams; Class type (0 = undergraduate; 1 = graduate).

Discussion

The amount and type of diversity within teams is an important characteristic that shapes group processes and affects the experiences of the individuals within a team (e.g., Barrick et al., 1998; Jackson & Ruderman, 1995; Milliken & Martins, 1996). The purpose of this study was to explore the differential impact of surface-level diversity (gender, ethnicity), deep-level diversity (time urgency, extraversion), and two moderating variables (team orientation, team processes) on conflict over time.

The lack of significant main effects for diversity variables in the current research supports the conclusions of Williams and O'Reilly (1998) and their call for increased attention to be given to the role of moderators. This study demonstrated that the impact of diversity goes well beyond simple main effects in that team orientation and team processes were found to moderate the relationships between diversity and conflict. Specifically, team orientation helped to neutralize the negative effects of surface-level (gender) diversity on relationship conflict. In a similar manner, team process worked to weaken the deleterious effects of deep-level diversity (time urgency and extraversion) on relationship conflict.

Although the effect of deep-level diversity on relationship conflict was hypothesized to increase over time, Time 2 was marked by the absence of significant conflict effects for both surface and deep-level diversity. Over the course of the semester, students may have found ways to cope with those with whom they had negative conflicts. In addition, it is also possible that there was a decrease in group interaction, and therefore the potential for conflict, over time for these groups. If members had more meetings earlier in the semester and then worked mainly independently after tasks had been divided up, then one would expect the level of conflict to be higher earlier as opposed to later. Although this pattern has been found to be characteristic of many temporary, task-focused teams (Denison, Hart, & Kahn, 1996; Levesque, Wilson, & Wholey, 2001), further research is clearly needed to confirm this post hoc theorizing.

Relationship conflict negatively predicted perceived overall performance, but was not related to objective performance. According to Jehn (1995, p. 276), 'while relationship troubles cause great dissatisfaction, the conflicts may not influence work as much as expected, because the members involved in the conflicts choose to avoid working with those with whom they experience emotional conflict.' It should also be noted that other recent studies have also found no evidence that relationship conflict impaired performance (e.g., De Dreu & Van Vianen, 2001; Jehn, 1995; Pelled et al., 1999). A recent meta-analysis found that task type moderated the conflict–performance linkage, suggesting stronger effects for more uncertain and complex tasks than for simple, routine tasks (De Dreu & Weingart, 2003). Relationship conflict may have significantly impaired performance in the current research if students had been responsible for executing all seven steps of the IMPROVE model as opposed to just three of the steps. In addition, restricted variance in grades may have attenuated effects.

Contributions and implications

Whereas the management literature has primarily considered the impact of surface-level diversity on team performance (e.g., Milliken & Martins, 1996; Williams & O'Reilly, 1998), the psychology literature has primarily focused on deep-level diversity as predictors of team processes and outcomes (e.g., Barrick et al., 1998; Neuman & Wright, 1999). However, the current research contributes to a small but growing group of studies (e.g., Jehn et al., 1999; Harrison et al., 2002) that simultaneously examines the surface- and deep-level diversity that characterizes intact teams. In addition, this study expands the range of diversity dimensions previously considered to include time urgency. As relevant deep-level variables in a given context will be those that directly affect the fundamental dynamics of

the team (Harrison et al., 1998), time urgency diversity may be especially salient in many groups. Indeed, time pressure is a ubiquitous aspect of organizational life. The increasing use of short-term project teams, coupled with urgent time deadlines and a high volume of work, would serve to increase the influence of time urgency composition on team conflict and outcomes.

As previous articles have called for future research to 'test specific moderators of the effects of relationship conflict on team functioning' (De Dreu & Van Vianen, 2001, p. 324), another contribution of the current study was to demonstrate the role of team orientation and team processes as moderators of the diversity–conflict linkage. Given that surface- and deep-level heterogeneity are realities for organizations and that both types of diversity can increase relationship conflict within groups, the present research suggests two pervasive moderators for counteracting these potentially negative effects on group functioning. Because behavior is a function of both internal and external forces, team orientation represents the individual, psychological context, and team processes represent the social, situational context. As demographic differences among members of workgroups are becoming the norm, positive attitudes concerning the value of teamwork may be a key to gaining the benefits of diversity in teams without suffering the costs of relationship conflict. Although individual preference differences may be difficult to alter through training, team orientation may be included as part of the selection criteria for placement on a team. Organizations have already begun to use an individual's willingness and enthusiasm to work in groups as a selection tool (e.g., Eby & Dobbins, 1997; Stevens & Campion, 1994). From the standpoint of improving group processes, interventions may be made through training or external facilitation.

In addition to the substantive contributions of expanding the range of diversity dimensions and exploring potentially pervasive moderators, the current research also examines conflict over time. Whereas the majority of intragroup conflict studies are cross-sectional (e.g., Jehn et al., 1999; Pelled, 1996b; Pelled et al., 1999), the time-sensitive design allows for greater confidence in causal conclusions. As groups exhibit dynamic processes, the importance of different types of diversity may wane or intensify at varying intervals.

Limitations and future research

Methodologically, a strength of the present research is that we investigated team members performing a real rather than contrived task over the course of several weeks that had actual consequences (e.g., grades). Teams in this study would be most similar to task forces with ad hoc membership, limited lifetimes, and narrowly defined goals. Nevertheless, the use of groups in an academic setting that disband after a few months limits generalizability for longer-term teams. In addition, even though ad hoc groups in firms may also dissolve after a short period of time, group members may continue to work together in the same department or organization. Therefore, further research in organizational contexts should be conducted. In addition, the team sample size was limited, but comparable to other studies in this area of research (e.g., Barrick et al., 1998; Jehn & Mannix, 2001; Pelled et al., 1999).

Although relationship conflict and team process data were collected at the same points in time, common method variance was minimized by the fact that team processes were measured via peer ratings, whereas relationship conflict was measured via self-report. In addition, because common method variance is itself a type of main effect or correlated error, it cannot explain the moderating effects of team processes on relationship conflict (Harrison, McLaughlin, & Coalter, 1996).

Surface-level and deep-level diversity results were each based on the measurement of only two factors. Although the characteristics of gender, ethnicity, extraversion, and time urgency were selected based on previous theoretical and empirical work as well as their expected salience in the present context, the teams may have had many other diversity elements affecting their performance that were not

indexed. However, the current study did attempt to broaden the range of variables considered in this literature to examine time urgency diversity. Future research should continue to expand the range of diversity dimensions to include behavioral styles, values, and beliefs (e.g., Jackson et al., 1995). In addition, multiple identities can be examined simultaneously by considering the faultlines or hypothetical dividing lines that may split a group into subgroups (Lau & Murnighan, 1998).

The current research found that team orientation and team processes helped to diffuse the negative impact of surface-level and deep-level diversity on relationship conflict. However, future research should continue to examine how the negative effects of relationship conflict can be minimized so that the benefits of diversity in teams can be realized.

Acknowledgements

The authors would like to thank David Harrison, David Day, Jan Cleveland, and Kevin Murphy for their assistance on earlier drafts of this manuscript.

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