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**TEMPORAL CONFLICT IN TEAMS: ANTECEDENTS, REGULATORY  
MECHANISMS, AND OUTCOMES**

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Psychology

by

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## Abstract

Temporal issues in team research have received increased attention, but empirical research with an explicit temporal focus is still limited (e.g., McGrath & Argote, 2001; Kozlowski & Bell, 2003). In response to the call for greater integration of time into team research (Mohammed, Hamilton, & Lim, 2009), this study followed 60 partially-distributed student teams (PDTs) that worked under weekly deadlines over a 4-week period and examined the influence of diversity in two temporal individual differences—time urgency and pacing styles—on temporal conflict and the role played by temporal planning and time awareness norms on this relationship. Results found no direct effect of diversity in time urgency and pacing styles. Instead of mitigating the detrimental effect of diversity as hypothesized, temporal planning intensified temporal conflict as diversity increased. Results on time awareness norms were mixed; in some cases, it had a positive effect on reducing conflict, while in other cases it did not demonstrate the hypothesized effect. These results suggested that, instead of mitigating the detrimental effects of diversity as hypothesized, activities that are rich in temporal cues, such as temporal planning and establishing temporal norms, can make certain deep-level individual differences more salient. Team effectiveness—performance quality and timeliness of delivery—was found to be largely unrelated to either diversity or temporal conflict. Although it was suggested that over time the relationship between diversity in time urgency and temporal conflict would become stronger, this hypothesis was not supported given the analysis conducted.

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## Introduction

The concept of time is omnipresent in many organizational issues. Time not only provides the context in which events take place, but also can be used to describe the nature of many organizational phenomena (McGrath & Tschan, 2004), such as the lifecycle of a group or the development of certain group dynamics (i.e., group identity, trust, etc.) in a team. Given the increasingly important role of time in complex modern organizations, Kelly and McGrath (1988) suggested that it is imperative that time is incorporated into the substantive, conceptual, and methodological domains in research.

A closer look at team research over the past few decades shows that theoretical and empirical research in groups and teams with a temporal component is growing, but at a limited pace (e.g., Gersick, 1988; Harrison, Mohammed, McGrath, Florey, & Vandersoep, 2003; Kelly, Futoran, & McGrath, 1990; Marks, Mathieu, & Zaccaro, 2001; McGrath, 1991; Rutkowski, Saunders, Vogel, & van Genuchten, 2007; Saunders, Slyke, & Vogel, 2004; Tuckman, 1965). In theoretical discussions, time has generally been viewed in its broad range of significance. For example, McGrath's "Time-Interaction-Performance" (TIP) model (1991) has treated time both as a contextual variable (i.e., groups may perform different types of tasks at different time periods) and as a substantive factor (i.e., all groups face temporal patterning problems as a result of either schedule conflict or limited temporal resources). In the empirical domain, however, the treatment of time tends to focus on one or a limited number of its significant features. For example, taking a longitudinal approach, Harrison et al. (2003) found significant effects for the history of interaction in a group and the pace a group develops to meet deadlines (entrainment) on team performance over time. More recently, particularly with the increasing popularity of virtual team research, there has been more attention paid to time as a focal factor in groups or

organizations (e.g., Saunders et al., 2004; Rutkowski et al., 2007; Massey, Montoya-Weiss, & Hung, 2003). This line of research has given importance to variables with explicit temporal content, such as planning and coordination with respect to when and how team activities take place.

This growing body of research on time in groups and teams has motivated the current study. Calling for a more thoughtful and thorough consideration of time in team research, Mohammed, Hamilton, and Lim (2009) suggested that time should be integrated into the context around team activities, the content of variables, and the design of research. The current research adheres to these guidelines and makes several contributions to team research by taking an integrative approach in examining a set of temporal issues in teams. First, this study takes a multi-level approach in investigating the influence of temporal individual differences on team-level processes and effectiveness. By examining the intra-group variability in temporal individual differences as team-level characteristics, this study addresses the need to go beyond using simple means to represent team properties (Kozlowski & Bell, 2003). Mohammed & Harrison (2007) suggested that this more sophisticated treatment of temporal individual differences in teams is better aligned with the current state of multi-level theory.

Second, this study looks at a set of crucial issues in team research—team composition, planning, team norms, conflict, and team performance—all through the temporal lens. The time-pressurized context around team activities is also taken into account. Although some of these constructs have previously been examined individually or in some combination (for example, Janicik and Bartel, 2003, looked at temporal planning and temporal norms), I have not identified any study that considers all of them simultaneously. As suggested by Mohammed and colleagues,

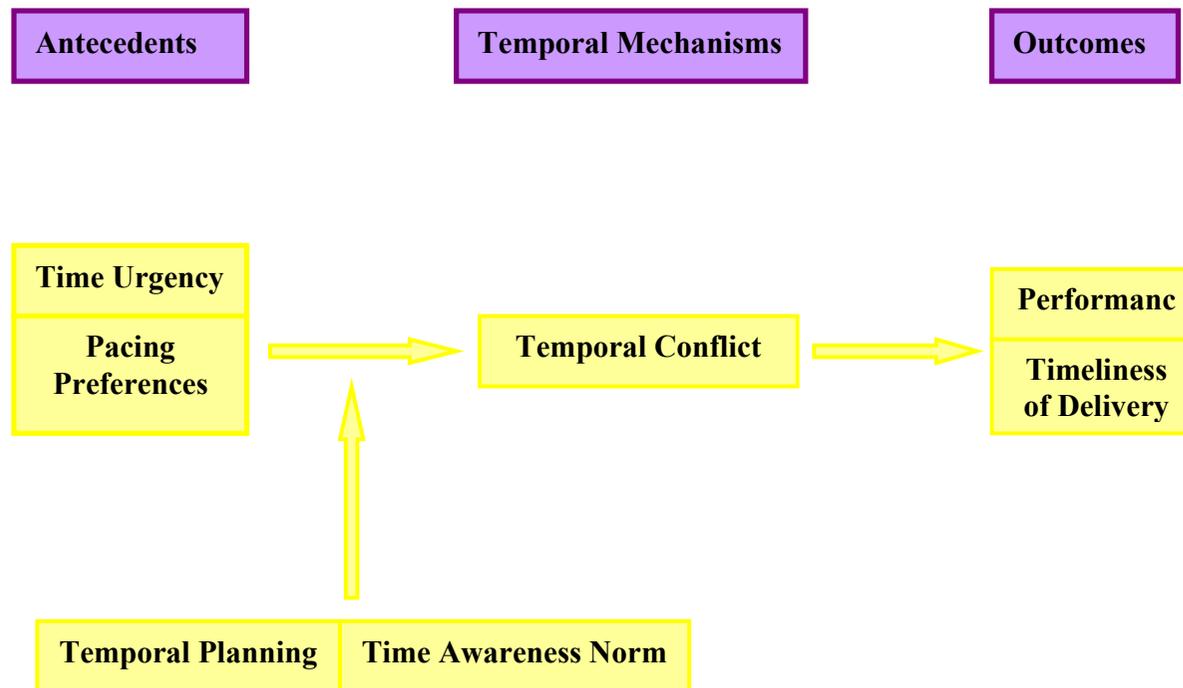
studying constructs with explicit temporal content is an important contribution to research of time in teams.

Furthermore, this study takes a longitudinal approach and measures several temporal mechanisms over time. Multiple measurements of temporal conflict, temporal planning, and time awareness norms were taken during a 4-week period. A longitudinal design helps capture phenomena and patterns that cannot be observed in one-shot studies. Relying on multiple measurements, this study attempted to examine the influence of diversity in temporal individual differences on temporal conflict over time. By taking such an approach, this study can potentially provide valuable information on the changing dynamics in teams.

Finally, in addition to examining the impact of diversity in individual differences on temporal conflict, I also take into consideration the moderating influence of temporal planning and time awareness norms. Diversity research in teams has shown that moderators and mediators are useful mechanisms in helping disentangle the mixed effects of diversity (Van Knippenberg, De Dreu, & Homan, 2004). By considering these moderators, this study also makes a contribution to the understanding of the role played by these mechanisms in the level of conflict in teams.

Overall, this study responds to Mohammed and colleague's (2009) call for an integrative approach in studying time in teams. It empirically tested the hypothesis that temporal individual differences influence team-level performance outcomes and do so through the mediation of relevant temporal processes. Because most of the constructs employed in this study were relatively new, this study also provided evidence of their validity, which is essential for future research. Figure 1 illustrates the basic overall research model.

Figure 1. Overall basic research model.



## Theoretical Framework

This study draws from research in several domains. It was heavily influenced by current thinking, theories, and empirical evidence on temporal issues in teams, ranging from research and theories on temporal individual differences to emerging work on temporal planning and norms. Relevant literature on individual differences provided support for the personality—effectiveness linkage in teams as well as for the choice of domain specific variables. Moreover, the current state of research on diversity in teams also influenced several major decision points in this study. Below I review research in each of these areas.

### *Time in Teams*

Time in teams encompasses a set of complex issues ranging from team composition based on temporal individual differences to research design and measurement over time. This study begins with some apparent “temporal problems” in teams—the fact that teams in organizations often fail to reach agreement over how to spend their time, how to coordinate members’ behaviors seamlessly, and how to complete work in a designated timeframe. In his paper *Time, interaction, and performance (TIP): A theory of groups*, McGrath (1991) described the flow of work in groups with three temporal criteria: Timing (synchronization issues in groups), timeliness (whether a set of actions, a project, or a task, is completed at its scheduled deadline), and time cost (the amount of time a project consumes). Corresponding to the three criteria described above, McGrath (1991) outlined three generic temporal problems in organizations: (1) temporal ambiguity (when an event will occur and how long it will last), (2) conflicting temporal interests and requirements, and (3) scarcity of temporal resources (see also McGrath & Kelly, 1986; McGrath, Kelly, & Machatka, 1984). McGrath suggested that, in response to these challenges, organizations enact a set of generic responses by scheduling and

synchronizing activities and allocating temporal resources accordingly. More importantly, the *misfit* between individual and organizational responses in dealing with these temporal challenges can lead to further problems in relation to establishing and enforcing deadlines, establishing norms, and regulating the flow of task and interpersonal interactions (McGrath, 1991).

McGrath's (1991) discussion on these temporal and planning problems and responses motivated the current study. I argue that the problems resulting from the misfit between the organization and its individual members manifest in the form of temporal conflict over the allocation of temporal resources. In response, an organization or a team may generate a set of regulatory activities aimed at aligning individual behaviors in order to meet the goal at the higher level, such as collective planning and establishing norms. Therefore this study also empirically examined two temporal mechanisms—temporal planning and time awareness norm—that can potentially mitigate temporal conflict.

In order to systematically examine the issues described above, I closely followed the guidelines presented in Mohammed and colleagues (2009), who suggested four categories of the treatment of time in the team literature. The first treatment of time is the use of longitudinal design; that is, input, process, and/or output variables are measured at several time points. A number of studies provided clear evidence that many team phenomena evolve in such a way that only longitudinal design can capture the meaningful patterns of changes. For example, Jehn and Mannix's (2001) study on the shifting patterns of task, relationship, and process conflict and Harrison, Price, Gavin, and Florey's (2002) finding on the diminishing effect of surface-level diversity and emerging effect of deep-level diversity over time are both notable examples in this category. In the current study, I adopted the longitudinal approach by studying student project

teams over a 4-week timeframe and measuring temporal conflict, norms, and planning at multiple points in time.

The second category of treatment of time is to examine variables with temporal properties. These constructs are time-related in their conceptualization and deal explicitly with time in team activities. For example, Massey et al. (2003) examined the effect of temporal coordination—an externally imposed structure that directs the timing and content of communication—on team behavior and performance. In the current study, I focused on time urgency, pacing styles, temporal planning, time awareness norms, and temporal conflict, which are all temporal in nature. In addition, I considered a performance criterion that is temporal in nature but has received little attention in the past (Mohammed et al., 2009): the timeliness of delivery.

The third category combines categories one and two by adopting a longitudinal approach in examining constructs with temporal properties. Examples include group socialization, group development models, and research that examines member familiarity (Mohammed et al., 2009). By examining temporal conflict, norms, and planning at multiple time points, I also represent the third category. The fourth and final category suggests that time is a part of the general environment in which teams operate. For example, Mohammed and colleagues (2009) discussed the potential influence of deadlines, time pressure, and organizational and cultural temporal context on teams. The context of the current study is a naturally time-pressurized environment because (1) the project was carried out within a university course, which imposes competing demands for team members, (2) teams had weekly deadlines to meet, and (3) teams had to deliver the final product by a pre-determined date. The fourth category is therefore also represented in the current study.

In summary, this study was motivated by discussions on temporal problems in McGrath's (1991) TIP paper. I examined the manifestation of these temporal problems—temporal conflict—and the regulatory mechanisms employed to deal with them. In addition, I investigated the antecedents and outcomes of temporal conflict, including temporal individual differences and team performance. Furthermore, adhering to the guidelines suggested by Mohammed et al. (2009), this investigation takes a comprehensive approach so that not only are temporal variables taken into account, but also they are examined over time.

### *Time in Virtual Teams*

Virtual teams are characterized by geographic dispersion (i.e., members work together from different physical locations) and technology-mediated communication (Axtell, Fleck, & Turner, 2001). These two characteristics give virtual teams distinct temporal qualities, including differences in working hours and time zones, the use of synchronous (same time) or asynchronous (different time) technologies, and increased time pressure from typically short lifespan (Mohammed & Zhang, 2008). However, temporal characteristics in virtual teams have not received sufficient attention conceptually or empirically (Walther, 2002). This study examines temporal issues in the context of *partially-distributed teams* (PDTs), a type of hybrid virtual team that consists of geographically-dispersed subteams, in which members interact and collaborate primarily face-to-face (Huang & Ocker, 2006). The distributed nature of a PDT can exert powerful influences on temporal dynamics. Simple differences in working cycles between dispersed subteams on a day-to-day basis can lead to uncoordinated collaboration as one subteam may arrive to work significantly later and another may need to leave earlier (e.g., Espinosa & Carmel, 2003). This is especially problematic when tasks require that team members be present simultaneously. Time zone differences can also create challenges even for asynchronous

communication (Espinosa & Carmel, 2003). For example, an email sent in the late afternoon in the US is unlikely to get an immediate response from the UK, which is 5-6 hours ahead of the Eastern Standard Time zone. Ideally, time zone differences ideally have the advantage of allowing virtual teams to work “around-the-clock” as team members pass off work as their workday ends to those whose workday just begins (Carmel, 2006). In reality, however, achieving this requires much coordination and communication (Mohammed & Zhang, 2008). Longer time delays between exchanges can make it more challenging for PDT members to use their time effectively, which can lead to greater time pressure on short-term projects.

The increased salience of temporal dynamics in virtual teams requires that we pay close attention to a number of measurement issues (Mohammed & Zhang, 2008). In terms of team composition, diversity in how team members perceive and manage time as well as can influence a team’s functioning. For example, individuals who prefer a steady working pace may have a difficult time adjusting to their colleagues who are energized by impending deadlines. This incompatibility can be exacerbated by a virtual team’s unpredictable work cycle due to differences in working hours and time zones. Cultural differences can also play a role in virtual team members’ interpretation and planning of temporal events, such as deadlines and schedules (Saunders, Slyke, & Vogel, 2004). For example, while speed of delivery is highly valued in the US (Brislin & Kim, 2003), Latin American and south European cultures put more emphasis on allowing events to unfold at a natural pace (Saunders et al., 2004). These cultural differences are highly relevant in global virtual teams consisting of members of diverse nationalities.

Virtual teams also have different choices of technologies, which can impact temporal dynamics differently. For example, synchronous technologies, such as telephone and chat, can facilitate speedier information exchange and minimize misunderstanding. However, coordinating

meeting times can be challenging for people who operate on different schedules (Warkentin, Sayeed, & Hightower, 1997). Using asynchronous technologies, such as e-mail and electronic bulletin boards, allows time for processing information, reflecting upon one's own responses, and speaking up when one chooses (Warkentin et al., 1997). However, communicating through asynchronous technologies often takes much longer and leads to disjointed information flow. Therefore, depending on the choice of technologies, temporal experiences in virtual teams can vary greatly in different situations.

The distributed nature of virtual teams presents another challenge that is more pronounced in virtual teams than in face-to-face teams: synchronization (Montoya-Weiss, & Hung, 2003). With the increased need to coordinate temporal differences and technology uses, virtual teams can benefit from explicit mechanisms that facilitate the synchronization in teamwork. Recent literature has examined the effectiveness of some of these mechanisms (e.g., Im, Yates, & Orlikowski, 2005; Montoya-Weiss et al., 2003). In a qualitative study, Im and colleagues (2005) identified three main communication “genres” used by a team in a small start-up technology company to temporally structure their work, including a status report informing others of their work progress, bug/error notification, and update notification. Montoya-Weiss and colleagues (2003) also reported that an interaction process structure that directs the *pattern*, *timing*, and *content* of interaction incidents in a team led to significantly more time spent on convergence-oriented behavior and allowed the team to critically examine and discuss each others' contributions. This interaction process structure was also found to be related to higher performance. Furthermore, it has also been suggested that temporal leadership—the extent to which leaders prioritize and set milestones as well as pace the team so that work is finished on

time (Mohammed and Nadkarni, 2009)—can play a pivotal role in managing performance in a distributed team (Bell & Kozlowski, 2002).

*Personality-outcome Linkage: The Issue of Domain Specificity*

A variety of factors can contribute to the temporal problems in teams described by McGrath (1991). This study focused on innate characteristics of individual team members—individual differences regarding temporal resource allocation. Traditionally in team research, two individual difference variables have demonstrated a relatively robust relationship with team effectiveness: cognitive ability (Bell, 2007; Devine & Philips, 2001) and conscientiousness (Bell, 2007; Barrick, Stewart, Neubert, & Mount, 1998; Stewart, 2006). Bell's (2007) meta-analysis reported that other types of deep-level team composition variables, including team agreeableness and team openness to experience, collectivism, and preference for teamwork, are related to team performance in field settings, but studies devoted to these variables are limited. Although team composition research on personality has traditionally emphasized the Big Five (McCrae & Costa, 1987), there is a need to go beyond these more general factors and explore other specific traits (Tett, Guterman, Bleier, & Murphy, 2000).

The call for specific, temporally meaningful individual difference variables is supported by the domain specificity argument in research examining the personality—performance linkage at the individual level (Tett et al. 2000). In examining the linkage between personality and job performance, Tett et al. (2000) proposed that, as compared to broad personality measures such as the Big Five (McCrae & Costa, 1987), domain specific personality measures have the advantage of better articulating the causes, effects, and measurement of certain constructs. Empirical evidence has shown that significant linkages between relatively broad predictors (e.g., the Big Five) and criterion variables can be explained by stronger relationships among a few specific

predictor and criterion variables (Tett, Steele, and Beauregard, 2003). Moreover, specific personality variables may not only be stronger predictors of specific processes and outcomes, but also help explain the mechanisms behind these relationships because of the “finer articulation of the nomological net.” (Tett et al., 2000, p. 336).

Furthermore, Tett and Burnett (2003) proposed a trait-based interactionist model and introduced the concept of *trait activation*—certain work situations will allow for the expression of certain traits more than others. That is, certain personality traits are activated when trait-relevant situational cues are presented. Taking into account the domain specificity argument and the trait-based interactionist model, in this study I chose specific personality variables that may (1) theoretically show strong linkages with temporal processes and (2) be activated in an environment where temporal features (e.g., deadlines and different schedules) are salient.

#### *Diversity in Teams: Theories and Research*

Diversity is one of the most studied topics in team research (e.g., Harrison, Price, & Bell, 1998; Harrison et al., 2002; Pelled & Xin, 1997; Pelled, Ensenhardt, & Xin, 1999). Individual-level characteristics examined in diversity research have generally been labeled either surface- or deep-level. Surface-level characteristics refer to those that are visible (Pelled, 1996a) or readily detectable (Milliken & Martins, 1996), including age, gender, and ethnicity. Deep-level characteristics refer to those attributes that are less readily observable and often considered psychological (Jackson & Ruderman, 1995). Values, beliefs, and personality are under the deep-level characteristics category. Although diversity research has traditionally given more attention to surface-level characteristics (e.g., Milliken & Martins, 1996; Tsui, Xin, & Egan, 1995; Williams & O’Reilly, 1998), deep-level diversity has been gaining popularity in recent years (e.g., Barrick, Stewart, Neubert, & Mount, 1998; Jackson & Ruderman, 1995; Jehn, Northcraft,

& Neale, 1999; Harrison et al., 2002). Research has found that although surface-level diversity in teams may be more salient and have some immediate effects on team processes, deep-level diversity has a greater influence on team outcomes over time (e.g., Harrison et al., 2002).

Diversity researchers have traditionally adopted two main theoretical approaches in examining the effect of diversity on performance (Williams & O'Reilly, 1998). In the framework of social categorization theory (Tajfel, 1981), people tend to categorize themselves and others based on certain attributes and characteristics. As a result, in a group with diverse members, one may subconsciously define one's own in-group relative to those categorized into the out-group(s) due to their perceived dissimilarities (van Knippenberg & Schippers, 2007). Furthermore, research findings based on the similarity/attraction approach (Berscheid & Walster, 1978) suggest that people tend to be more positive in their evaluation of those that are similar to themselves (William & O'Reilly, 1998). Combining the social categorization theory and the similarity/attraction approach, it is reasonable to suggest that (1) subgroups may emerge in groups with diverse membership based on perceived similarities and (2) the in- vs. out-group distinction may affect inter-group relations negatively (van Knippenberg et al., 2004). In fact, research has found that homogeneity in work groups was positively related to group cohesion (e.g., O'Reilly, Caldwell, & Barnett, 1989) and member commitment (e.g., Riordan & Shore, 1997; Tsui, Egan, & O'Reilly, 1992) and negatively related to conflict (e.g., Pelled, Eisenhardt, & Xin, 1999). Group performance may therefore benefit from group membership homogeneity through these relational mechanisms (e.g., Jehn et al., 1999).

The information/decision-making approach (Gruenfeld, Mannix, Williams, & Neale, 1996), on the other hand, suggests that groups of diverse members are better at generating alternatives and ideas than homogeneous groups. Heterogeneous group members bring more

diverse opinions, thinking styles, and a larger pool of resources to the table, which provides more alternatives for the group to consider. More importantly, discussing discrepancies and differences among a range of approaches and opinions may help reveal innovative solutions to the problems at hand. Empirical research has found that group member diversity can produce better outcomes in innovative and problem-solving tasks (e.g., Bantel & Jackson, 1989; Cox, Lobel, & McLeod, 1991; Jehn et al., 1999). It should be noted that the mechanism through which diversity benefits performance is primarily a cognitive one, in contrast to the relational links suggested in social categorization and similarity/attraction approaches. Furthermore, all three theories primarily focus on the effect of diversity on *processes* instead of on performance.

The approaches described above have provided some fundamental explanations for the observed effect of diversity. Examined together, these approaches are contradictory, but advances in disentangling these mixed effects have taken place. One direction of advancement is seen in the work by Harrison and Klein (2007). The assumption of Harrison and Klein's work is that, in order to predict the outcomes of diversity, it is essential to first distinguish among different types of diversity (also see Jackson, 1992; Webber & Dohahue, 2000; Mannix & Neale, 2005; Horwitz & Horwitz, 2007). By categorizing diversity into three types, Harrison and Klein link specific outcomes to distinct types of diversity through theoretically meaningful relationships, which showed that the effects of diversity are not contradictory but vary depending on the type of the diversity. The authors proposed three different types of diversity whose influence on team processes and outcomes can be meaningfully predicted. These three types are: (1) separation: (lateral) positions or opinions among members, primarily of values, beliefs, or attitudes, (2) variety: kind, source, or category of relevant knowledge or experience among members, and (3) disparity: proportion of socially valued assets or resources held among

members. They proposed that these three types of diversity would be linked to different outcomes. More importantly, they specified the theoretical linkages between these different types of diversity and their related outcomes. For example, separation would lead to heightened interpersonal conflict, reduced cohesiveness, and decreased task performance through the mechanisms described in the similarity attraction paradigm and social categorization theory.

The other direction of advancement in reconciling the two opposing views of diversity is seen in the work on Categorization-Elaboration Model (CEM) by van Knippenberg, De Dreu and Homan (2004). Compared to the theories and frameworks described earlier, this model is dynamic and focuses on the moderators and mediators in the relationship between diversity and performance. It suggests that, instead of being contradictory, the effects of diversity on performance are influenced by a variety of other factors in the environment and the process through which they takes place. This model incorporates a number of mediators, such as social categorization, elaboration of task-relevant information and perspectives and moderators, such as identity threat and task ability. CEM suggests that when differences in group members result in intergroup biases as a result of social categorization, it has the potential to impede team performance by impairing in-depth processing (elaboration) of task-relevant information and perspectives. Specifically, if social categorization is activated by perceived dissimilarities (diversity) among team members and if identity threat is experienced in the group, negative affective/evaluative responses may occur: conflict may arise and commitment may decrease. These negative affective/evaluative responses may interfere with elaboration of task-relevant information and perspectives and lead to lowered performance. If diversity does not lead to social categorization, however, it may produce positive effects on information sharing and idea generation, hence leading to innovative problem solutions and high-quality decisions. The basic

assumption of this integrative model is that a variety of moderators and mediators should be taken into account in understanding the strengths and directions of the diversity—performance relationship.

Both Harrison and Klein (2007) and van Knippenberg et al. (2004) were theoretical pieces, but empirical work can benefit from incorporating ideas suggested in them. A finer distinction among different types of diversity and the consideration of moderators and mediators in these theoretical advances should be integrated into empirical research in order to explain the null or mixed effects of diversity on either team processes or performance outcomes. At present, empirical research has been inconclusive about the effect of diversity on team effectiveness (e.g., Bowers, Pharmed, & Salas, 2000; Horwitz & Horwitz, 2007; Webber and Dohahue, 2000; William & O'Reilly, 1998). Most comprehensive reviews and meta-analyses have found no effect of demographic diversity on performance (Bowers, Pharmed, & Salas, 2000; Webber and Dohahue, 2000; William & O'Reilly, 1998). Webber and Dohahue's meta-analysis (2000) reported that regardless of job-relatedness (i.e., whether or not an attribute captures skills, opinions, and experiences that are relevant to work tasks), diversity in these attributes had no relationship with team cohesion. Contrastingly, a more recent meta-analysis by Horwitz and Horwitz found that task-related diversity (i.e., acquired individual attributes, such as functional expertise and education) was positively related to team performance.

The lack of overall conclusions about the effects of diversity has motivated researchers to examine these issues in more depth. Considering the mediating processes between diversity and performance, for example, may prove a useful direction to move this area of research forward (van Knippenberg et al., 2004). In the current study, the mediating role played by temporal conflict is examined as a potential channel through which diversity in temporal individual

differences exercises its influence on team performance. A variety of moderators can also affect the effect of diversity on outcomes, including task characteristics, organizational context, team processes and team climate, temporal factors, and interdependence (Jackson, Joshi, & Erhardt, 2003; Mannix & Neale, 2005; van Knippenberg et al., 2004; van Knippenberg & Schippers, 2007). In this study I examine two moderators: temporal planning and time awareness norms. In the following section, I will review relevant background literature on the key process variables in this study.

#### Temporal Processes in Teams: Temporal Conflict, Norms, and Planning

In my review of McGrath's (1991) discussion on temporal problems in organizations, I noted that problems resulting from the misfit between individual and organizational responses to temporal problems can be summarized as difficulties in (1) establishing and enforcing deadlines, (2) developing norms to achieve smooth and dynamic teamwork, and (3) regulating the flow of task and interpersonal interactions in order to resolve inefficiency or inadequacy in meeting task demands. In this study, I examined three temporal mechanisms corresponding to these challenges. First, I argued that the manifestation of these temporal problems, as discussed by McGrath (1991), would be reflected in the level of *temporal conflict* a team experiences. Second, a team may engage in *temporal planning* that aims at establishing and enforcing deadlines and regulating the flow of interactions. Finally, in order to ensure that team members act consistently in a time-conscious manner, teams are likely to attempt to establish *time awareness norms*, which align and encourage team members' effective responses. It should be noted that although conflict, norms, and planning have all been previously studied in a team context, they have only on rare occasions adopted an explicit temporal referent (e.g., Janicik & Bartel, 2003).

#### *Temporal Conflict*

Three major types of conflict have been examined in the organizational behavior literature: task, relationship, and process conflict (e.g., Jehn & Mannix, 2001). Task conflict, similar to cognitive conflict (Amason & Sapienza, 1997), refers to an awareness of differences in opinions and ideas about a group task. Relationship conflict, on the other hand, focuses on the frictions and frustration in the interpersonal dynamics among team members and is associated with affective reactions in a team. Finally, process conflict is defined as “an awareness of controversies about aspects of *how* task accomplishment will proceed” (Jehn & Mannix, 2001, p. 239).

Temporal conflict was introduced as a new construct in the current study. Temporal conflict is a variation of process conflict that more directly addresses the temporal aspects of process conflict (Mohammed et al., 2009). Mohammed and colleagues pointed out that “failure to meet deadlines may not only result from disagreements about ‘who should do what,’ but also may be an outgrowth of differences in opinion regarding when work should be accomplished” (p. 13). Because process conflict deals directly with issues in how to distribute responsibilities to team members, it has the greatest potential to take on a temporal referent. Temporal conflict arises from disagreements in the allocation of temporal resources. Team members may disagree on how long a particular task should take, how work should be distributed in the given timeframe, or how the team should spend its time in relation to the project at hand.

#### *Temporal Planning*

Effective teamwork depends heavily on coordinated actions among team members, which result from the combination of a variety of factors and processes. For example, the knowledge of each team member’s role, the understanding of one’s own and others’ tasks and when they will be accomplished, as well as having the big picture of the relationships and workflow between

team members can all potentially contribute to good coordination (Janicik & Bartel, 2003). Team coordination can help direct the pattern, timing, and content of interaction incidents in a team (Massey et al., 2003), and one specific type of coordination mechanism is temporal planning. Planning is the process of specifying the course of action for project completion (e.g., Argote & McGrath, 1993; Cannon-Bowers, Salas, & Milanovich), and *temporal planning* refers to specific, time-related discussions, including when a certain action will occur, how long it will last, and other temporal matters that are central to task completion (Janicik & Bartel, 2003). These discussions provide a context for individual members to bring to the table their own temporal constraints and compare them with other people's constraints ahead of time. Temporal planning also serves the purpose of scoping out how much time may be needed for each task and the whole project, and how a team's progress can be assessed over time.

#### *Time Awareness Norms*

Conflict represents disagreement, while group norms signify a group's attempt to bring its members into alignment with the collective. Feldman (1984) defined group norms as a set of informal rules that groups use to "regulate and regularize" (p. 47) members' behavior. According to Feldman, group norms serve a variety of functions, ranging from ensuring group survival to avoiding embarrassing interpersonal situations. The development of group norms is a key stage in the process of group socialization. For example, one of the stages in Tuckman's group development model is "norming", in which group members develop informal rules. A variety of channels are in place to facilitate the formation of group norms, such as explicit statements by group leaders and members, critical incidents in a group's history, or experiences carried over from past situations (Feldman, 1984).

*Temporal norms*, defined as “the informal rules that groups adopt to regulate responses to temporal issues (deadlines, delays, etc.)” (p. 123, Janicik & Bartel, 2003), are a specific type of group norm. Janicik and Bartel (2003) suggested that the nature of temporal norms can vary widely depending on the priorities members face in their projects. More importantly, groups also can choose to emphasize certain temporal aspects of their situation to varying degrees. For example, a group that is working on a task that is always contingent upon another group completing their part may develop a “wait and see” norm because they cannot anticipate ahead of time, while another group that has other groups relying upon their output to carry forward the project may develop a norm that helps them to get their job done as soon as possible. Basically, temporal norms can adopt varying degrees of time efficiency and effectiveness and do not always have to be urging team members to act quickly or act in a highly time-conscious manner.

However, when teams work under strict deadlines on tasks and team members have other competing demands and potentially conflicting schedules, team survival may be hinged upon a temporal norm that expects team members to strategically utilize their temporal resources in a planned and coordinated fashion. This type of temporal norm is termed *time awareness norms* by Janicik and Bartel (2003). The authors defined time awareness norms as the tendency in a group to conserve time and to plan its use, which may be characterized by setting schedules and deadlines accordingly. Because a group’s norms serve to regulate members’ behaviors, teams that have established time awareness norms expect members to be mindful in planning and using their own time on tasks and to treat synchronization and timing of team activities as a top priority (Janicik & Bartel, 2003).

It should be noted that time awareness norms represent a conceptually distinct but related construct from temporal planning. Whereas temporal planning is characterized as a transition

process (Marks, Mathieu, & Zaccaro, 2001), time awareness norms are part of the team context. While temporal planning refers to a strategic choice regarding how a team deals with temporal issues, time awareness norms emphasizes a heightened state of awareness to these issues and represents an expectation that team members be mindful of their team's priorities in managing their own temporal resources. Time awareness norms may result from successful temporal planning. Janicik and Bartel's (2003) study supported this argument; they reported that temporal planning was significantly and positively correlated (.36) with time awareness norms at a later time. The magnitude of this correlation speaks to the empirical distinction between the two constructs.

#### Temporal Individual Differences: Time Urgency and Pacing Styles

The temporal problems described by McGrath (1991) focus on two key questions in team activities. The first question is "when", as reflected in problems in establishing and setting deadlines (e.g., When will a team activity occur? When will it end?). The second question is "how", as reflected in problems in establishing norms and regulating task flow and interactions (e.g., how should temporal resources be allocated?). Although multiple factors can contribute to the rise of these two questions, in this study I specifically investigated two temporal individual difference variables that may play a role. Time urgency, an individual tendency to conserve time and to act quickly (e.g., Conte, Landy, & Mathieu, 1995) is directly relevant to the "when" aspect of team processes. Individuals differing on time urgency may hold different views on when an event should start and how quickly it should be finished. Pacing style, an individual's preference for how work should be spaced out over time (Blount & Janicik, 2002), deals with the "how" aspect. Individuals with different pacing styles may have different opinions regarding how work should be distributed over time.

### *Time Urgency*

Time urgency has been identified as a relatively stable individual-difference variable and a central component of the Type A behavior pattern (Conte, Landy, & Mathieu, 1995; Conte, Mathieu, & Landy, 1998; Friedman & Roseman, 1974; Landy, Rastegary, Thayer, & Colvin, 1991; Rastegary & Landy, 1993). A review of the literature on time urgency shows that the construct not only refers to an individual tendency to treat time as a scarce resource to be conserved but is also associated with behavioral consequences, such as time awareness, task prioritization, and the scheduling of tasks within the allotted time (Conte et al., 1995). A time-urgent individual tends to schedule more and more activities into shorter and shorter periods of time (Friedman & Roseman, 1974) and attends to the passage of time by frequently checking time remaining. Because there are many tasks to accomplish, time-urgent individuals use deadlines to prioritize their activities (Rastegary & Landy, 1993), tend to be preoccupied with these deadlines, and often appear to be hurried in their actions (Glass, Snyder, & Hollis, 1974).

Existing research on time urgency has provided some evidence supporting the validity of this construct. Time urgency has been found to be related to achievement striving and impatience/irritability, but it covers certain psychological and behavioral tendencies that are not entirely overlapping with these constructs, hence providing discriminant validity evidence (Conte et al., 1998; Landy et al., 1991). Moreover, studies comparing one's own and other observers' ratings (e.g., one's spouse) of time urgency have reported significant correlations between the two, and therefore provide evidence for convergent validity (e.g., Conte et al., 1995; Landy et al., 1991). In addition, time urgency has been found to be related to various psychological and physiological outcomes, such as organizational commitment, job involvement,

burnout, and sleeping habits (Conte et al., 1998; Conte, Ringenbach, Moran, & Landy, 2001). These results have provided support for the criterion validity of this construct.

### *Pacing Style*

Pacing style is a relatively new construct as compared to time urgency (Mohammed & Harrison, 2007); therefore, research is limited. A pacing style refers to an individual's preference regarding (1) how long a task should take and (2) the spacing of work activities devoted to completing the task (Blount & Janicik, 2002). Pacing style as an individual difference construct is rooted in the assumption from the procedural justice literature (Lind & Tyler, 1998; Tyler, 1994) that people give importance to not only the type of outcomes they receive but also the *timing* of the outcomes (Blount & Janicik, 2002). According to Mohammed and Harrison (2007), while time urgency describes an individual's tendency to focus attention on and adapt his/her behavior with regards to *when* a task should be completed, pacing style focuses on an individual's anticipation of *how* a task will be completed in terms of its temporal process. That is, the construct is concerned with the rate at which an event will occur over time (Blount & Janicik, 2002).

Unlike time urgency, which exists on a continuum, pacing style is more categorical in nature (Mohammed & Harrison, 2007). Three main pacing styles are: early-action style (starting work early and finishing long before deadlines), steady-action style (spacing work evenly throughout the allotted time for the task), and deadline-action style (completing most of the work right before the deadline) (Gevers, Claessens, van Eerde, Rutte, & Roe, 2006). Gevers et al. (2006) examined two additional styles: U-shaped (doing most work at the beginning and the end) and the inverted U-shaped (most effort exerted halfway towards the deadline). Three studies by Gevers et al. (2006) provided validity evidence for the construct. Pacing style, coded in the

direction of deadline-action style, was found to be moderately and negatively correlated with conscientiousness. Pacing styles also contributed to team performance above and beyond conscientiousness, thus providing evidence for discriminant validity. In addition, moderate test-retest reliability ( $r = .53$ ) indicates that this construct is less stable than personalities but more so than transitory states (Gevers et al., 2006).

### Development of Hypotheses

As discussed earlier, time urgency and pacing styles describe individual tendencies in the “when” and “how” aspects in the planning and use of time, and these two aspects directly correspond to two key aspects of temporal problems in teams. When individuals with varying levels of time urgency and pacing style work together, the variability in their individual tendencies is likely to surface as different views and opinions on how temporal issues should be handled in their collaboration. In this section, I examine the relationships between diversity in these two temporal individual differences and temporal conflict as well as the role of two regulatory mechanisms—temporal planning and time awareness norm—in moderating this diversity—conflict linkage.

#### *Diversity in Time Urgency and Temporal Conflict*

The relationship between diversity on time urgency and temporal conflict has not been examined in existing research. In fact, empirical research investigating the relationship between time urgency and team-level outcomes is quite limited. Studying groups in the context of a manufacturing organization, Jansen and Kristof-Brown (2005) examined the effect of fit/misfit between individual-level and group-level hurriedness (one aspect of time urgency) on outcomes including satisfaction, psychological strain, and helping behavior. Using polynomial regression and hierarchical linear regression, the authors found that when an individual’s hurriedness and

that of the group to which s/he belongs match, maximum levels of satisfaction and helping behavior were achieved. These results were consistent with the view that organizational members achieve the highest level of performance and well-being when their temporal preferences match the norms of their organizations (Schriber & Gutek, 1987). However, although Jansen and Kristof-Brown's study examined the fit between an individual's time urgency and that of his/her environment, it did not directly address the effect of *variability* in time urgency among team members. More direct evidence comes from a study conducted by Mohammed and Angell (2004), who reported a moderated relationship between variability in time urgency and relationship conflict. Specifically, variability in time urgency among team members produced lower levels of relationship conflict when effective team processes were more frequent than when they were less frequent. A direct relationship between diversity in time urgency and conflict, however, was not found.

Although there has been no empirical evidence supporting a direct relationship between diversity in time urgency and conflict, I argue that, when *temporal* conflict is the targeted outcome, such a direct relationship is plausible. My rationale is supported by two lines of reasoning. At a general level, specific predictor and criterion variables have the advantage of articulating a clearer cause-effect relationship and may show stronger relationships than when broader variables are used (Tett et al., 2000; Tett et al., 2003). Time urgency and temporal conflict are both constructs with an explicit temporal referent, and therefore may be more strongly linked to temporal conflict than when other types of conflict constructs are the target criteria.

A close look at the specific content of time urgency and temporal conflict also lead to similar conclusions. Individuals tending towards the high end of time urgency have a high sense

of time awareness, are sensitive to deadlines, and may strategically set their own internal markers in order to facilitate task completion (Waller, Giambatista, & Zellmer-Bruhn, 1999). Waller and colleagues found that when working in a team, time-urgent individuals had the tendency to set deadlines for their team and help team members to stay on track. Although these behaviors may facilitate task completion in the team (Waller and colleagues found a positive relationship between the presence of time-urgent individuals and task performance), they may also potentially generate disagreement over scheduling and prioritizing, especially when other team members are lower on time urgency. First, less time-urgent individuals may perceive the actual deadline for their work to be further away than more time-urgent individuals, and as a result, when compared to more time-urgent individuals, they may feel that more time should be allowed on a task. Furthermore, because time-urgent members tend to act more quickly, what they may perceive as enough time for a task may not be sufficient for less time-urgent members. This may be less of a problem if team members are working on tasks that suit their own rhythms, but when a task requires simultaneous input of all members, different perceptions in how much time is enough can lead to disagreement on how much time should be allotted. Moreover, less time-urgent individuals may view additional deadlines as unnecessary, or even as interfering with the slower rhythm of their work. Therefore, they may be more reluctant to participate in setting internal deadlines for their work. In addition, because less time-urgent individuals may not be as concerned with prioritizing tasks as more time-urgent individuals, teams with members diverging on their levels of time urgency may have a difficult time reaching agreement on when the team should do what. Overall, disagreement over scheduling and prioritizing, as reflected in temporal conflict, can increase with more time urgency diversity.

*H1. Diversity in time urgency will be positively correlated with temporal conflict.*

### *Diversity in Pacing Styles and Temporal Conflict*

Based on Harrison and Klein's (2007) typology of diversity, divergence on time urgency and pacing style falls under the category of separation, which refers to composition of differences in lateral positions or opinion among members, primarily of values, beliefs, or attitudes. It was predicted that, through the mechanisms underlying the similarity/attraction approach (Berscheid & Walster, 1978), social categorization theory (Tajfel, 1981), and the attraction-selection-attrition model (Schnider, 1987), separation on values, beliefs, or attitudes would likely lead to reduced cohesiveness, more distrust, and increased interpersonal conflict. Similar to time urgency, it is also predicted that diversity in pacing style will also likely lead to a heightened level of conflict.

The main distinctions among the three types of pacing style (early-, steady-, and deadline-action styles) are on these aspects: (1) when work will start (individuals with early- or steady-action style individuals are likely to start their work earlier than deadline-action style individuals, (2) the amount of time perceived as available for the work to be done (i.e., individuals with early- or deadline-action styles are likely to see themselves as having less time to finish work than steady-action individuals), and (3) the extent to which their efforts will be spaced out (people with steady-action style are more likely to spread out their efforts as compared to early-action and deadline-action styles, Blount & Janicik, 2002).

There is no existing empirical research from which plausible relationships between pacing styles and temporal conflict can be directly drawn. However, given the distinctions among the types of pacing styles, the three points of disagreement as outline above are likely to be applicable: People with different pacing styles are likely to have divergent opinions on when to begin, how much time to spend, and how tightly paced they should be. These points of

disagreement are predicted to increase the level of conflict a team experiences on setting schedules and allocating time resources. Therefore, I propose that:

*H2. Diversity in pacing styles will be positively correlated with the level of temporal conflict.*

*The Moderators: Temporal Planning and Time Awareness Norms*

Although it has been suggested that examining the moderating effect of temporal processes may help achieve a better understanding of team dynamics (Weingart, 1997), team processes have not been traditionally examined as moderators. Mohammed and Angell's (2004) study was an exception; they reported that team processes (leadership, communication, and coordination) moderated the diversity–conflict link. Specifically, team processes weakened the detrimental effects of diversity in time urgency on relationship conflict. This finding suggests that the role played by certain regulatory mechanisms in a team should not be overlooked. For the current study, I argue that two temporal processes—temporal planning and time awareness norm—can help mitigate the effect of diversity in time urgency and pacing styles in a team and reduce the level of temporal conflict.

*Temporal Planning*

According to earlier discussions, diversity in time urgency and pacing styles heightens the level of temporal conflict in a team through similar mechanisms. Essentially, team members with varying levels of time urgency or diverging pacing styles are likely to hold different views about a number of temporal issues, including the amount of time that should be allotted to certain tasks, the starting and finishing dates of a project, the pace at which the team should act, the importance of setting internal deadlines and adhering to them, and the need to prioritize tasks and how to do so. Temporal conflict arises as a result of disagreement on these issues. During

temporal planning, team members explicitly address the issues described above. They discuss task prioritization and setting deadlines, the rhythm of meetings, and milestones for assessing progress. More importantly, these discussions require team members to compare their individual schedules and availability (Janicik & Bartel, 2003).

Planning can help minimize temporal conflict through two channels. First, explicit temporal planning provides a context for a team to collectively make decisions about how they will allocate their temporal resources. The discussion on how team members should pool their temporal resources is a useful mechanism that encourages convergence among individuals with different preferences. Secondly, it is possible that because planning itself focuses on more objective issues, it may direct team members' attention to more task-relevant issues and away from the actual differences among team members' temporal tendencies. Blount and Janicik (2002) suggested that when team members have different temporal rhythms, they may experience an "out-of-synch" feeling, which can lead to frustration and anxiety and eventually impair interpersonal relationships and give rise to conflict. If team members attribute this lack of synchronization to characteristics of their teammates (e.g., "Bob works more slowly than the rest of us because he does not care about meeting the deadline."), teamwork is likely to suffer. However, if team members attribute their feelings to external reasons such as other individuals may have competing demands or different schedules, damage to the team may be minimized. I argue that because temporal planning focuses on task-relevant temporal issues, when diversity in time urgency and pacing styles leads to a sense of "out-of-synch" for team members, it can help focus team members' attention on more objective differences in each others' schedules and external demands rather than on deep-level differences that cannot be easily changed. Furthermore, temporal planning can serve as a constructive mechanism for team members to find

ways to make up for each other's absence or to distribute work in a way that takes into account the differences in members' schedules. As a result, a collaborative arrangement that takes into account team members' realistic constraints is likely to lead to a higher degree of agreement over temporal issues and hence less temporal conflict.

*H3a. Temporal planning will moderate the relationship between diversity in time urgency and temporal conflict such that this relationship will be weaker when the level of temporal planning is high as compared to when it is low.*

*H3b. Temporal planning will moderate the relationship between diversity in pacing styles and temporal conflict such that this relationship will be weaker when the level of temporal planning is high as compared to when it is low.*

#### *Time Awareness Norms*

Similar to temporal planning, time awareness norms may also play a moderating role in the diversity—conflict relationship. As discussed earlier, while temporal planning focuses on the explicit act of discussion of temporal issues, time awareness norms emphasize a heightened sense of awareness to these issues and represents an expectation that team members will be mindful of their team's priorities in managing their own temporal resources. Establishing strong time awareness norms communicates to team members the importance to plan their use of time effectively. These norms can set the general direction for the team's actions. When team members have clear perceptions of the group's expectation for them, a sense of obligation may arise. As a result, they are more likely to adjust their own behaviors to be aligned with what is expected of them from the collective.

Time awareness norms, like temporal planning, can play a regulatory role in bringing people with divergent temporal tendencies on the same page in terms of behavior. While

temporal planning allows people the opportunity to discuss their different schedules and do explicit coordination, time awareness norms work at a more psychological level and bring people the same understanding of the group's goals in terms of how they should act. This shared understanding provides the basis for people to regulate and adjust their own behaviors in order to fulfill their obligation to the group. Therefore, I propose that:

*H4a. Time awareness norms will moderate the relationship between diversity in time urgency and temporal conflict such that this relationship will be weaker when the level of time awareness norms are high as compared to when it is low.*

*H4b. Time awareness norms will moderate the relationship between diversity in pacing styles and temporal conflict such that this relationship will be weaker when the level of time awareness norms are high as compared to when it is low.*

#### *The Relationship between Temporal Conflict and Team Performance*

Some of the early research on the conflict—performance relationship led researchers to conclude that, although relationship conflict may decrease satisfaction and lower task performance level, task conflict may increase performance (Amason, 1996; Amason & Schweiger, 1997; Jehn, 1995, 1997). However, a meta-analysis by De Dreu and Weingart (2003) showed a moderately negative correlation between both task and relationship conflict and overall team effectiveness, hence suggesting that conflict is likely to be disruptive to team performance in general. Although process conflict was not included in this meta-analysis, limited research on this construct showed that it interferes with team performance and leads to reduced productivity (Jehn, 1997; Jehn et al., 1999). Results from a qualitative study found that uncertainty brought about by extended discussions on who should do what led to the desire to quit or switch groups (Jehn, 1997). Furthermore, this study also found that members in the worst performing group

perceived disputes over responsibilities and resources as unfairness, which may have led to decreased performance. Based on this evidence, I propose that:

*H5. Temporal conflict will be negatively correlated with the quality of performance.*

Existing research on diversity and conflict have predominantly used quality of performance (objective or perceived) as a criterion variable (e.g., Jehn, 1995, 1997; Jehn et al., 1999; Mohammed & Angell, 2004; Pelled et al., 1999). Although team effectiveness has been frequently assessed by quality and quantity (e.g., Austin, 2003; Chen & Klimoski, 2003), Mohammed and colleagues (2009) presented compelling arguments for better integration of “timeliness” as an important dimension of team effectiveness in empirical research. The limited research that investigates timeliness as a criterion variable is inconsistent with the reality that modern organizations treat time as a scarce and valuable resource and the fact that they frequently rely on the timeliness of delivery to meet organizational and market demands (Mohammed et al., 2009). Given that the central issues in this study are all temporally-based, I also examine *timeliness* of delivery as a performance criterion. Moreover, if members fail to reach agreement over when a task should be completed, confusion over internal deadlines can result in weakened coordination and synchronization, which could interfere with efficient task completion. It has been reported that groups that continually spend time discussing task assignments could take longer to complete tasks (Jehn, 1997) or were unable to accomplish tasks (Jehn et al., 1999). Therefore, I propose that:

*H6. Temporal conflict will be negatively correlated with the timeliness of delivery.*

#### *The mediating effect of temporal conflict*

Theories have suggested that conflict can play the role of the mediator in the “black box” between diversity and performance (e.g., Pelled, 1996). Empirical research has also found

evidence for such a mediated relationship (Jehn et al., 1999; Pelled et al., 1999). For example, Pelled and colleagues reported that diversity in functional background drives task conflict, which in turn favorably affected cognitive task performance. Jehn and colleagues also showed that information diversity positively influenced group performance through the mediation of task conflict. I propose that temporal conflict can play a similar mediating role between diversity in temporal individual differences and quality of performance and timeliness of delivery:

*H7a. Temporal conflict will mediate the relationship between diversity in time urgency and the quality of team performance.*

*H7b. Temporal conflict will mediate the relationship between diversity in pacing styles and the quality of team performance.*

*H8a. Temporal conflict will mediate the relationship between diversity in time urgency and the timeliness of delivery.*

*H8b. Temporal conflict will mediate the relationship between diversity in pacing styles and the timeliness of delivery.*

#### *The Effect of Time*

*Time urgency.* Conducting longitudinal studies in teams have many benefits. As compared to cross-sectional studies, longitudinal studies can reveal phenomena and patterns that would not occur in a short-lived team (McGrath, Arrow, Gruenfeld, Hollingshead, & O'Connor, 1993), hence facilitating better understanding of the dynamic nature of processes, development, and change in teams in the “real world” (Arrow, McGrath, & Berdahl, 2000; McGrath & Argote, 2001). However, despite the repeated calls for research that measures teams over time (e.g., Cohen & Bailey, 1997; Kozlowski & Bell, 2003), the number of longitudinal studies remains limited. Mohammed et al. (2009) content-coded studies that measured at least one team-level

variable over time and found that only 22% of team research in three highly regarded psychology journals (*Journal of Applied Psychology*, *Personnel Psychology*, and *Organizational Behavior and Decision Processes*) between 1990 to 2004 were truly longitudinal .

This study takes a longitudinal approach in tracking the development of temporal conflict over time. Research has shown that conflict evolves over time (Jehn & Mannix, 2001). In this study, I examined the effect of time on the relationship between diversity in time urgency and temporal conflict. Research on deep-level diversity has shown that, as compared to surface-level characteristics, the effect of deep-level individual differences on team outcomes takes longer to emerge (Harrison et al., 1998; Harrison et al., 2002; Watson, Kumar, & Michaelsen, 1993). Harrison and colleagues (1998) found that as a group worked together longer, the relationship between attitudinal diversity and group social integration strengthened. Similarly, Harrison and colleagues (2002) reported that team collaboration strengthened the effect of psychological factors on team outcomes. In addition, in examining the effect of cultural diversity over time, Watson et al. (1993) found although initially culturally homogeneous groups scored higher on both team process and performance effectiveness, the difference between diverse and homogeneous groups converged over time. By the end, culturally diverse groups even exhibited higher levels of performance on certain tasks. Altogether, these findings suggest that, as team members continue to interact and work together, time may allow deep-level individual differences become more evident and allow their effects to emerge.

Time urgency is considered a deep-level characteristic, reflecting less visible, dispositional tendencies. Consistent with the findings reported above, I propose that the effect of diversity in time urgency is likely to emerge later rather than earlier. More specifically, I argue that this increasingly stronger effect of time on the relationship between diversity in time

urgency and temporal conflict is likely to result from increased intensity of team interaction and a higher level of time pressure experienced by team members, especially time-urgent individuals.

My first line of reasoning is informed by Gersick's (1988) model of punctuated equilibrium. Gersick found that the first half of a project is typically characterized by relatively little action after the initial meeting. Towards the midpoint between initiation and deadline, the group goes through a transition phase where strategies and plans are redefined, and during the second half of interaction, the group engages in more intense task activities. Towards the end of a project, Gersick found that groups redirected their attention towards requirements and expectations and held longer meetings. More intense task planning and task work at a later stage in a project are likely to involve more discussions on various temporal issues among group members, which provides the opportunity for divergent opinions and views on issues to emerge. However, intense planning and task work alone may not be sufficient for diversity in temporal individual differences to exercise greater impact on temporal conflict. I argue that, at a later stage, as a team approaches the deadline for their work, experienced time pressure and perceived "distance" to deadline may have differential effects on individuals with different levels of time urgency. That is, time urgency is likely to be activated to a greater extent by a heightened sense of time pressure. This argument is informed by Tett and Burnett's (2003) trait-based interactionist model.

Tett and Burnett's (2003) trait-based interactionist model suggests that the expression of certain traits is likely to be stronger when relevant situational cues are present. By nature, more time-urgent individuals are more aware of the passage of time and more sensitive to deadlines. Approaching deadlines and greater time pressure are the relevant situational cues that are likely to activate time urgency. As a result, the characteristics of time-urgent individuals manifest

themselves to a greater extent when the team is closer to the deadline and under more time pressure, while less time-urgent individuals may still retain relatively consistent behaviors as before, which may lead to greater divergence in their approaches to temporal issues. For example, time-urgent individuals may urge other team members to act even faster or finish certain tasks even more quickly than before. They may propose to set more frequent internal deadlines in order to be sure that work is completed on time. If other team members share their mentality and appreciate the situation in a similar fashion, they are more likely to agree on these “emergency contingencies.” However, if other members do not sense time pressure and deadlines the same way as the time-urgent individuals do, they are unlikely to willingly alter their own schedules and plans. As a result, a greater level of temporal conflict is likely to arise. Therefore, I propose that:

*H9. The effect of diversity in time urgency is likely to have a stronger, positive relationship with temporal conflict at a later rather than earlier time.*

In addition, temporal conflict experienced at an earlier time point is likely to have an influence on temporal conflict experienced at a later time point:

*H10. Temporal conflict at a later time will be positively correlated with temporal conflict at an earlier time.*

*Pacing styles.* The effect time has on the relationship between diversity in pacing styles and temporal conflict is, however, likely to be different. Early-action style individuals prefer beginning work right away. If the team is diverse on pacing styles and other members prefer to start later, temporal conflict is likely to arise as soon as a project begins. If the team does not reach an agreement over when they should start, early-action style individuals may begin doing their share of the work early, especially if a project allows a high degree of de-coupling. As the

project draws to its end, deadline-action style individuals begin to work more intensely. They may need to coordinate with early-action style individuals in order to make sure that their work is not redundant. However, at this point early-action style individuals may feel that they have already done their share and no longer want to invest much more time. Coordinating efforts and activities is likely to become difficult when everyone on the team is not willingly contributing at the same time. This may be especially problematic if the entire team is under time pressure to finish work but is having difficulty pooling enough temporal resources together. As a result, temporal conflict will likely arise again. Therefore, I argue that the passage of time is unlikely to have a visible effect on the relationship between diversity in pacing styles and temporal conflict.

## Method

### *Context: General Background of the Study*

Data collection was made possible through a large-scale, multi-year international collaboration between The Pennsylvania State University and universities in several other countries around the world. Dr. Rosalie Ocker is a Principal Investigator in this effort and has provided this valuable opportunity. Partially-distributed teams (PDTs) consisting of students from different countries were formed each semester. PDTs are a type of hybrid virtual teams that consist of geographically-dispersed subteams (Ocker, Kracaw, Hiltz & Rosson, 2009). In the case of this study, subteam members could meet face-to-face, while the larger teams were connected only by internet or phone. Each team consisted of two subteams. Although geographically distributed, the two subteams were interdependent because deliverables had to be completed by the entire team. In the present research, I will use “subteam” to refer to the group of members who are co-located and “team” to refer to the overall team. Data for this study were collected in the Fall of 2007 and the Spring of 2008.

It should be noted that as part of the experimental design (for the purpose of another PhD student's dissertation), each team was assigned to one of three types of leadership configurations. In the centralized leadership configuration, each team had one overall leader (one leader in total). In the decentralized leadership configuration, each subteam had one leader (two leaders in total). Finally, in the hierarchical leadership configuration, each subteam had one leader and the team had one overall leader (three leaders in total). The effect of leadership configurations was tested as a covariate in the preliminary analysis and was eliminated because of its lack of influence on any substantive variable.

#### *PDT Projects*

PDT teams worked on one of two tasks, both of which involved designing emergency management information systems (EMIS) (Ocker, Kracaw, Hiltz & Rosson, 2009). Both tasks asked PDT teams to conduct high-level analysis and to come up with high-level design requirements for an emergency management information system (EMIS). In the GRRR project (Grassroots Regional Resource Repository), teams were asked to develop functional requirements for a self-help regional emergency preparedness information system. This system should enable residents of a specific geographic region (e.g., Peru) to manage and deploy the region's resources without external assistance. PDT teams in the fall of 2007 worked on the GRRR task. The BTMAPS project (Bioterrorism Management and Planning System) involves determining functional requirements for a system that would support the detection of bioterrorist threats to a certain region (e.g., Zurich) and resource management when associated responses were activated. Teams were tasked with considering the types of the diseases/epidemic trends that should be monitored, decisions that should be made and how they are made, civil and governmental resources that should be mobilized and how, as well as the needs of the users of

this system. PDT teams in the spring of 2008 worked on the BTMAPS task. By incorporating different cultural and regional information and characteristics, the two tasks were designed to be appropriate for an international audience.

### *Training modules*

Each semester, PDT teams participated in a project that lasted for a total of 4 weeks (Ocker, Kracaw, Hiltz & Rosson, 2009). Three training modules were designed to teach effective PDT collaboration among students. Each module contains a set of activities that focus on specific team processes and behaviors. PDT teams also had concrete deliverables for each week. All the deliverables described below were submitted by the team instead of by subteams. Table 1 describes training modules and deliverables for each week.

The project began with the PDT tutorial. Prior to the start of the project, students were required to learn the functions of the PDT collaboration system, an open-source Web-based communication and content management system (Drupal 4.7, see [Drupal.org](http://Drupal.org); more details about this platform will be discussed later). During week 1, students introduced themselves to other team members by sharing certain personal information (favorite food, music, etc.) with one another. Before teams began working on the assigned task, they completed a tutorial designed to familiarize them with the project and the PDT online platform they used. In this week, PDT teams were also given three scenarios, each illustrating a set of challenges facing the PDT (e.g., communication breakdown due to confusion over what chat tool to use, lack of responses from the other subteam). After reading the scenarios, team members completed a team contract together that contained the following sections: Contact information for team members, communication between subteams, meetings between subteams, project management and team leadership, work submissions, conflict between subteams, and decision making processes.

During week 2, team members worked together to brainstorm the functionality of the EMIS system. Each subteam came up with a list of brainstormed items based on a template and shared their list with the distant subteam. After reviewing each other's work, a joint list was created by the two subteams. In this week, each PDT team was also asked to create a webpage for the team based on biographic information obtained through their one-on-one interviews.

During week 3, PDT teams completed an assessment of their collaboration thus far and identified the weak and strong areas in their teamwork. They submitted an action plan specifying how they would correct or improve their behaviors based on their assessment.

PDT teams spent the third and fourth weeks working on the EMIS proposal. The proposal followed a template, which covered the following sections: Purpose of the project, background information, project scope, goals of the information system (GRRR or BTMAPS), description of the users of the EMIS system, high-level functional requirements and user interface design, management and operation practices, and next steps. Project teams were also made aware of the grading rubric. Proposals were evaluated on the following aspects: Quality of writing (clarity, organization, and grammar), coverage of all the required sections, appropriate use of language for a non-technical audience, inclusion of screen-shots of the prototype, and content of all the sections specified above. Proposals were graded by a graduate research assistant to ensure consistency.

### *Participants*

Data from a total of 521 students in selected classes from participating universities were used in this study (51 students with no data were removed). Between fall of 2007 and Spring of 2008, participating universities were from the United States, United Kingdom, Netherlands, China, and Spain. Participating students were taking a class taught by professors and instructors

who were involved in the project. They primarily majored in information science and systems (50.0%), followed by business (i.e., accounting, finance, management, and marketing, 35.7%), computer science (4.8%), engineering (8.7%), and other (0.8%). The majority of the students were under 23 years old (84.4%), and 97% of the participants were studying at the undergraduate level. Approximately 78.1% of the participants were male. In terms of ethnicity, 72.6% were Caucasian/white, followed by 16.2% Asian/Asian American, 4.1% African American/Black, and 3.4% Hispanic.

Participants also reported their self-perceived levels of experience working with technology and working in (virtual) teams, preference for working in teams, and identification with their university, country, and culture. Table 2 presents descriptives at the individual level for these items. Overall, participants reported having had significant experience working with computers and using high speed internet and less experience working with wiki (the technology used to build the online collaborative tool used in the PDT project). Participants' virtual team experience was below average, although they reported having had an average amount of experience working in culturally-mixed and computer-mediated teams. Their general teamwork experience was above average as well. Moreover, participants expressed a high degree of interest in working on nationally- or culturally-mixed teams (both above 4 out of a 5-point scale). In addition, participants reported a higher than average level of identification with their university and country.

Students in each class were randomly assigned to subteams with their co-located classmates. A total of 120 subteams were included in this study. Among the 120 subteams, 3 were located in Spain (2.5%), 8 in China (6.7%), 8 in the UK (6.7%), 39 in the Netherlands (32.5%), and 62 in the US (51.7%). Subteams averaged between 4-5 persons (range = 2-6, mean

= 4.34) in size. Each subteam then joined another subteam at a different university to form a partially distributed team. Sixty teams with an average size of 8-9 members per team (range = 6-11, mean = 8.68) were included in this study. Among the 60 teams, there were 2 US-US teams (3.3%), 3 US-Spain teams (5.0%), 8 US-China teams (13.3%), 8 US-UK teams (13.3%), and 39 US-Netherlands teams (65.0%). The average response rates by team, subteam, and country are shown in Table 3. In addition, it should be noted that since the project began after the midpoint of the semester, members of each subteam had already interacted with one another for at least 6 or 7 weeks on average at the start of data collection.

#### *Subteam and Team Communication*

Teams primarily interacted through a Web-based communication and content management system (Ocker, Kracaw, Hiltz & Rosson, 2009). After logging in, students could see a description of PDT project, including instructions, milestones, and deliverables. They also could utilize a threaded discussion board, a file sharing repository, shared document creation and editing, and a project calendar. Each team had a private workspace and could create private workspace for subteams, leaders, or individual members of the team. In addition to the online forum, team members also used a variety of communication tools that suited their needs (e.g., email, instant messaging, telephone, or face-to-face meetings).

Many co-located subteams in the US were given time in class to work on the assignment; however, this was not necessarily the case for all US subteams or subteams in other countries, as classes were structured differently. Therefore, face-to-face interaction varied across subteams.

#### *Data Collection Procedures*

Data were collected across four weeks. Figure 2 depicts the data collection process by week. Yellow textboxes with text in bold indicate main variables of interest. Temporal individual

differences were assessed in the background survey prior to the start of the project. In order to lessen the burden on the participants but still to capture temporal processes over time, temporal planning was measured in weeks 2 and 4 and time awareness norms were measured in weeks 3 and 4. In the fall of 2007, temporal conflict was measured only during week 3 and 4. In the spring of 2008, temporal conflict was also measured in weeks 1 and 2. As a result, 21 teams from Spring 2008 had data on temporal conflict from all four weeks, while the remaining 39 teams from Fall 2007 had data on temporal conflict only from the last two weeks. Scores for proposals were obtained at the end of the project. Weekly timeliness was gathered by recording the exact time each deliverable was received by email.

### *Measures*

#### *Time Urgency*

Six items from the Task-Related Hurry & General Hurry sub-scales from Landy et al. (1991) were used to measure time urgency (Appendix A). A sample item for this scale is “I find myself hurrying to get places even when there is plenty of time.” A five-point Likert scale was used, with 1 being “extremely uncharacteristic” and 5 being “extremely characteristic”. The alpha for this scale was .61.

#### *Pacing Styles*

To measure this construct, Gevers, Rutte, and van Eerde (2006) devised a one-item scale, which consists of five graphs depicting five distinct ways in which activities lead up to the deadline. However, using this measure Gevers, Claessens, et al. (2006) failed to find any relationship between pacing styles and performance. The authors suggested that one of the causes may be that a one-item measure used to examine five types of styles might have significantly reduced the power for analysis. Therefore, the current study used a measure adapted

from items developed by Gevers, Mohammed, Baytalskaya, and Beeftink (2008). A total of nine items were used (Appendix B). Three items captured the early-action style, three captured the deadline-action style, and the remaining three captured the steady-action style. A sample item from the early action style is “When performing a task or project, I start right away and finish the work long before the deadline.” A five-point Likert scale was used, with 1 being “extremely uncharacteristic” and 5 being “extremely characteristic.” Exploratory factor analysis (see Table 3) showed that two factors emerged. Early- and deadline-action styles were two opposites of a single dimension, correlating  $-.66$ . The three items for early-action style were therefore combined with the three items for the deadline-action style, forming one 6-item deadline action style. Alphas for these two styles were  $.79$  for steady-action style and  $.86$  for deadline-action style.

#### *Temporal Conflict*

Three items were used to measure temporal conflict adapted from Jehn & Mannix, 2001) (Appendix C). One sample item is: “To what extent do team members disagree about time allocation in your work team (how much time to spend on tasks)?” A 7-point Likert scale was employed. Team members were asked to give two separate ratings, one for their subteam and one for the team. Alphas for temporal conflict measured in weeks 1, 2, and 3, and 4 with references to the subteam and team averaged  $.85$ . *Temporal planning*. Seven items were used to measure temporal planning (Appendix D). Example items include: “To what extent did your group prioritize tasks and allocate time to each task?” and “To what extent did your group discuss any deadlines?” A 7-point Likert scale was employed. Team members were asked to give two separate ratings, one for their subteam and one for the team. Alphas for temporal planning measured at week 2 and week 4 with references to the subteam and team were on average  $.85$ .

### *Time Awareness Norms*

A total of 13 items (Janicik & Bartel, 2003; adapted from Schriber & Gutek, 1987) were used to measure time awareness norms (Appendix E). Examples of the items are: “Staying on schedule was important in our group” and “It was very important to be ‘on time’ for everything.” Team members were asked to give two separate ratings, one for their subteam and one for the team. Alphas for time awareness norms measured at week 3 and week 4 with references to the subteam and team were on average .85.

### *Performance*

Quality of performance was assessed by the score each team received on the final proposal. The following aspects were assessed: Quality of writing (clarity, organization, and grammar), completeness of content, attention paid to the audience (should be written for a non-technical audience), inclusion of the goal for the project and users, description of functional requirements and management and operation practices, and next steps. A 100-point grading scale was used.

### *Timeliness of Delivery*

Each week teams were required to deliver a set of deliverables via email to the administrator’s account by a certain time (i.e., 11:59PM EST in the US on the Friday of each week during the 4-week period). To obtain a measure for timeliness of delivery, the exact submission time for each deliverable was recorded from emails to the PDT email account, which collected all the submissions. The timeliness measure was operationalized in three ways.

The first method of operationalization rendered the timeliness measure a continuous variable. Timeliness of delivery was measured as “time to submission”. The number of minutes to the due time was calculated for each submission. If a team submitted an assignment before the

due time, a positive number was obtained. If a team submitted an assignment after the due time, a negative number was obtained. The earlier a team submitted a deliverable, the larger the positive number of minutes. The later a team submitted a deliverable, the larger the absolute value of the negative number of minutes. Timeliness of delivery was obtained for each week. There were two distinct assignments for week 2; separate timeliness measures were assessed for each assignment for a total of 5 timeliness measures at the team level. Because most teams submitted their assignments either early or on time, this measure is highly skewed to the positive end. The timeliness measure was normalized for all the following analyses with the rank method. This normalization method ranks all the data and is appropriate for data with both positive and negative values. This method of operationalization treats timeliness as a continuous variable and does not see late submissions as qualitatively different from early submissions.

The timeliness measure was also operationalized as a dichotomous variable, although analysis conducted with the dichotomized timeliness outcome was only reported in the ancillary analysis section. Teams that submitted their assignment early or on time received a 1, and those that submitted their assignments late received a 0. This method treats the early and on-time submissions as qualitatively different from late submissions.

### *Demographic Information*

In addition to the scales described above which measure the main variables of interest, demographic information about the participants was gathered. In addition, a scale that assesses the type of team interaction was also used. Each is described below.

In a background survey prior to the start of the project, participants were asked to report their status in school (undergraduate vs. graduate), undergraduate major, gender, age, country of origin, ethnicity, overall grade point average, technology background, experience working in

teams, attitudes about themselves, their university, and native country, first language, and English language proficiency (for non-native speakers) (Appendix F).

#### *Team Interaction Type Scale*

A scale asking team members to estimate how much they worked in the team was devised for this study (Appendix G). Specifically, this scale asked a respondent to estimate the percentage of time their team spent (1) working all together as the team (all team members work together), (2) working in subteams, (3) working as individuals (e.g., We divide tasks up individually, work on our own, and then pool efforts together), and (4) other (the respondent was asked to describe the specific form of work sharing here).

#### *Collective Efficacy, Task Interdependence, and Workload Sharing*

Although these were not substantive variables in this study, they were included in the surveys completed at the end of the project by respondents. Collective efficacy had 9 items (Lent, Schmidt, & Schmidt, 2006), task interdependence had 5 items (Van der Vegt & Janssen, 2003), and workload sharing had 3 items (Campion, Medsker, & Higgs, 1996) (See Appendices H, I, & J).

*Table 1.* PDT project training modules and weekly deliverables.

	<b>Training Module</b>	<b>Deliverable</b>
<b>Week 1</b>	“Getting off to a good start”: 3 scenarios on PDT challenges	Team Contract
<b>Week 2</b>	“From ‘Us vs. Them’ to We”: Interview distant team members	Team Web Page
<b>Week 3</b>	“Establishing/maintaining a positive team trajectory”: Team Assessment	Corrective Action Plan
<b>Week 4</b>		EMIS Proposal

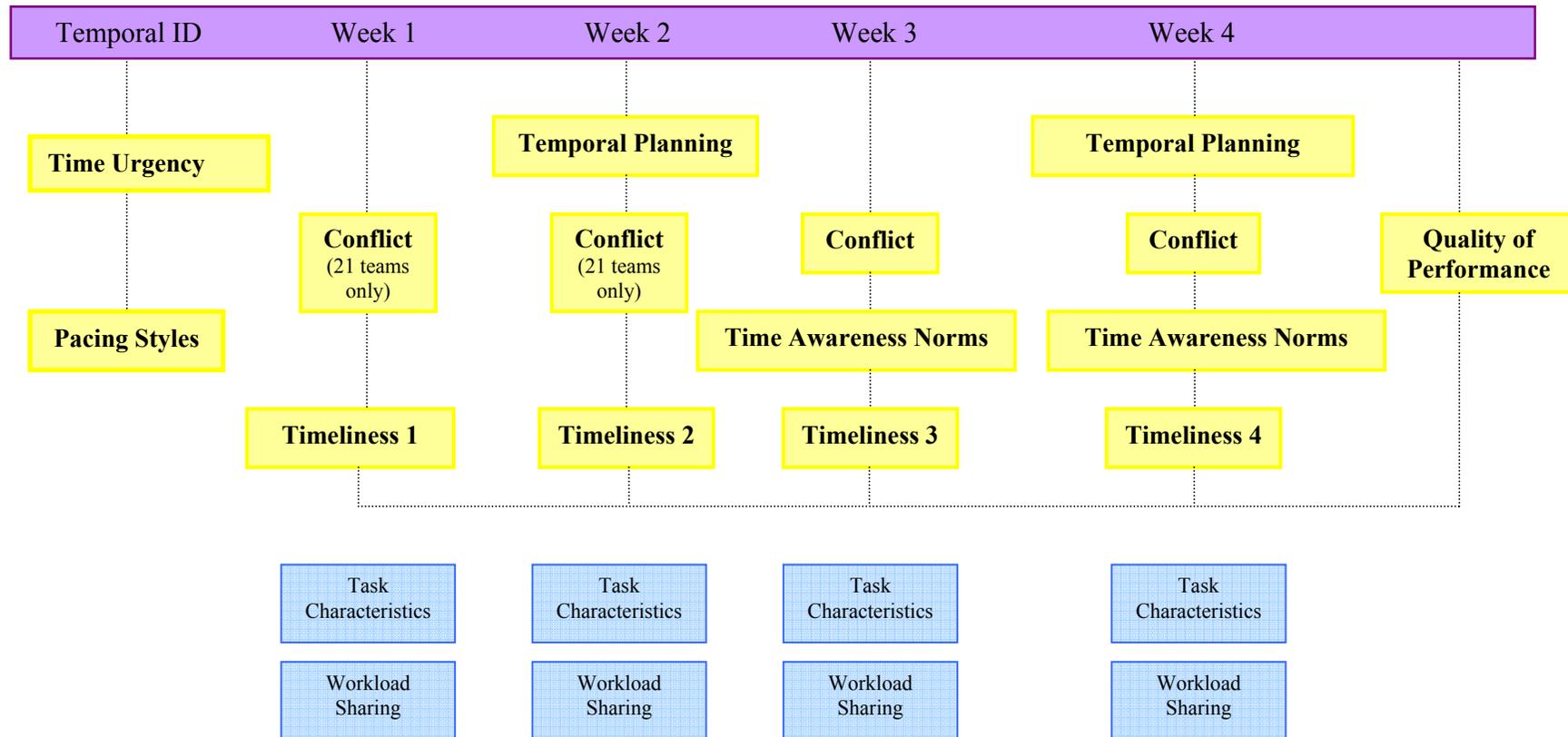
*Table 2.* Individual-level means and standard deviations of items capturing backgrounds and attitudes of participants.

<b>Item</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>Range</b>	<b>Min</b>	<b>Max</b>
Computer experience	495	3.66	0.92	4.00	1.00	5.00
Wiki experience	495	2.81	1.44	4.00	1.00	5.00
Easy access to internet	495	4.54	0.94	4.00	1.00	5.00
Internet speed	495	4.55	0.77	4.00	1.00	5.00
Virtual team experience	495	2.09	1.00	4.00	1.00	5.00
Culturally-mixed team experience	495	3.15	1.10	4.00	1.00	5.00
Computer-mediated team experience	495	3.58	1.06	4.00	1.00	5.00
Preference for working on nationally-mixed teams	495	4.15	0.73	4.00	1.00	5.00
Preference for working on culturally-mixed teams	495	4.14	0.66	4.00	1.00	5.00
Teamwork experience	495	3.87	0.55	3.00	2.00	5.00
Identification with university	495	3.57	0.68	4.00	1.00	5.00
Identification with country	495	3.91	0.64	3.25	1.75	5.00
Representativeness of one's own culture	495	3.44	0.76	4.00	1.00	5.00

*Table 3.* Average response rates by subteam, team, and country (i.e., percentage of respondents who have at least some data across subteams, teams, and countries).

<b>Average response rates</b>		<b>Background questionnaire</b>	<b>Week 1</b>	<b>Week 2</b>	<b>Week 3</b>	<b>Week 4</b>	<b>Post-task questionnaire</b>	<b>Total</b>
<b>By Team</b>		86.50%	74.30%	78.00%	77.30%	75.70%	74.20%	77.70%
<b>By Subteam</b>		86.68%	74.64%	78.81%	77.75%	75.78%	73.54%	77.87%
	US	88.18%	87.68%	76.04%	75.40%	78.59%	75.40%	80.22%
	The Netherlands	81.66%	81.16%	75.74%	76.92%	62.72%	61.54%	73.29%
<b>By country</b>		97.62%	80.49%	85.71%	76.19%	92.86%	90.48%	87.22%
	UK	97.62%	80.49%	85.71%	76.19%	92.86%	90.48%	87.22%
	Spain	78.57%	90.91%	71.43%	57.14%	50.00%	71.43%	69.91%
	China	67.65%	95.65%	79.41%	79.41%	85.29%	76.47%	80.65%

Figure 2. Data collection procedure.



## Results

### *Preliminary Analysis*

#### *Exploratory Factor Analysis*

Tables 4 and 5 show the results from exploratory factor analysis with data at the individual level. The maximum likelihood method with oblique rotation was used for all factor analyses. Results showed that items that belonged to the same temporal individual difference scale generally loaded on the same factor. Early-action and deadline-action styles loaded on the same factor. Two items on the time urgency scale did not load highly on the same factor and therefore were removed when constructing the scale (however, it should be noted that removing them did not improve the reliability of the scale significantly). Similarly, items from temporal conflict, time awareness norms, and temporal planning scales also loaded on separate factors.

#### *Aggregation of Individual Responses to Group Level*

There are several ways to aggregate individual-level data to the group level. Much of the group composition literature has traditionally used the mean to aggregate up to the team level (Kozlowski & Bell, 2003). However, theories that take a multi-level approach in explaining and predicting organizational phenomena have suggested a variety of frameworks that describe the possibilities in combining lower-level properties into higher-level properties depending on the nature of the functional relationships between levels and the nature of the variables (e.g., Chan, 1998; Kozlowski & Klein, 2000). Because the interest in this research is to examine the effect of diversity in temporal individual differences, aggregation of time urgency and pacing styles from individual level to the subteam and team levels requires the use of within-group variability among scores of all subteam and team members respectively. Because diversity in individual differences is best described as a form of separation (i.e., lateral positions or opinion among

members, primarily of value, belief, or attitude, Harrison & Klein, 2007), the most appropriate aggregation method for this type of diversity is within-group standard deviation (Bedeian & Mossholder, 2000). This study used the within-subteam and within-team standard deviation to represent diversity in time urgency and pacing styles (i.e., steady- and deadline-styles).

It should be noted again that all temporal conflict, time awareness norms, and temporal planning items were repeated with both subteam and team as the referent. Therefore, aggregation to the subteam level only used items with subteam as the referent and aggregation to the team level only used items with team as the referent. Prior to doing this, it was necessary to assess within-group agreement to ascertain that the target variables can adequately adopt a group-level shared property (George & Bettenhausen, 1990). ICC1 and ICC2 values for both subteam and team levels were shown in Table 6. There were significant between-group variances for temporal conflict, time awareness norms, and temporal planning measures at all points of measurement.

#### *Potential Categorical Control Variables*

Six potential control variables were categorical, including semester in which data collection took place (Fall 07 vs. Spring 08), class to which the subteam or team belonged (there were 11 different classes between the two semesters of data collection), leadership configuration (de-centralized, centralized, and hierarchical), country in which a subteam is located (a subteam-level variable referred to as “subteam country”) and cross-cultural team composition (a team-level variable, e.g., US-China combination or US-Spain combination). Oneway ANOVAs were used to assess their effects on outcome variables and are reported in Table 7 (subteam level) and 8 (team level).

Overall, subteams and teams showed very few differences across semesters and only one significant difference (in week 1 timeliness of delivery) across three different leadership

configurations at the team level. Subteams showed a few significant differences across classes in temporal conflict, time awareness norms, and temporal planning, but at the team level these differences reduced significantly. Moving forward, leadership configuration and class were eliminated as candidates for covariates.

Both subteam country and cross-cultural team composition had a number of significant effects on the substantive variables. In general, subteams in China reported experiencing greater temporal conflict (mean = 3.69 in week 3 and 3.24 in week 4) than subteams in the US (mean = 2.50 and 2.40), UK (mean = 2.10 and 1.93), and the Netherlands (mean = 2.42 and 2.40) ( $F > 4.20, p < .01$ ). In week 4, subteams in Spain also reported having done less temporal planning (mean = 3.37) than subteams in the US (mean = 4.46) and UK (mean = 4.87) ( $F = 3.56, p < .01$ ). Subteams in Spain also perceived lower time awareness norms (mean = 4.26) than subteams in the Netherlands (mean = 5.19) and UK (mean = 5.50) ( $F = 3.07, p < .05$ ). Similarly, teams in different cross-cultural compositions reported different levels of temporal conflict, temporal planning, time awareness norms, and delivery time (final week only). For example, US-China teams reported greater temporal conflict (mean = 3.17) than US-Netherlands (mean = 2.40) and US-UK (mean = 2.07) teams in week 4 ( $F = 5.71, p < .05$ ). US-China (mean = 4.86) and US-Spain (mean = 4.38) teams also reported lower time awareness norms than US-Netherlands (mean = 5.31) teams in week 4 ( $F = 5.99, p < .001$ ). These distinctions should be made with caution, as there were significantly fewer Chinese and Spanish subteams present in the sample. Because of these differences, subteam country and cross-cultural team composition (team property) were included as control variables in further analyses.

#### *Descriptive Statistics for Control Variables and Correlations*

Tables 9 and 10 present the means, standard deviations, and correlations of the potential control variables that were continuous (subteam- or team-level sizes, gender diversity, English language proficiency, and teamwork experience) and the substantive variables used (diversity in temporal individual differences, temporal planning, and time awareness norms) in this study. Gender and ethnic diversity were calculated using Blau's index (calculated as  $1 - \sum P_i^2$ , where  $P$  is the proportion of individuals in a category and  $i$  is the number of categories). Blau's index ranges from 0 to 1, with 0 indicating no diversity and 1 indicating maximum diversity (Richard, Barnett, Dwyer, & Chadwick, 2004). As data in these tables show, overall, gender diversity in subteams and teams is not very high (mean = 0.20 and 0.28 respectively), as the majority of these teams were composed of mainly male students. Teamwork experience is relatively high at both subteam (mean = 3.84 out of 5) and team (mean = 3.86 out of 5) levels. In addition, English proficiency was also high at both subteam (mean = 5.11 out of 6) and team levels (mean = 5.21 out of 6). Further analysis showed that, at the subteam level, Chinese teams reported lowest English proficiency (mean = 2.52), followed by Spain (mean = 2.63), the Netherlands (mean = 4.40), UK (mean = 5.83), and US (mean = 5.92) ( $F = 235.71, p < .001$ ). At the team level, US-China teams reported the lowest level of proficiency (mean = 4.35), followed by US-Spain (mean = 4.46), US-Netherlands (mean = 5.26), US-UK (mean = 5.91), and US-US (mean = 5.94) teams ( $F = 27.57, p < .001$ ).

Characteristics of the subteams and teams influenced temporal processes and outcomes differently. Subteam and team sizes and gender diversity had few effects, whereas English proficiency and teamwork experience were correlated with majority of the temporal process and outcome variables. As expected, English proficiency and teamwork experience were correlated positively with temporal planning and time awareness norms and negatively with temporal

conflict. At the team level, teamwork experience was also found to be positively correlated with proposal grades. Most of these correlations were in the .20 - .40 range and thus only moderate. Taking these findings into consideration gender and ethnic diversity were left out due to too few effects on the substantive variables. In summary, five control variables were included in further analysis: Subteam/team size, English language proficiency, teamwork experience, and subteam country (for subteams) or cross-cultural team composition (for teams).

#### *Descriptive Statistics for Substantive Variables and Correlations*

As shown in Tables 10 and 11, both subteams and teams exhibited moderate level of time urgency (mean = 2.85 and 2.86 out of 5), steady pacing style (mean = 2.77 and 2.76), and deadline pacing style (mean = 2.99 and 3.00). Overall, subteams and teams reported relatively low levels of temporal conflict across all four weeks (between 2.00 and 3.00 out of 7) and moderate levels of temporal planning and time awareness norms (between 4.00 and 5.50 out of 7). Teams received an average of 88.72 on a 100-point scale for their final proposals. In terms of timeliness of delivery, most teams submitted their weekly deliverables before or on the deadline. The medians of the submission times were between 196 to 599 minutes (approximately 3.2 to 10 hours) before the time due. Figure 3-7 show the distributions of submission time of week 1, 2, 3, and 4 assignments.

There are a few notable correlations in Tables 10 and 11. At both subteam and team levels, mean level steady pacing preference negatively correlated with mean level deadline pacing style ( $r = -.48$  and  $-.36$ ,  $p < .01$ ). At the subteam level (Table 9), mean level steady pacing style positively correlated with temporal conflict in week 4 ( $r = .21$ ,  $p < .05$ ). Mean level deadline pacing style correlated negatively with temporal conflict in week 4 ( $r = -.22$ ,  $p < .05$ )

and temporal norms in week 4 ( $r = -.26, p < .01$ ). Furthermore, diversity in deadline pacing style correlated positively with temporal planning in week 2 ( $r = .20, p < .05$ ).

At the team level (Table 10), mean level steady pacing style correlated positively with timeliness of delivery for week 2 assignment 1 ( $r = .32, p < .05$ ) and week 3 assignment ( $r = .27, p < .05$ ). Furthermore, mean level deadline pacing style negatively correlated with temporal planning in week 2 ( $r = -.40, p < .01$ ) and week 4 ( $r = -.29, p < .05$ ) as well as time awareness norms in week 3 ( $r = -.26, p < .05$ ) and week 4 ( $r = -.40, p < .01$ ). Mean level deadline pacing style also correlated with timeliness of delivery for week 2 assignment 1 negatively ( $r = -.28, p < .05$ ) as well as week 4 final proposal ( $r = -.33, p < .05$ ). In addition, timeliness of delivery for week 2 assignment 1 was positively correlated with temporal planning in week 2 ( $r = .27, p < .05$ ). Week 4 timeliness was correlated positively with time awareness norms in week 4 ( $r = .35, p < .01$ ) as well as timeliness in week 1 ( $r = .29, p < .05$ ), week 2 assignment 1 ( $r = .37, p < .01$ ), and week 2 assignment 2 ( $r = .35, p < .01$ ). Finally, proposal grade was negatively correlated with temporal conflict in week 4 ( $r = .29, p < .05$ ) and positively correlated with time awareness norms in week 3 ( $r = .39, p < .01$ ) and week 4 ( $r = .34, p < .01$ ).

In general, temporal planning and time awareness norms showed moderate levels of stability over time. Correlations between temporal planning in week 2 and 4 were .30 ( $p < .01$ , subteam) and .50 ( $p < .01$ , team). Correlations between time awareness norms in week 3 and 4 were .72 ( $p < .01$ , subteam) and .67 ( $p < .01$ , team). As expected, temporal conflict was found to be negatively associated with time awareness norms to a moderate degree (correlations ranged between -.14 and -.34 at the subteam level and -.38 and -.54 at the team level). However, neither the average nor the diversity in temporal individual differences in subteams and teams had notable effects on temporal processes and outcomes. Contrary to what was expected, temporal

conflict was not related to temporal planning at any point in time. Time awareness norms and temporal planning were positively correlated at around .50, which suggests that they were related but empirically distinguishable.

#### *Subteam versus Team Levels of Analysis*

Data were collected at both the subteam and team levels with the exception of performance data (quality of performance, represented by proposal grades, and timeliness of delivery). Observations and quantitative evidence suggest that the same variables are likely to have different relationships between these two levels.

Observation took place in classes at Penn State at least once each week during the four weeks of the project in the spring of 2008. A general impression gathered during this time was that teams varied a great deal in terms of how closely subteams collaborated. US students felt that a major determining factor from the US perspective, was how competent the other subteam was in doing their share of the work. Conversations with team members on the US side revealed that time zone differences between subteams presented a significant challenge, especially when most teams attempted “meetings” online between subteams. Subteams were not always able to “meet” in real time either due to time constraints or lack of motivation and commitment to the project.

Observations also suggested that, although subteams could benefit a great deal from closer collaboration in both generating and implementing ideas, logistically it was quite difficult for subteams to contribute equally to all aspects of the project. The nature of the project determined required a high level of goal interdependence in that the proposal completed at the team level ultimately determined each subteam’s performance quality. However, task interdependence at the subteam level is sequential or reciprocal but pooled at the team level.

subteams was relatively low, as the deliverables during each week could potentially be completed by each subteam independently and then combined.

Quantitative analysis also revealed differences in the dynamics at the subteam and team levels. Participant rated the degree of workload sharing, interdependence, and collective efficacy for the subteam as well as the team levels. Correlations between these two sets of data were generally high at around .80, but not uniformly so. For example, correlations between the two levels ranged between .56 and .79 for workload sharing, interdependence, and collective efficacy. Moreover, individuals reported greater interdependence, workload sharing, and collective efficacy at the subteam level than at the team level ( $p < .001$ ). Team members also estimated the amount of time spent on working in subteams and working all together. Results from t-tests showed that individuals reported spending 25% more time working in subteams than together in the team all together ( $p < .001$ ). Results from t-tests between the two levels showed that individuals gave lower ratings to temporal planning and time awareness norms when the referent was team than when it was subteam ( $p < .001$ ). Temporal conflict did not differ significantly between two levels at week 1, 2, and 4, but individuals reported lower conflict at the subteam level than at the team level during week 3.

#### *Multilevel Design and Hierarchical Linear Modeling (HLM)*

The design of this study is multilevel in nature: Each team has two subteams nested within. In order to take into account the effect of team-level factors or the fact that two subteams in the same team are not entirely independent of each other, I considered using HLM. HLM is a technique that allows researchers to model a higher-level effect on a lower-level outcome (see Bryk & Raudenbush, 1987). In this study, characteristics at the team level may have an effect on the dynamics that emerge at the subteam level and HLM can potentially allow for testing that

effect. However, the fact that only two subteams were nested within one large team does not give enough power to conduct HLM. Although in theory the team effect is meaningful to test, it cannot be done in this particular study.

### *Tests of Hypotheses*

Because variables were measured over time and across levels, choices had to be made regarding how their relationships were to be tested. Adopting a conservative approach, I tested these relationships with various combinations of variables. Figure 8 and Table 11 illustrate these choices. Essentially, the direct relationship between the diversity in temporal individual differences and temporal conflict as well as the mediating effect of temporal conflict between diversity in temporal individual differences and outcomes (quality of performance as well as timeliness of delivery) were tested in both weeks 3 and 4. The moderating effect of temporal planning was tested at both weeks 2 (on the relationship between temporal individual difference diversity and week 3 temporal conflict) and 4 (on the relationship between temporal individual difference diversity and week 4 temporal conflict). Finally, the moderating effect of time awareness norms were tested at both weeks 3 (on the relationship between temporal individual differences and week 3 temporal conflict) and 4 (on the relationship between temporal individual differences and week 4 temporal conflict). All hypotheses were tested at both the subteam and team levels with multiple regressions whenever data were available. At the subteam level, subteam size, subteam country (dummy-coded by three categories—Spain, China, and others—as the distinctions among US, Netherlands, and UK were non-existent), English language proficiency and teamwork experience were controlled for. At the team level, team size, cross-cultural configurations (coded by three categories: US-others, US-Spain, and US-China), English language proficiency, and teamwork experience were used. At the first step, subteam or team

size, country (subteam) or cross-cultural composition (team), English language proficiency, teamwork experience as well as **mean** levels of temporal individual differences (time urgency, steady pacing style, and deadline pacing style) were entered as covariates. When the outcome variable was week 4 temporal conflict, week 3 temporal conflict was also controlled for. At the second step, main effects were tested with standard deviations (diversity) of temporal individual differences being entered. At the third step, the interaction terms were entered.

#### *Diversity in Temporal Individual Differences and Temporal Conflict*

Hypotheses 1 and 2 proposed that diversity in time urgency (H1) and in pacing styles (H2) would be positively related to temporal conflict. As shown in Tables 12 and 13, at the subteam level, the overall regression models with all the control variables and temporal individual differences included were significant for both week 3 ( $R^2 = .22$ ,  $F = 2.75$ ,  $p < .01$ ) and week 4 ( $R^2 = .32$ ,  $F = 4.01$ ,  $p < .001$ ). However, after taking into account control variables and mean levels, diversity in time urgency and pacing styles explained little additional variance in temporal conflict during weeks 3 and 4. The only significant finding was that diversity in steady pacing style was related to temporal conflict in week 3 ( $\beta = .20$ ,  $p < .05$ ).

As shown in Tables 14 and 15, at the team level, the overall regression model with control variables and temporal individual differences included was not significant for week 3 but was significant for week 4 ( $R^2 = .37$ ,  $F = 2.56$ ,  $p < .05$ ). Temporal individual differences explained no additional variance in temporal conflict in either week 3 or 4 after the control variables and mean level temporal individual differences were taken into account. Therefore, Hypothesis 1 was not supported, whereas Hypothesis 2 was only supported for steady pacing style with regards to temporal conflict in week 3 at the subteam level.

#### *The Moderating Role of Temporal Planning*

Hypotheses 3a and 3b proposed that temporal planning would play a moderating role in the relationship between diversity in time urgency (3a) and in pacing styles (3b) and temporal conflict such that this relationship would weaken with greater temporal planning. These relationships were tested at both subteam and team levels with hierarchical regressions. Results showed that these dynamics manifested differently at the two levels.

*Subteam-level analysis.* As shown in Tables 16 and 17, at the subteam level, temporal planning in week 2 did not affect the relationship between diversity in temporal individual differences and temporal conflict in either week 3 or 4. Although the overall models with all the control variables, main effects, and the interaction effects taken into account were significant ( $R^2 = .24$ ,  $F = 2.66$ ,  $p < .01$  for week 3 temporal conflict and  $R^2 = .30$ ,  $F = 3.24$ ,  $p < .01$  for week 4 temporal conflict), the interaction terms added no significant additional variance.

As shown in Table 18, in week 4, temporal planning played a role in the relationship between diversity in temporal individual differences and temporal conflict after taking into account the effects of the control variables and the main effects (overall model:  $R^2 = .37$ ,  $F = 4.41$ ,  $p < .001$ ). The added interaction terms contributed 8% variance above and beyond the effects of the covariates and main effects ( $p < .01$ ). Specifically, week 4 temporal planning moderated the relationship between diversity in time urgency and week 4 temporal conflict ( $\beta = .17$ ,  $p < .10$ ) as well as the relationship between diversity in steady pacing style and week 4 temporal conflict ( $\beta = .22$ ,  $p < .05$ ).

However, these effects were opposite of what were hypothesized. As shown in Figure 9, temporal conflict in week 4 increased as diversity in time urgency increased when temporal planning in week 4 was high. Results from tests of simple slopes showed that, when week 4 temporal planning was high, diversity in time urgency positively predicted temporal conflict in

week 4 ( $\beta = .37, p < .05$ ). When temporal planning was low, diversity in time urgency did not predict temporal conflict ( $\beta = -.16, ns$ ). Therefore, at the subteam level, Hypothesis 3a was not supported.

Similarly, as shown in Figure 10, temporal conflict in week 4 increased as diversity in steady pacing style increased when temporal planning in week 4 was high. Results from tests of simple slopes showed that, when week 4 temporal planning was high, diversity in steady pacing style positively predicted temporal conflict in week 4 ( $\beta = .58, p < .001$ ). When temporal planning was low ( $\beta = -.09, ns$ ), diversity in time urgency did not predict temporal conflict. Temporal planning did not affect the relationship between deadline pacing style and temporal conflict. Therefore, at the subteam level, Hypothesis 3b was not supported.

*Team-level analysis.* As shown in Tables 19, 20, and 21, at the team level, temporal planning did not have a significant effect on the relationship between temporal individual differences and temporal conflict in any week. The overall models with the interaction terms of temporal planning and temporal individual differences included were significant for week 4 temporal conflict (for week 2 temporal planning:  $R^2 = .55, F = 4.31, p < .001$  and for week 4 temporal planning:  $R^2 = .54, F = 4.11, p < .001$ ). However, the interaction terms did not contribute any significant variance above and beyond the control variables and main effects. Therefore, at the team level, Hypotheses 3a and 3b were not supported.

#### *The Moderating Role of Time Awareness Norms*

Hypotheses 4a and 4b proposed that time awareness norms would play a moderating role in the relationship between diversity in time urgency (4a) and in pacing styles (4b) and temporal conflict such that time awareness norms would mitigate the negative influence of diversity on conflict. These relationships were also tested at both subteam and team levels.

*Subteam-level analysis.* As shown in Tables 22, 23, and 24, at the subteam level, when the interaction terms of time awareness norms and temporal individual differences were included, the overall models were significant when temporal conflict in weeks 3 or 4 were the outcomes ( $R^2 = .26$ ,  $F = 3.01$ ,  $p < .01$  for week 3 time awareness norms and week 3 temporal conflict,  $R^2 = .31$ ,  $F = 3.49$ ,  $p < .001$  for week 3 time awareness norms and week 4 temporal conflict, and  $R^2 = .34$ ,  $F = 3.91$ ,  $p < .001$  for week 4 time awareness norms and week 4 temporal conflict). However, the interaction terms did not add significant variance above and beyond the control variables and main effects in these overall models. In Table 22, a marginally significant interaction emerged between diversity in deadline pacing style and time awareness norms in week 3 when temporal conflict in week 3 was the outcome ( $\beta = -.18$ ,  $p < .10$ ). This effect was in the hypothesized direction. Figure 11 and the results from simple slope tests suggested that when time awareness norms in week 3 were low, diversity in deadline pacing style negatively predicted temporal conflict in week 3 ( $\beta = -.18$ ,  $p < .10$ ). When time awareness norms in week 3 were high, this relationship was not significant ( $\beta = -.18$ , ns). Taken together, Hypotheses 4a (time urgency) received no support and 4b (pacing styles) received partial support at the subteam level.

*Team-level analysis.* Several significant or marginally significant findings emerged at the team level. As shown in Table 25, time awareness norms in week 3 did not moderate the relationship between diversity in temporal individual differences and temporal conflict in week 3. However, as shown in Table 26, week 3 time awareness norms did significantly moderate the relationship between diversity in temporal individual differences and temporal conflict in week 4 ( $F = 5.20$ ,  $p < .001$ ). The interaction terms together contributed an additional 7% variance after controlling for the covariates and main effects ( $p < .10$ ). Specifically, week 3 time awareness

norms did significantly moderate the relationship between diversity in steady pacing style and temporal conflict in week 4 ( $\beta = -.27, p < .05$ ). Figure 12 and simple slope tests showed that this effect was in the hypothesized direction. When time awareness norms in week 3 were high, diversity in steady pacing style negatively predicted temporal conflict in week 4 ( $\beta = .44, p < .001$ ), while when time awareness norms in week 4 were low, diversity in steady pacing style positively predicted temporal conflict in week 4 ( $\beta = -.37, p < .001$ ).

Time awareness norms in week 4 also moderated the relationship between diversity in temporal individual differences and temporal conflict in week 4 ( $R^2 = .67, F = 7.09, p < .001$ , Table 27). The interaction terms added 10% variance in the overall model ( $p < .01$ ). Specifically, time awareness norms in week 4 had an effect on the relationship between diversity in all three temporal individual differences and temporal conflict in week 4. These effects are explicated below.

Time awareness norms in week 4 had an opposite effect of what was hypothesized on the relationship between diversity in time urgency and temporal conflict in week 4 ( $\beta = .22, p < .05$ ). Figure 13 suggests that, when time awareness norms in week 4 were high, temporal conflict in week 4 tended to increase as diversity in time urgency increased. However, results from tests of simple slope effects failed to show that diversity in time urgency significantly predicted temporal conflict during week 4 at either high ( $\beta = -.04, ns$ ) or low ( $\beta = .29, ns$ ) levels of time awareness norms.

Time awareness norms in week 4 had a significant effect on the relationship between diversity in steady pacing style and temporal conflict in week 4 in the hypothesized direction ( $\beta = -.29, p < .05$ ). Figure 14 shows that when time awareness norms in week 4 were high, greater diversity in steady pacing style was associated with lower level of temporal conflict in week 4.

Results from simple slope tests confirmed this directionality. When time awareness norms in week 4 were high, diversity in steady pacing style negatively predicted temporal conflict in week 4 ( $\beta = .24, p < .10$ ), while when time awareness norms in week 4 were low, diversity in steady pacing style did not predict temporal conflict in week 4 ( $\beta = -.15, ns$ ).

Finally, time awareness norms in week 4 had a significant effect on the relationship between diversity in deadline pacing style and temporal conflict in week 4, again opposite of what was hypothesized ( $\beta = .23, p < .05$ ). Figure 15 illustrates this effect: When time awareness norms in week 4 were high, teams showed a very slight tendency to report greater temporal conflict in week 4 as diversity in deadline pacing style increased. However, results from simple slope tests showed that diversity in deadline pacing style did not predict temporal conflict in week 4 at either low ( $\beta = .10, ns$ ) or high ( $\beta = .10, ns$ ) levels of time awareness norms in week 4. Taken together, Hypothesis 4a and 4b received only partial support at the team level.

#### *The Mediating Role of Temporal Conflict*

Hypothesis 5 proposed that temporal conflict would be negatively related to quality of performance (proposal grade). As shown in Tables 28 and 29, after controlling for the effects of covariates, temporal conflict in neither 3 nor 4 contributed any additional variance in proposal grades. Therefore, Hypothesis 5 was not supported.

Hypothesis 6 proposed that temporal conflict would be negatively related to the timeliness of delivery. Because only temporal conflict in weeks 3 and 4 were available across all teams, only the timeliness variables (i.e., minutes to submission deadline) in weeks 3 and 4 were used as the outcomes. In addition, the timeliness measure was normalized because it was initially highly skewed towards the positive end. The effect temporal conflict in week 3 on timeliness in weeks 3 and 4 was tested, as well as the effect of temporal conflict in week 4 on timeliness in

week 4. Tables 30, 31, and 32 showed that temporal conflict in weeks 3 and 4 did not contribute to the timeliness of delivery in either week. Therefore, Hypothesis 6 was not supported.

Hypotheses 7a (time urgency) and 7b (pacing styles) proposed that temporal conflict would mediate the relationship between diversity in temporal individual differences and the quality of performance. Sobel tests were conducted as well to examine the mediating effect of temporal conflict in both week 3 and 4 on the relationship between diversity in time urgency, steady pacing style, and deadline pacing style and proposal grade. Results in Table 33 showed that none of these effects were significant. Therefore, Hypotheses 7a and 7b were not supported.

Hypotheses 8a (time urgency) and 8b (pacing styles) proposed that temporal conflict would mediate the effect of diversity in temporal individual differences on timeliness of delivery. Since no relationship between temporal conflict and timeliness was found in either weeks 3 or 4 (Hypothesis 6), Hypotheses 8a and 8b were not supported.

*The effect of time.* Hypothesis 9 proposed that diversity in time urgency is likely to have a stronger positive relationship with temporal conflict at a later rather than earlier time. However, since no relationship between diversity in time urgency and temporal conflict was found in either weeks 3 or 4, Hypothesis 9 was not supported.

#### *Ancillary Analysis*

##### *The Role of Time Zone Differences*

Previous analyses used cross-cultural combination as covariates at the team level. Because cross-cultural combination and time zone difference were confounded in this study, a choice had to be made between the two. Because of the temporal focus of this research, time zone differences were controlled for. Specifically, in this and the following analysis, teams were categorized based on the numbers of hours of differences between the time zones in which the

two subteams were located. The US and China have 12 or 13 hours of difference (depending on daylight saving), the US and Spain and the US and the Netherlands have 6 hours of difference, while the US-UK have 5 hours of difference. Results from an ANOVA showed that time zone differences made a difference in temporal conflict in week 3 ( $F = 4.38, df = 2, p < .05$ ) and week 4 ( $F = 9.29, df = 2, p < .001$ ), time awareness norms in week 3 ( $F = 3.98, df = 2, p < .05$ ), and timeliness of delivery in week 4 ( $F = 4.48, df = 2, p < .05$ ). Overall, the pattern detected in specific comparisons is consistent: US-China teams, with 12-13 hours of difference, reported greater temporal conflict, less time awareness norms, and submitted their completed proposals closer to deadlines as compared to teams with smaller time zone differences.

*The Mediating Role of Time Awareness Norms between Temporal Planning and Performance*

Janicik and Bartel (2003) reported that time awareness norms mediated the effect of temporal planning on coordination and performance. In order to examine the possible mediating effect of time awareness norms on the temporal planning—temporal conflict relationship, Sobel tests were conducted. In Table 34, results showed that, at both subteam and team levels, time awareness norms mediated the relationship between temporal planning and temporal conflict at various time points. Specifically, time awareness norms in week 3 mediated the relationship between temporal planning in week 2 and temporal conflict in weeks 3 (subteam level: Sobel statistic = -1.67,  $p < .10$ ; team level: Sobel statistic = -2.41,  $p < .05$ ) and 4 (subteam level: Sobel statistic = -2.21,  $p < .05$ ; team level: Sobel statistic = -2.38,  $p < .05$ ). Time awareness norms in week 4 also mediated the relationship between temporal planning in week 4 and temporal conflict in week 4 (subteam level: Sobel statistic = -3.26,  $p < .01$ ; team level: Sobel statistic = -.214,  $p < .05$ ).

*The Moderating Role of Temporal Planning on the Diversity—Time Awareness Norms Relationship*

Temporal planning may also potentially play a moderating role on the relationship between diversity in temporal individual differences and time awareness norms. Following the rationale of the hypotheses in this study, it is possible that, when a group is diverse in its members' temporal individual differences, temporal planning can help *mitigate* these differences and as a result, lead to *greater* norms regarding the allocation of temporal resources. This relationship was tested at both subteam and team levels with hierarchical regressions. At the first step, subteam or team size, country (subteam) or time zone difference (team), English language proficiency, teamwork experience, and use of technology were entered as covariates. At the second step, mean levels of temporal individual differences (time urgency, steady pacing style, and deadline pacing style) were entered. At the third step, main effects were tested when standard deviations (diversity) of temporal individual differences were entered. At the last step, the interaction terms of temporal individual differences and temporal planning at either week 2 or 4 were entered.

Table 35, 36, and 37 showed results at the *subteam* level. Table 35 shows that temporal planning in week 2 had a positive main effect on time awareness norms in week 3 ( $\beta = .33$ ,  $p < .001$ ). Temporal planning in week 2 also moderated the relationship between diversity in deadline placing style and time awareness norms in week 3, but the effect was in the opposite direction of what was expected ( $\beta = -.19$ ,  $p < .05$ ). Figure 16 depicts this relationship. Tests of simple slopes showed when temporal planning in week 2 was high, diversity in deadline pacing style negatively predicted time awareness norms in week 3 ( $\beta = -.32$ ,  $p < .01$ ). When temporal

planning in week 2 was low, diversity in deadline pacing style did not predict time awareness norms in week 3.

Table 36 shows that temporal planning in week 2 had a positive main effect on time awareness norms in week 4 ( $\beta = .25, p < .05$ ). It also shows that temporal planning in week 2 moderated the relationship between diversity in deadline placing style and time awareness norms in week 4, again in the direction opposite of what was expected ( $\beta = -.17, p < .10$ ). Figure 17 depicts this relationship. Tests of simple slopes showed that when temporal planning in week 2 was high, diversity in deadline pacing style negatively predicted time awareness norms in week 4 ( $\beta = -.23, p < .05$ ). When temporal planning in week 2 was low, diversity in deadline pacing style did not predict time awareness norms in week 4.

Table 37 shows that temporal planning in week 4 had a positive main effect on time awareness norms in week 4 ( $\beta = .49, p < .001$ ). It also shows that temporal planning in week 4 moderated the relationship between diversity in time urgency and time awareness norms in week 4, again in the direction opposite of what was expected ( $\beta = -.18, p < .05$ ). Figure 18 depicts this relationship. Tests of simple slopes showed that when temporal planning in week 4 was low, diversity in time urgency positively predicted time awareness norms in week 4 ( $\beta = .20, p < .10$ ). When temporal planning in week 4 was high, diversity in time urgency did not predict time awareness norms in week 4.

Table 38 shows results at the *team* level. Temporal planning had a positive main effect on time awareness norms ( $\beta = .48, p < .001$ ). In addition, temporal planning in week 4 moderated the relationship between diversity in steady pacing style and time awareness norms in week 4 ( $\beta = .21, p < .10$ ). Figure 19 depicts this relationship. However, tests of simple slopes did not reveal any significant findings.

Overall, results at the subteam and team levels suggest that temporal planning positively influenced time awareness norms. However, the interaction effects at the subteam level suggest that temporal planning had the opposite effect as expected. Instead of improving time awareness norms, planning has potentially made the differences among team members more salient and led to lower norms. The finding at the team level was only marginally significant and only shows a slight tendency that temporal planning can help build greater norms when the group is diverse; however, this finding is unlikely to be reliable.

*The Moderating Role of Time Awareness Norms on the Diversity—Temporal Planning Relationship*

Exploratory tests were also conducted on the moderating role of time awareness norms on the diversity—temporal planning relationship. Is it possible that teams use norming as a process to moderate the effect of diversity and as a result engage in greater temporal planning? This relationship was tested at both levels as well. Only one significant finding emerged at the subteam level. Table 39 shows the results. Time awareness norms in week 4 moderated the relationship between steady pacing style and temporal planning in week 4 ( $\beta = -.29, p < .01$ ). Figure 20 depicts this relationship. Tests of simple slopes showed that when time awareness norms in week 4 were high, diversity in steady pacing style negatively predicted temporal planning in week 4 ( $\beta = -.36, p < .01$ ). When time awareness norms in week 4 were low, diversity in steady pacing style did not predict temporal planning in week 4. No significant finding emerged at the team level. One interpretation of the finding at the subteam level suggests that greater time awareness norms might be able to compensate for temporal planning when members' temporal habits and preferences were divergent. However, this isolated finding should

be interpreted with caution because temporal planning and time awareness norms were from the same time period.

#### *Other Exploratory Analysis*

A large number of other relationships were tested to explore other possible patterns of the data. Specifically, the following relationships were tested, but no significant findings emerged with any of the relationships below. It should be noted that both the continuous and dichotomous measures of the timeliness of delivery variable were used in the analysis when timeliness of delivery was the outcome variable.

- Does diversity in temporal individual differences moderate the relationship between temporal planning (or time awareness norms) and quality of performance (or timeliness of delivery)?
- Does temporal planning (or time awareness norms) moderate the relationship between conflict at an earlier point in time and conflict at a later point in time?
- Does temporal planning (or time awareness norms) moderate the relationship between temporal conflict and quality of performance (or timeliness of delivery)?

Table 4. Exploratory factor analysis for temporal individual differences measures.

No.	Item	Factors		
		Deadline-action style	Steady-action style	Time Urgency
1	When performing a task or project, I start right away and finish the work long before the deadline. (R)	<b>0.72</b>	-0.08	-0.08
2	When performing a task or project, I do quite a bit of work the start so that I can relax a little towards the end. (R)	<b>0.63</b>	-0.07	-0.07
3	I would rather turn work in early than risk being late. (R)	<b>0.56</b>	-0.08	-0.09
4	I do not get much done on a task or project until the due date is close.	<b>0.85</b>	0.05	0.11
5	I do most of the work on a task or project in a relatively short time before the deadline.	<b>0.75</b>	0.04	0.02
6	I put in more effort towards the end of a project than the beginning.	<b>0.65</b>	-0.06	0.10
7	When working on a project, I work steadily on tasks, spreading my work out evenly over time (e.g., 3 hours per week until the deadline).	0.06	<b>0.86</b>	-0.03
8	The amount of effort I put into a project is fairly consistent over time from start to finish.	-0.07	<b>0.76</b>	-0.02
9	I do small chunks of work over time rather than a large chunk one time.	-0.04	<b>0.62</b>	0.06
10	I find myself hurrying to get places even when there is plenty of time.	-0.05	-0.02	<b>0.69</b>
11	I often work slowly and leisurely. (R)	-0.34	-0.15	0.17
12	People that know me well agree that I tend to do most things in a hurry.	0.10	0.07	<b>0.64</b>
13	I tend to be quick and energetic work.	-0.13	0.06	0.26
14	I often feel very pressed for time.	0.08	-0.01	<b>0.53</b>
15	My spouse or a close friend would rate me as definitely relaxed and easy going. (R)	-0.19	-0.05	<b>0.37</b>
	<b>Eigenvalues</b>	<b>4.48</b>	<b>2.10</b>	<b>1.41</b>

Note: Factor analysis with data at the individual level (N = 521).

Table 5. Exploratory factor analysis for temporal conflict, time awareness norm, and temporal planning scales (only data from week 4 were used).

No.	Items	Factors		
		Temporal Planning	Time Awareness Norms	Temporal Conflict
1	To what extent do subteam/team members disagree about time allocation in your group (how much time to spend on tasks)?	0.02	0.02	<b>0.65</b>
2	To what extent is there is conflict about how you should pace task activities in your subteam/team?	-0.02	0.01	<b>0.90</b>
3	To what extent are there disagreements about how long to spend on specific tasks in your subteam/team?	0.02	-0.10	<b>0.86</b>
4	Subteam/team members felt that deadlines didn't really matter. (R)	-0.10	<b>0.51</b>	-0.27
5	Staying on schedule was important in our subteam/team.	-0.04	<b>0.93</b>	0.14
6	It was important to meet the deadlines that we set for ourselves.	0.01	<b>0.91</b>	0.06
7	We didn't pay much attention to schedules we set for ourselves. (R)	-0.12	<b>0.63</b>	-0.17
8	It was very important to be "on time" for everything.	0.05	<b>0.66</b>	-0.03
9	Subteam/team members did things when they were ready; we did not set a schedule for our work. (R)	-0.06	<b>-0.30</b>	0.18
10	No one got upset when we missed a deadline that we set for our work. (R)	0.09	<b>-0.36</b>	0.05
11	Subteam/team members did most of their work under deadline.	0.09	<b>0.36</b>	-0.02
12	All of our work was tightly scheduled.	0.21	<b>0.41</b>	0.14
13	Most subteam/team members didn't think about how they used their time. (R)	-0.12	<b>-0.32</b>	0.32
14	Subteam/team members worried about using their time well.	0.27	0.05	0.06
15	Subteam/team members planned their time very carefully.	0.40	<b>0.44</b>	0.05
16	Subteam/team members expected you to know how long it would take you to do something.	<b>0.43</b>	0.15	0.05
17	To what extent did your subteam/team prioritize tasks and allocate time to each task?	<b>0.63</b>	0.07	-0.09

No.	Items	Factors		
		Temporal Planning	Time Awareness Norms	Temporal Conflict
18	To what extent did your subteam/team discuss any deadlines?	0.55	0.14	-0.10
19	To what extent did your subteam/team prepare and build-in time for contingencies, problems, and emerging issues?	0.61	-0.09	-0.02
20	To what extent did your subteam/team discuss how often it was going to meet?	0.68	-0.08	-0.03
21	To what extent did your subteam/team discuss how long each particular task would take?	0.77	-0.13	0.03
22	To what extent did your subteam/team set milestones to measure progress on the project?	0.74	-0.12	-0.01
23	To what extent did people compare their personal schedules for meetings, project-related tasks, etc?	0.59	0.05	0.06
	<b>Eigenvalues</b>	<b>12.23</b>	<b>6.62</b>	<b>2.68</b>

Note: Factor analysis with data at the individual level (N = 521).

Table 6. Oneway ANOVA Fs, ICC1 and ICC2 for temporal conflict, temporal planning, and time awareness norms for subteams and teams.

	Team Level			Subteam Level		
	F	ICC1	ICC2	F	ICC1	ICC2
Temporal Conflict (Week 1)	2.64**	0.16	0.62	1.60*	0.12	0.37
Temporal Conflict (Week 1)	2.03**	0.11	0.51	2.36***	0.24	0.58
Temporal Conflict (Week 1)	1.79**	0.08	0.44	1.60**	0.12	0.37
Temporal Conflict (Week 1)	1.75**	0.08	0.43	1.34*	0.07	0.25
Temporal Planning (Week 2)	1.59**	0.06	0.37	1.61**	0.12	0.38
Temporal Planning (Week 4)	1.48*	0.05	0.32	1.30*	0.06	0.23
Time Awareness Norms (Week 3)	1.67**	0.07	0.40	1.44**	0.09	0.30
Time Awareness Norms (Week 4)	2.30***	0.13	0.56	1.72***	0.14	0.42

†  $p < .10$   
 \*  $p < .05$   
 \*\*  $p < .01$   
 \*\*\*  $p < .001$

Table 7. Effects of semester, class, leadership configuration, and country on substantive variables:  
ANOVA results at the subteam level.

	Variable			
	Semester	Class	Leadership Configuration	Subteam Country
Temporal Conflict (Week 1)		3.17*	0.76	4.69*
Temporal Conflict (Week 2)		1.01	0.88	1.56
Temporal Conflict (Week 3)	1.59	3.16**	1.35	6.30**
Temporal Conflict (Week 4)	0.65	1.95*	0.72	4.30**
Temporal Planning (Week 2)	6.88*	3.91**	1.19	1.86
Temporal Planning (Week 4)	0.01	2.05*	1.37	3.56*
Time Awareness Norms (Week 3)	4.27*	2.80**	0.89	2.78*
Time Awareness Norms (Week 4)	14.24**	4.81**	0.32	3.07*

Entries are F values.

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

Table 8. Effects of semester, class, leadership configuration, and country composition on substantive variables.

	Semester	Class	Variable Team Leadership Configuration	Cross- cultural Team Comp.
Temporal Conflict (Week 1)		2.75	1.31	5.42 *
Temporal Conflict (Week 2)		1.80	0.56	1.13
Temporal Conflict (Week 3)	1.21	1.61	1.44	2.70 *
Temporal Conflict (Week 4)	2.13	1.39	1.44	5.71 **
Temporal Planning (Week 2)	1.31	1.06	1.01	1.38
Temporal Planning (Week 4)	0.13	1.12	0.47	4.19 **
Time Awareness Norms (Week 3)	4.04 *	1.93	1.00	2.88 *
Time Awareness Norms (Week 4)	13.89 **	1.87	0.32	5.99 **
Proposal Grade	0.00	1.97	0.86	0.47
Timeliness of Delivery (Wk 1)	0.00	1.59	3.97 *	0.90
Timeliness of Delivery (Wk 2, T1)	0.46	3.65 **	0.18	0.28
Timeliness of Delivery (Wk 2, T2)	0.00	2.46 *	0.58	0.23
Timeliness of Delivery (Wk 3)	0.25	0.68	2.40	1.06
Timeliness of Delivery (Final)	2.50	8.11 **	0.07	2.58 *

Entries are F values.

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

Table 9. Means, standard deviations, and correlations: **Subteam** level.

	N	Mean	SD	1	2	3	4	5	6	7	8
<i>Control Variables</i>											
1	Subteam Size	120	4.34	0.87	-						
2	Gender Diversity	120	0.20	0.21	-0.08	-					
3	English Proficiency	120	5.11	1.14	.33 **	-.19 *	-				
4	Teamwork Experience	120	3.84	0.35	.28 **	-.19 *	.48 **	-			
<i>Substantive Variables</i>											
5	Time Urgency (mean)	120	2.85	0.34	0.12	0.06	.24 **	-0.03	-		
6	Steady Pacing Style (mean)	120	2.77	0.41	-0.03	-0.04	-0.05	0.05	-0.02	-	
7	Deadline Pacing Style (mean)	120	2.99	0.42	0.00	0.07	0.07	-0.14	0.05	-.48 **	-
8	Time Urgency (SD)	119	0.58	0.30	0.09	-0.11	0.16	0.10	.21 *	-0.01	-0.07
9	Steady Pacing Style (SD)	119	0.71	0.33	0.14	-0.07	0.14	0.10	0.10	0.01	0.03
10	Deadline Pacing Style (SD)	119	0.68	0.32	0.13	0.08	.22 *	.35 **	-0.07	-.32 **	-0.08
11	Temporal Conflict (Week 1)	41	2.03	0.75	-0.11	0.23	-.54 **	-.36 *	0.00	.32 *	-0.15
12	Temporal Conflict (Week 2)	42	2.58	0.96	-0.10	0.16	-0.25	-.39 *	.32 *	0.13	0.01
13	Temporal Conflict (Week 3)	119	2.54	0.80	-0.08	0.10	-.28 **	-.27 **	0.07	0.04	0.00
14	Temporal Conflict (Week 4)	116	2.45	0.77	-0.08	-0.02	-.24 **	-.22 *	0.09	.21 *	-.22 *
15	Temporal Planning (Week 2)	119	4.45	0.72	0.16	0.16	.23 *	.29 **	0.04	0.04	-0.17
16	Temporal Planning (Week 4)	116	4.41	0.65	0.18	0.05	.21 *	.23 *	0.00	0.09	-0.14
17	Temporal Norms (Week 3)	119	5.05	0.55	.38 **	0.06	.22 *	.25 **	0.08	0.06	-0.13
18	Temporal Norms (Week 4)	116	5.18	0.60	0.16	0.00	0.18	.28 **	0.04	0.09	-.26 **

†  $p < .10$ \*  $p < .05$ \*\*  $p < .01$ \*\*\*  $p < .001$ 

Note: Only 42 subteams from Spring 2008 had temporal conflict data in week 1 and 2.

Table 9. Means, standard deviations, and correlations: **Subteam** level (continued).

	9	10	11	12	13	14	15	16	17	18
<i>Control Variables</i>										
1	Subteam Size									
2	Gender Diversity									
3	English Proficiency									
4	Teamwork Experience									
<i>Substantive Variables</i>										
5	Time Urgency (mean)									
6	Steady Pacing Style (mean)									
7	Deadline Pacing Style (mean)									
8	Time Urgency (SD)									
9	Steady Pacing Style (SD)									
10	0.19 *	-								
11	0.03	-0.08	-							
12	0.16	-0.12	0.28	-						
13	0.09	-0.17	.53 **	.56 **	-					
14	0.16	-0.09	.50 **	.36 *	.44 **	-				
15	0.02	0.20 *	0.13	-0.11	-0.10	-0.06	-			
16	-0.17	0.04	-0.02	-0.10	0.01	0.03	.30 **	-		
17	-0.16	-0.04	-0.14	-.32 *	-.25 **	-.27 **	.44 **	.45 **	-	
18	-0.15	-0.02	-0.14	-0.29	-0.16	-.34 **	.43 **	.51 **	.72 **	-

†  $p < .10$ \*  $p < .05$ \*\*  $p < .01$ \*\*\*  $p < .001$ 

Note: Only 42 subteams from Spring 2008 had temporal conflict data in week 1 and 2.

Table 10. Means, standard deviations, and correlations: **Team** level.

		<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<i>Control Variables</i>								
1	Team Size	60	8.68	1.27	-			
2	Gender Diversity	60	0.28	0.18	0.02	-		
3	English Proficiency	60	5.21	0.57	0.19	-0.08	-	
4	Teamwork Experience	60	3.86	0.22	.31*	0.00	.27*	-
<i>Substantive Variables</i>								
5	Time Urgency (m.)	60	2.86	0.22	0.04	-0.09	0.18	0.03
6	Steady Style (m.)	60	2.76	0.27	-0.13	0.13	-0.10	0.02
7	Deadline Style (m.)	60	3.00	0.29	-0.01	-0.15	0.05	-0.15
8	Time Urgency (sd.)	60	0.64	0.18	0.04	0.02	-0.13	0.04
9	Steady Style (sd.)	60	0.76	0.21	0.04	-0.24	0.01	-0.08
10	Deadline Style (sd.)	60	0.73	0.20	0.13	0.05	-0.05	.39**
11	T. Conflict (Wk 1)	21	2.24	0.83	-.48*	-0.04	-.62**	-.57**
12	T. Conflict (Wk 2)	21	2.60	0.68	-0.36	0.06	-0.26	-0.38
13	T. Conflict (Wk 3)	60	2.62	0.61	-0.21	0.05	-.31*	-.33**
14	T. Conflict (Wk 4)	60	2.49	0.62	-0.17	-0.16	-.41**	-.35**
15	T. Planning (Wk 2)	60	4.26	0.52	0.13	.27*	0.03	.36**
16	T. Planning (Wk 4)	60	4.24	0.49	0.02	0.24	0.22	.32*
17	T. Norms (Wk 3)	60	5.02	0.41	0.22	.39**	0.19	.37**
18	T. Norms (Wk 4)	60	5.16	0.47	0.10	0.25	0.22	.47**
19	Proposal Grade	60	88.72	10.51	.35**	0.17	-0.02	.32*
20	Timeliness (Wk 1., normalized)	60	0.00	1.00	.39**	0.13	.45**	.42**
21	Timeliness (Wk 2: T1, normalized)	60	0.00	0.99	0.17	0.12	0.03	0.12
22	Timeliness (Wk 2: T2, normalized)	60	0.00	1.00	.30*	0.15	0.20	0.04
23	Timeliness (Wk 3, normalized)	60	0.00	0.99	0.14	0.17	0.22	0.08
24	Timeliness (Final, normalized)	60	0.00	1.00	0.23	0.19	0.19	0.09

†  $p < .10$ \*  $p < .05$ \*\*  $p < .01$ \*\*\*  $p < .001$ 

Note: Only 21 teams from Spring 2008 had temporal conflict data in week 1 and 2.

Table 10. Means, standard deviations, and correlations: **Team** level (continued).

	5	6	7	8	9	10
<i>Control Variables</i>						
1	Team Size					
2	Gender Diversity					
3	English Proficiency					
4	Teamwork Experience					
<i>Substantive Variables</i>						
5	Time Urgency (m.)	-				
6	Steady Style (m.)	-0.16	-			
7	Deadline Style (m.)	0.11	-.36 **	-		
8	Time Urgency (sd.)	0.13	-0.02	-0.22	-	
9	Steady Style (sd.)	0.22	0.00	0.08	0.11	-
10	Deadline Style (sd.)	-0.04	-.38 **	-0.05	0.09	-0.07
11	T. Conflict (Wk 1)	-0.07	.46 *	-0.16	-0.22	0.16
12	T. Conflict (Wk 2)	0.30	0.32	-0.16	0.16	0.19
13	T. Conflict (Wk 3)	0.01	0.00	-0.11	-0.06	0.08
14	T. Conflict (Wk 4)	0.02	0.14	-0.10	0.15	0.16
15	T. Planning (Wk 2)	-0.09	0.06	-.40 **	0.19	-0.22
16	T. Planning (Wk 4)	-0.02	0.21	-.29 *	-0.20	-0.12
17	T. Norms (Wk 3)	-0.08	0.05	-.26 *	0.02	-0.19
18	T. Norms (Wk 4)	-0.02	0.03	-.40 **	-0.09	-0.11
19	Proposal Grade	-0.02	0.09	0.03	-0.16	-0.03
20	Timeliness (Wk 1., normalized)	0.10	0.04	0.06	0.04	-0.15
21	Timeliness (Wk 2: T1, normalized)	0.09	.32 *	-.28 *	-0.06	-0.15
22	Timeliness (Wk 2: T2, normalized)	0.04	-0.03	-0.06	0.10	-0.11
23	Timeliness (Wk 3, normalized)	0.14	.27 *	-0.23	-0.03	-0.15
24	Timeliness (Final, normalized)	-0.16	0.06	-.33 *	0.14	-0.10

†  $p < .10$ \*  $p < .05$ \*\*  $p < .01$ \*\*\*  $p < .001$ 

Note: Only 21 teams from Spring 2008 had temporal conflict data in week 1 and 2.

Table 10. Means, standard deviations, and correlations: **Team** level (continued).

	11	12	13	14	15	16	17
<i>Control Variables</i>							
1	Team Size						
2	Gender Diversity						
3	English Proficiency						
4	Teamwork Experience						
<i>Substantive Variables</i>							
5	Time Urgency (m.)						
6	Steady Style (m.)						
7	Deadline Style (m.)						
8	Time Urgency (sd.)						
9	Steady Style (sd.)						
10	Deadline Style (sd.)						
11	T. Conflict (Wk 1)	-					
12	T. Conflict (Wk 2)	0.33	-				
13	T. Conflict (Wk 3)	.50 *	.51 *	-			
14	T. Conflict (Wk 4)	.76 **	.48 *	.61 **	-		
15	T. Planning (Wk 2)	-0.21	-0.24	-0.23	-0.11	-	
16	T. Planning (Wk 4)	-0.04	-0.20	-0.22	-0.20	.50 **	-
17	T. Norms (Wk 3)	-.54 *	-.50 *	-.51 **	-.47 **	.56 **	.39 **
18	T. Norms (Wk 4)	-0.38	-.45 *	-.30 *	-.52 **	.46 **	.52 **
19	Proposal Grade	-0.39	-.67 **	-0.25	-.29 *	0.12	0.11
20	Timeliness (Wk 1., normalized)	-.45 *	-0.31	-.48 **	-.34 **	.29 *	.31 *
21	Timeliness (Wk 2: T1, normalized)	-0.07	-0.25	-0.17	-0.08	.27 *	0.17
22	Timeliness (Wk 2: T2, normalized)	-0.32	-0.34	-0.21	-0.11	0.24	0.09
23	Timeliness (Wk 3, normalized)	-0.36	0.27	-0.13	-0.22	0.17	0.21
24	Timeliness (Final, normalized)	-0.15	-0.39	-0.15	-0.07	0.22	-0.05

†  $p < .10$ \*  $p < .05$ \*\*  $p < .01$ \*\*\*  $p < .001$ 

Note: Only 21 teams from Spring 2008 had temporal conflict data in week 1 and 2.

Table 10. Means, standard deviations, and correlations: **Team** level (continued).

	18	19	20	21	22	23	24
<i>Control Variables</i>							
1	Team Size						
2	Gender Diversity						
3	English Proficiency						
4	Teamwork Experience						
<i>Substantive Variables</i>							
5	Time Urgency (m.)						
6	Steady Style (m.)						
7	Deadline Style (m.)						
8	Time Urgency (sd.)						
9	Steady Style (sd.)						
10	Deadline Style (sd.)						
11	T. Conflict (Wk 1)						
12	T. Conflict (Wk 2)						
13	T. Conflict (Wk 3)						
14	T. Conflict (Wk 4)						
15	T. Planning (Wk 2)						
16	T. Planning (Wk 4)						
17	T. Norms (Wk 3)						
18	T. Norms (Wk 4)	-					
19	Proposal Grade	.34 **	-				
20	Timeliness (Wk 1., normalized)	.28 *	0.13	-			
21	Timeliness (Wk 2: T1, normalized)	.30 *	.44 **	0.18	-		
22	Timeliness (Wk 2: T2, normalized)	0.22	.27 *	.35 **	.48 **	-	
23	Timeliness (Wk 3, normalized)	.28 *	0.15	.35 **	.38 **	.35 **	-
24	Timeliness (Final, normalized)	.35 **	0.16	.29 *	.37 **	.35 **	0.17

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

Note: Only 21 teams from Spring 2008 had temporal conflict data in week 1 and 2.

Table 11. Tests of hypotheses: Combinations of variables.

Hypothesized relationship	IVs	Moderators/mediators	DVs
H1. Diversity in time urgency → temporal conflict	Time urgency		Temporal conflict week 3 Temporal conflict week 4
H2. Diversity in pacing preferences → temporal conflict	Steady pacing style Deadline style		Temporal conflict week 3 Temporal conflict week 4
H3a. Diversity in time urgency → temporal conflict ↑ Temporal planning	Time urgency	Temporal planning week 2 → Temporal planning week 2 → Temporal planning week 4 →	Temporal conflict week 3 Temporal conflict week 4 Temporal conflict week 4
H3b. Diversity in pacing pref. → temporal conflict ↑ Temporal planning	Steady style Deadline style	Temporal planning week 2 → Temporal planning week 2 → Temporal planning week 4 →	Temporal conflict week 3 Temporal conflict week 4 Temporal conflict week 4
H4a. Diversity in time urgency → temporal conflict ↑ Time awareness norm	Time urgency	Time awareness norm week 3 → Time awareness norm week 3 → Time awareness norm week 4 →	Temporal conflict week 3 Temporal conflict week 4 Temporal conflict week 4
H4b. Diversity in pacing pref. → temporal conflict ↑ Time awareness norm	Steady style Deadline style	Time awareness norm week 3 → Time awareness norm week 3 → Time awareness norm week 4 →	Temporal conflict week 3 Temporal conflict week 4 Temporal conflict week 4
H5. Temporal conflict → quality of perf.	Temporal conflict week 3 Temporal conflict week 4		Quality of performance
H6. Temporal conflict → timeliness	Temporal conflict week 3 Temporal conflict week 4		Timeliness of delivery
H7a. Diversity in time urgency → conflict → quality of perf.	Time urgency	Temporal conflict week 3 Temporal conflict week 4	Quality of performance
H7b. Diversity in pacing pref. → conflict → quality of perf.	Pacing preferences	Temporal conflict week 3 Temporal conflict week 4	Quality of performance
H8a. Diversity in time urgency → conflict → timeliness	Time urgency	Temporal conflict week 3 Temporal conflict week 4	Timeliness of delivery
H8b. Diversity in pacing pref. → conflict → timeliness	Pacing preferences	Temporal conflict week 3 Temporal conflict week 4	Timeliness of delivery
H9. The effect of time urgency on conflict will increase over time	Time urgency		Temporal conflict week 3 Temporal conflict week 4

Table 12. The effect of diversity in time urgency and pacing styles on temporal conflict in week

3: Subteam level.

	Model	
	1	2
<i>Control variables</i>		
Subteam Size	-0.01	-0.03
Country Dummy Code 1	0.11	0.11
Country Dummy Code 2	0.37 **	0.41 **
Subteam English Language Proficiency	0.02	0.04
Subteam Teamwork Experience	-0.11	-0.08
Mean Time Urgency	0.07	0.06
Mean Steady Pacing Style	-0.02	-0.08
Mean Deadline Pacing Style	0.02	-0.02
<i>Main Effects</i>		
Diversity in Time Urgency		-0.05
Diversity in Steady Pacing Style		0.20 *
Diversity in Deadline Pacing Style		-0.11
R <sup>2</sup>	0.18	0.22
F	3.07 **	2.75 **
ΔR <sup>2</sup>		0.04

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

Note: Entries are beta weights; df=117; country categories: Spain, China, and Others.

Table 13. The effect of diversity in time urgency and pacing styles on temporal conflict in week

## 4: Subteam level.

	Model	
	1	2
<i>Control variables</i>		
Subteam Size	0.00	-0.03
Country Dummy Code 1	0.08	0.08
Country Dummy Code 2	0.05	0.10
English Proficiency	-0.03	-0.03
Teamwork Experience	-0.11	-0.13
Week 3 Temporal Conflict	0.36 **	0.34 **
Mean Time Urgency	0.08	0.05
Mean Steady Pacing Style	0.10	0.11
Mean Deadline Pacing Style	-0.18 †	-0.16
<i>Main effects</i>		
Diversity in Time Urgency		0.11
Diversity in Steady Pacing Style		0.13
Diversity in Deadline Pacing Style		0.04
R <sup>2</sup>	0.29	0.32
F	4.66 ***	4.01 ***
ΔR <sup>2</sup>		0.04

†  $p < .10$ \*  $p < .05$ \*\*  $p < .01$ \*\*\*  $p < .001$ 

Note: Entries are beta weights; df=117; country categories: Spain, China, and Others.

Table 14. The effect of diversity in time urgency and pacing styles on temporal conflict in week

**3: Team level.**

	Model	
	1	2
<i>Control variables</i>		
Team Size	-0.09	-0.09
Cultural Comp. Dummy Code 1	0.13	0.16
Cultural Comp. Dummy Code 2	0.29 †	0.27
English Proficiency	-0.02	-0.06
Teamwork Experience	-0.26 †	-0.21
Mean Time Urgency	0.05	0.04
Mean Steady Pacing Style	-0.11	-0.18
Mean Deadline Pacing Style	-0.20	-0.26
<i>Main effects</i>		
Diversity in Time Urgency (sd)		-0.14
Diversity in Steady Pacing Style (sd)		0.06
Diversity in Deadline Pacing Style (sd)		-0.09
R <sup>2</sup>	0.25	0.27
F	2.08 *	1.60
ΔR <sup>2</sup>		0.02

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

Note: Entries are beta weights; df=59; cultural composition categories: US-others, US-Spain, and US-China.

Table 15. The effect of diversity in time urgency and pacing styles on temporal conflict in week

4: Team level.

	Model	
	1	2
<i>Control variables</i>		
Team Size	-0.01	-0.01
Cultural Comp. Dummy Code 1	0.22	0.17
Cultural Comp. Dummy Code 2	0.36 *	0.36 *
English Proficiency	-0.06	-0.04
Teamwork Experience	-0.26 *	-0.30 *
Mean Time Urgency	0.07	0.06
Mean Steady Pacing Style	0.04	0.10
Mean Deadline Pacing Style	-0.15	-0.10
<i>Main effects</i>		
Diversity in Time Urgency (sd)		0.10
Diversity in Steady Pacing Style (sd)		0.09
Diversity in Deadline Pacing Style (sd)		0.10
R <sup>2</sup>	0.35	0.37
F	3.38 **	2.56 *
ΔR <sup>2</sup>		0.02

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

Note: Entries are beta weights; df=59; cultural composition categories: US-others, US-Spain, and US-China.

Table 16. The moderating effect of temporal planning in week 2 on the relationship between temporal individual differences and temporal conflict in week 3: **Subteam** level.

	Model		
	1	2	3
<i>Control variables</i>			
Subteam Size	0.00	-0.02	-0.04
Country Dummy Code 1	0.12	0.11	0.11
Country Dummy Code 2	0.38 **	0.40 **	0.46 ***
English Proficiency	0.06	0.06	0.10
Teamwork Experience	-0.13	-0.10	-0.11
<i>Main effects</i>			
Week 2 Temporal Planning		0.01	-0.03
Diversity in Time Urgency		-0.04	-0.03
Diversity in Steady Pacing Style		0.20 *	0.19
Diversity in Deadline Pacing Style		-0.08	-0.03
<i>Interaction terms</i>			
Diversity in Time Urgency X Week 2 Temporal Planning			0.02
Steady Pacing Style Diversity X Week 2 Temporal Planning			-0.06
Deadline Pacing Style Diversity X Week 2 Temporal Planning			-0.12
R <sup>2</sup>	0.18	0.22	0.24
F	4.83 ***	3.26 **	2.66 **
ΔR <sup>2</sup>		0.04	0.02

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

Note: Entries are beta weights; df=116; country categories: Spain, China, and Others.

Table 17. The moderating effect of temporal planning in week 2 on the relationship between temporal individual differences and temporal conflict in week 4: **Subteam** level.

	Model		
	1	2	3
<i>Control variables</i>			
Subteam Size	-0.01	-0.04	-0.03
Country Dummy Code 1	0.13	0.14	0.14
Country Dummy Code 2	0.13	0.18	0.11
English Proficiency	0.02	0.01	-0.04
Teamwork Experience	-0.06	-0.08	-0.06
Week 3 Temporal Conflict (subteam)	0.36 ***	0.33 **	0.36 ***
<i>Main effects</i>			
Week 2 Temporal Planning		0.03	0.10
Diversity in Time Urgency		0.14	0.12
Diversity in Steady Pacing Style		0.14	0.15
Diversity in Deadline Pacing Style		0.00	-0.06
<i>Interaction terms</i>			
Diversity in Time Urgency X Week 2 Temporal Planning			-0.08
Steady Pacing Style Diversity X Week 2 Temporal Planning			0.09
Deadline Pacing Style Diversity X Week 2 Temporal Planning			0.10
R <sup>2</sup>	0.23	0.27	0.30
F	5.22 ***	3.83 ***	3.24 ***
$\Delta R^2$		0.04	0.03

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

Note: Entries are beta weights; df=113; country categories: Spain, China, and Others.

Table 18. The moderating effect of temporal planning in week 4 on the relationship between temporal individual differences and temporal conflict in week 4: **Subteam** level.

	Model		
	1	2	3
<i>Control variables</i>			
Subteam Size	-0.01	-0.05	-0.07
Country Dummy Code 1	0.13	0.16	0.15
Country Dummy Code 2	0.13	0.18	0.17
English Proficiency	0.02	0.00	-0.01
Teamwork Experience	-0.06	-0.09	-0.02
Week 3 Temporal Conflict (subteam)	0.36 ***	0.32 **	0.29 **
<i>Main effects</i>			
Week 4 Temporal Conflict (subteam)		0.13	0.09
Diversity in Time Urgency (subteam, centered)		0.15	0.13
Diversity in Steady Pacing Style (subteam, centered)		0.16 †	0.19 *
Diversity in Deadline Pacing Style (subteam, centered)		0.00	0.02
<i>Interaction effects</i>			
Diversity in Time Urgency X Week 4 Temporal Planning			0.17 †
Diversity in Steady Pacing Style X Week 4 Temporal Planning			0.22 *
Diversity in Deadline Pacing Style X Week 4 Temporal Planning			-0.07
R <sup>2</sup>	0.23	0.29	0.37
F	5.22 ***	4.10 ***	4.41 ***
ΔR <sup>2</sup>		0.06 †	0.08 **

†  $p < .10$   
 \*  $p < .05$   
 \*\*  $p < .01$   
 \*\*\*  $p < .001$

Note: Entries are beta weights; df=113; country categories: Spain, China, and Others.

Table 19. The moderating effect of temporal planning in week 2 on the relationship between temporal individual differences and temporal conflict in week 3: **Team** level.

	<b>Model</b>		
	<b>1</b>	<b>2</b>	<b>3</b>
<i>Control variables</i>			
Team Size	-0.08	-0.07	-0.06
Cultural Comp. Dummy Code 1	0.08	0.05	-0.03
Cultural Comp. Dummy Code 2	0.28	0.27	0.27
English Proficiency	-0.04	-0.07	0.01
Teamwork Experience	-0.24 †	-0.18	-0.17
<i>Main effects</i>			
Week 2 Temporal Planning		-0.14	-0.10
Diversity in Time Urgency		-0.03	-0.03
Diversity in Steady Pacing Style		0.03	0.04
Diversity in Deadline Pacing Style		-0.01	-0.03
<i>Interaction terms</i>			
Diversity in Time Urgency X Week 2 Temporal Planning			-0.05
Diversity in Steady Pacing Style X Week 3 Temporal Planning			-0.24
Diversity in Deadline Pacing Style X Week 4 Temporal Planning			-0.09
R <sup>2</sup>	0.21	0.23	0.30
F	2.91 *	1.67	1.64
ΔR <sup>2</sup>		0.02	0.06

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

Note: Entries are beta weights; df=59; cultural composition categories: US-others, US-Spain, and US-China.

Table 20. The moderating effect of temporal planning in week 2 on the relationship between temporal individual differences and temporal conflict in week 4: **Team** level.

	Model		
	1	2	3
<i>Control variables</i>			
Team Size	0.02	0.01	0.05
Cultural Comp. Dummy Code 1	0.16	0.13	0.12
Cultural Comp. Dummy Code 2	0.25 †	0.26 †	0.27 †
English Proficiency	-0.04	0.00	0.04
Teamwork Experience	-0.13	-0.17	-0.17
Week 3 Temporal Conflict (team)	0.46 ***	0.47 ***	0.44 **
<i>Main effects</i>			
Week 2 Temporal Planning		0.06	0.06
Diversity in Time Urgency		0.15	0.18
Diversity in Steady Pacing Style		0.08	0.08
Diversity in Deadline Pacing Style		0.05	0.05
<i>Interaction terms</i>			
Diversity in Time Urgency X Week 2 Temporal Planning			0.14
Diversity in Steady Pacing Style X Week 2 Temporal Planning			-0.17
Diversity in Deadline Pacing Style X Week 4 Temporal Planning			-0.03
R <sup>2</sup>	0.48	0.52	0.55
F	8.21 ***	5.28 ***	4.31 ***
ΔR <sup>2</sup>		0.04	0.03

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

Note: Entries are beta weights; df=59; cultural composition categories: US-others, US-Spain, and US-China.

Table 21. The moderating effect of temporal planning in week 4 on the relationship between temporal individual differences and temporal conflict in week 4: **Team** level.

	<b>Model</b>		
	<b>1</b>	<b>2</b>	<b>3</b>
<i>Control variables</i>			
Team Size	0.02	0.01	0.05
Cultural Comp. Dummy Code 1	0.16	0.13	0.17
Cultural Comp. Dummy Code 2	0.25 †	0.26 †	0.29 †
English Proficiency	-0.04	-0.01	0.03
Teamwork Experience	-0.13	-0.16	-0.18
Week 3 Temporal Conflict (team)	0.46 ***	0.47 ***	0.44 **
<i>Main effects</i>			
Week 4 Temporal Planning		0.03	-0.02
Diversity in Time Urgency		0.17	0.15
Diversity in Steady Pacing Style		0.07	0.06
Diversity in Deadline Pacing Style		0.05	0.04
<i>Interaction terms</i>			
Diversity in Time Urgency X Week 4 Temporal Planning			0.16
Diversity in Steady Pacing Style X Week 4 Temporal Planning			-0.11
Diversity in Deadline Pacing Style X Week 4 Temporal Planning			-0.01
R <sup>2</sup>	0.48	0.52	0.54
F	8.21 ***	5.23 ***	4.11 ***
ΔR <sup>2</sup>		0.03	0.02

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

Note: Entries are beta weights; df=59; cultural composition categories: US-others, US-Spain, and US-China.

Table 22. The moderating effect of time awareness norms in week 3 on the relationship between temporal individual differences and temporal conflict in week 3: **Subteam** level.

	Model		
	1	2	3
<i>Control variables</i>			
Subteam Size	0.00	0.03	0.05
Country Dummy Code 1	0.12	0.10	0.09
Country Dummy Code 2	0.38 **	0.37 **	0.41 **
English Proficiency	0.06	0.05	0.01
Teamwork Experience	-0.13	-0.08	-0.11
<i>Main effects</i>			
Week 3 Time Awareness Norms		-0.13	-0.13
Diversity in Time Urgency		-0.04	-0.06
Diversity in Steady Pacing Style		0.16 †	0.22 *
Diversity in Deadline Pacing Style		-0.10	-0.15
<i>Interaction terms</i>			
Diversity in Time Urgency X Week 3 Time Awareness Norms			-0.08
Diversity in Steady Pacing Style X Week 3 Time Awareness Norms			0.07
Diversity in Deadline Pacing Style X Week 3 Time Awareness Norms			-0.18 †
R <sup>2</sup>	0.18	0.23	0.26
F	4.87 ***	3.52 **	3.01 **
ΔR <sup>2</sup>		0.05	0.03

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

Note: Entries are beta weights; df=117; country categories: Spain, China, and Others.

Table 23. The moderating effect of time awareness norms in week 3 on the relationship between temporal individual differences and temporal conflict in week 4: **Subteam** level.

	Model		
	1	2	3
<i>Control variables</i>			
Subteam Size	-0.01	0.01	-0.01
Country Dummy Code 1	0.13	0.13	0.14
Country Dummy Code 2	0.13	0.16	0.09
English Proficiency	0.02	0.00	0.03
Teamwork Experience	-0.06	-0.05	-0.03
Week 3 Temporal Conflict	0.36 ***	0.32 **	0.36 ***
<i>Main effects</i>			
Week 3 Time Awareness Norms		-0.11	-0.11
Diversity in Time Urgency		0.14	0.16 †
Diversity in Steady Pacing Style		0.11	0.07
Diversity in Deadline Pacing Style		-0.01	0.04
<i>Interaction terms</i>			
Diversity in Time Urgency X Week 3 Time Awareness Norms			0.11
Diversity in Steady Pacing Style X Week 3 Time Awareness Norms			-0.03
Diversity in Deadline Pacing Style X Week 3 Time Awareness Norms			0.17
R <sup>2</sup>	0.23	0.28	0.31
F	5.22 ***	3.99 ***	3.49 ***
ΔR <sup>2</sup>		0.05	0.03

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

Note: Entries are beta weights; df=113; country categories: Spain, China, and Others.

Table 24. The moderating effect of time awareness norms in week 4 on the relationship between temporal individual differences and temporal conflict in week 4: **Subteam** level.

	<b>Model</b>		
	<b>1</b>	<b>2</b>	<b>3</b>
<i>Control variables</i>			
Subteam Size	-0.01	-0.01	0.03
Country Dummy Code 1	0.13	0.08	0.07
Country Dummy Code 2	0.13	0.15	0.14
English Proficiency	0.02	-0.02	0.02
Teamwork Experience	-0.06	-0.01	-0.01
Week 3 Temporal Conflict	0.36 ***	0.32 **	0.33 **
<i>Main effects</i>			
Week 4 Time Awareness Norms		-0.23 *	-0.31 **
Diversity in Time Urgency		0.14 †	0.11
Diversity in Steady Pacing Style		0.10	0.11
Diversity in Deadline Pacing Style		-0.03	-0.03
<i>Interaction terms</i>			
Diversity in Time Urgency X Week 4 Time Awareness Norms			0.07
Diversity in Steady Pacing Style X Week 4 Time Awareness Norms			0.16
Diversity in Deadline Pacing Style X Week 4 Time Awareness Norms			-0.09
R <sup>2</sup>	0.23	0.31	0.34
F	5.22 ***	4.71 ***	3.91 ***
ΔR <sup>2</sup>		0.09 *	0.02

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

Note: Entries are beta weights; df=113; country categories: Spain, China, and Others.

Table 25. The moderating effect of time awareness norms in week 3 on the relationship between temporal individual differences and temporal conflict in week 3: **Team** level.

	Model		
	1	2	3
<i>Control variables</i>			
Team Size	-0.08	-0.04	-0.02
Cultural Comp. Dummy Code 1	0.08	0.03	-0.04
Cultural Comp. Dummy Code 2	0.28 †	0.12	0.09
English Proficiency	-0.04	-0.13	-0.05
Teamwork Experience	-0.24 †	-0.10	-0.14
<i>Main effects</i>			
Week 3 Time Awareness Norms		-0.40 **	-0.44 **
Diversity in Time Urgency		-0.06	-0.05
Diversity in Steady Pacing Style		-0.01	0.00
Diversity in Deadline Pacing Style		-0.04	-0.03
<i>Interaction terms</i>			
Diversity in Time Urgency X Week 3 Time Awareness Norms			-0.05
Diversity in Steady Pacing Style X Week 3 Time Awareness Norms			-0.14
Diversity in Deadline Pacing Style X Week 3 Time Awareness Norms			-0.20
R <sup>2</sup>	0.21	0.33	0.39
F	2.91 *	2.76 *	2.47 *
ΔR <sup>2</sup>		0.12 †	0.05

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

Note: Entries are beta weights; df=59; cultural composition categories: US-others, US-Spain, and US-China.

Table 26. The moderating effect of time awareness norms in week 3 on the relationship between temporal individual differences and temporal conflict in week 4: **Team** level.

	Model		
	1	2	3
<i>Control variables</i>			
Team Size	0.02	0.02	-0.03
Cultural Comp. Dummy Code 1	0.16	0.11	0.07
Cultural Comp. Dummy Code 2	0.25 †	0.24	0.16
English Proficiency	-0.04	-0.03	-0.03
Teamwork Experience	-0.13	-0.13	-0.06
Week 3 Temporal Conflict	0.46 ***	0.42 **	0.41 **
<i>Main effects</i>			
Week 3 Time Awareness Norms		-0.11	-0.09
Diversity in Time Urgency		0.16	0.15
Diversity in Steady Pacing Style		0.05	0.04
Diversity in Deadline Pacing Style		0.04	0.07
<i>Interaction terms</i>			
Diversity in Time Urgency X Week 3 Time Awareness Norms			0.14
Diversity in Steady Pacing Style X Week 3 Time Awareness Norms			-0.27 *
Diversity in Deadline Pacing Style X Week 3 Time Awareness Norms			0.10
R <sup>2</sup>	0.48	0.52	0.60
F	8.21 ***	5.38 ***	5.20 ***
ΔR <sup>2</sup>		0.04	0.07 †

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

Note: Entries are beta weights; df=59; cultural composition categories: US-others, US-Spain, and US-China.

Table 27. The moderating effect of time awareness norms in week 4 on the relationship between temporal individual differences and temporal conflict in week 4: **Team** level.

	Model		
	1	2	3
<i>Control variables</i>			
Team Size	0.02	-0.01	0.00
Cultural Comp. Dummy Code 1	0.16	0.00	0.00
Cultural Comp. Dummy Code 2	0.25 †	0.16	0.12
English Proficiency	-0.04	-0.09	-0.15
Teamwork Experience	-0.13	0.00	0.05
Week 3 Temporal Conflict	0.46 ***	0.43 ***	0.42 ***
<i>Main effects</i>			
Week 4 Time Awareness Norms		-0.32 *	-0.23 †
Diversity in Time Urgency		0.14	0.13
Diversity in Steady Pacing Style		0.07	0.07
Diversity in Deadline Pacing Style		-0.02	-0.05
<i>Interaction terms</i>			
Diversity in Time Urgency X Week 4 Time Awareness Norms			0.22 *
Diversity in Steady Pacing Style X Week 4 Time Awareness Norms			-0.29 *
Diversity in Deadline Pacing Style X Week 4 Time Awareness Norms			0.23 *
R <sup>2</sup>	0.48	0.57	0.67
F	8.21 ***	6.52 ***	7.09 ***
ΔR <sup>2</sup>		0.09 †	0.10 **

†  $p < .10$   
 \*  $p < .05$   
 \*\*  $p < .01$   
 \*\*\*  $p < .001$

Note: Entries are beta weights; df=59; cultural composition categories: US-others, US-Spain, and US-China.

Table 28. The effect of temporal conflict in week 3 on quality of performance (proposal grade).

	Model	
	1	2
<i>Control variables</i>		
Team Size	0.28 *	0.28 *
Cultural Comp. Dummy Code 1	0.06	0.07
Cultural Comp. Dummy Code 2	-0.16	-0.12
English Proficiency	-0.22	-0.23
Teamwork Experience	0.28 *	0.24 †
<i>Main effect</i>		
Week 3 Temporal Conflict (team)		-0.15
R <sup>2</sup>	0.22	0.24
F	3.00 *	2.72 *
ΔR <sup>2</sup>	0.22	0.02

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

Note: Entries are beta weights; df=59; cultural composition categories: US-others, US-Spain, and US-China.

Table 29. The effect of temporal conflict in week 4 on quality of performance (proposal grade).

	Model	
	1	2
<i>Control variables</i>		
Team Size	0.27 *	0.28 *
Cultural Comp. Dummy Code 1	0.07	0.11
Cultural Comp. Dummy Code 2	-0.12	-0.06
English Proficiency	-0.23	-0.24
Teamwork Experience	0.24 †	0.21
Week 3 Temporal Conflict (team)	-0.15	-0.04
<i>Main effect</i>		
Week 4 Temporal Conflict (team)		-0.24
R <sup>2</sup>	0.24	0.27
F	2.72 *	2.68 *
ΔR <sup>2</sup>	0.24	0.03

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

Note: Entries are beta weights; df=59; cultural composition categories: US-others, US-Spain, and US-China.

Table 30. The effect of temporal conflict in week 3 on timeliness of delivery (normalized) in week 3.

	Model	
	1	2
<i>Control variables</i>		
Team Size	0.09	0.09
Cultural Comp. Dummy Code 1	-0.29 †	-0.29 †
Cultural Comp. Dummy Code 2	-0.30 †	-0.30 †
English Proficiency	-0.05	-0.05
Teamwork Experience	-0.03	-0.04
<i>Main effect</i>		
Week 3 Temporal Conflict (team)		0.00
R <sup>2</sup>	0.14	0.14
F	1.79	1.47
ΔR <sup>2</sup>	0.14	0.00

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

Note: Entries are beta weights; df=59; cultural composition categories: US-others, US-Spain, and US-China.

Table 31. The effect of temporal conflict in week 3 on timeliness of delivery (normalized) in week 4 (final proposal).

	Model	
	1	2
<i>Control variables</i>		
Team Size	0.18	0.18
Cultural Comp. Dummy Code 1	0.06	0.06
Cultural Comp. Dummy Code 2	-0.36 *	-0.36 *
English Proficiency	-0.04	-0.04
Teamwork Experience	0.00	-0.01
<i>Main effect</i>		
Week 3 Temporal Conflict (team)		-0.01
R <sup>2</sup>	0.17	0.17
F	2.27 †	1.86
ΔR <sup>2</sup>	0.17	0.00

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

Note: Entries are beta weights; df=59; cultural composition categories: US-others, US-Spain, and US-China.

Table 32. The effect of temporal conflict in week 4 on timeliness of delivery (normalized) in week 4 (final proposal).

	Model	
	1	2
<i>Control variables</i>		
Team Size	0.18	0.18
Cultural Comp. Dummy Code 1	0.06	0.03
Cultural Comp. Dummy Code 2	-0.36 *	-0.40 *
English Proficiency	-0.04	-0.04
Teamwork Experience	-0.01	0.02
Week 3 Temporal Conflict (team)	-0.01	-0.10
<i>Main effect</i>		
Week 4 Temporal Conflict (team)		0.18
R <sup>2</sup>	0.17	0.19
F	1.86	1.75
$\Delta R^2$	0.17	0.02

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

Note: Entries are beta weights; df=59; cultural composition categories: US-others, US-Spain, and US-China.

*Table 33.* Results of Sobel tests examining the mediating effect of temporal conflict on the relationship between diversity in temporal individual differences and quality of performance (proposal grades)

<b>IV: Diversity in Temporal IDs</b>	<b>Mediator: Temporal Conflict</b>	<b>DV</b>	<b>Sobel test statistic</b>
Time Urgency	Week 3	Proposal Grade	0.73
	Week 4		-0.71
Steady Pacing Style	Week 3		-0.40
	Week 4		-0.66
Deadline Pacing Style	Week 3		0.49
	Week 4		-0.63

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

Table 34. Results of Sobel tests examining the mediating effect of time awareness norms in the relationship between temporal planning and temporal conflict.

Temporal Planning (IV)	Time Awareness Norms (Mediator)	Temporal Conflict (DV)	Level of analysis	Sobel test statistic
Week 2	Week 3	Week 3	Subteam	-1.67 †
			Team	-2.41 *
Week 2	Week 3	Week 4	Subteam	-2.21 *
			Team	-2.38 *
Week 4	Week 4	Week 4	Subteam	-3.26 **
			Team	-2.14 *

†  $p < .10$

\*  $p < .05^{**}$   $p < .01$

Table 35. Ancillary analysis: The effect of temporal conflict in week 2 on the relationship between diversity in temporal individual differences and time awareness norms in week 3:

**Subteam** level.

	Model			
	1	2	3	4
<i>Control variables</i>				
Subteam Size	0.34 ***	0.35 ***	0.35 ***	0.32 ***
Cultural Comp. Dummy Code 1	-0.04	-0.09	-0.01	-0.01
Cultural Comp. Dummy Code 2	-0.20 *	-0.25 *	-0.28 *	-0.24 *
English Proficiency	-0.09	-0.14	-0.14	-0.12
Teamwork Experience	0.12	0.10	0.09	0.12
Use of Technology	-0.04	-0.07	-0.10	-0.10
Mean Time Urgency		0.08	0.09	0.13
Mean Steady Pacing Style		0.07	0.01	-0.03
Mean Deadline Pacing Style		-0.12	-0.10	-0.14
<i>Main effects</i>				
Week 2 Temporal Planning			-0.10	-0.13
Diversity in Time Urgency			-0.22 **	-0.20 *
Diversity in Steady Pacing Style			-0.18 †	-0.13
Diversity in Deadline Pacing Style			0.39 ***	0.33 ***
<i>Interaction terms</i>				
Diversity in Time Urgency X Week 2 Temporal Planning				0.05
Diversity in Steady Pacing Style X Week 2 Temporal Planning				0.11
Diversity in Deadline Pacing Style X Week 2 Temporal Planning				-0.19 *
R <sup>2</sup>	0.19	0.22	0.43	0.46
F	4.24 ***	3.27 **	5.94 ***	5.27 ***
ΔR <sup>2</sup>	.19 **	0.03	.21 ***	0.03

†  $p < .10$   
 \*  $p < .05$   
 \*\*  $p < .01$   
 \*\*\*  $p < .001$

Note: Entries are beta weights; df=114; country categories: Spain, China, and Others.

Table 36. Ancillary analysis: The effect of temporal conflict in week 2 on the relationship between diversity in temporal individual differences and time awareness norms in week 4:

Subteam level.

	Model			
	1	2	3	4
<i>Control variables</i>				
Subteam Size	0.11	0.11	0.11	0.09
Cultural Comp. Dummy Code 1	-0.26 *	-0.31 **	-0.24 *	-0.25 *
Cultural Comp. Dummy Code 2	-0.11	-0.18	-0.19	-0.14
English Proficiency	-0.12	-0.17	-0.16	-0.13
Teamwork Experience	0.22 *	0.19 †	0.18 †	0.20 †
Use of Technology	0.02	-0.03	-0.05	-0.05
Mean Time Urgency		0.10	0.10	0.14
Mean Steady Pacing Style		0.03	-0.04	-0.08
Mean Deadline Pacing Style		-0.25 *	-0.24 *	-0.29 **
<i>Main effects</i>				
Week 2 Temporal Planning			-0.07	-0.09
Diversity in Time Urgency			-0.15 †	-0.14
Diversity in Steady Pacing Style			-0.17 †	-0.13
Diversity in Deadline Pacing Style				
<i>Interaction terms</i>				
Diversity in Time Urgency X Week 2 Temporal Planning			0.33 ***	0.25 *
Diversity in Steady Pacing Style X Week 2 Temporal Planning				0.12
Diversity in Deadline Pacing Style X Week 2 Temporal Planning				0.05
				-0.17 †
R <sup>2</sup>	0.14	0.21	0.35	0.38
F	2.85 *	3.02 **	4.12 ***	3.71 ***
ΔR <sup>2</sup>	.14 *	.07 *	.14 **	0.03

†  $p < .10$   
 \*  $p < .05$   
 \*\*  $p < .01$   
 \*\*\*  $p < .001$

Note: Entries are beta weights; df=113; country categories: Spain, China, and Others.

Table 37. Ancillary analysis: The effect of temporal conflict in week 4 on the relationship between diversity in temporal individual differences and time awareness norms in week 4:

**Subteam** level.

	Model			
	1	2	3	4
<i>Control variables</i>				
Subteam Size	0.11	0.11	0.08	0.07
Cultural Comp. Dummy Code 1	-0.26 *	-0.31 **	-0.22 *	-0.19 †
Cultural Comp. Dummy Code 2	-0.11	-0.18	-0.22 †	-0.26 *
English Proficiency	-0.12	-0.17	-0.22	-0.25 †
Teamwork Experience	0.22 *	0.19 †	0.19 †	0.17
Use of Technology	0.02	-0.03	-0.12	-0.14
Mean Time Urgency		0.10	0.12	0.14
Mean Steady Pacing Style		0.03	-0.04	-0.04
Mean Deadline Pacing Style		-0.25 *	-0.24 *	-0.25 **
<i>Main effects</i>				
Week 4 Temporal Planning			-0.05	-0.06
Diversity in Time Urgency			-0.08	-0.06
Diversity in Steady Pacing Style			-0.13	-0.12
Diversity in Deadline Pacing Style			0.43 ***	0.49 ***
<i>Interaction terms</i>				
Diversity in Time Urgency X Week 4 Temporal Planning				-0.18 *
Diversity in Steady Pacing Style X Week 4 Temporal Planning				0.06
Diversity in Deadline Pacing Style X Week 4 Temporal Planning				0.01
R <sup>2</sup>	0.14	0.21	0.40	0.42
F	2.85 *	3.02 **	5.10 ***	4.46 ***
ΔR <sup>2</sup>	.14 *	.07 *	.19 ***	0.03

†  $p < .10$   
 \*  $p < .05$   
 \*\*  $p < .01$   
 \*\*\*  $p < .001$

Note: Entries are beta weights; df=113; country categories: Spain, China, and Others.

*Table 38.* Ancillary analysis: The effect of temporal conflict in week 4 on the relationship between diversity in temporal individual differences and time awareness norms in week 4: **Team** level.

	<b>Model</b>			
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<i>Control variables</i>				
Subteam Size	0.04	0.03	0.02	-0.08
Time Zone Dummy Code 1	0.22	0.13	-0.09	-0.21
Time Zone Dummy Code 2	0.43 *	0.34 †	0.21	0.12
English Proficiency	0.45 **	0.36 **	0.39 **	0.41 **
Teamwork Experience	0.24	0.23	-0.04	-0.16
Use of Technology	0.05	0.00	-0.09	-0.09
Mean Time Urgency		0.01	0.02	0.08
Mean Steady Pacing Style		-0.07	-0.25 *	-0.28 *
Mean Deadline Pacing Style		-0.39 **	***	***
<i>Main effects</i>				
Week 4 Temporal Planning			-0.15	-0.14
Diversity in Time Urgency			0.00	0.01
Diversity in Steady Pacing Style			-0.30 *	-0.27 *
Diversity in Deadline Pacing Style			0.42 ***	0.48 ***
<i>Interaction terms</i>				
Diversity in Time Urgency X Week 4 Temporal Planning				-0.15
Diversity in Steady Pacing Style X Week 4 Temporal Planning				0.21 †
Diversity in Deadline Pacing Style X Week 4 Temporal Planning				-0.09
R <sup>2</sup>	0.32	0.44	0.66	0.69
F	3.94 **	4.19 ***	6.58 ***	5.74 ***
ΔR <sup>2</sup>	.32 **	.12 *	.22 ***	0.03

†  $p < .10$   
 \*  $p < .05$   
 \*\*  $p < .01$   
 \*\*\*  $p < .001$

Note: Entries are beta weights; df=57; cultural composition categories: US-others, US-Spain, and US-China.

*Table 39.* Ancillary analysis: The effect of time awareness norms in week 4 on the relationship between diversity in temporal individual differences and temporal planning in week 4: **Subteam** level.

	<b>Model</b>			
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<i>Control variables</i>				
Subteam Size	0.10	0.11	0.07	0.02
Cultural Comp. Dummy Code 1	-0.18 †	-0.19 †	-0.05	-0.02
Cultural Comp. Dummy Code 2	0.06	0.05	0.10	0.13
English Proficiency	0.13	0.15	0.22	0.19
Teamwork Experience	0.10	0.07	-0.03	-0.05
Use of Technology	0.22 *	0.21 *	0.22 *	0.24 **
Mean Time Urgency		-0.04	-0.07	-0.14
Mean Steady Pacing Style		0.02	0.04	0.04
Mean Deadline Pacing Style		-0.10	0.03	0.00
<i>Main effects</i>				
Week 4 Time Awareness Norms			0.01	0.07
Diversity in Time Urgency			-0.12	-0.13
Diversity in Steady Pacing Style			0.06	0.05
Diversity in Deadline Pacing Style			0.45 ***	0.59
<i>Interaction terms</i>				
Diversity in Time Urgency X Week 4 Time Awareness Norms				-0.14
Diversity in Steady Pacing Style X Week 4 Time Awareness Norms				-0.29
Diversity in Deadline Pacing Style X Week 4 Time Awareness Norms				0.12
R <sup>2</sup>	0.17	0.18	0.37	0.44
F	3.63 **	2.58 *	4.45 ***	4.73 ***
ΔR <sup>2</sup>	.17 **	0.01	.18 ***	.07 **

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

Note: Entries are beta weights; df=113; country categories: Spain, China, and Others.

Figure 3. Distribution of week 1 assignment submission time.

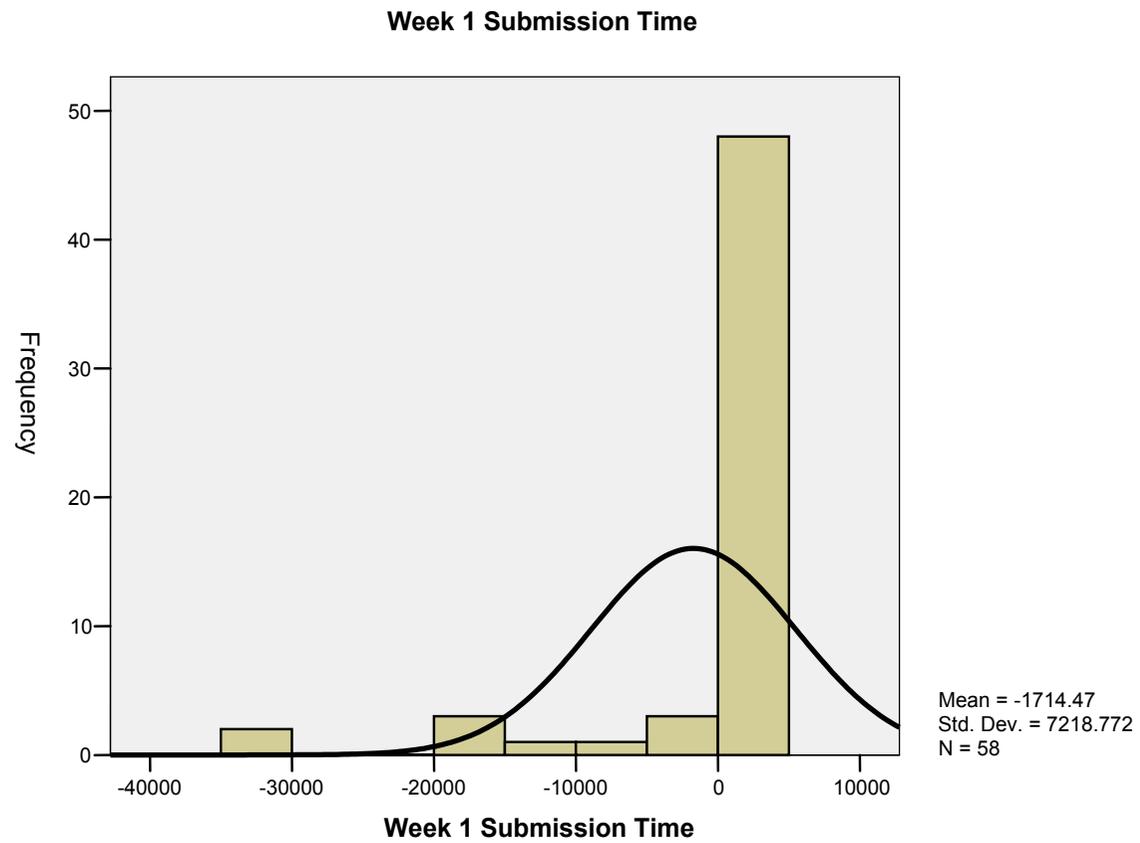


Figure 4. Distribution of week 2 assignment 1 submission time.

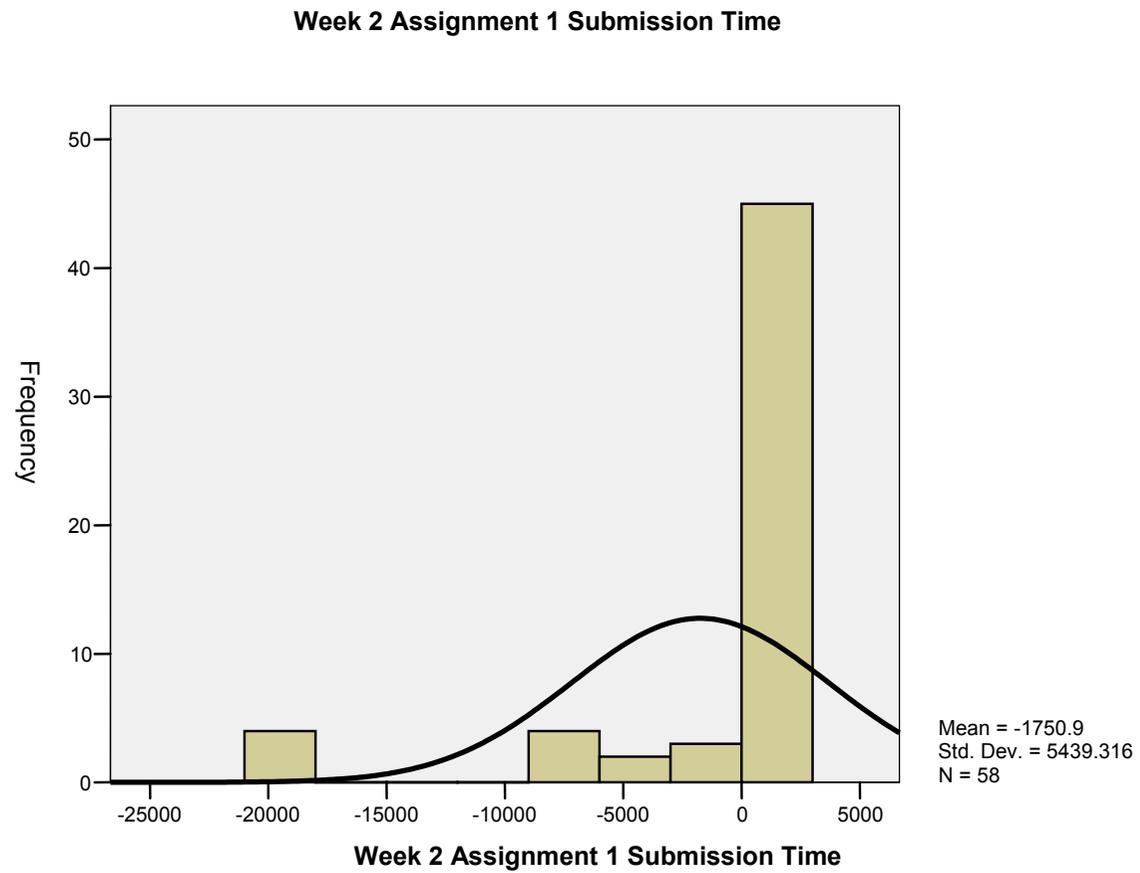


Figure 5. Distribution of week 2 assignment 2 submission time.

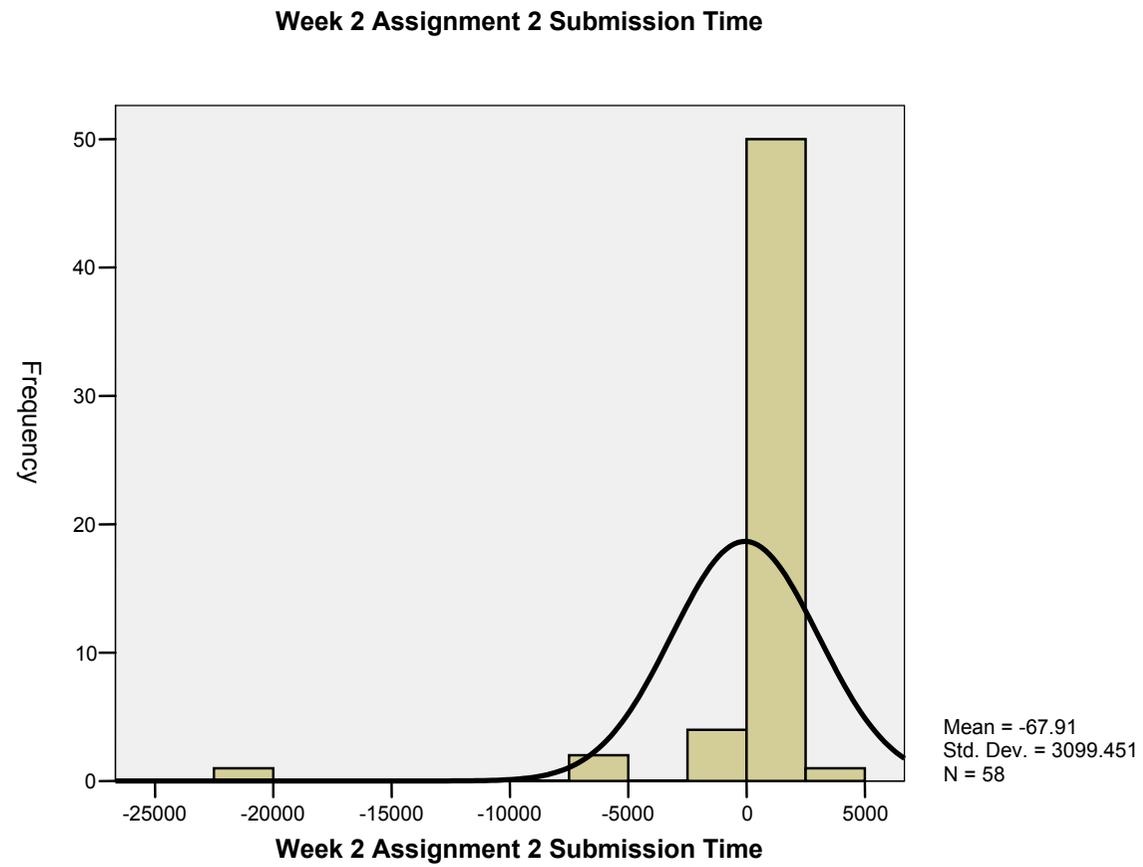


Figure 6. Distribution of week 3 submission time.

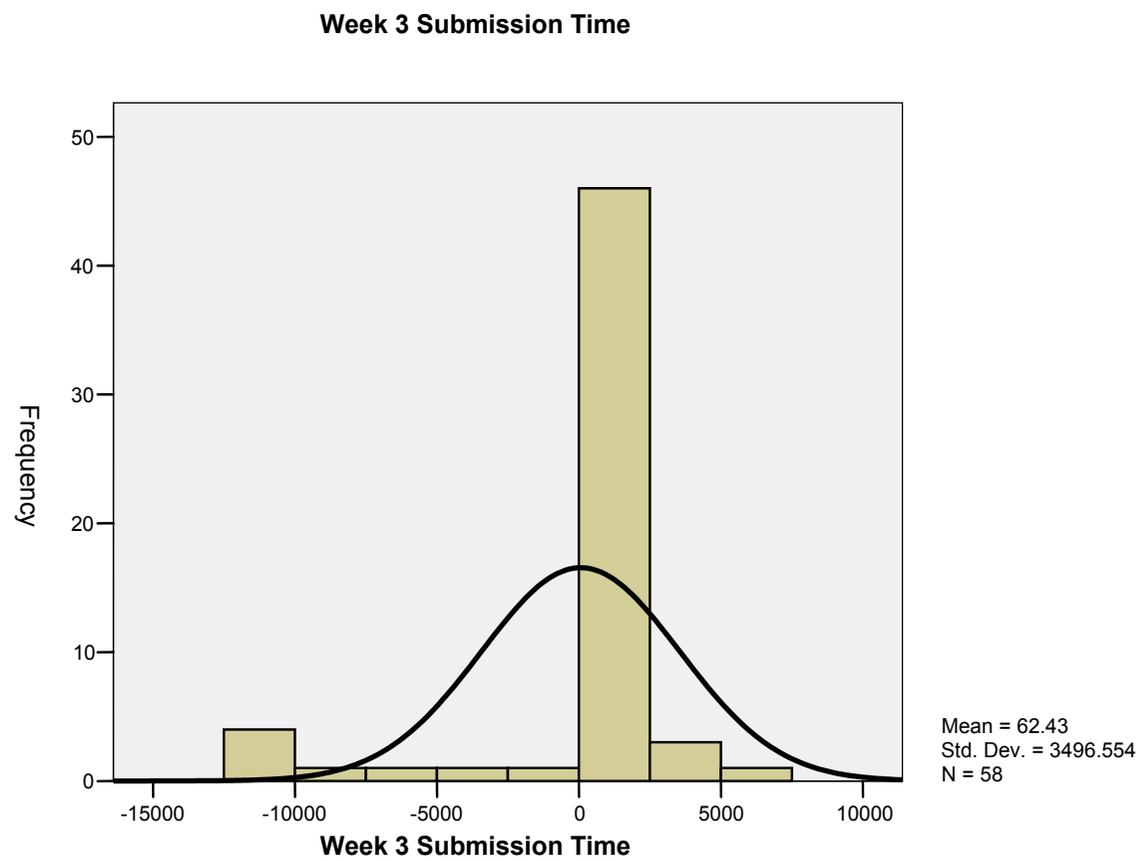


Figure 7. Distribution of week 4 submission time (final proposal).

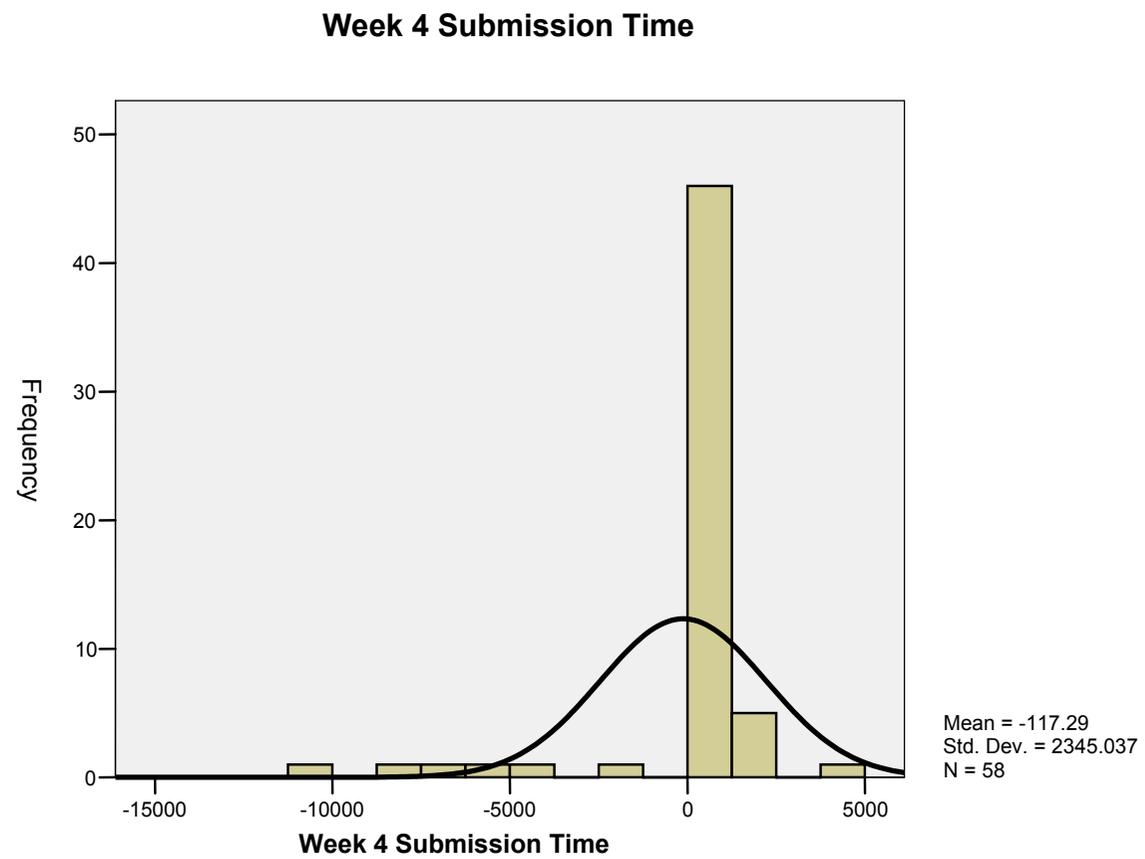


Figure 8. Tests of hypotheses: Combinations of variables.

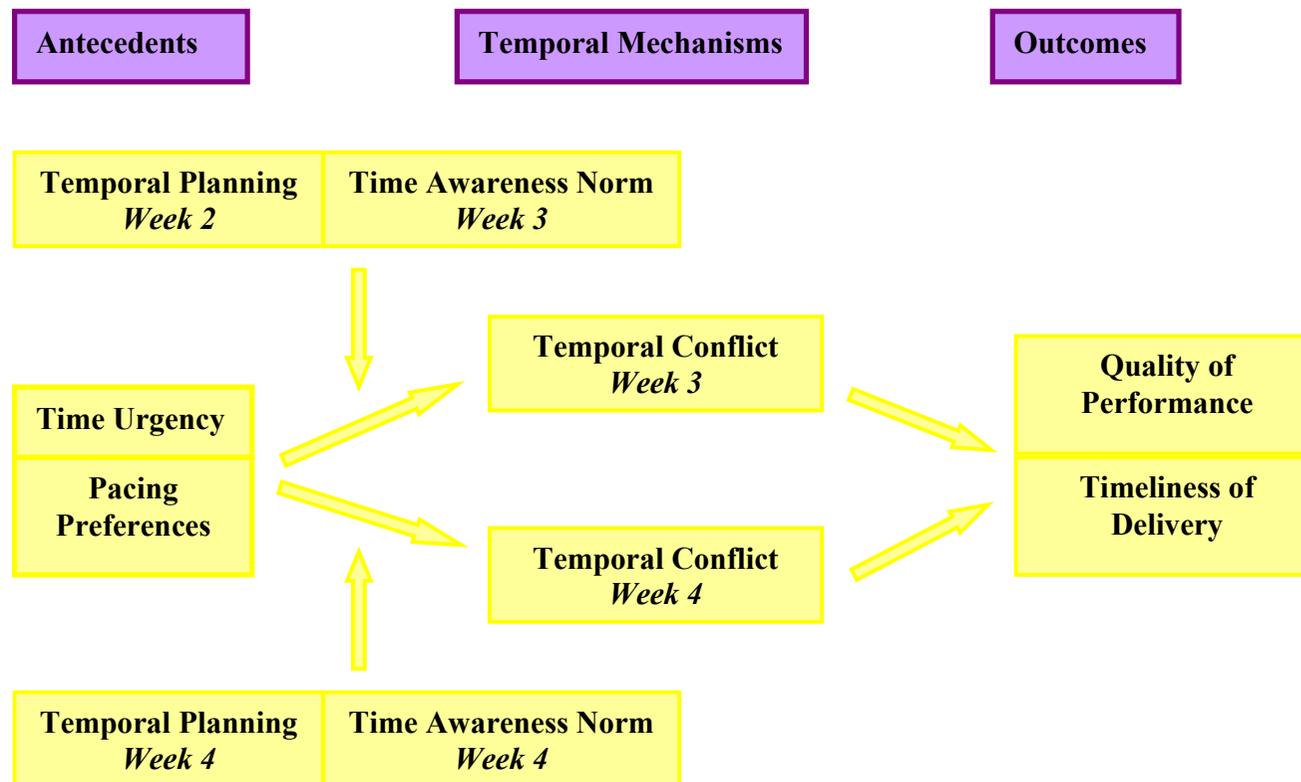


Figure 9. The moderating effect of week 4 temporal planning on the time urgency diversity—temporal conflict (week 4) relationship: **Subteam** level.

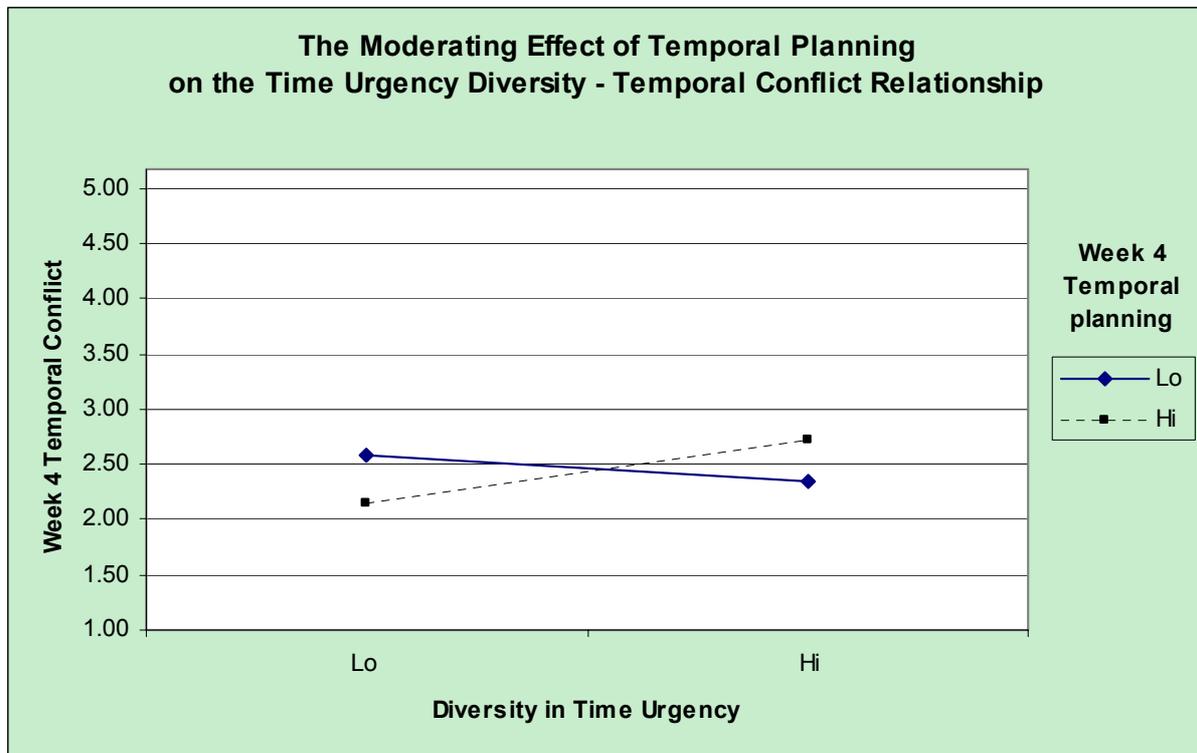


Figure 10. The moderating effect of week 4 temporal planning on the steady pacing style diversity—temporal conflict (week 4) relationship: **Subteam** level.

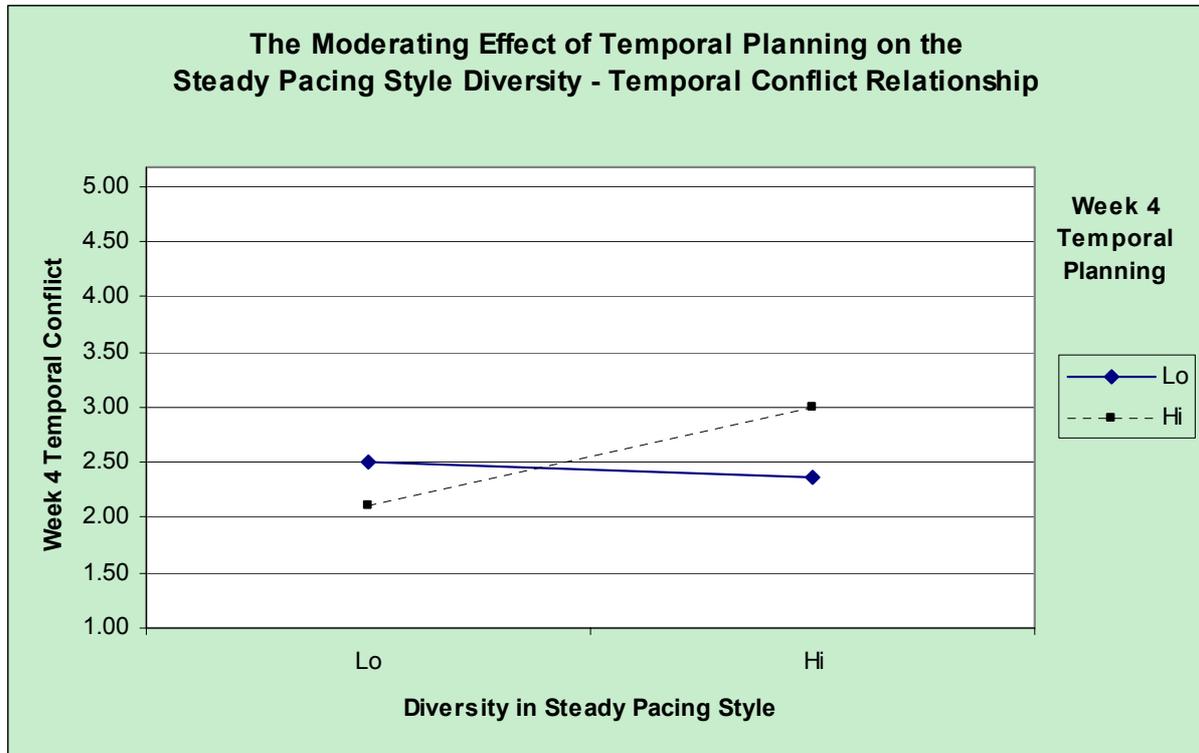


Figure 11. The moderating effect of week 3 time awareness norms on the deadline pacing style diversity—temporal conflict (week 3) relationship: **Subteam** level.

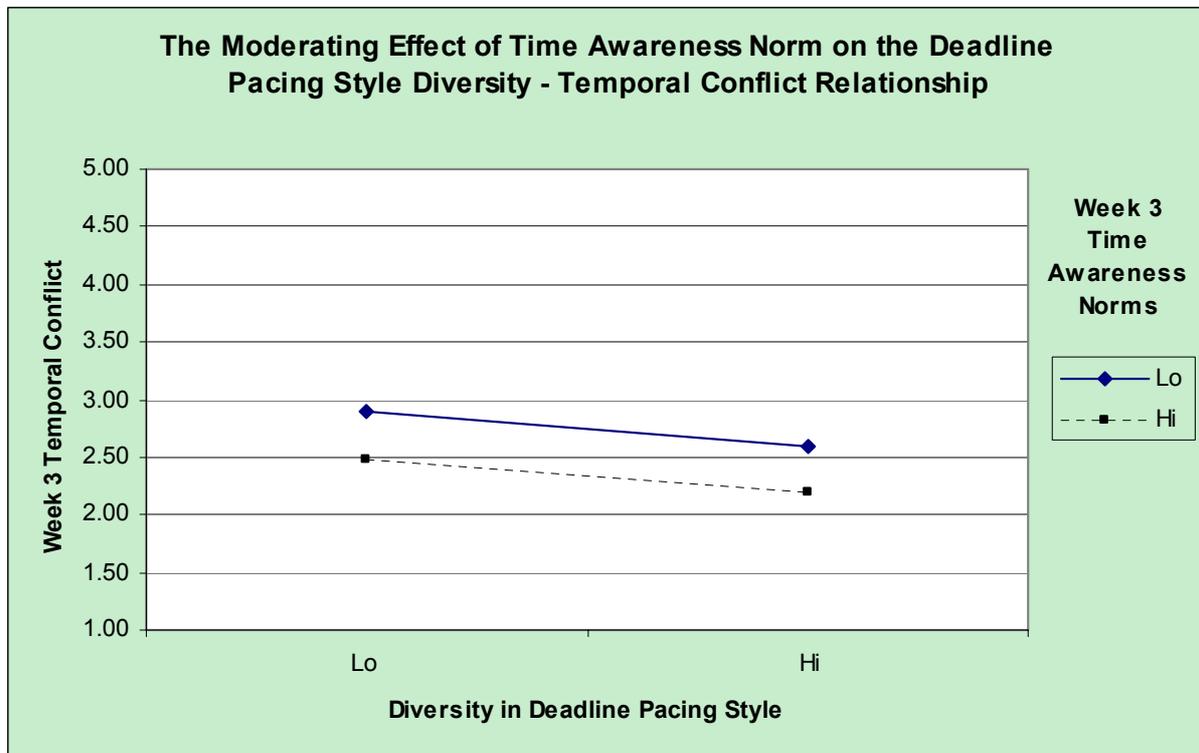


Figure 12. The moderating effect of week 3 time awareness norms on the steady pacing style diversity—temporal conflict (week 4) relationship: **Team** level.

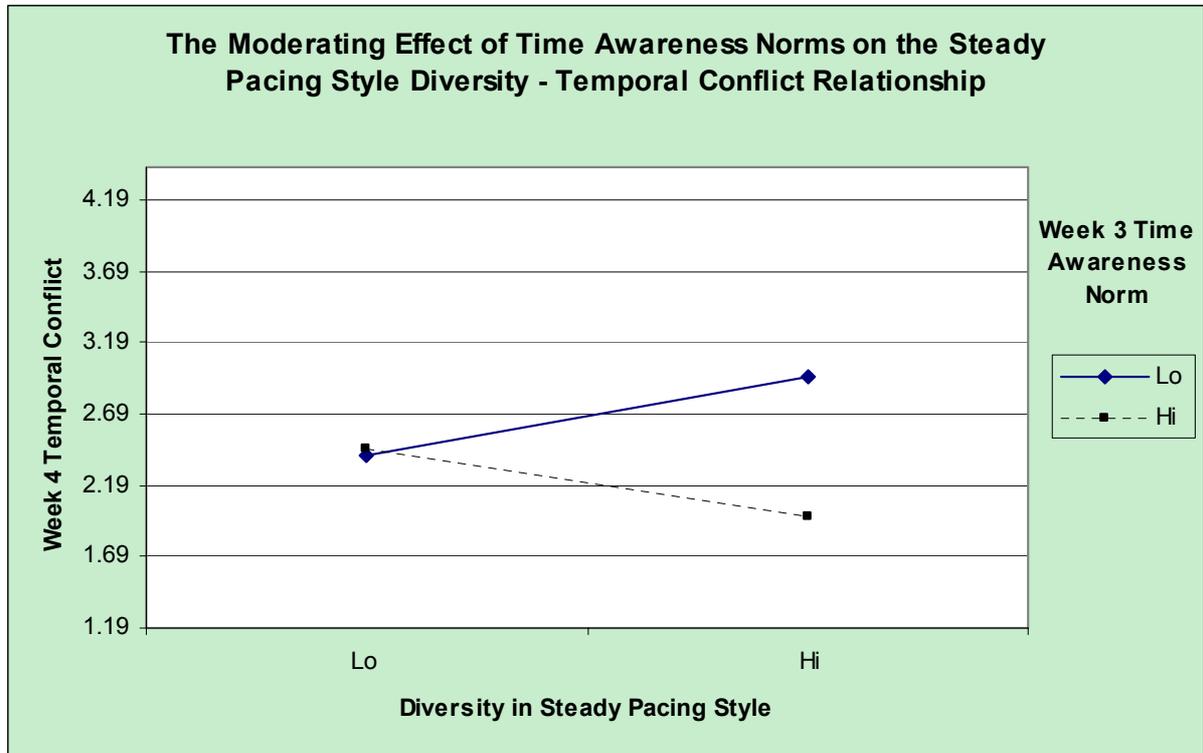


Figure 13. The moderating effect of week 4 time awareness norms on the time urgency diversity—temporal conflict (week 4) relationship: **Team** level.

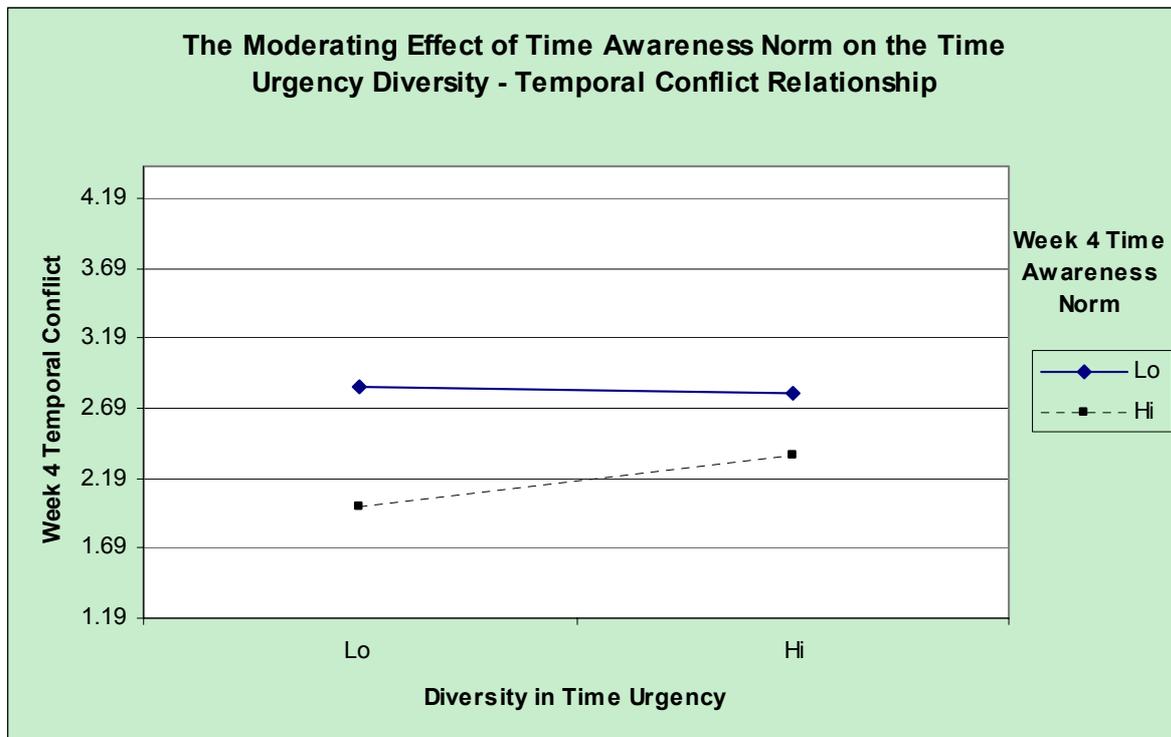


Figure 14. The moderating effect of week 4 time awareness norms on the steady pacing style diversity—temporal conflict (week 4) relationship: **Team** level.

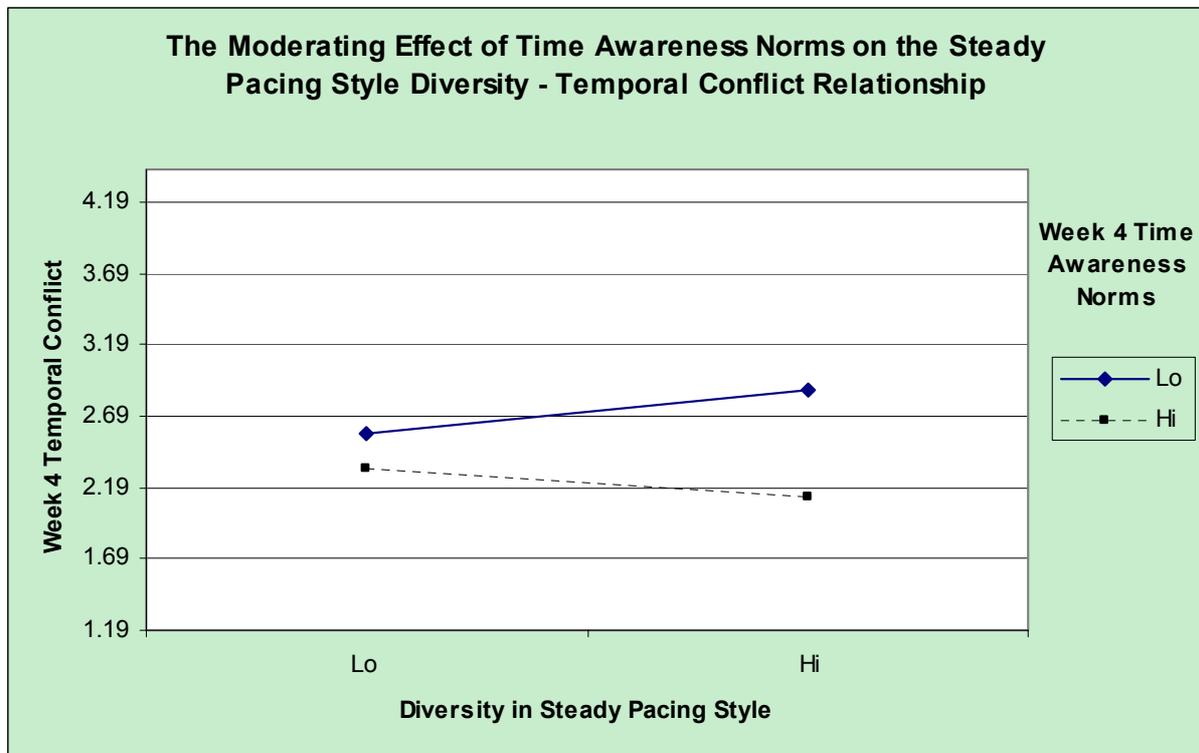


Figure 15. The moderating effect of week 4 time awareness norms on the deadline pacing style diversity—temporal conflict (week 4) relationship: **Team** level.

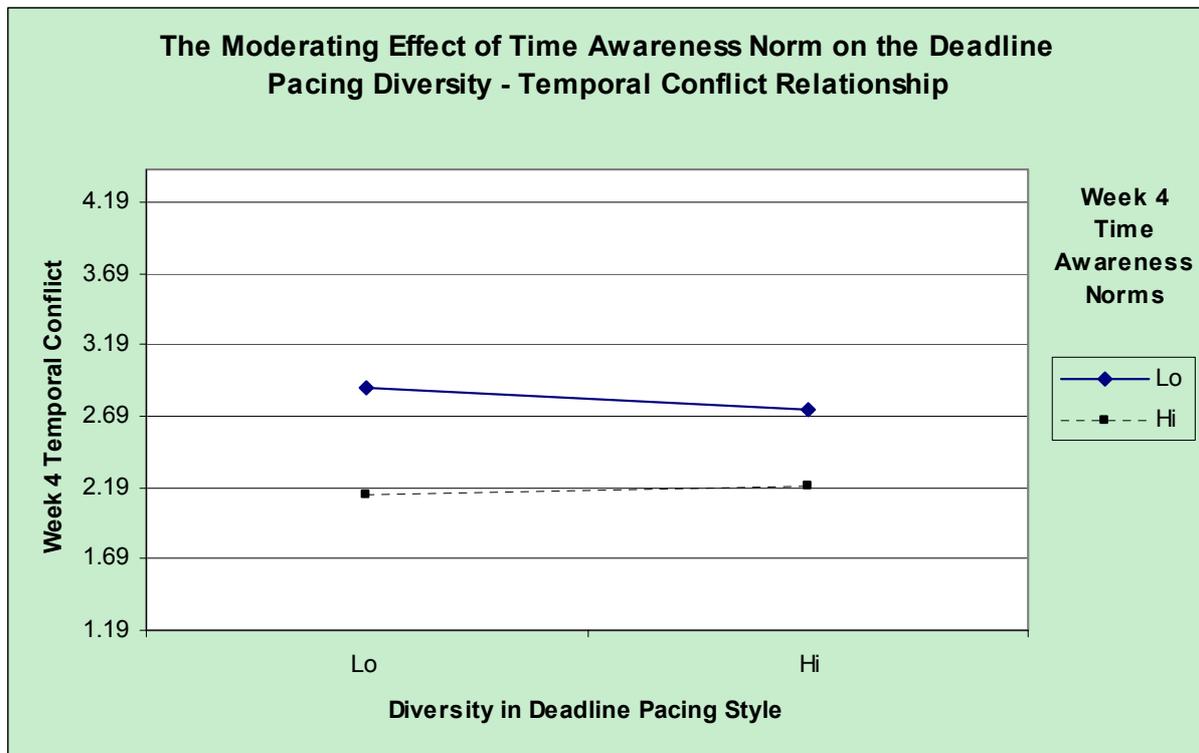


Figure 16. Ancillary analysis: The moderating effect of week 2 temporal planning on the deadline pacing style diversity—time awareness norms (week 3) relationship: **Subteam** level.

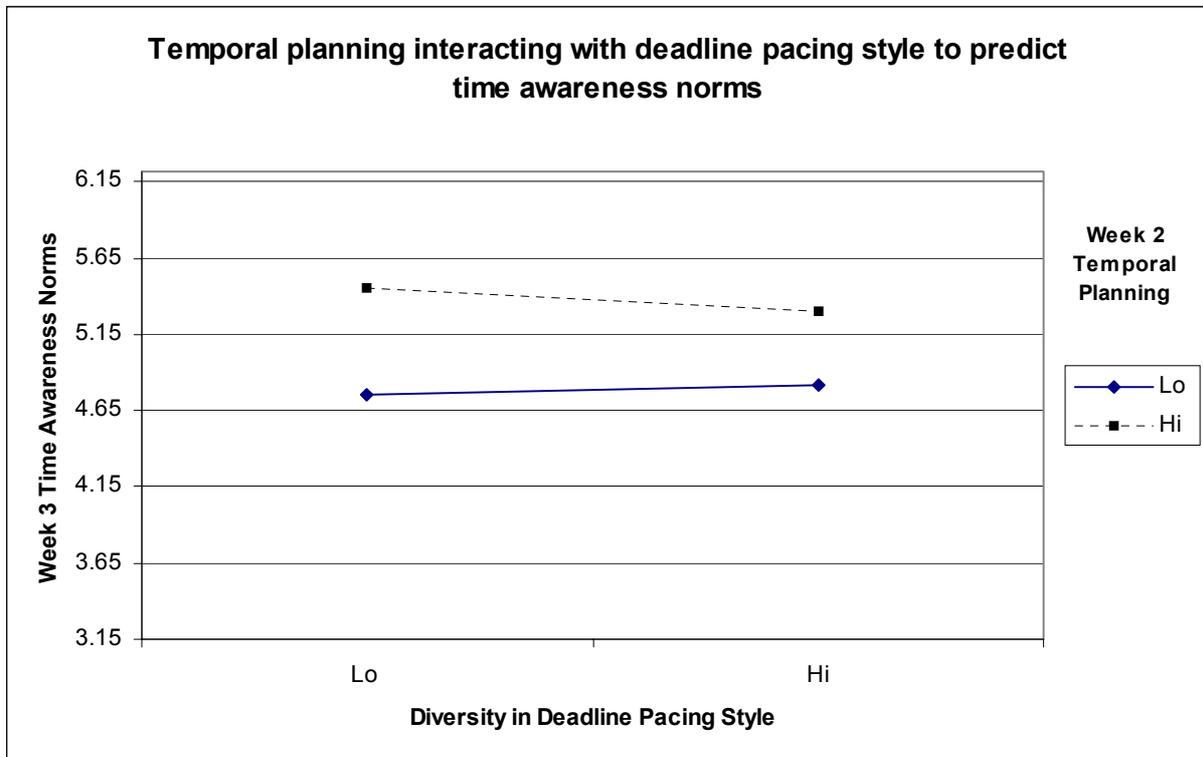


Figure 17. Ancillary analysis: The moderating effect of week 2 temporal planning on the deadline pacing style diversity—time awareness norms (week 4) relationship: **Subteam** level.

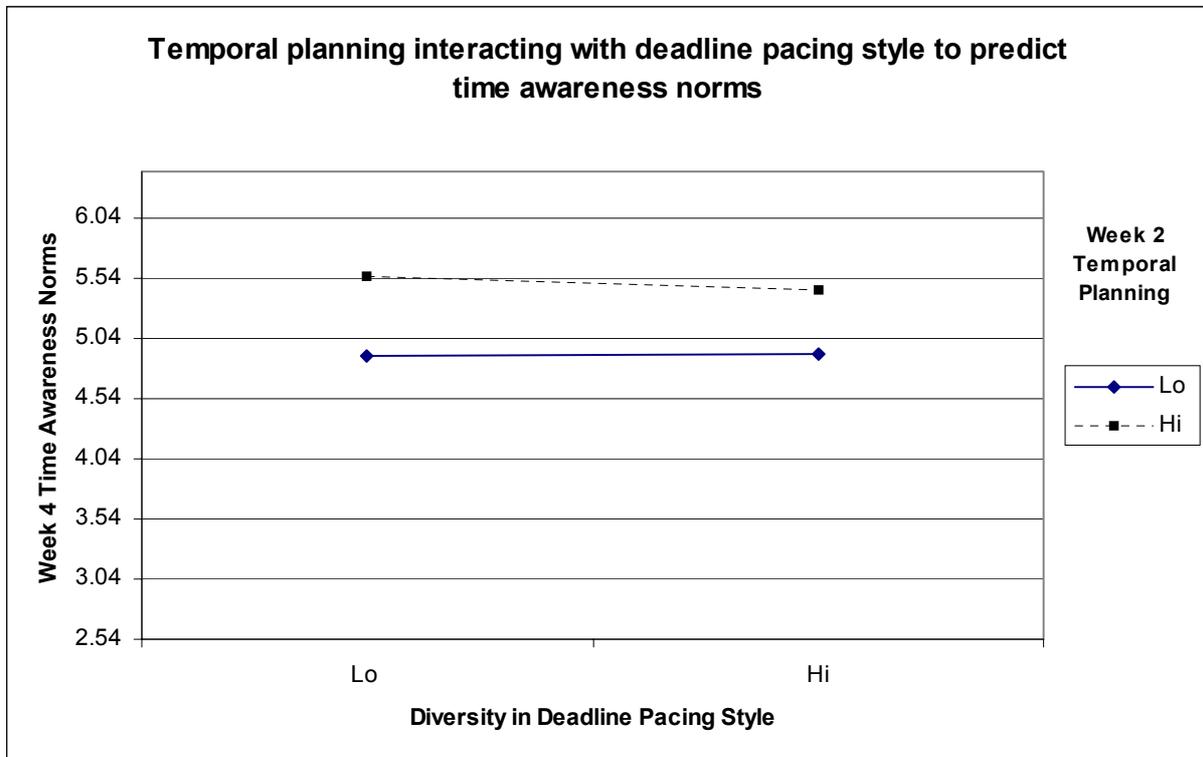


Figure 18. Ancillary analysis: The moderating effect of week 4 temporal planning on the time urgency diversity—time awareness norms (week 4) relationship: **Subteam** level.

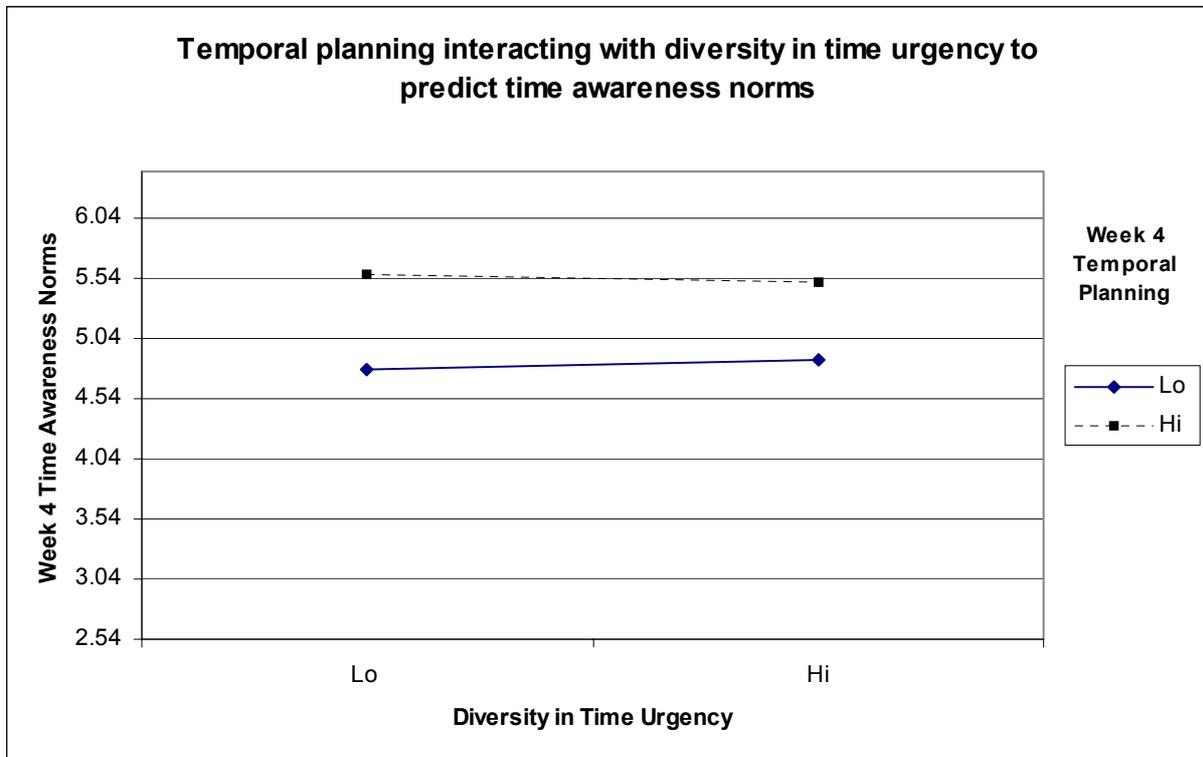


Figure 19. Ancillary analysis: The moderating effect of week 4 temporal planning on the steady pacing style diversity—time awareness norms (week 4) relationship: **Team** level.

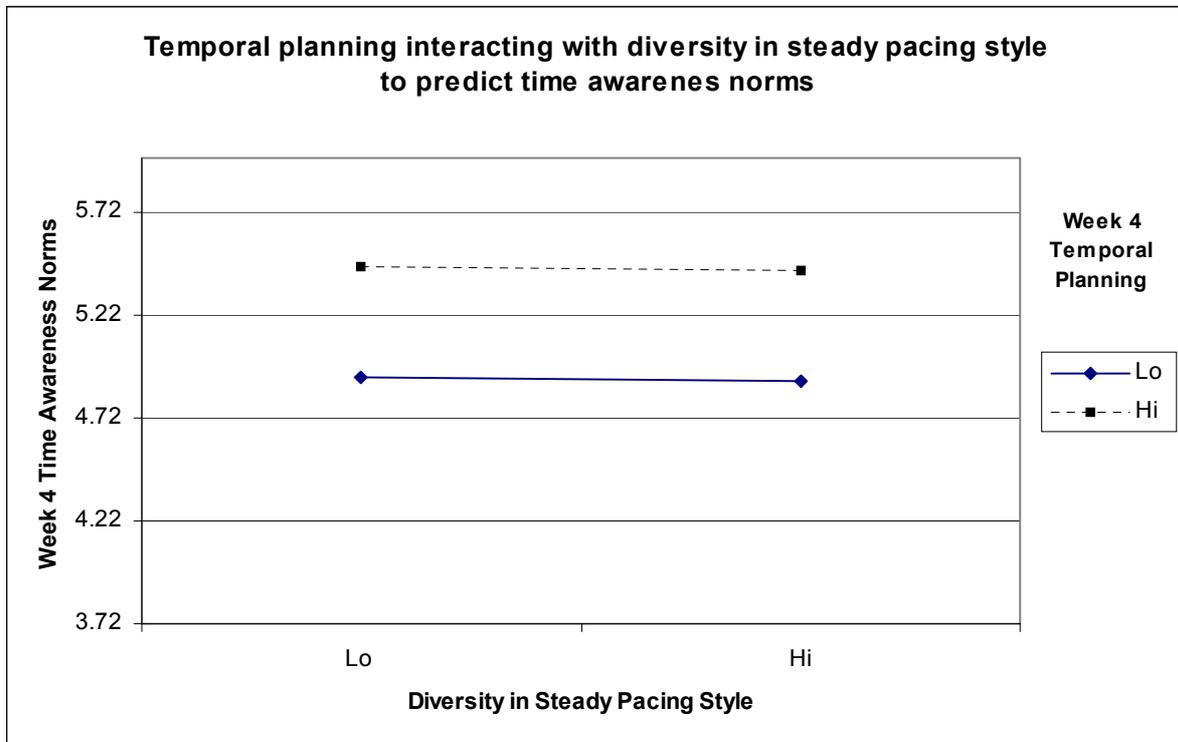
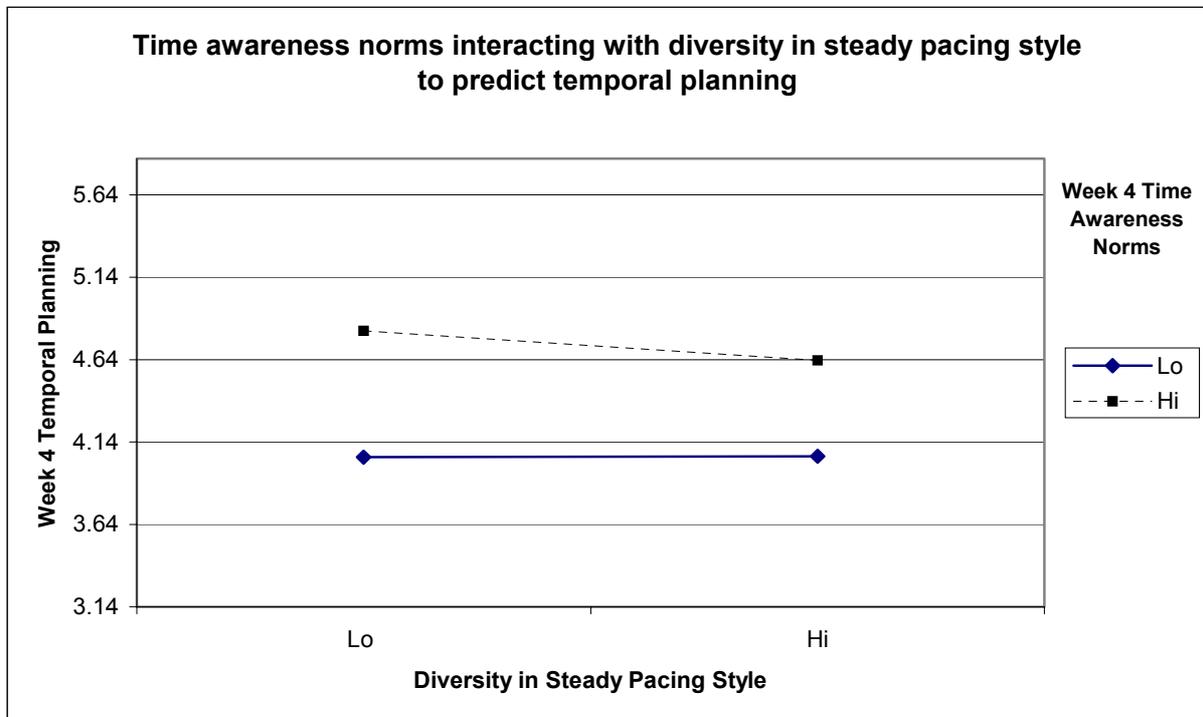


Figure 20. Ancillary analysis: The moderating effect of week 4 time awareness norms on the steady pacing style diversity—temporal planning (week 4) relationship: **Subteam** level.



## Discussion

Initially motivated by McGrath's (1991) discussion on temporal problems and responses in organizations, the overarching goal of this study was to understand the temporal dynamics in teams from a diversity perspective. Organizations and teams are composed of members with divergent temporal tendencies. At a basic level, some people are hurried and generally like getting things done quickly, whereas others prefer to take their time. How do diverse group members work together to achieve results collectively? How much do their tendencies surface and to what extent do members experience disagreement and conflict with regards to how they should spend their time? Moreover, what temporal regulatory mechanisms do teams employ to bring people onto the same page? This study empirically tested the effect of temporal individual difference diversity on conflict with regards to the allocation of temporal resources. Furthermore, this research examined the extent to which temporal regulatory mechanisms (temporal planning and time awareness norms) helped to align team members and reduced conflict despite individuals' temporal tendencies.

Existing diversity literature has largely focused on traditional personality variables, such as the Big Five and cognitive ability (Bell, 2007). This study directs attention to temporal individual differences, which have been rarely studied. Given the prevalence of temporal issues in teams and organizations, providing empirical evidence on temporal individual differences in teams is a step towards a better understanding of these issues. Team researchers have also lamented the lack of consistency in findings regarding diversity (van Knippenberg et al., 2004). Going beyond main effects, this study looked at time awareness norms and temporal planning as moderators. This study identified a number of significant moderated relationships in the absence

of significant main effects. Moderated findings make a contribution to the diversity literature by identifying patterns of situations in which diversity may make a difference.

### *Summary of Findings*

#### *Initial Findings*

A number of notable correlations emerged in the initial analysis. It was found that steady pacing style was negatively correlated with deadline pacing style. At the subteam level, mean level steady pacing style and deadline pacing style both correlated with intermediate temporal outcomes and temporal processes; however, there was no apparent and consistent pattern to these correlations (for example, mean level deadline pacing style correlated negatively with temporal conflict in week 4 and temporal norms in week 4, which seems counter-intuitive).

At the team level, the results were more consistent with what was expected. For example, a higher level of steady pacing style was associated with timeliness of delivery, which suggests that steady pacing style might be more conducive to completing work on time. In contrast, the level of deadline pacing style in a team was found to be negatively associated with temporal planning and norms, which may suggest that groups with individuals high on deadline pacing style may have had difficulty effectively planning and using their time. In addition, as expected, groups with individuals high on deadline pacing styles also tended to turn in their assignments later and performed more poorly, as reflected in the grades for their final proposal. Furthermore, both timeliness of delivery and performance quality were related to greater time awareness norms and less temporal conflict, which was expected.

It should be noted that time zone differences, as revealed in the ancillary analysis section, played a role in several aspects of a team's temporal intermediate outcomes. Teams with greater

time zone differences reported greater conflict, less time awareness norms, and even submitted their assignments later than teams with smaller differences.

### *Findings on Substantive Hypotheses*

Table 40 summarizes all study results in relation to hypotheses. In general, main effect hypotheses were not supported. For example, in examining the direct relationship between diversity in temporal individual differences and temporal conflict, only steady pacing style emerged as a significant predictor of temporal conflict in week 3 at the subteam level. In addition, no significant relationship between temporal conflict and outcome measures emerged.

In contrast to main effects, several significant findings emerged with regards to the moderating effects of temporal planning and time awareness norms. Because a large number of moderated effects were tested (36 in total) and the inconsistencies in findings, summarizing overall patterns of relationships is somewhat difficult. Compared to temporal planning, time awareness norms had a larger number of significant effects on the relationship between diversity in temporal individual differences and temporal conflict. Diversity in steady pacing style, compared to time urgency or deadline pacing style was also associated with a larger number of significant findings. Temporal planning and time awareness norms did not have the same effects in subteams and teams. In fact, there was no instance in which the moderating effect was significant at both subteam and team levels with the same temporal individual difference and moderator. Moreover, although a few effects were consistent with initial hypotheses, moderated results overall tended to be opposite of what was hypothesized. That is, instead of mitigating the potential detrimental effect of diversity in temporal individual differences, temporal planning and time awareness norms either did not help or in some cases amplified it.

### *The Temporal Individual Difference—Conflict Link*

Overall, diversity in temporal individual differences had little effect on temporal conflict in either weeks 3 or 4. The only significant finding was the positive relationship between diversity in steady pacing style and temporal conflict in week 3 in subteams. None of the other effects emerged as significant. Throughout the diversity literature, several studies have pointed to a similar lack of findings for main effect hypotheses. For example, Mohammed and Angell (2004) reported no significant main effects of surface- or deep-level diversity (gender, ethnicity, time urgency, and extraversion) on relationship conflict. Instead, they found that team orientation and team processes played a moderating role in the relationship between diversity and conflict. William and O'Reilly (1998) called for greater attention to be paid to moderators in diversity research. In a similar vein, van Kippenberg, De Dreu and Homan's (2004) Categorization-Elaboration Model (CEM) also focused on the importance of moderators and mediators to help tease apart the potentially conflicting effects of diversity found in the literature. This trend suggests that the effect of diversity may indeed be situation-dependent. Several moderated relationships emerged in this study.

#### *The Moderating Role of Temporal Planning and Time Awareness Norms*

I had initially hypothesized that when team members engage in temporal planning that aims at establishing and enforcing deadlines and regulating flow of interactions, even if the diversity in temporal individual differences was high in these teams, temporal conflict would be mitigated as a result of these alignment-oriented activities. Results from this study showed that proposed alignment-oriented activities sometimes failed to "align" and, in some cases, actually had a detrimental effect. It should be noted that, given the complexity of the findings, results discussed here are overall patterns observed across the different conditions of temporal individual differences, temporal regulatory mechanisms, and time.

The reversed hypothesized effect of temporal planning—the finding that as diversity increases, temporal planning tended to exacerbate the temporal conflict experienced in the team instead of mitigating it—is examined below in light of Tett and Burnett's (2003) trait-based interactionist model. The concept of trait activation suggests that if a particular work situation presents certain types of trait-relevant cues, these cues will likely activate certain kinds of innate traits more than other work situations, which lack such cues. The act of temporal planning—having discussions about time-related priorities and setting deadlines for completing tasks—may be a situation in which temporal cues are richly primed. On the other hand, discussions may be successful at generating appropriate solutions and aligning team members, thereby mitigating conflict. On the other hand, it is also possible that having these discussions may run the risk of increasing conflict, especially when team members have very divergent perceptions and attitudes towards time. During temporal planning, team members explicitly prioritize tasks and set deadlines as well as determine the rhythm of meetings and milestones for assessing progress. These discussions also require team members to compare their individual schedules and availability (Janicik & Bartel, 2003). Time-urgent members may propose to have action-packed meetings and try to get things moving, while less time-urgent members may want to take the time to deliberate and assess. Steady-paced individuals may want to spread tasks out over time, which may meet with resistance from others who want to accomplish tasks all at once. As a result, temporal conflict may heighten when diverse groups engage in more planning instead of less.

This detrimental effect of temporal planning was only found at the subteam level and not at the team level. There are several possible explanations for this. As shown in the preliminary results section, participants spent 25% more time working in subteams than in the larger team

reported greater interdependence, workload sharing, and collective efficacy at the subteam level than at the team level. Subteams also did significantly more temporal planning in subteams than in teams. The more intense interaction in subteams might have made temporal “situational cues” more salient and therefore the effect of temporal planning more pronounced at the lower level of analysis.

Temporal planning in teams also could have occurred after it had taken place in subteams. My observations in the classroom suggested that subteams typically completed portions of weekly tasks and then combined their work. If my observations in PSU’s classrooms can be generalized across subteams, it is possible that by the time two subteams began coordinating their activities, each subteam had already to some extent resolved, or at least put aside their internal conflict and accomplished their part of the work. Because the core work had already been finished by that point, temporal planning between subteams may have a different function as compared to within subteams. Temporal planning may have been significantly “easier” if all that was required was to copy and paste two documents by one of the team leaders. Planning may also have been less complicated when only a small subset of team members had to be involved at this stage. Therefore, temporal planning as it was conducted between subteams might not have been able to reduce temporal conflict when team members were highly diverse in their temporal tendencies. That is, temporal planning at the team level may have been a matter of mechanical coordination between subteams that did not activate deep-level individual differences. However, overall it should be noted that the moderating effects of temporal planning at the subteam level was small and quite sparse.

Time awareness norms played a more significant moderating role as compared to temporal planning but effects were more pronounced at the team level. Whereas only one

marginally significant moderated effect emerged at the subteam level with time awareness norms in week 3 and temporal conflict in week 3, time awareness norms moderated the relationship between all three temporal individual differences and temporal conflict at the team level. Furthermore, results were also inconsistent. For example, time awareness norms in week 3 help reduce the detrimental effect of diversity in steady pacing style on temporal conflict in week 4, but in week 4 showed a reverse tendency in its effect on the relationship between diversity in time urgency and deadline pacing style and temporal conflict in week 4.

Some of these findings are difficult to interpret. For example, preliminary analyses showed that subteams generally reported greater time awareness norms than teams. Following the similar rationale laid out earlier, greater time awareness norms should also enhance the temporal cues in the environment and therefore lead to more apparent manifestation of temporal individual differences at the subteam level. Yet, the moderating effect of time awareness norms was actually more pronounced at the team level (only one marginal effect was found at the subteam level). I argue that the more pronounced effect of time awareness norms at the team level (as compared to the more pronounced effect of temporal planning at the subteam level) may be related to its conceptual and empirical difference from temporal planning. Results earlier showed that these two constructs were only moderately correlated. Time awareness norms are more static and are described as the tendency in a group to conserve time, which can be characterized by setting schedules and deadlines accordingly (Janicik & Bartel, 2003). The norming process gives team members the opportunity to reflect upon their own standards and expectations regarding how they want to spend their time. It can potentially challenge team members to modify their own standards to be aligned with the group. In the case of time awareness norms, which expects team members to conserve and use their time effectively,

members who are more relaxed about their time use may feel compelled to alter their natural preferences. Cultural differences may play a role here and were more prominent at the team level because subteams were from two different cultures in most cases. Within a subteam, in which individuals generally shared a similar national cultural background, temporal norms may be easier to establish due to more similar temporal expectations. Cultural differences in time-related issues have been documented. For example, while speed of delivery is highly valued in the US (Brislin & Kim, 2003), Latin American and south European cultures put more emphasis on allowing events to unfold at a natural pace (Saunders et al., 2004). It is possible that establishing a uniform temporal norm in a team is therefore much more challenging in a team than in a subteam. The more effortful norming process at the team level may account for the more pronounced effect of time awareness norms.

Moreover, the mixed effects associated with time awareness norms suggest that time awareness norms may be a more complex concept and possibly more situation-dependent than temporal planning. In theory, if a group has reached the implicit agreement that members will have a set schedule and adhere to deadlines, the implication is that individuals have agreed to “put aside” their individual temporal differences and conform to the expectation of the group. That is, time awareness norms should be a stage in a group’s lifecycle when individuals are on the same page about how they were going to carry out their collaboration. If that is the case, time awareness norms should help reduce conflict as diversity increases. Evidence from this study suggests that norming as a regulatory mechanism may not always produce the intended result. The specific findings in this study suggested that, in most cases, time awareness norms did not help mitigate the effect of diversity but also did not necessarily aggravate it. As compared to the detrimental effect of temporal planning (in terms of heightening conflict), the effect of time

awareness norms was more moderate. Furthermore, this trend can also be an indicator that differences in deep-level diversity are not easy to mitigate and regulate. This is consistent with what the diversity literature has generally suggested.

*The Absence of Temporal Conflict's Mediating Effect*

I proposed that temporal conflict would play a mediating role between temporal individual differences and (1) the quality of performance and (2) timeliness of delivery. These hypotheses were not supported because no significant relationships were found between temporal conflict and either outcome measure. Although past research has suggested that conflict could play a mediating role between diversity and performance (Jehn et al., 1999; Pelled et al., 1999), temporal conflict had no such effect in this study.

The lack of relationship between temporal conflict and performance quality may be explained by the restricted range in both temporal conflict and project scores. Project scores had a mean of 88.72 with a standard deviation of 10.51. However, 70% of the project scores from the 60 teams were in the 85-100 points range. Temporal conflict at the team level was relatively low, with means ranging between 2.24 and 2.62 and standard deviations ranging between .61 and .83. The greatest difference between lowest and highest conflict scores was 3.23, reported at week 4. Restricted range in both these variables may have attenuated their relationship. Similarly, timeliness of delivery, operationalized as the difference in minutes between time of delivery and deadline, also had a limited range. Seventy-five percent of time, across all teams and all 4 weeks, teams submitted required tasks within one day, either before or after the deadline.

*The Effect of Time on the Diversity (in Time Urgency)—Temporal Conflict Link*

Because no significant relationship was found between time urgency and temporal conflict in either weeks 3 or 4, no further analysis was conducted on the data gathered for the 60

teams. As discussed earlier, the lack of a significant direct impact of temporal individual differences is not an unexpected result in the current diversity literature. However, the emphasis on the effect of time should be examined with more sophisticated methods, such as hierarchical linear modeling. Since only two points of conflict were measured across the 60 teams and HLM cannot be used with only two points of measurement, this technique was not explored further. However, Looking across temporal planning and time awareness norms, all the effects found tended to emerge later in the project. For example, temporal planning in week 2 showed no influence and time awareness norms in week 3 had little effect as well on the relationship between diversity in temporal individual differences and temporal conflict. This is not surprising given that the interaction among group members was likely to be much more intense later in the project rather than earlier.

#### *Summary*

Looking across findings from this study, it is apparent that time played a crucial role in various aspects of a team's life. Although some findings were not consistent and sometimes counter-intuitive, they suggest that the temporal nature of teamwork should not be overlooked. A few key trends are identified here. First, temporal planning and time awareness norms, by themselves, can be effective mechanisms that can help create better performance quality and on-time delivery. Secondly, at least from the correlation analysis, conflict around time is likely to negatively influence performance. Furthermore, although it is unclear how diversity in temporal individual differences directly influences intermediate temporal outcomes such as temporal conflict and time awareness norms, they *can* become more salient as a result of temporal planning and as a result, lead to greater conflict and weaker norms. This effect is more salient at

the subteam level than at the team level. Again, findings from this study are largely complex and inconsistent and these themes are general patterns identified from these results.

#### Limitations and Future Research

There are a number of limitations in this study. Relying on a student sample, this study offers a limited view of the temporal dynamics in teams. Specifically, students have a strong tendency to start late in the process (typically right before deadline) and often have a last-minute crunch period. The potential lack of variability in terms of the rhythm or pace at which the project was carried out across different student teams may have contributed to the general lack of findings. Outside university setting, project teams may not have the luxury of starting at the last minute and still completing work without suffering unpleasant consequences. In addition, faced with a large number of survey items and being surveyed on a weekly basis, students in this sample might not have taken the survey as seriously as researchers would have liked. Both the background and post-project surveys were very lengthy. Students were given credits for completing the surveys, but this does not guarantee the quality of their responses. The quality of survey responses in this study might have also contributed to the general lack of significant findings. Therefore, investigating the issues examined in this study with other types of research methods (i.e., more qualitative methods) in an organizational setting may be important for future research.

Moreover, a variety of factors other than conflict can influence performance quality and timeliness, but were not indexed in this study. For example, meta-analyses have found that cognitive ability ((Bell, 2007; Devine & Philips, 2001) and conscientiousness (Bell, 2007; Stewart, 2006) are positively related to team performance. One complexity with measuring grade

point average (GPA) as a proxy for cognitive ability was that there is no equivalent system like GPA in countries other than US.

In addition, the original design of this study purposefully incorporated multiple measurements of temporal regulatory mechanisms in order to capture (1) dynamic changes in conflict, norm, and planning and (2) the evolving impact of diversity in temporal individual differences on temporal conflict and team effectiveness. However, to avoid over-burdening participating students, measurements were not consistently taken across all four weeks. The limited number of measurements did not allow for more thorough analysis of dynamic changes. Taking multiple measurements should also be considered as a direction for future research.

The study was designed to focus solely on temporal variables with the intention to (1) better understand variables with a temporal referent and (2) better capture the relationship among input, process, and outcome variables by leveraging the content alignment. However, do temporal individual differences actually add unique variance in team performance beyond other traditionally-used variables, such as the Big Five and cognitive ability? It was not practical to measure these variables within the scope of this project, considering that participants were already responding to long surveys. The different cultural and language backgrounds of teams in other cultures made lengthy surveys in English infeasible. However, future research should incorporate broader personality and ability measures in order to differentiate the effects of time-based individual differences in the team context.

Moreover, significant findings tended to emerge in the same time period, making it difficult to draw inferences about the causal direction of these relationships. More importantly, although temporal conflict, norms, and planning were measured at multiple points in time, they were treated as “snapshots” of what was happening in the team at that moment. In reality, these

concepts are much more fluid in nature and are likely evolving all the time. Finding a method that can capture the fluid nature of these concepts and investigate their (causal) interrelationships will be a challenge.

Finally, as research on temporal individual differences increases, one way to capture meaningful distinctions among different measures will be to establish specific mechanisms between measures and outcomes. For example, does diversity in time urgency influence temporal conflict through a different mechanism than diversity in time awareness norm? Future research that investigates specific mechanisms will help provide validity evidence for these temporal constructs that are gathering greater interest in team research.

Beyond the current study, future research should answer a number of questions. First, to what extent do temporal mechanisms compliment other types of team processes, such as team mental models and cohesion? This is a particularly interesting question because temporal processes are fundamental to “alignment” and “synchronization” in a team. For example, can team mental models develop properly and quickly enough if team members are temporally misaligned? Will temporal misalignment disrupt the development of cohesion? Future research should consider the interrelationships between temporal team processes and other non-temporal processes in a team.

Temporal alignment across levels can also be a fruitful direction for multi-level research. The extent to which synchronization among individuals, teams, and units occurs can have important implications for organizational success. In different contexts, synchronization may or may not be effective. For example, when a higher level requires continuous input from a lower level in order to make good decisions, temporal alignment may be crucial. However, when higher and lower levels face different environmental pressures and forces, decoupling between

levels might be more effective. Moreover, when certain temporal processes do not align across levels or when different temporal dynamics occur at different levels, cross-level relationships may be particularly informative. This study examined some of these issues by testing a similar set of hypotheses at two different levels.

More importantly, cultural differences played a crucial role in all virtual teams that work across national boundaries. Cultural differences were downplayed in this study because the focus here was on time, but these differences no doubt have contributed to the dynamics surfaced in these teams. Moreover, cultural and temporal differences were intertwined in this study. For example, people from different cultures may have different expectations for the use of time and may view deadlines very differently. The fact that culture and time zone difference were confounded in this study makes it impossible to simultaneously consider the effect of both. Future research needs to be able to tease apart the effects of two, but more importantly, investigate the role played by culture in this type of virtual teams.

Timeliness of delivery was introduced as a measure of performance outcome in this study. The concept in itself is interesting for two reasons. First, although quality of performance is important, timeliness of completion can determine whether or not a product gets out to the market on time or a proposal gets a fair chance of being reviewed and compared with competitors. Secondly, the operationalization of timeliness can be tricky. Is turning in a proposal 5 minutes before deadline qualitatively different from turning it in 5 hours before the deadline? The answer depends on the context in which the question is asked. In industries, being able to beat the deadline by a few days might mean winning a significant bid or a significant segment of the market. In this particular study, turning in an assignment early does not win students any extra credit. This study operationalized this construct both as a dichotomous (early/on-time or

late) and as a continuous variable (minutes to submission deadline), but no significant finding emerged with either. This construct remains a conceptually interesting and practically relevant one for future research.

“Temporal difference” is a multi-dimensional construct. When looking at the differences in relation to time between subteams and teams, this study only took into account time zone differences measured as the number of hours apart as a control variable. In reality, there are many other aspects to temporal differences. Within a subteam, team members have different schedules and availabilities. Within a team, subteams may have different course schedules or get different amount class time to work on tasks. Future research may need to begin with a taxonomy of such “structural” temporal differences and investigate whether or not different temporal differences have distinguishable impact on team members’ perceptions, team processes, and team outcomes.

Table 40. Summary of study results.

	IV	Moderator/Mediator	DV	Effect Found
H1. Diversity in time urgency	----- temporal conflict	Time urgency	Temporal conflict wk. 3 Temporal conflict wk. 4	
H2. Diversity in steady style	----- temporal conflict	Steady style	Temporal conflict wk. 3 Temporal conflict wk. 4	S * (e)
H2. Diversity in deadline style	----- temporal conflict	Deadline style	Temporal conflict wk. 3 Temporal conflict wk. 4	
H3a. Diversity in time urgency	----- temporal conflict ↑ Temporal planning	Time urgency	Temporal planning wk. 2 → Temporal conflict wk. 3 Temporal planning wk. 2 → Temporal conflict wk. 4 Temporal planning wk. 4 → Temporal conflict wk. 4	S † (u)
H3b. Diversity in steady style	----- temporal conflict ↑ Temporal planning	Steady style	Temporal planning wk. 2 → Temporal conflict wk. 3 Temporal planning wk. 2 → Temporal conflict wk. 4 Temporal planning wk. 4 → Temporal conflict wk. 4	S * (u)
H3b. Diversity in Deadline style	----- temporal conflict ↑ Temporal planning	Deadline style	Temporal planning wk. 2 → Temporal conflict wk. 3 Temporal planning wk. 2 → Temporal conflict wk. 4 Temporal planning wk. 4 → Temporal conflict wk. 4	
H4a. Diversity in time urgency	----- temporal conflict ↑ Time awareness norms	Time urgency	Time awareness norms wk. 3 → Temporal conflict wk. 3 Time awareness norms wk. 3 → Temporal conflict wk. 4 Time awareness norms wk. 4 → Temporal conflict wk. 4	T * (u)
H4b. Diversity in steady style	----- temporal conflict ↑ Time awareness norms	Steady style	Time awareness norms wk. 3 → Temporal conflict wk. 3 Time awareness norms wk. 3 → Temporal conflict wk. 4 Time awareness norms wk. 4 → Temporal conflict wk. 4	T * (e) T * (e)
H4b. Diversity in deadline style	----- temporal conflict ↑ Time awareness norms	Deadline style	Time awareness norms wk. 3 → Temporal conflict wk. 3 Time awareness norms wk. 3 → Temporal conflict wk. 4 Time awareness norms wk. 4 → Temporal conflict wk. 4	S † (e) T * (u)

S – Effects found at the subteam level; T – Effects found at the team level

† –  $p < .10$ ; \* –  $p < .05$

(u) – unexpected, opposite of hypothesized; (e) – expected, same as hypothesized

Table 40. Summary of study results. (continued)

			<b>IV</b>	<b>Moderator/Mediator</b>	<b>DV</b>	<b>Effect Found</b>
H5. Temporal conflict	-----	perf. quality	Conflict (wk. 3) Conflict (wk. 4)		Quality of performance	
H6. Temporal conflict	-----	timeliness of delivery	Conflict (wk. 3) Conflict (wk. 4)		Timeliness of Delivery (wk. 3 & 4)	
H7a. TU --- Div.	T. Conflict ---	perf. Quality	Diversity in time urgency	Temporal conflict wk. 3 & 4	Quality of performance	
H7b. PS --- Div.	T. Conflict ---	perf. quality	Diversity in pacing styles	Temporal conflict wk. 3 & 4	Timeliness of Delivery (wk. 3 & 4)	
H8a. TU --- Div.	T. Conflict --	timeliness of delivery	Diversity in time urgency	Temporal conflict wk. 3 & 4	Quality of performance	
H8b. PS --- Div.	T. Conflict --	timeliness of delivery	Diversity in pacing styles	Temporal conflict wk. 3 & 4	Timeliness of Delivery (wk. 3 & 4)	
H9. Diversity in time urgency will have a stronger effect on temporal conflict later than earlier.			Diversity in time urgency		Temporal conflict wk. 3 & 4	

S – Effects found at the subteam level; T – Effects found at the team level

† –  $p < .10$ ; \* –  $p < .05$

(u) – unexpected, opposite of hypothesized; (e) – expected, same as hypothesized

## Conclusion

Overall, there were three key findings in this study. First, diversity in temporal individual differences did have an impact on temporal conflict, but its influence was largely situation-dependent. Second, temporal planning and time awareness norms did not always mitigate the influence of diversity, but in some cases even aggravated conflict around temporal resource allocation when diversity is high. Temporal regulatory mechanisms aimed at aligning team members, but inevitably bring out people's inherent temporal tendencies run the risk of leading to greater challenges in the alignment process. Finally, dynamics at a lower level of the organization did not always manifest in the same way at a higher level. The effects found in this study did not overlap between the team and subteam levels, and the differences in the intensity of interaction between two levels may explain this discrepancy. Moreover, the nature of the challenges facing different levels of the organization (in this case, the presence of cultural differences at the team level) may largely dictate how diversity and a regulatory process exert their impact.

## Appendix A

## Time urgency scale

For each statement below, please indicate the extent to which the statement is characteristic of you.

1. I find myself hurrying to get places even when there is plenty of time.

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

2. I often work slowly and leisurely.

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

3. People that know me well agree that I tend to do most things in a hurry.

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

4. I tend to be quick and energetic at work.

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

5. I often feel very pressured for time.

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

6. My spouse or a close friend would rate me as definitely relaxed and easy going.

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

## Appendix B

## Pacing styles scale

For each statement below, please indicate the extent to which the statement is characteristic of you.

1. When performing a task or project, I start right away and finish the work long before the deadline.

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

2. When performing a task or project, I do quite a bit of work at the start so that I can relax a little towards the end.

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

3. I would rather turn work in early than risk being late.

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

4. I do not get much done on a task or project until the due date is close.

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

5. I do most of the work on a task or project in a relatively short time before the deadline.

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

6. I put in more effort towards the end of a project than at the beginning.

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

7. When working on a project, I work steadily on tasks, spreading my work out evenly over time (e.g., 3 hours per week until the deadline).

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

8. The amount of effort I put into a project is fairly consistent over time from start to finish.

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

9. I do small chunks of work over time rather than a large chunk at one time.

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

## Appendix C

## Temporal conflict scale

Please respond to the following questions based on your group's activities **this week**:

1. To what extent do team members disagree about time allocation in your work team (how much time to spend on tasks)?

1	2	3	4	5	6	7
To a small extent						To a great extent

2. To what extent is there is conflict about how you should pace task activities in your team?

1	2	3	4	5	6	7
To a small extent						To a great extent

3. To what extent are there disagreements about how long to spend on specific tasks in your team?

1	2	3	4	5	6	7
To a small extent						To a great extent

## Appendix D

## Temporal planning scale

Please respond to the following questions based on your group's activities **this week**:

1. To what extent did your group prioritize tasks and allocate time to each task?

1	2	3	4	5	6	7
To a small extent						To a great extent

2. To what extent did your group discuss any deadlines?

1	2	3	4	5	6	7
To a small extent						To a great extent

3. To what extent did your group prepare and build-in time for contingencies, problems, and emerging issues?

1	2	3	4	5	6	7
To a small extent						To a great extent

4. To what extent did your group discuss how often it was going to meet?

1	2	3	4	5	6	7
To a small extent						To a great extent

5. To what extent did you discuss how long each particular task would take?

1	2	3	4	5	6	7
To a small extent						To a great extent

6. To what extent did your group set milestones to measure progress on the project?

1	2	3	4	5	6	7
To a small extent						To a great extent

7. To what extent did people compare their personal schedules for meetings, project-related tasks, etc?

1	2	3	4	5	6	7
To a small extent						To a great extent

## Appendix E

## Time awareness norm scale

Please respond to the following questions based on your group's activities **this week**:

1. Subteam/team members felt that deadline didn't really matter.

1	2	3	4	5	6	7
To a small extent						To a great extent

2. Staying on schedule was important in our subteam/team.

1	2	3	4	5	6	7
To a small extent						To a great extent

3. It was important to meet the deadlines that we set for ourselves.

1	2	3	4	5	6	7
To a small extent						To a great extent

4. We didn't pay much attention to schedules we set for ourselves.

1	2	3	4	5	6	7
To a small extent						To a great extent

5. It was very important to be "on time" for everything.

1	2	3	4	5	6	7
To a small extent						To a great extent

6. Subteam/team members did things when they were ready; we did not set a schedule for our work.

1	2	3	4	5	6	7
To a small extent						To a great extent

7. No one got upset when we missed a deadline that we set for our work.

1	2	3	4	5	6	7
To a small extent						To a great extent

8. Subteam/team members did most of their work under deadline.

1	2	3	4	5	6	7
To a small extent						To a great extent

9. All of our work was tightly scheduled.

1	2	3	4	5	6	7
To a small extent						To a great extent

10. Most subteam/team members didn't think about how they used their time.

1	2	3	4	5	6	7
To a small extent						To a great extent

11. Subteam/team members worried about using their time well.

1	2	3	4	5	6	7
To a small extent						To a great extent

12. Subteam/team members planned their activities very carefully.

1	2	3	4	5	6	7
To a small extent						To a great extent

13. Subteam/team members expected you to know how long it would take you to do something.

1	2	3	4	5	6	7
To a small extent						To a great extent

## Appendix F

## Demographic information

The purpose of this questionnaire is to gather some background information. All information is confidential.

1. I am an: \_\_\_\_\_ undergraduate student      \_\_\_\_\_ graduate student

2. My undergraduate major is/was:

\_\_\_\_\_ business (i.e., accounting, finance, management, marketing)

\_\_\_\_\_ computer science

\_\_\_\_\_ engineering

\_\_\_\_\_ information systems/science

\_\_\_\_\_ psychology

\_\_\_\_\_ other (please specify): \_\_\_\_\_

3. I am a: \_\_\_\_\_ female      \_\_\_\_\_ male

4. My age is:

\_\_\_\_\_ under 23

\_\_\_\_\_ 23-30

\_\_\_\_\_ 31-35

\_\_\_\_\_ over 35

5. Your country of origin refers to the country in which you were born. My country of origin is:

\_\_\_\_\_

6. Ethnicity:

\_\_\_\_\_ Caucasian/White

\_\_\_\_\_ Hispanic

\_\_\_\_\_ African American/Black

\_\_\_\_\_ Asian/Asian American

\_\_\_\_\_ American Indian

\_\_\_\_\_ Other

## Appendix G

## Team interaction type scale

Please estimate the percentage of time that your team spends working in the following way for the current project **this week**:

1. \_\_\_\_\_% working all together as the team (all subteams together)
2. \_\_\_\_\_% working in subteams
3. \_\_\_\_\_% working as individuals (e.g., We divide tasks up individually, work on our own, and then pool efforts together).
4. \_\_\_\_\_%. Other (Please describe: \_\_\_\_\_)

Note: Percentages should add up to 100%.

## Appendix H

## Collective efficacy scale

Rate your team (or subteam) on the extent to which you agree that it exhibits the following characteristics, with 1 = Completely disagree and 7 = Completely agree.

1. Reach agreement about what needs to get done at each meeting.

1	2	3	4	5	6	7
To a small extent						To a great extent

2. Find ways to bridge individual differences between team members.

1	2	3	4	5	6	7
To a small extent						To a great extent

3. Assist members who are having difficulty with certain tasks.

1	2	3	4	5	6	7
To a small extent						To a great extent

4. Develop a workable project design in a reasonable amount of time.

1	2	3	4	5	6	7
To a small extent						To a great extent

5. Communicate well with one another despite differences in cultural background.

1	2	3	4	5	6	7
To a small extent						To a great extent

6. Adapt to changes in group tasks and goal.

1	2	3	4	5	6	7
To a small extent						To a great extent

7. Work well together even in challenging situations.

1	2	3	4	5	6	7
To a small extent						To a great extent

8. Deal with feedback or criticism from the course instructor.

1	2	3	4	5	6	7
To a small extent						To a great extent

9. Find ways to capitalize on the strengths of each member.

1	2	3	4	5	6	7
To a small extent						To a great extent

## Appendix I

## Task interdependence scale

Rate your team (or subteam) on the extent to which you agree that it exhibits the following characteristics, with 1 = Completely disagree and 7 = Completely agree.

1. I need information and advice from my team members to perform my tasks in this project.

1	2	3	4	5	6	7
To a small extent						To a great extent

2. I have a one-person job; it is not necessary for me to coordinate or cooperate with other team members in this project.

1	2	3	4	5	6	7
To a small extent						To a great extent

3. I need to collaborate with my team members to perform my tasks in this project.

1	2	3	4	5	6	7
To a small extent						To a great extent

4. My team members need information and advice from me to perform their tasks well.

1	2	3	4	5	6	7
To a small extent						To a great extent

5. In this project, I regularly have to communicate with team members about project-related issues.

1	2	3	4	5	6	7
To a small extent						To a great extent

## Appendix J

## Workload sharing scale

Rate your team (or subteam) on the extent to which you agree that it exhibits the following characteristics, with 1 = Completely disagree and 7 = Completely agree.

1. Everyone on my team does their fair share of work.

1	2	3	4	5	6	7
To a small extent						To a great extent

2. No one in my team depends on other team members to do the work for them.

1	2	3	4	5	6	7
To a small extent						To a great extent

3. Nearly all the team members on my team contribute equally to the work.

1	2	3	4	5	6	7
To a small extent						To a great extent

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