2011

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Effects of Psychological Collectivism on Team Performance Over Time

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We examined the influences of different facets of psychological collectivism (Preference, Reliance, Concern, Norm Acceptance, and Goal Priority) on team functioning at 3 different performance depictions: initial team performance, end-state team performance, and team performance change over time. We also tested the extent to which team-member exchange moderated the relationships between facets of psychological collectivism and performance change over time. Results from multilevel growth modeling of 66 teams ($N = 264$) engaged in a business simulation revealed differential effects across facets of psychological collectivism and across different performance measurements. Whereas facets concerned with affiliation (Preference and Concern) were positively related to initial team performance, reliance was negatively related to initial team performance. Goal Priority was a strong predictor of end-state performance. Team-member exchange moderated the relationship between performance change and 3 of the 5 facets of psychological collectivism (Preference, Reliance, Norm Acceptance). Implications for team composition and team training are discussed.

Keywords: collectivism, team performance, longitudinal performance, TMX, multilevel modeling

There is substantial consensus that an essential component of effective team functioning is cooperation among individual members (LePine, Hanson, Borman, & Motowidlo, 2000; Stevens & Campion, 1994). As such, identifying the factors that account for differences in the extent to which individuals exhibit cooperative behaviors and, ultimately, differences in team performance is often cited as an important issue both for organizational research and for human resource practice (Wagner, 1995). One factor purported to enhance individuals' propensities to cooperate in team contexts is *collectivism* (Cox, Lobel, & McLeod, 1991; Earley & Gibson, 1998; Wagner, 1995). In a broad sense, collectivism represents the degree to which individuals hold a general orientation toward group goals, a concern for the well-being of the group and its members, an acceptance of group norms, and a tendency toward cooperation in group contexts (Triandis, 1995; Wagner, 1995; Wagner & Moch, 1986). For these reasons, collectivism would seem a logical and fruitful construct to examine for its influence on how teams function.

Yet, whether or not collectivism actually predicts performance in team contexts remains largely unexplored (Jackson, Colquitt, Wesson, & Zapata-Phelan, 2006). Several authors have noted (e.g.,

Earley & Gibson, 1998; Oyserman, Coon, & Kemmelmeier, 2002; Triandis, Chan, Bhawuk, Iwao, & Sinha, 1995) that one reason for the paucity of empirical work stems from various psychometric shortcomings associated with collectivism measures. Recognizing these reliability and validity problems, Jackson et al. (2006) recently developed a new measure of collectivism derived from an integrative conceptual review of existing scales. Their multifaceted measure of *psychological collectivism* is designed to capture individual differences (vs. cultural differences) in collectivism. In addition to offering supportive evidence of the construct-related validity of this measure, Jackson et al. presented findings linking psychological collectivism to several important individual-level outcomes for people working in team contexts. For example, psychological collectivism was shown to be positively associated with supervisor ratings of team-member task performance and citizenship behavior and negatively associated with counterproductive work behavior and withdrawal behavior. The particular facets of psychological collectivism also displayed differential prediction across these four outcomes, further suggesting that a more nuanced view of psychological collectivism can lend valuable insight into how this construct relates to team functioning.

Although the preliminary results for the influence of psychological collectivism on team-member behavior are indeed promising, additional research that focuses on psychological collectivism as a team composition variable is clearly needed. Therefore, we sought to extend this nascent research domain in three important ways. First, we examined whether average individual psychological collectivism within a team was predictive of team performance, which allowed us to test whether elevated levels of the psychological collectivism facets were predictive of performance at the team level. This approach extends the work by Jackson et al. (2006), which focused on individual-level outcomes, by directly investigating the consequences of psychological collectivism on

team outcomes. Second, we examined how psychological collectivism affects team performance as it unfolds over time. Such longitudinal investigations are essential for understanding team functioning and performance, primarily because teams are now widely conceptualized as adaptive and dynamic systems (Ilgen, Hollenbeck, Johnson, & Jundt, 2005; McGrath, Arrow, & Berdahl, 2000; Mohammed, Hamilton, & Lim, 2008). We tested psychological collectivism for its potential effects on three performance time points: (a) the team's initial performance level, (b) the team's end-state or final performance level, and (c) the team's performance change over time. Third, we explicitly incorporated an assessment of team members' perceptions of the quality of cooperation among team members by using a measure of team-member exchange (Seers, 1989). The perceived quality of exchanges may influence team members' motivation to continue to expend team-directed efforts and consequently attenuate or amplify the effects of psychological collectivism on team performance over time.

In the following sections, we discuss the dynamic nature of team performance and how psychological collectivism shapes such performance. We develop hypotheses for the effects of different facets of psychological collectivism on team performance at various temporal stages. We then describe the moderating role that team members' perceptions of the quality of cooperation play in relation to the effects of psychological collectivism facets on longitudinal changes in team performance.

Psychological Collectivism and Team-Level Performance

Although collectivism has historically been studied at the cultural level (Hofstede, 2001), more recent research has begun to examine collectivism as an individual difference variable in team settings (Eby & Dobbins, 1997; Kirkman & Shapiro, 2001). Given that individuals with higher collectivistic orientations base their identity on group membership as well as value interdependence and the group over themselves, teams composed of more collectivistic individuals should engage in behaviors that promote the effective functioning of the team. The limited empirical research investigating collectivism as a team compositional variable is generally supportive of this notion. For example, in teams composed of highly collectivistic individuals, members give more emotional, informational, and appraisal support to one another than do members of teams composed of those low on collectivism (Drach-Zahavy, 2004). The proportion of highly collectivistic individuals on a team is related to cooperation in teams (Eby & Dobbins, 1997). Finally, research has shown higher psychological collectivism of team members to be associated with increased citizenship behavior among these individuals (Jackson et al., 2006). Given the link between collectivism and supportive teamwork behaviors and the importance of these behaviors for team performance, it follows logically that teams comprising more psychologically collectivistic members should perform more effectively than teams comprising less psychologically collectivistic members.

Jackson et al. (2006) described five specific facets of psychological collectivism: Preference, Concern, Reliance, Norm Acceptance, and Goal Priority. Although all of these facets should promote cooperation in teams and ultimately benefit performance, the facets are thought to promote cooperation for different reasons.

For example, Preference and Concern reflect a sense of attraction to the group, and this affinity toward the group promotes cooperation. Goal Priority and Reliance are thought to support cooperation by fostering goal and task interdependence. Finally, Norm Acceptance is thought to benefit cooperation through the development of shared norms and prosocial behavior. Given the different avenues through which these facets should facilitate cooperation, it is also likely that the facets of psychological collectivism will show differential relationships with how teams perform over time.

Jointly considering the nature of team performance and the distinct facets of psychological collectivism can contribute to our understanding of the relationship between collectivism and team performance. Despite the widespread agreement that team performance is dynamic and the importance of time in theories of team performance (e.g., Kozlowski, Gully, Nason, & Smith, 1999), longitudinal studies that examine the temporal nature of predictors of team performance are rare (Mohammed et al., 2008). Kozlowski et al. (1999) suggested that newly formed teams shift from being a collection of individuals to a fully functioning interdependent team via a compilation process. In other words, effective teams do not start initially with their full capabilities; instead, they form, establish regulatory mechanisms, and evolve over time (Kozlowski et al., 1999). The compilation process for teams is a continuous set of phases: team formation, task compilation, role compilation, and team compilation. During team formation, individuals come together and seek information about one another and the basic nature of the team, including its purpose. During task compilation, individuals try to demonstrate their task competencies to one another and are focused on what they need from one another. During role compilation, team members begin to connect with one another and figure out how their actions affect other members. Members also focus on having their needs met and what they must do to help others. During the final phase (team compilation), team members learn how to improve their network of roles and to deal with routine and normative situations. Given the different primary concerns of teams through the compilation process, some factors are thought to be more important than others during specific phases. Teams that effectively develop performance capabilities appropriate to the different phases should more effectively navigate the compilation process and display better team performance at measurements consistent with these phases.

In the ensuing paragraphs, we use Kozlowski et al.'s (1999) theory of compilation and performance to describe how facets of psychological collectivism are related to initial and end-state performance, as well as changes in team performance over time. Two important caveats should be noted. First, we do not directly test Kozlowski et al.'s theory; rather, we use it at a global level of specificity. That is, we rely on the theory as a conceptual backdrop to inform hypothesis building around the effects of psychological collectivism on team performance over time. For example, we expect measures of initial team performance to be reflective of a team in early stages of development (i.e., team formation) and measures of end-state team performance (after several weeks of interaction) to be reflective of a team in later stages of team development (e.g., team compilation). However, we do not directly test specific propositions of the theory, such as phase transitions and shifts in focal level (individual to dyad to team). Second, although we expect facets of psychological collectivism to be highly related and to some degree have effects on performance

throughout a team's development, we argue that some facets are more likely to exert influence at particular periods of performance measurement. Thus, when developing hypotheses we necessarily emphasize predictions for those facets most likely to be influential for team performance measured at specific stages of team development.

Initial Team Performance

During team formation, individuals socialize into the team and try to develop an understanding of the new team situation. The initial focus of team members is thought to be that of new team members working toward reducing social ambiguity with the other members. Team members also gain basic knowledge about the team itself (e.g., its goal, climate, norms) and begin to understand where their individual roles align with team goals. Key outcomes of team formation are knowledge about social relationships and an orientation to the team as a whole, including developing a commitment to team goals, climate perceptions, and behavioral norms (Kozlowski et al., 1999). Teams that can more quickly and effectively navigate through team formation can turn their focus to task performance. An underlying motivation for collectivists is thought to be the propensity to associate with social units in order to establish their own self-concepts (Shamir, 1990). Because the identities of collectivistic individuals are based on social contexts, these individuals should more easily identify with the team and thereby align more easily with the team's agenda (Gundlach, Zivnuska, & Stoner, 2006). Facets of collectivism that are associated with affiliation, such as Preference and Concern, should be particularly important for early team performance.

In particular, individuals high on the Preference facet emphasize relationships with in-group members and prefer to exist within the bounds of a group (Jackson et al., 2006). Because they believe that affiliated efforts are superior to individual efforts, individuals high on Preference should be inherently more interested in aligning themselves with other team members and be more motivated to align their roles with the team's purpose. In addition, if teams are composed of high-Preference individuals, movement toward a focus on the group should be easier and quicker for those teams. Similarly, individuals high on the Concern facet are motivated by a concern for the well-being of the entire group and its members (Jackson et al., 2006). As such, individuals high on Concern should be interested in gaining knowledge about other team members and want to develop an understanding of their needs. This concern for others should help teams composed of high-Concern individuals shift from a self-view to a team view of performance. Because Preference and Concern reflect affinity toward the team and its members, teams composed of members high on Preference and Concern should more easily navigate through the team formation phase and have stronger initial team performance than should teams composed of members low on Preference and Concern.

Hypothesis 1: Average team-member Preference is positively related to initial team performance.

Hypothesis 2: Average team-member Concern is positively related to initial team performance.

Although team members' affinity toward the team should be helpful for early team performance, teams composed of high-reliance members may not navigate team formation as effectively. Individuals high on the Reliance facet believe that one person's responsibility is the responsibility of the entire group. Moreover, they have a collective sense of responsibility that leads them to feel comfortable relying on and trusting in the group (Jackson et al., 2006). Although this willingness to rely on one another may be important for effective team performance once roles are defined and an understanding of the team has developed, a general willingness to rely on the team may have a negative effect on early team performance (i.e., during team formation). For example, viewing the team task as a purely shared responsibility at the outset could result in poor initial performance, because feelings of personal responsibility might be limited when team members interact with the team (Kerr & Bruun, 1983; Sweeney, 1973).

The collective effort model (Karau & Williams, 1993) suggests that team members are willing to exert effort on a collective task only to the extent that they expect their individual efforts to be instrumental in obtaining valued outcomes. An application of expectancy theory of motivation to team performance, the collective effort model holds that a team member must see the link between individual performance and team performance (expectancy), see the link between team performance and team outcomes (instrumentality), and value the team outcomes (valence). Early in the compilation process, teams are collections of individuals still working to form a team identity, and thus norms are being developed, roles are not yet assigned, and the strengths and weakness of the different team members are not yet understood. Teams composed of members low on Reliance may work harder to understand what each team member can contribute to the larger team assignments. They also put systems in place (e.g., checks, deadlines, team charters) in order to formalize the extent to which team members can be relied upon. Formal planning activities, such as the creation of team charters and performance strategies, have been show to have positive effect on team performance both early in a team's history and over time (Mathieu & Rapp, 2009). A more deliberate attempt to understand the particular team and its members should lead to more effective team formation and, thus, to better early team performance. Team members low on Reliance may see their individual performance as critical to the team's success (i.e., they are not sure whether or not they can rely on other team members) and may expend more effort than team members high on Reliance. Further, teams early in the compilation process reflect a collection of individuals working coactively rather than a highly interdependent team. Individuals low on collectivism tend to work harder in situations when working coactively rather than interdependently, whereas individuals high in collectivism work harder when working interdependently rather than coactively (B. N. Smith, 2002). Because the team formation phase requires individuals to come to an understanding of the specific team of which they are a part, teams composed of low-reliance members may apply more effort toward navigating team formation and may have higher initial team performance than teams composed of high-reliance members.

Hypothesis 3: Average team-member Reliance is negatively related to initial team performance.

End-State Team Performance

During late phases of team development, such as team compilation, team members focus on improving their current network of roles needed for effective team functioning. Dealing with normative routines for task performance, as well as novel situations, is commonplace in the team compilation phase. Thus, more effective teams at this late phase should be those in which team members have established a thorough understanding and acceptance of the team's performance norms and a strong commitment to the team's performance goals. Highly collectivistic individuals are more likely to form strong bonds with other team members and more likely to make personal sacrifices for the good of the group (Ho & Chiu, 1994; Oyserman et al., 2002; Triandis, 1995). Therefore, facets of psychological collectivism that facilitate internalization of team norms (e.g., Norm Acceptance) and promote a stronger emphasis on team needs versus individual needs (e.g., Goal Priority) should be particularly important.

The reason for the importance of these facets is that commitment to team goals and understanding of team norms serve as the initial foundation for ensuing performance (Kozlowski et al., 1999). The implication for team functioning is that Norm Acceptance and Goal Priority are most likely to impact later phases of team development, when the effects of these facets will have had sufficient time to manifest. Because teams are developing their norms and aligning individual and team goals in early phases of team development (making attraction and a willingness to rely on the team important), there will not have been a chance for issues of norm compliance and whether or not team members are motivated to work toward the identified team goals to affect early measures of team performance. Once teams are in the later phases of team development, however, Goal Priority and Norm Acceptance should have a strong influence on team performance because they directly benefit the cooperation required by the interdependence of the defined team task, even more so than the facets focused on attraction and reliance.

Team members high on Norm Acceptance focus on the norms and rules of the in-group and comply with these norms in order to foster harmony with the team (Jackson et al., 2006). Individual attitudes and preferences are secondary to team norms for these team members (Ho & Chiu, 1994; Triandis, 1995). Team norms are an essential component of effective and efficient team functioning (Bettenhausen & Murnighan, 1991; Wageman, 1997) because, when accepted by team members, they promote consensus on the proper way to approach and accomplish the team's task (Chatman & Flynn, 2001). Although norms are thought to form in early development phases (Kozlowski et al., 1999), research has shown that early norm formation is often based on inadequate understanding of the required tasks to be undertaken and that norms are frequently modified over time (Bettenhausen & Murnighan, 1985). These findings suggest that the effects of the Norm Acceptance facet of psychological collectivism are likely to be seen in specific relation to end-state team performance, when sufficient time has passed for team norms to be routinized into team functioning or modified to improve their effectiveness.

> *Hypothesis 4:* Average team-member Norm Acceptance is positively related to end-state team performance.

Team members high on Goal Priority are guided by a consideration for the in-group's interests. With these individuals, team goals take precedence over individual goals even when it causes them to make sacrifices (Jackson et al., 2006). In this sense, team members high on Goal Priority confer primacy to goals of the team rather than their own personal goals (Triandis, 1995). Because goals increase effort toward the goal-related task (Locke & Latham, 2002), team members with high Goal Priority should have motivation, maintain effort, and persist toward team goals. Although Goal Priority may not influence early team performance before team goals have been identified or persistence on the team task is required, teams composed of members who consistently value team goals over their individual goals should outperform teams composed of members with low Goal Priority. Further it is not until the last phase of compilation (i.e., team compilation) that interdependent interaction is paramount. Commitment to team goals is important when task interdependency is high rather than low (Aubé & Rousseau, 2005), and this also suggests that teams composed of members with high Goal Priority would display higher levels of team performance during the latest stages of development.

> *Hypothesis 5:* Average team-member Goal Priority is positively related to end-state team performance.

Longitudinal Team Performance

Collectivism is thought to promote team performance because team members are motivated to cooperate with one another (e.g., Triandis, 1989; Wagner, 1995). Although the facets of collectivism reflect a strong motivational component to cooperate in general, the degree to which this motivation to cooperate enhances team performance over time is likely a function of the quality of cooperation among team members. That is, the extent to which highly collectivistic teams outperform other teams is likely moderated by the quality of the cooperation among those teams' members. Further, because the facets of psychological collectivism are thought to promote cooperation in teams for different reasons (Jackson et al., 2006), we expect the extent to which cooperation quality moderates relationships between psychological collectivism and team performance to vary as a function of the facets.

One way to conceptualize how teams differ in terms of the quality of cooperation between team members is to examine the perceptions of individuals regarding the quality of social interactions among team members. Team-member exchange (TMX) has been put forth as a member's perception of the quality of interpersonal exchanges (Seers, 1989). TMX measures team member self-perception of the willingness to help others, to share ideas and feedback with other team members, and team member perception of how readily help, information, and recognition are received from others. Individuals can and do aggregate their perceptions of social exchanges across members of the work team (Seers, Petty, & Cashman, 1995). Thus, when individuals within a team perceive there to be a high-quality exchange, they view both themselves and other team members as engaging in reciprocal cooperative behaviors. As Seers et al. (1995) noted, "Individual-level analysis [of TMX] involves the individual employee's perception of his or her reciprocity with

other team members. When these data are aggregated to the group level, we are dealing with the average reciprocity across the group" (p. 23). In this sense, teams display meaningful (and systematic) variation with regard to the average level of TMX perceived by their members (Seers, 1989; Seers et al., 1995). It is this between-team variation in TMX that, we argue, will amplify or attenuate the effects of psychological collectivism on team performance. Although TMX is likely associated with ultimate team performance, the moderating effects of TMX are likely to be most noticeable when one examines team performance changes over time (i.e., differences in performance trajectories).

Psychological collectivism facets that are related to initial performance (e.g., Preference, Concern, Reliance) may interact with the perceived quality of cooperation as teams continue to function together. In particular, Preference and Concern (facets that reflect affiliation) may amplify performance benefits over time for teams if team members perceive there to be a higher quality TMX. If expectations are unclear, feedback is lacking, and helping is not perceived to be present in the team (characteristics of a low TMX), the motivation of team members high on Preference and Concern to engage in cooperative behaviors with other members of that particular team may diminish as the exchange component is repeatedly frustrated. Although there is a general attraction toward working in teams for individuals high on Preference and Concern, whether or not the team members adopt the new team as an in-group is a function of the quality of the reciprocal exchange between team members (Seers et al., 1995). Thus, if team members high on Preference and Concern perceive low quality of cooperation, they may not adopt the new team as an in-group, resulting in limited long-term performance benefit for teams composed of high-Preference and high-Concern individuals. This expected moderation is congruent to related research on collectivism in general that has shown that collectivists more readily draw distinctions between in-groups and out-groups, resulting in more engagement in cooperative behaviors with members of their in-group and less with members of out-groups (Gómez, Kirkman, & Shapiro, 2000; Triandis, 1995; Triandis, Bontempo, Villareal, Asai, & Lucca, 1988). Thus, the extent to which teams comprising individuals high on Preference or Concern continue to experience increases in performance beyond early performance should be moderated by whether or not team members generally perceive there to be high-quality cooperation within the team.

Hypothesis 6: TMX and average team-member Preference interact to predict performance change such that there is a stronger relationship for teams with high TMX.

Hypothesis 7: TMX and average team-member Concern interact to predict performance change such that there is a stronger relationship for teams with high TMX.

Team members high on the Reliance facet of psychological collectivism believe that one team member's responsibility is the responsibility of the entire group. Although teams composed of members low in Reliance may have better initial team performance, once a team has come to an understanding of team members' roles and created its interpersonal interaction norms, a willingness to rely on other team members should benefit team performance. This positive relationship between reliance and team performance over time, however, is likely to be contingent upon the quality of the cooperation between team members. High-quality TMX relationships are characterized by willingness for team members to help one another and share ideas, information, and feedback (Seers et al., 1995). A high-quality exchange relationship should provide a context in which team members high on reliance feel comfortable continuing to rely on other members and approaching the interdependent task as a shared responsibility, ultimately resulting in more effective team performance. Teams composed of high-reliance individuals prefer to approach the task with a shared responsibility; yet, if team members perceive there to be a low-quality reciprocal exchange between team members, team members may become frustrated and performance would decrease over time.

Hypothesis 8: TMX and average team-member reliance interact to predict performance change such that there is a negative relationship for teams with low TMX and a positive relationship for teams with high TMX.

Whether compliance with team norms promotes effective team performance over time is also contingent upon team members' perceptions that there is a quality interaction between team members. For instance, in order for Norm Acceptance to benefit team performance, teams require norms that facilitate assistance, feedback, and open communication among team members—the hallmarks of high-quality TMX. If team norms reflect an unwillingness to help other team members or share information, compliance with these uncooperative norms may be detrimental to team performance. Although overall levels of Norm Acceptance in teams are likely related to performance as it unfolds over time, we expected this relationship would be moderated by TMX.

Hypothesis 9: TMX and average team-member Norm Acceptance interact to predict performance change such that there is a positive relationship for teams with high TMX and a negative relationship for teams with low TMX.

As teams continue to function over time, competing priorities and divided attention may reduce the effort team members apply to the team task. For example, effective team performance requires individuals to place the team goals above their individual goals. Goal Priority has been shown to be associated with increased task performance and decreased withdrawal behavior among individual team members, as the prioritization of team goals is thought to foster an intense and long-lasting exertion of effort (Jackson et al., 2006). Thus, teams composed of individuals high on Goal Priority are likely to reap greater performance benefits than those composed of individuals low on this facet. However, this positive relationship is also likely to be amplified by the extent to which team members perceive there to be a quality exchange among the team. That is, members are unlikely to continually apply effort toward the team goals unless team members perceive that a high-quality exchange exists between the team members and that their collec-

tive efforts are not futile. In this sense, the degree to which prioritizing the team's goals over individuals' goals promotes team performance is likely moderated by whether or not the members of a team perceive reciprocity in their efforts toward the team's task (i.e., high TMX).

Hypothesis 10: TMX and average team-member Goal Priority interact to predict performance change such that there is a stronger positive relationship for teams with high TMX.

Method

Participants and Setting

Participants ($N = 264$) were undergraduate and graduate students enrolled in a capstone business course at a large midwestern university. These participants were members of a total of 66 teams, with 3–6 individuals on each team ($M = 4.12$). To reflect a realistic organizational context, all of the teams had a multifunctional composition consisting of at least three different business majors or concentrations (e.g., accounting, marketing, management). Average age of the undergraduate participants was 23.4 years (58% male). Average age of the graduate participants was 30.0 years (77% male).

A major focus of the course was on a business simulation (Capstone Business Simulation; D. Smith, 2008) in which participants had to make complex sets of decisions as a team involving all aspects of a business's operation. Teams competed in a real-time, interactive decision-making environment against other teams in the same course. Team performance on the simulation accounted for a significant portion of the participants' grades (24% of total grade), thus ensuring sufficient effort and motivation. The simulation software is designed to mimic a dynamic marketplace that reflects changing technology, customer values, and competitive pressures. Participant roles on the teams were similar to those of upper level management in a manufacturing organization. Teams had to make operating decisions that involved a variety of issues (e.g., research and development, marketing, production, human resources, total quality management, finance). All teams began with equal amounts of resources and equal market positions, so no team was at a disadvantage at the start of the simulation. Teams had to develop their own budgets and allocate finite resources on the basis of competitive relationships. No teams were allowed to go bankrupt and prematurely exit the simulation. Teams running a cash deficit were automatically given an emergency loan, which included a penalty.

Prior to the start of the simulation, participants were given a 36-page guide and access to an online tutorial and an online practice simulation. Teams made operating decisions twice weekly with the exception of the first two decisions, which were done once a week to familiarize the participants with the simulation. Each decision cycle corresponded to a 1-year time frame in the simulation. Teams performed the simulation for 8 simulated years over a 5-week period. Psychological collectivism was measured after a practice decision. TMX was collected after the second, fourth, and sixth team decisions and a week prior to the eighth team decision. To ensure temporal precedence of the moderator, we assessed team-level performance immediately after the third, fifth, seventh, and eighth decisions.

Measures

Psychological collectivism. We measured psychological collectivism using the five-facet instrument by Jackson et al. (2006). This scale consists of 15 total items, with each facet assessed by three items on a 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*). Each item began with the prompt "Think about groups (work or class) to which you currently belong and/or have belonged to in the past." Sample items included "I preferred to work in those groups rather than working alone" (Preference facet); "I was not bothered by the need to rely on group members" (Reliance facet); "I was concerned about the needs of those groups" (Concern facet); "I followed the norms of those groups" (Norm Acceptance facet); and, "Group goals were more important to me than my personal goals" (Goal Priority facet). Coefficient alphas were .90 for Preference, .86 for Reliance, .84 for Concern, .80 for Norm Acceptance, and .90 for Goal Priority.

Because our hypotheses centered on the relation of elevated levels of psychological collectivism to team performance, we used the average level of psychological collectivism to describe the level of psychological collectivism within a team. When operationalized as the team mean, team composition variables have shown consistently stronger relationships with team performance than when operationalized as other descriptive properties, such as variability (Bell, 2007). However, we also included the level of variability within the team as a potential covariate. Two teams may have identical average levels of psychological collectivism but have different levels of variability. For example, Team 1 may be composed of members with the same score for psychological collectivism, and Team 2 may be composed of members with high and low scores that average to the same level of psychological collectivism as in Team 1. Thus, to allow for a more comprehensive examination of the relationships between average team psychological collectivism and team performance, we controlled for team variability.

Team cooperation quality. This variable was assessed with the TMX scale developed by Seers (1989). This 14-item scale captures the quality and reciprocity of relationships among team members, as well as perceptions of the willingness of team members to share information and assist one another. Items were rated with a 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*). Sample items included "Other group members usually let me know what they expected from me," "I often made suggestions to other group members about better work methods," "When I was busy, other group members volunteered to help me out," and "I was willing to help finish work that had been given to other group members." Scores were averaged across team members to produce a team-level variable. Evidence for aggregation was supportive for each time point: Time 1, intraclass correlation [ICC] (1) = .35, ICC(2) = .73, $F(65, 264) = 3.74$, $p < .01$, $\eta^2 = .56$; Time 2, ICC(1) = .33, ICC(2) = .71, $F(65, 264) = 3.49$, $p < .01$, $\eta^2 = .54$; Time 3, ICC(1) = .34, ICC(2) = .72, $F(65, 264) = 3.58$, $p < .01$, $\eta^2 = .55$; Time 4, ICC(1) = .39, ICC(2) = .76, $F(65, 264) = 4.22$, $p < .01$, $\eta^2 = .59$.

Team-level performance. Performance was operationalized with metrics automatically generated by the simulation. These data correspond to various financial indicators of business effectiveness typically used in real-world organizations: return on assets, return on sales, and stock value. The simulation computes these perfor-

mance indicators by taking into account the decisions of each "company" relative to the simulated marketplace as a whole. In each of these measures, the level of performance of a company is viewed relative to different aspects of its operation. Return on assets measures how effectively a company is using assets to reach its level of performance. Return on sales, sometimes referred to as operating profit margin, assesses a company's level of performance relative to the amount of sales that are generated. Stock value represents how effectively debt and equity are being used to create a firm's level of performance. As Helfert (2001) observed about these and other financial indicators, "They serve best when used in selected combinations to point out changes in financial conditions or operating performance over several periods and as compared to similar businesses" (p. 96). Thus, a composite measure was created with these three metrics. Variables were standardized prior to creation of the composite score. Coefficient alpha for scores on the composite measure was .94.

Education level. Study participants were enrolled in an undergraduate or a graduate version of the course; thus, teams were homogenous in composition (i.e., either all graduate students or all undergraduate students). We controlled for this educational difference between teams using a dichotomously coded variable (0 = undergraduate, 1 = graduate).

Analytical Strategy

We tested Hypotheses 1–10 using multilevel growth modeling to simultaneously analyze intrateam change and interteam differences in performance change trajectories, initial performance, and end-state performance. All analyses were conducted with HLM 6 (Raudenbush, Bryk, Cheong, & Congdon, 2004) and followed a staged approach (Bryk & Raudenbush, 1992). First, an unconditional means model was conducted to test for significant differences between teams in performance. Second, two unconditional growth models (linear change was the only predictor) were conducted to test for significant differences in performance change trajectories (slopes) across teams, as well as to establish baseline estimates of initial and end-state performance (intercepts). One model coded the time series as 0, 1, 2, and 3 to reflect initial team performance. An additional model coded the time series as −3, −2, −1, and 0, so the intercept would reflect end-state team performance. Third, two conditional change models were conducted to test hypotheses regarding team-level predictors of initial team performance and end-state team performance (intercepts), as well as performance trajectories (slopes). Fourth, a final conditional change model was conducted in which team TMX scores from each time point were modeled as "time-varying covariates." This is appropriate when both the covariate and the criterion vary over time. This time-varying covariate was group mean centered to avoid bias that occurs when the aggregate of the covariate has a separate but distinct relationship with the intercept (see Raudenbush & Bryk, 2002). Because group mean centering does not account for main effects of Level 1 variables when assessing main effects of Level 2 predictors or cross-level interaction effects (Hofmann & Gavin, 1998), we reintroduced between-group variance into this model by including the mean of TMX for each team as a Level 2 predictor. This model's results show longitudinal relationships between team-level performance and TMX and test for longitudinal interactions between facets of psycho-

logical collectivism and TMX. To reiterate, team performance was measured subsequent to TMX, thus creating temporal precedence.

Results

Table 1 displays the means, standard deviations, and correlations for study variables. The majority of correlations (75%) between team mean psychological collectivism facets and each of the four team performance measurements were significant ($p < .05$). Only Reliance did not display significant team-level correlations with performance. A majority of correlations (63%) between the team mean psychological collectivism facets and the four TMX assessments were significant ($p < .05$) as well. For team variability on psychological collectivism, only Concern and Goal Priority variability were related to team performance. Team variability on the facets was unrelated to TMX.

The first stage of our analyses examined an unconditional means model (null model) that partitioned variance in team performance into within- and between-teams components. Results indicated significant between-teams variance in performance ($\tau_{00} = 92.45$, $df = 65$, $\chi^2 = 123.95$, $p < .01$) and showed that 19% of total variation in performance resided between teams. The second stage posited two unconditional change models to test for significant differences between teams in initial performance and end-state performance (intercepts), as well as performance change trajectories (slopes). Results from these models indicated significant between-teams differences in initial team performance ($\tau_{00} = 19.54$, $df = 65$, $\chi^2 = 84.77$, $p < .05$) and end-state team performance ($\tau_{00} = 474.83$, $df = 65$, $\chi^2 = 507.81$, $p < .01$). Differences in team performance change over time were evident, as the variance component for growth trajectories was significant ($\tau_{01} = 33.59$, $df = 65$, $\chi^2 = 155.90$, $p < .01$). Results also indicated that 76% of within-team performance variation was associated with linear change.

The third stage of analyses posited conditional change models to test whether particular psychological collectivism facets predicted initial team performance (Hypotheses 1–3) and end-state team performance (Hypotheses 4–5). The intercept results from these "intercepts-as-outcomes" models are shown in Table 2. Time, education level, and team variances of each psychological collectivism facet were included in these models as controls. Results from the first model that coded the intercept to represent initial team performance as the criterion indicated that psychological collectivism explained 71% of the between-teams variance in initial team performance (approximately 13% of total variation in team performance). Without the controls for psychological collectivism variability, psychological collectivism still explained 60% of the between-teams variance in initial team performance (approximately 11% of total variation in team performance). Results from the second model that coded the intercept to represent end-state team performance as the criterion showed that psychological collectivism explained 53% of the between-teams variation in end-state team performance (10% of total variation). Without the controls for psychological collectivism variability, psychological collectivism still explained 38% of the between-teams variation in end-state team performance (7% of total variation).

Hypothesis 1 predicted that Preference would be positively related to initial team performance. Results in the top half of Table

Table 1
Correlations Between Study Variables

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Preference (m)	3.42	0.58	—																	
2. Preference (v)	0.78	0.31	-.03	—																
3. Concern (m)	3.88	0.40	.35	-.17	—															
4. Concern (v)	0.58	0.25	-.13	.11	-.29	—														
5. Reliance (m)	3.36	0.42	.43	-.20	.14	.01	—													
6. Reliance (v)	0.73	0.27	.20	.31	.11	.07	-.31	—												
7. Norm Acceptance (m)	3.94	0.28	.22	-.16	.19	-.17	.18	.14	—											
8. Norm Acceptance (v)	0.43	0.22	.11	.14	.12	.43	.10	.09	-.15	—										
9. Goal Priority (m)	3.38	0.48	.47	.05	.38	-.32	.11	.05	.30	-.08	—									
10. Goal Priority (v)	0.83	0.32	.01	.34	-.01	.11	-.11	.28	-.10	.30	.03	—								
11. Education level	0.41	0.50	.07	-.18	-.08	-.19	.38	-.46	.03	-.21	.15	-.17	—							
12. TMX, Time 1	3.83	0.31	.22	-.10	.32	-.07	.28	-.14	.14	.13	.32	-.12	.26	—						
13. TMX, Time 2	3.85	0.32	.26	-.06	.38	.13	.33	.01	.14	.07	.24	.02	.08	.58	—					
14. TMX, Time 3	3.93	0.35	.22	-.02	.39	.09	.29	-.06	.22	.03	.29	-.01	.18	.54	.84	—				
15. TMX, Time 4	4.09	0.33	.27	-.22	.28	.01	.22	.04	.40	-.01	.42	.02	.17	.41	.47	.53	—			
16. Performance, Time 1	14.38	7.74	.32	.02	.38	-.39	-.09	-.01	.08	-.10	.41	-.26	.08	.21	.17	.04	.13	—		
17. Performance, Time 2	17.25	12.68	.43	-.17	.33	-.34	.17	-.10	.26	-.07	.41	-.25	.30	.35	.32	.26	.32	.66	—	
18. Performance, Time 3	27.79	18.04	.40	-.04	.34	-.31	.11	.04	.26	-.09	.59	-.21	.26	.36	.30	.30	.40	.63	.67	—
19. Performance, Time 4	51.87	24.27	.32	-.05	.33	-.43	.17	-.15	.23	-.11	.50	-.35	.28	.35	.18	.23	.34	.65	.63	.84

Note. $N = 66$ teams. Teams were homogenous in terms of education level. Team educational level was dummy coded as $0 =$ undergraduate, $1 =$ graduate. Correlations greater than .31 significant at $p < .01$, greater than .24 significant at $p < .05$. m = mean; v = variance; TMX = team-member exchange.

Table 2

Psychological Collectivism Predicting Initial and Final Team Performance

Fixed effect	Coefficient	SE	t ratio
Initial team performance			
Intercept (performance), β_0			
Intercept, γ_{00}	−5.88	13.79	−0.426
Education level, γ_{01}	2.43	1.83	1.324
Preference (m), γ_{02}	5.28**	1.79	2.946
Preference (v), γ_{03}	0.25	2.43	0.015
Concern (m), γ_{04}	3.80*	2.19	1.737
Concern (v), γ_{05}	−4.06	3.84	−1.059
Reliance (m), γ_{06}	−5.65**	2.15	−2.632
Reliance (v), γ_{07}	−1.28	3.55	−0.360
Norm Acceptance (m), γ_{08}	0.31	2.84	0.109
Norm Acceptance (v), γ_{09}	1.72	4.05	0.426
Goal Priority (m), γ_{010}	1.49	2.14	0.695
Goal Priority (v), γ_{011}	−4.24	3.89	−1.464
End-state team performance			
Intercept (performance), β_0			
Intercept, γ_{00}	−50.49**	23.00	−2.195
Education level, γ_{01}	9.67**	4.39	2.202
Preference (m), γ_{02}	5.13	3.89	1.317
Preference (v), γ_{03}	8.34	6.84	1.219
Concern (m), γ_{04}	6.84	5.92	1.155
Concern (v), γ_{05}	−21.02**	9.40	−2.236
Reliance (m), γ_{06}	−3.91	5.42	−0.723
Reliance (v), γ_{07}	−3.05	8.44	−0.362
Norm Acceptance (m), γ_{08}	7.16	8.98	0.798
Norm Acceptance (v), γ_{09}	15.93	10.51	1.516
Goal Priority (m), γ_{010}	16.25**	3.76	4.323
Goal Priority (v), γ_{011}	−24.67**	6.58	−3.751

Note. Estimates for initial and end-state performance are from separate hierarchical linear models. m = mean; v = variance; SE = robust standard error.
* $p \leq .05$. ** $p \leq .01$ (one-tailed).

2 support this hypothesis, as teams higher on the Preference facet performed better at the initial time point ($\gamma_{02} = 5.28$, $p < .01$). Similarly, Hypothesis 2 predicted that Concern would be positively related to initial team performance. Results in Table 2 support this hypothesis, as teams higher on the Concern facet performed better at the initial time point ($\gamma_{04} = 3.80$, $p < .05$). Finally, Hypothesis 3 predicted Reliance would be negatively related to initial team performance. This hypothesis was supported, as teams higher on the Reliance facet showed lower initial team performance ($\gamma_{06} = -5.65$, $p < .01$).

Hypothesis 4 predicted that Norm Acceptance would be positively associated with end-state team performance. Results shown in the bottom half of Table 2 failed to support this hypothesis, as the Norm Acceptance facet was not significantly related to end-state performance. Hypothesis 5 predicted that Goal Priority would be positively related to end-state team performance. Findings support this conjecture, with teams higher on the Goal Priority facet displaying higher end-state performance ($\gamma_{010} = 16.25$, $p < .01$). Although this was not hypothesized, teams with higher variability on the Concern facet and the Goal Priority facet displayed lower end-state team performance ($\gamma_{05} = -21.02$, $p < .01$ and $\gamma_{011} = -24.67$, $p < .01$, respectively).

The fourth and final stage of analysis examined a conditional change model in which team TMX scores were modeled as time-

varying covariates in order to test for longitudinal interactions between facets of psychological collectivism and TMX (Hypotheses 6–10). Results from this model are shown in Table 3. Mean levels of Reliance and Goal Priority displayed positive main effects accounting for team performance change over time ($\gamma_{15} = 2.83$, $p < .05$ and $\gamma_{111} = 5.69$, $p < .01$, respectively). Variability in Concern and Goal Priority showed negative main effects for team performance change over time ($\gamma_{18} = -6.83$, $p < .01$ and $\gamma_{112} = 4.46$, $p < .05$, respectively). Results also indicated significant between-teams differences in performance change trajectories ($\tau_{01} = 15.58$, $df = 53$, $\chi^2 = 87.26$, $p < .01$) and changes in

Table 3

Psychological Collectivism, Team-Member Exchange, and Performance Change

Fixed effect	Coefficient	SE	t ratio
Intercept (end-state performance), β_0			
Intercept, γ_{00}	−71.01*	42.35	−1.677
Education level, γ_{01}	8.23	5.60	1.471
TMX mean, γ_{02}	18.38*	10.79	1.704
Preference (m), γ_{03}	3.55	5.25	0.677
Preference (v), γ_{04}	9.98	7.93	1.258
Reliance (m), γ_{05}	−1.86	7.14	−0.260
Reliance (v), γ_{06}	0.98	10.88	0.090
Concern (m), γ_{07}	0.43	7.53	0.057
Concern (v), γ_{08}	−26.68**	11.72	−2.277
Norm Acceptance (m), γ_{09}	−0.59	8.85	−0.067
Norm Acceptance (v), γ_{010}	14.67	12.78	1.148
Goal Priority (m), γ_{011}	15.70**	6.39	2.458
Goal Priority (v), γ_{012}	−21.29**	8.07	−2.639
Time, β_1			
Intercept, γ_{10}	−18.47*	11.10	−1.663
Education level, γ_{11}	2.22	2.19	1.013
TMX mean, γ_{12}	4.76	4.34	1.096
Preference (m), γ_{13}	−1.25	2.06	−0.604
Preference (v), γ_{14}	3.68	3.00	1.227
Reliance (m), γ_{15}	2.83*	1.70	1.664
Reliance (v), γ_{16}	2.24	4.28	0.523
Concern (m), γ_{17}	−1.31	3.09	−0.423
Concern (v), γ_{18}	−6.83*	3.74	−1.826
Norm Acceptance (m), γ_{19}	−1.92	3.50	−0.550
Norm Acceptance (v), γ_{110}	3.38	5.20	0.651
Goal Priority (m), γ_{111}	5.69**	2.70	2.104
Goal Priority (v), γ_{112}	−4.46*	2.41	−1.853
TMX, β_2			
Intercept, γ_{20}	52.37*	30.82	1.699
Education level, γ_{21}	2.24	12.11	0.185
TMX mean, γ_{22}	4.19	26.45	0.158
Preference (m), γ_{23}	15.56**	7.65	2.035
Preference (v), γ_{24}	−4.56	13.63	0.335
Reliance (m), γ_{25}	−28.39**	12.84	2.210
Reliance (v), γ_{26}	−20.24	21.37	0.947
Concern (m), γ_{27}	10.00	17.08	0.586
Concern (v), γ_{28}	−25.21	25.53	0.987
Norm Acceptance (m), γ_{29}	18.77*	11.03	1.702
Norm Acceptance (v), γ_{210}	7.93	30.43	0.260
Goal Priority (m), γ_{211}	−18.36	15.24	1.204
Goal Priority (v), γ_{212}	−34.02**	16.20	2.100

Note. TMX mean does not describe a meaningful property of the Level 2 units and is included for statistical reasons. SE = robust standard error; m = mean; v = variance; TMX = team-member exchange.
* $p \leq .05$. ** $p \leq .01$ (one-tailed).

TMX over time ($\tau_{03} = 66.56$, $df = 53$, $\chi^2 = 77.74$, $p < .05$). TMX alone accounted for approximately 6% of within-team differences in performance change. Modeling the influences of psychological collectivism and TMX explained 55% of the between-teams variation in end-state performance (approximately 10% of total variation in team performance), as well as an additional 11% of end-state performance variation beyond that explained in the model without TMX. Without the controls for psychological collectivism variability, modeling psychological collectivism and TMX still explained 43% of the between-teams variation in end-state performance (8% of total variation in team performance). In relation to variation in performance change trajectories, modeling psychological collectivism and TMX explained 53% of the between-teams differences in performance change and an additional 20% beyond the model without TMX. Without controlling for psychological collectivism variability, modeling psychological collectivism and TMX still explained 46% of the between-teams differences in performance change and 6% beyond the model without TMX.

Hypothesis 6 predicted a longitudinal interaction between TMX and Preference in which the relationship would be stronger for teams with high TMX. Results in Table 3 show a significant parameter ($\gamma_{23} = 15.56$, $p < .01$) for this interaction. The form of this interaction is shown in Figure 1 and indicates that teams with a high Preference facet and high-quality TMX displayed amplified performance change over time (i.e., steeper slope). These results support Hypothesis 6.

Hypothesis 7 posited a longitudinal interaction between TMX and Concern such that a stronger relationship would be found for teams with high TMX. From Table 3, the interaction parameter was not significant ($\gamma_{27} = 10.00$, $p > .05$). Thus, our findings failed to support Hypothesis 7.

Hypothesis 8 predicted a longitudinal interaction between TMX and Reliance such that a negative relationship for teams with low TMX and a positive relationship for teams with high TMX would

be found. Our results showed a significant parameter ($\gamma_{25} = -28.39$, $p < .01$) for the interaction between TMX and Reliance. The nature of this interaction is depicted in Figure 2. For teams low on the Reliance facet, contrary to our hypothesis, higher levels of TMX were associated with higher performance change. However, for teams high on the Reliance facet, higher levels of TMX were not associated with higher performance change. Overall, these findings failed to support Hypothesis 8.

The longitudinal interaction described in Hypothesis 9 predicted that TMX would moderate the relationship between Norm Acceptance and performance change by having a positive relationship for teams with high TMX and a negative relationship for teams with low TMX. The parameter for this interaction was significant ($\gamma_{29} = 18.77$, $p < .05$). The plot of this interaction, shown in Figure 3, indicates that teams high on the Norm Acceptance facet and having high-quality TMX show positive performance change, whereas teams having low-quality TMX show negative performance change. These results provided support for Hypothesis 9.

Finally, Hypothesis 10 predicted that TMX and Goal Priority would interact to predict performance change such that the relationship for teams with high-quality TMX would be amplified. Results failed to support this hypothesis, as the interaction parameter was not significant ($p > .05$). Although not hypothesized, there was a significant interaction between TMX and Goal Priority variability ($\gamma_{211} = -34.02$, $p < .01$).

Discussion

In a recent comprehensive meta-analytic review of deep-level team composition variables, Bell (2007) observed a medium effect for the relationship between team collectivism and team performance. Despite the size of the effect, only a limited amount of variance could be attributed to artifacts suggesting the presence of moderators. Our main objective in this research was to investigate the relationship between psychological collectivism and team per-
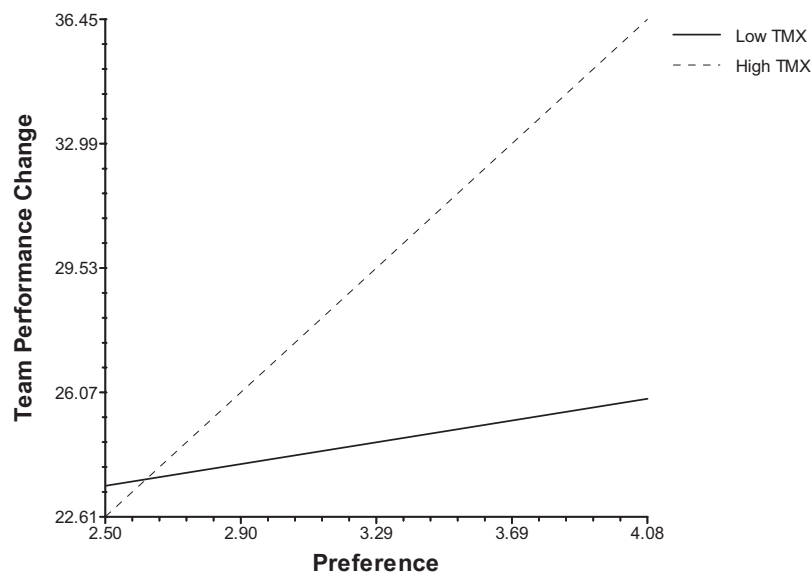

Figure 1. Moderating effects of team-member exchange (TMX) on Preference and team performance change.
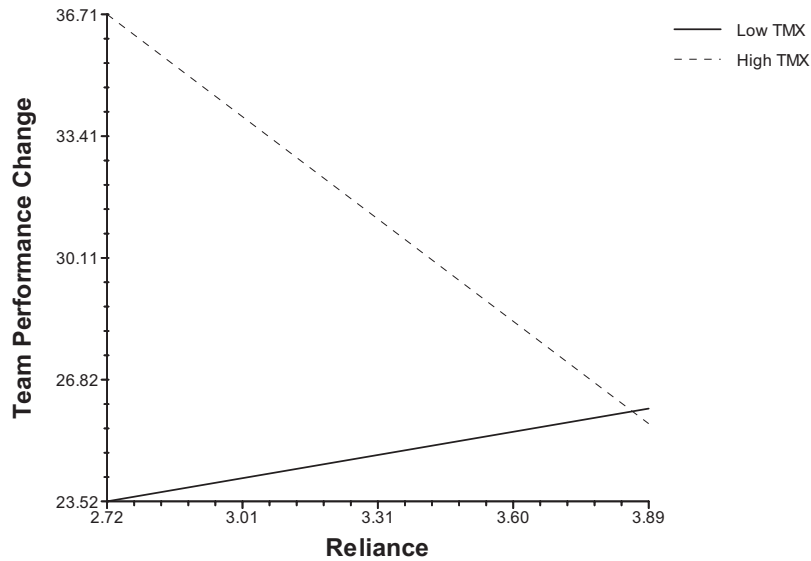
Figure 2. Moderating effects of team-member exchange (TMX) on Reliance and team performance change.

formance with specific consideration of the different facets of psychological collectivism, the role of time in the psychological collectivism and team performance relationships, and the extent to which cooperation quality moderates those relationships as performance changes over time.

First, in order to gain a more nuanced understanding of the collectivism and team performance relationship, we used Jackson et al.'s (2006) recent measure of psychological collectivism to examine collectivism at the facet level. Our results suggest that relationships between collectivism and team performance vary as a function of the specific facets of psychological collectivism forwarded by Jackson et al. (Preference, Concern, Reliance, Norm

Acceptance, and Goal Priority). The size of the bivariate relationships between team performance and Preference, Concern, and Goal Priority surpassed medium effects and thus supported the use of mean levels of psychological collectivism facets as predictors of team performance.

Second, we applied a "temporal lens" to the study of psychological collectivism and team performance (Ancona, Goodman, Lawrence, & Tushman, 2001) and examined performance at three stages: initial team performance, end-state performance, and performance change over time. We used Kozlowski et al.'s (1999) theory of team compilation and performance as a conceptual backdrop for our temporal hypotheses. The relative importance of
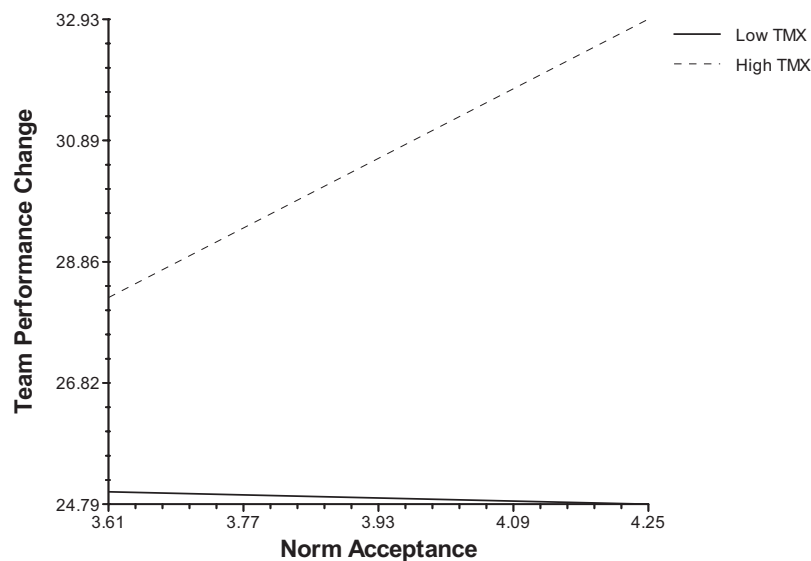

Figure 3. Moderating effects of team-member exchange (TMX) on Norm Acceptance and team performance change.

the psychological collectivism facets in terms of predicting performance varied over time. For example, our results indicate that facets of collectivism associated with affiliation (i.e., Preference and Concern) are important for initial team performance, whereas Goal Priority is important for end-state performance. These results are consistent with those of studies calling for research to examine work team relationships within the context of time (e.g., Mohammed et al., 2008).

Finally, we examined TMX as a moderator and found that the perceived quality of cooperation within teams significantly shapes the relationships between three of the five facets of psychological collectivism and team performance as it unfolds over time. Overall, these moderation findings indicate the importance of cooperation quality as an influential contextual factor that can amplify or attenuate the effects of some facets of psychological collectivism. We next discuss our specific findings and organize this discussion by the specific facets of psychological collectivism.

Preference and Concern

Although all facets of psychological collectivism are thought to affect cooperation between team members and ultimately performance (Jackson et al., 2006), our results show that facets related to the extent that team members affiliate with the team (i.e., Preference and Concern) are positively related to initial team performance. Subsequent to initial team performance, teams that are high on the Preference facet and display high-quality TMX also reap greater longitudinal performance gains. This finding suggests that although high Preference positively influences early performance and performance change, higher quality of cooperation among team members serves to amplify the performance gains over time. This amplification may exist because perceptions of a high-quality exchange signal the team members high on Preference to view the particular team as an in-group, and the cooperative behaviors expected from high-Preference team members might then follow. Our results also show that TMX fails to yield the same moderating effects for the relationship between Concern, the other affiliative facet of psychological collectivism, and performance change. Although not hypothesized, a main effect for variability on team-member Concern and performance change was observed such that teams with increased variability had decreased end-state performance and weaker team performance change trajectories. Taken together, our results suggest different dynamics for how team-member Preference and Concern relate to performance over time. High-Preference team members may look to the quality of cooperation to determine whether they will continue with their cooperative efforts thought to enhance performance. On the other hand, it may be important for team members to perceive that the level of Concern they have for the team and other team members is reciprocated. Although not measured in the current study, cues from team affect (George, 1990) or emotions (Barsade, 2002), rather than the perceived quality of cooperation, may play a role in the relationship between Concern and performance.

Reliance

As hypothesized, Reliance was negatively related to initial team performance. This result suggests that teams benefit from members being skeptical of the extent that they can rely on other team members during team formation. Reliance also interacts with TMX to provide benefits to longitudinal team performance. However, the interaction was incongruent with our hypothesis that predicted a negative relationship between Reliance and performance change for teams with low-quality TMX and a positive relationship between Reliance and performance change for teams with high-quality TMX. Instead, the performance benefits of high-quality TMX appear most salient for teams with members low on Reliance and least salient for teams with members high on Reliance. To further understand and facilitate interpretation of this unexpected finding, we examined an alternative interaction plot in which teams were split based on Reliance scores. This plot similarly indicates that the positive benefit of high TMX seems to manifest only for teams low on the Reliance facet. These results suggest that in teams composed of individuals who feel uncomfortable relying on and trusting in other team members, the quality of cooperation among team members is especially critical for effective performance over time.

One possible explanation for these results is that team members low on Reliance may be more sensitive to the presence of a "sucker effect." The sucker effect is the notion that if an individual has a teammate who appears to be free riding on the team's effort, the individual will reduce his or her efforts rather than play the role of the sucker (Kerr, 1983). Teams composed of low-Reliance members may more closely monitor the quality of the exchange relationship as captured by TMX. For example, individuals with higher perceptions of TMX are more likely to contribute to collective capital (i.e., dense networks of information sharing, trust, and norms of reciprocation that facilitate a collective action; see M. L. Smith, 1995). TMX is also related to helping behaviors (Kamdar & Van Dyne, 2007). Thus, if a high-quality exchange is perceived within a team, low-Reliance members may be willing to continue their collective efforts. A low-quality exchange may feed into discomfort low-Reliance team members have about relying on and trusting in other team members and may diminish their motivation to contribute to the team task.

Another explanation is that teams composed of members low on Reliance may engage in more team monitoring and backup behaviors (Marks, Mathieu, & Zaccaro, 2001). If an individual does not feel comfortable relying on other team members, this may motivate the individual to ensure that other team members are executing their assigned tasks, allowing the individual opportunities to provide backup behaviors when needed. Backing up team members with a heavy share of the workload has been shown to increase team performance (Porter et al., 2003); however, there seem to be limits to the benefits of backing up behaviors (Barnes et al., 2008). For example, backing up behavior may have negative long-term consequences if teams have evenly distributed workloads or if recipients become dependent on the backup behaviors. This dynamic offers another potential explanation why high TMX is particularly important for team composed of low-Reliance members. Low-Reliance members may be more likely to monitor other team members, which allows them to offer backup behaviors when appropriate, but these behaviors will lead to performance gain over time only in the context of high-quality cooperation.

In sum, the Reliance and TMX interaction predicting performance change over time is particularly interesting in combination with the negative relationship between Reliance and initial team performance. It could be that low levels of Reliance ensure the

individual effort needed at the early phases of team development (e.g., team formation) and that as long as a high-quality reciprocal exchange continues as the team develops, team performance will be highest when members are low on Reliance.

Goal Priority

For end-state performance, teams whose members tended to prioritize team goals were found to have more effective performance than teams whose members did not. In other words, although having a natural affinity for other team members and sense of attraction to the team is particularly helpful when the team begins (i.e., Preference and Concern), an overall sense of interdependence through valuing team goals (i.e., Goal Priority) is important for ultimate performance. Although not hypothesized, variability in Goal Priority displayed inverse main effects with end-state performance and performance change. These results suggests that, as do low mean levels, heterogeneity in the extent to which individuals place team goals over personal goals has deleterious effects on team performance. Variability in Goal Priority also displayed significant interactive effects with TMX on team performance. The form of this interaction shows that teams with high TMX, more than with low TMX, experienced the deleterious effects of high Goal Priority variability. This suggests that although team members may perceive high-quality exchange relationships, team performance will suffer if they hold different value Preferences for team versus personal goals. We believe that Goal Priority is particularly important for continuing organizational teams. That is, the demands of the team compete with members' other job demands, but valuing the team's goals may be the basis for the continued motivation members need to consistently apply effort toward the team's task. Examining psychological collectivism and performance over time helped reveal this result.

Norm Acceptance

Contrary to our prediction, Norm Acceptance did not have a linear relationship with end-state performance. However, our results showed that TMX moderates the relationship between Norm Acceptance and team performance over time. As we hypothesized, teams with high Norm Acceptance and high TMX reaped positive performance gains, whereas teams with low TMX experienced performance degradation over time. These findings suggest that the quality of interpersonal interactions is critical to promoting and maintaining the positive effects of Norm Acceptance on team performance. One reason for this moderating effect of TMX could be that if strong commitment to team norms is to translate into effective team functioning over time, these norms must include individual behavioral expectations that are beneficial to collective performance. From our study, actions associated with high TMX (e.g., open communication, feedback) appear to be clear examples of such beneficial behavior. This moderated effect may also explain why Norm Acceptance did not predict end-state performance. It may be necessary to measure if teams have developed productive and beneficial norms for Norm Acceptance to predict end-state performance.

Limitations and Future Research

Despite the contributions of our results, limitations of the study are important to note and can provide potentially fruitful areas for future research. First, the simulation used in our study should not necessarily be viewed as an ideal task for examining intrateam dynamics. The manner in which the simulation was performed did not allow for identification of individual-level contributions, behaviors, and decisions or the particulars of between-person communication and coordination (e.g., role definitions, communication networks, backing up behaviors). In addition, teams were intact over the 5-week period, and earlier performance likely influenced later team performance. Although our analyses accounted for dependency over time, we did not account for potential interactions between different facets of psychological collectivism and team performance over time. For example, if a team is composed of members with a low concern for others and has poor initial team performance, Goal Priority (which was found to affect later performance) may matter less, because low initial performance may disrupt what the team can accomplish later. Thus, although we were able to uncover multiple and differential relationships across longitudinal team performance, we could not tease apart many of the complexities of team performance change and intragroup processes that likely serve as explanatory mechanisms of the psychological collectivism and team performance relationships. Future research should include measures, manipulations, or tasks that are sensitive to such mechanisms in order to better depict how psychological collectivism contributes to team performance over time.

Second, teams participated in a task designed to simulate decision making in top management teams. It could be that project teams—or teams charged with a more creative task—would not benefit from composing teams of members high on the affiliative facets (Preference or Concern). Teams of individualists often generate more ideas and are more creative than teams of collectivists (Goncalo & Staw, 2006). This is thought to be because individualists value expressing uniqueness whereas collectivists value cooperation and solidarity. The implication might be that project teams would not benefit from collectivism facets that reflect an affinity toward and an attraction to the team (Preference or Concern) but would still benefit from facets that help to motivate team members to expend effort toward the team's creative task (e.g., Goal Priority).

Third, our performance metric was a composite of objective team performance measures (e.g., return on assets). Facets such as Concern may be more important for outcomes such as team satisfaction and team viability (Barrick, Stewart, Neubert, & Mount, 1998; Hackman, 1987). Future research could investigate the relationship between facets of psychological collectivism and these outcomes as well as important emergent states, such as team efficacy (Marks et al., 2001). Although we found Reliance was negatively related to initial team performance, it could be that a willingness to rely on the team is important for the development of team efficacy (i.e., the belief in the team's capability to effectively perform the task; Bandura, 1997; Gully, Incalcaterra, Joshi, & Beaubien, 2002). The development of team efficacy is important to team functioning, as team efficacy is thought to be related to regulatory processes such that the team will set higher goals, maintain effort for longer periods of time, and address obstacles preventing task completion with more confidence (Bandura, 1997; Pescosolido, 2003).

Fourth, although we examined team members' perceptions of the quality of cooperation as a moderator of the psychological collectivism and team performance relationship, there are in-

trateam processes that likely serve as important links between the facets of psychological collectivism and team performance. Future studies could include specific processes measures (e.g., team monitoring, backup behavior, conflict management) to determine if particular facets predict the extent to which team members engage in particular processes ultimately benefiting team performance. For example, as mentioned, it is unclear if Reliance is related to team performance through backup behaviors or some other mechanism. Further, members high on Concern may be more likely to engage in better interpersonal processes, such as conflict management, which are thought to be related to team performance (Marks et al., 2001).

Fifth, the teams in our sample performed over the course of a 5-week period. In the broader world of work, teams could remain intact and perform for much longer durations. Thus, some of the effects we found may still be developing. Despite the time frame of the current study we did find several significant relationships for facets of psychological collectivism, and these effects differentiated according to initial and end-state performance stages and performance as it unfolded over time. Nonetheless, longer performance periods may allow other relationships not found in our study to emerge. For example, perhaps higher levels of Concern could be beneficial in more mature intact teams. In such situations more socioemotional behavior could promote effective performance, as these teams have most likely formed and adjusted their task strategies and routines.

Sixth, in order to focus our study, we made several decisions in regard to the measurement of variables and analyses used to test the relationships. We argued that elevated levels of psychological collectivism would be beneficial for team functioning and examined the extent to which mean levels of psychological collectivism predicted team performance. Although we controlled for team-level variability, additional research on the extent to which other operationalizations that reflect alternative distributions of psychological collectivism are related to team performance may be worth pursuing. Research has suggested that deep-level diversity in terms of values can influence team functioning and outcomes such as satisfaction, commitment to stay in the team, and attraction to the team (Jehn, Northcraft, & Neale, 1999). Our results suggest that variability on Goal Priority and Concern has a role in effective team performance and warrants further research. Further, our models posited a linear change function for longitudinal team performance. Although our results indicated that linear change described a large proportion of within-team performance change (76%), variance in this change parameter remained. This suggests that future research could benefit from modeling nonlinear forms of change and including more time points than did the current study to allow for a more thorough depiction of different change patterns.

Finally, given our support for the differential validity of the facets in terms of predicting team performance, future research should continue to incorporate psychological collectivism (Jackson et al., 2006) in the study of team-member behavior. Although we used Kozlowski et al.'s (1999) theory of compilation and performance to guide our longitudinal hypotheses, we did not directly investigate the individual team-member behaviors that contribute to the different compilation phases (e.g., role compilation). Future research could investigate how the specific behaviors of team members high on Preference and Concern facets affect

role development and differentiation. Similar research on team-member personality has linked individual traits to team outcomes using roles (Stewart, Fulmer, & Barrick, 2005).

Practical Implications and Conclusions

Our findings hold several implications for practice. Similar to those of Jackson et al. (2006), our results provide evidence that psychological collectivism could be useful in selection systems where work roles are embedded in team contexts or require interpersonal cooperation for successful performance. One caveat to this use is that our findings indicate that certain aspects of psychological collectivism may require additional time to translate into more effective performance. Thus, practitioners seeking to validate psychological collectivism for selection purposes would be well advised to capture multiple time points of team performance.

Team training and development efforts may benefit from the inclusion of psychological collectivism. For example, a common practice in team building is to incorporate assessments of personality or work styles to increase both self-awareness and understanding of individual differences. Assessments of psychological collectivism could be included in such developmental assessments. With regard to team training, instruction focused on behaviors that are congruent to more collectivistic task strategies could be used. Here, it would seem that behaviors representative of some facets of psychological collectivism might be more easily trained. For instance, teaching individuals the importance of prioritizing team goals over individual goals (Goal Priority), as well as the value of defining and gaining buy-in to team norms (Norm Acceptance), is likely to be more malleable than influencing Preference for teams or Concern for others. Our findings of the moderating effects of TMX hold implications for team training efforts as well. For example, many models of team training routinely include aspects of cooperation as key learning components (Salas & Cannon-Bowers, 2000). Empirical evidence also indicates that training aimed at improving intrateam communication and interaction can increase the adaptability of the team (Marks, Zaccaro, & Mathieu, 2000). Expanding team training efforts to enhancing the quality of interpersonal exchanges could be a natural extension of such programs.

Conclusion

Given the continued interest in creating and developing effective teams within organizations, we investigated the influence of psychological collectivism and TMX on team performance over time. Our findings add to the research on psychological collectivism and performance in team contexts in three important ways. First, we extend Jackson et al.'s (2006) developmental work linking psychological collectivism to individual-level performance to the team level. In doing so, we find differential effects across facets providing further support for a multifaceted approach to examining psychological collectivism. Second, by applying a temporal lens to the study of psychological collectivism and team performance, we show that the relative importance of the different facets in terms of predicting performance varies as teams perform over time. Third, our findings indicate the value of directly assessing the key factor often credited for the effects of collectivism on

performance, namely, the quality of cooperation among team members. We believe our results bring clarity to the observed collectivism and team performance relationships and provide potentially useful information for practitioners.

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