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RESOURCE-BASED CONTINGENCIES OF WHEN TEAM-MEMBER EXCHANGE HELPS MEMBER PERFORMANCE IN TEAMS

ABSTRACT

We integrate social exchange theory with social capital theory to present a resource-based contingency model of when team-member exchange (TMX) helps individual performance in teams. We argue that strong TMX produces obligations to utilize resources (e.g., task information) provided by one's teammates, and these obligations enhance performance when: a) teammates provide resources of high quality, or b) the quality of resources available from individuals outside of the TMX relationship (i.e., the leader) are low, purportedly because TMX-based obligations protect individuals from over-utilizing low quality resources from the leader. We test our model in two studies. In Study 1, multisource team data revealed that TMX enhanced member performance when teammates possessed attributes associated with high quality resources (i.e., high cognitive ability) or when the leader did not. In Study 2, we replicated these findings in a scenario experiment, showing that TMX impacted performance under different resource conditions via felt obligation to utilize teammates' resources. Our findings advance the literature by delineating the teammate- and leader- resource conditions under which TMX benefits member performance, as well as demonstrating felt obligation to utilize teammates' resources as an important mechanism underlying these effects. Theoretical and practical implications are discussed.

Key words: TMX, social exchange theory, social capital theory, teams

In interdependent team settings, members necessarily come to develop social exchange relationships with their fellow teammates known as team-member exchange, or TMX (Seers, 1989). According to Seers (1989), TMX relationships can vary in strength. Compared to weaker TMX relationships, strong TMX relationships are marked by the mutual exchange of desirable resources and a heightened sense of mutual commitment, obligation and trust. The extant literature has linked strong TMX relationships to favorable outcomes on the basis of social exchange theory (Blau, 1964) and the assumption that members are motivated to reciprocate the benefits they receive with more positive work attitudes (e.g., Banks, Batchelor, Seers, O'Boyle, Porrack, & Gower, 2014), higher identification with teammates (Farmer, Van Dyne, & Kamdar, 2014), and increased creativity and citizenship behaviors benefiting the collective (e.g., Kamdar & Van Dyne, 2007; Liao, Liu, & Loi, 2010; Seers, 1989; Seers, Petty, & Cashman, 1995). However, as some scholars have observed, the relationship between TMX and performance is equivocal (Banks et al., 2014), with some studies establishing a positive link between the two (Seers, 1989) and others failing to do so (Kamdar & Van Dyne, 2007). These mixed findings signal the need to pursue a contingency approach to TMX that clarifies the conditions under which TMX might be more or less strongly related to member performance.

Drawing from a resource contingency framework, we posit that the quality of resources transmitted through social exchange relationships explain why some TMX relationships are more beneficial for performance than others. Following Foa and Foa (1980), we define resources as "anything transacted in an interpersonal situation" (p. 78) such as objects, states, conditions, and other things that people value (Hobfoll, 1988). Surprisingly, although the literature acknowledges that teammates vary in the types of resources they contribute as exchange partners (i.e., task information, social support, affirmation, and assistance; Tangirala, Green, &

Ramanujam, 2007; Venkataramani, Green, & Schleicher, 2010; Wilson, Sin, & Conlon, 2010), it has been mostly silent about the *quality* of resources transmitted among TMX partners, the associated obligations inhering TMX relationships to utilize those resources, and their joint implications for performance.

Integrating social exchange theory (Blau, 1964) with social capital theory (Bourdieu, 1985; Coleman, 1990), we introduce and test a resource contingency model of when TMX helps individual performance. From a social exchange perspective, we argue that in addition to producing general feelings of indebtedness toward teammates, the strength of the TMX relationship also heightens *obligations to utilize resources* provided by the focal exchange partner(s) versus others (Blau, 1964). At the same time, social capital theory provides valuable insights on the performance implications of those relationships, as a function of the nature and quality of resources exchanged (Burt, 1992; Granovetter, 1973; Lin, 1999, 2008). Together, these two theoretical perspectives suggest that because exchange-based obligations increase the likelihood of mobilizing exchange partners' resources to accomplish purposive action (Adler & Kwon, 2000), the performance implications of the TMX relationship ultimately depend on how well obligations to utilize teammates' resources align with the quality of resources available from teammates versus those made available from others in the team environment that are outside of that exchange relationship (Gargiulo & Benassi, 2000; Portes & Landolt, 2000).

Within the context of TMX, one of the most critical types of resources exchanged in team environments is *task information* (Nebus, 2006; Pettigrew, 1972), and in the team environment, individuals may receive informational resources of varying quality from both their fellow teammates and their team leader. Consistent with the tenets of social exchange and social capital theory, we argue that TMX enhances performance when teammates provide resources of higher

quality or when the leader's resources are of lower quality because strong TMX creates obligations to utilize teammates' high quality resources and at the same time protects individuals from otherwise relying on low quality resources from their team leader. Conversely, we expect that strong TMX is less likely to promote performance when teammates provide resources of low quality or when high quality resources are available from the team leader, because TMX-based obligations to utilize teammates' resources constrain individuals to over-utilize low quality resources from their teammates and to under-utilize high quality resources from their team leaders. We test our theoretical model in: a) a simulated team setting in which teammates' and leader's cognitive abilities served as proxies for the quality of their informational resources (Study 1), and b) a controlled scenario experiment where we directly manipulated the quality of information from both sources (Study 2).

Our integrated framework goes beyond traditional assumptions that high quality exchanges are unilaterally beneficial and offers the following new contributions to theory and practice. First, we extend the TMX literature by highlighting the quality of teammates' (and leader's) resources as critical boundary conditions of when TMX will enhance performance. In doing so, we explain why prior work that has failed to take a resource perspective may have shown weak and inconsistent effects of TMX on performance (Banks et al., 2014), and also point to the importance of considering the collective configuration of resources provided across actors in the social context as contingencies of this relationship. Second, we build new theory on the psychological mechanisms that explain why these boundary conditions occur. Specifically, we show that beyond generalized exchange obligations such as feelings of indebtedness, it is TMX-based obligations to utilize teammates' resources that – when combined with high quality resources from teammates or low quality resources from leaders – allow individuals to accrue

performance gains. This also explains why access to the same set of resources may, owing to exchange-based obligations to utilize certain resources over others, result in differing performance for different individuals.

Our research promises to inform practice as well. As organizations become increasingly team-based, TMX relationships are a necessary part of how work is accomplished in organizations (Seers, 1989; Seers et al., 1995). Without a framework delineating when TMX maximizes performance dividends, it remains unknown whether and how "the limited time of employees is best spent developing…horizontal relationships among team members" (Banks et al., 2014: 2), thus leaving well-intentioned practitioners in danger of forging TMX relationships that may have no positive effect on performance. Relatedly, by testing our theoretical model across two studies that featured teammates' and leader's attributes and informational resources as contingencies of the TMX-performance relationship, we show in concrete terms what constitutes high quality resources in the team context, which in turn can inform practitioners as to how they might strategically forge TMX relationships to enhance individual performance.

THEORETICAL BACKGROUND

Social Exchange and Social Capital Theory: A Joint Perspective on Obligations to Utilize Resources, Quality of Resources, and Performance

In social exchange relationships, partners make contributions in an open-ended stream of giving and receiving instrumental and expressive resources (Blau, 1964; Homans, 1958). Unlike economic and contractual exchanges that can be quantified and occur on a quid pro quo basis, the form and timing of contributions in social exchange relationships are discretionary and guided by interpersonal commitment and trust that one's contributions will be returned at some point in the future (Cook & Whitmeyer, 1992). Such exchanges can occur between individuals or

between an individual and a group of others (Cook & Whitmeyer, 1992; Emerson, 1976), as is the case with TMX, which refers to the overall quality of the exchange relationship an individual team member has with his or her fellow teammates as a group (Seers, 1989). According to current perspectives in TMX research, strong social exchange relationships heighten feelings of indebtedness and obligations that in turn motivate individuals to increase their efforts and commitment to the relationship as a way of giving back to benefactors. What this perspective overlooks, however, is how social exchange can also shape *obligations to utilize resources* provided by the exchange partner, or how those obligations combine with the *quality* of resources channeled through the relationship to jointly shape performance.

Notably, the obligation to utilize resources provided by exchange partners is distinct from generalized exchange obligations such as feelings of indebtedness and the need to reciprocate emphasized in most applications of social exchange theory (Eisenberger, Armeli, Rexwinkel, Lynch, & Rhoades, 2001). Indeed, Blau's (1964) early writings stated that "the obligations individuals incur in social exchanges…are defined only in general, somewhat diffuse terms" (p. 95) – meaning that besides obligations to reciprocate, other types of obligations to the relationship also exist. In the context of resource exchanges, relational obligations can extend to influence individuals' perceived obligation to preferentially utilize the resources provided by one's exchange partner. To quote Blau (1964: 107), social exchange "not only carries with it the obligation to repay gifts received" but also implies "the obligation to receive them," and in fact the refusal to receive – or utilize – resources given by an exchange partner essentially is "a refusal of friendship..." Especially for resources such as information or status that are symbolic in nature (Foa & Foa, 1980), receiving resources is demonstrated by utilizing those resources in one's purposive action. Doing so not only expresses respect for the exchange partner, but also an

increased commitment to the relationship into the future. Indeed, "acceptance [of others' resources can] become the starting point of a budding relation and possibly a lasting friendship" (Blau, 1964: 107).

The notion that utilizing resources signals something fundamental about the giver and the relationship is also supported in the advice receiving literature. For example, Goldsmith and Fitch (1997) stated, "advice recipients may feel pressure to follow advice in order to not disrespect the advice giver or appear ungrateful for his or her concern…Rejecting advice… risks showing a lack of gratitude for the giver's concern" (p. 469). On the flipside, when the recipient takes and utilizes the advice, the giver perceives this act as a positive signal about the giver's standing. These arguments suggest that, in the context of resources provided through a strong exchange relationship, there also emerges the obligation to utilize resources from the exchange partner and a willingness to be influenced by the exchange partner (Homans, 1961). In contrast, when the exchange relationship is less strong, obligations to rely on and be influenced by partners' resources are reduced (Ford, Wilkerson, Seers, & Moormann, 2014).

Social capital is defined as the "sum of actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit" (Nahapiet & Ghoshal, 1998: 243). Social capital theory is specifically concerned with how the "access to and use of resources embedded in social networks" affects performance (Burt, 1992; Coleman, 1990; Lin, 1999). Although social capital theory and social exchange have evolved along different intellectual traditions, the two perspectives are fitting complements because all relationships by which social capital is attained are by nature exchange relationships (Cook, 2005). Thus, not surprisingly, the notion of exchange-based obligations to utilize partners' resources also appears in social capital theory. Indeed, Lin (2008) posited that social

ties of a binding nature – i.e., those characterized by mutual support, confiding relations, and shared sentiment, and in which individuals are obligated to reciprocate exchanges and services to one another – increase the likelihood of mobilizing resources gained through the exchange, in part because of the heightened commitment and desire to maintain and prolong the relationship.

According to social capital theory, however, exchange-based obligations to utilize exchange partners' resources do not in and of themselves guarantee performance advantages. Whereas social exchange theory would assume obligations alone are sufficient to enhance performance, social capital theory provides a helpful counterpoint, precisely because it takes into account the quality of resources involved in the exchange and assesses the resource conditions under which performance benefits accrue to the focal individual. Social capital theory posits that performance is enhanced to the extent that the resources individuals utilize are actually of high quality – that is, have value for enhancing performance (Lin, 2008). In fact, the importance of resource quality is even more pronounced in strong exchange relationships, because the heightened obligations to utilize resources within these exchanges can cause individuals to preferentially weigh these resources over other resources that might be available in the environment. That means it is plausible that even when the quality of resources provided by the exchange partner is low, strong exchange relationships and the obligations to utilize exchange partners' resources can constrain individuals from utilizing other, higher quality resources available outside of the relationship. This constraining effect is referred to as the "double-edged sword" of social capital (Portes & Landolt, 2000). That is, when resources inside the relationship are of low quality and those available outside of the relationship are of high quality, "strong bonds may…serve as a filter for information and perspectives reaching the actors, generating a *cognitive lock-in* that isolates them from the outer world" (Gargiulo & Benassi, 2000: 186).

Thus, social capital theory suggests that the quality of resources available inside as well as outside of strong exchange relationships both constitute important boundary conditions of when a given relationship should help or harm performance (Uzzi, 1997). If the quality of resources from within a strong exchange relationship is high or the quality of resources outside of the exchange relationship is low, then the relationship can be expected to enhance performance, because in both conditions, obligations to rely on exchange partners' resources are well-aligned with the performance-enhancing nature of those resources. On the other hand, if the quality of resources within the strong exchange relationship is low or the quality of resources outside of the exchange relationship is high, then the relationship is less likely to enhance performance because obligations to rely on exchange partners' resources reduce the utilization of high quality resources outside of that specific social exchange.

Performance-enhancing Resources in the Team Context from Teammates and Leaders

Although a number of resources are exchanged in TMX relationships (e.g., social support, affirmation, assistance; Foa & Foa, 1974), receiving high quality and task-relevant information from teammates is especially important for enhancing one's own task performance (Nebus, 2006). Task information is one of the foundational resources exchanged among teammates (Seers, 1989; Seers, Wilkerson, & Grubb, 2006) and is a critical means by which interdependent team members achieve performance synergies in knowledge-based teams (Chung & Jackson, 2013; Hinsz, Tindale, & Vollrath, 1997; Mathieu, Tannenbaum, Donsbach, & Alliger, 2014). High quality task-related information involves advice, suggestions, and recommendations that correctly guide the way task details should be prioritized and executed so as to yield higher performance. Particularly in decision-making tasks, higher quality information

possesses greater ecological validity and accuracy in how task cues should be combined to inform the "right" decision (Hollenbeck, Ilgen, Sego, Hedlund, Major, & Phillips, 1995).

In a team environment, aside from teammates, team leaders also serve as sources of task information. Although leaders can provide a range of material and immaterial resources (e.g., status, advancement opportunities, political sponsorship; Foa & Foa, 1974; Graen & Uhl-Bien, 1995; Wilson et al., 2010), they are frequently seen as important and normative sources of task information because of their position of authority. In fact, one of the core functions of leadership is to provide task direction, clarify task roles, and orient followers toward task goals (Stogdill, 1950). Members often look to leaders for task information to develop their own performance strategies, to enhance their understanding of tasks, and to provide sensemaking as task demands change (Morgeson, DeRue, & Karam, 2010). This is especially the case when leaders are part of the team, occupy a strategically core role in carrying out the task, and wield considerable task expertise (Humphrey, Morgeson, & Mannor, 2009).

In addition, theory suggests that informational resources provided by leaders and team members are likely to differ in content because of these parties' positional differences in an organization's structure and networks. Some scholars argue that information provided by leaders may be more strategic in nature, whereas information from teammates may be more tactical in nature (Casadesus-Masanell & Ricart, 2010; Wilson et al., 2010). Furthermore, leaders and teammates can vary in the *quality* of the information that they provide, owing to differences in teammates' and leaders' abilities to effectively retrieve, access, and correctly interpret aspects of the task environment. Therefore, high quality information provided by leaders and members is likely to be independently helpful and non-substitutable for increasing member performance,

assuming obligations to utilize resources from a given source are correctly aligned with the quality of those resources.

Implications for When TMX Enhances Performance

The preceding sections imply two conditions under which the TMX-performance relationship will be enhanced. The first is when teammates' resources are of high quality. Specifically, because strong TMX enhances the obligation to utilize resources provided by teammates, that obligation should enhance performance when teammates' resources are indeed of high quality. In contrast, when the quality of resources provided by teammates is lower, high TMX may not translate into performance advantages because individuals are more heavily utilizing low quality resources. In fact, this combination of high TMX and low quality teammates' resources may reflect the phenomenon of being "trapped in your own net" (Gargiulo & Benassi, 2000: 186), where the obligations to utilize teammates' resources associated with strong TMX cause individuals to overly rely on low quality resources from teammates (and by extension, rely less on the leader's resources that may potentially be of high quality). Thus, we propose the following conditional hypothesis regarding the effects of TMX on performance:

Hypothesis 1a: The relationship between TMX and individual performance is more positive when resources provided by teammates are of higher rather than lower quality.

And more specifically, we propose the following moderated mediation hypothesis, in which the quality of teammates' resources moderates the linkage between felt obligation to utilize teammates' resources and performance:

Hypothesis 1b: The indirect relationship between TMX and individual performance via felt obligation to utilize teammates' resources is more positive when resources provided by teammates are of higher rather than lower quality.

Second, we expect that TMX should enhance individual member performance when resources provided by the leader are of low quality. As argued previously, because strong TMX produces heightened obligations to utilize teammates' resources, those obligations may prevent members from depending more heavily on resources from their leader. In cases where leaders in fact provide low quality resources, strong TMX and its associated obligations to rely on teammates' resources may "protect" individuals from utilizing low quality resources from leaders that could otherwise degrade their performance. This is especially important because the hierarchical and authority-differentiated structure informing leader and member relations may render individuals more likely to utilize task information from leaders as a form of role compliance (Katz & Kahn, 1966) or because they assume that on account of positional differences, leaders may possess unique information (Wilson et al., 2010) or task expertise (French & Raven, 1959). TMX-based obligations to utilize teammates' resources that disrupt tendencies to utilize leaders' resources may in fact be enhancive of performance to the extent that they protect individuals from over-relying on low quality resources from the leader. In sum, we propose the following conditional hypothesis regarding the effects of TMX on performance:

Hypothesis 2a: The relationship between TMX and individual performance is more positive when resources provided by the leader are of lower rather than higher quality.

And more specifically, we propose the following moderated mediation hypothesis, in which the quality of leader's resources moderates the linkage between felt obligation to utilize teammates' resources and performance:

Hypothesis 2b: The indirect relationship between TMX and individual performance via felt obligation to utilize teammates' resources is more positive when resources provided by the leader are of lower rather than higher quality.

Overview of Studies

We test our hypotheses in two complementary studies that focus on individual performance in team decision-making contexts. Study 1 was conducted in a simulated team context involving real tasks, leaders and team members. Based on research suggesting that, on account of individual differences in ability, exchange partners can vary in the quality of resources they provide (Lin, 1999), we used leader's and teammates' cognitive ability as proxies for the quality of task information they provided. Cognitive ability refers to the capacity to understand complex ideas, learn from experience, reason, problem solve, and adapt (Neisser et al., 1996; Sternberg, 1997). To date, numerous studies have documented cognitive ability to predict task performance across job contexts (Hunter, 1983; Schmidt, Hunter, Outerbridge, & Goff, 1988), purportedly because cognitive ability allows individuals to develop high quality task-related knowledge and expertise (Hunter, 1986). Exchange partners with higher cognitive ability likely possess a more accurate understanding of what the team task entails, how to prioritize task-related information to promote performance, and how to most effectively or efficiently accomplish the team task, thus channeling higher quality task information to others in the team environment. As such, we expected that leaders and teammates with higher cognitive ability will have the capacity to provide more accurate, better organized, and correctly prioritized task information compared to those with lower cognitive ability (LePine, 2003; LePine, Colquitt, & Erez, 2000; Schmidt, Hunter, & Outerbridge, 1986).

In Study 2, we sought to provide a constructive replication of Study 1's findings (Lykken, 1968), as well as to establish internal validity by conducting a decision-making scenario experiment in which we manipulated TMX and the quality of information provided by a hypothetical leader and teammate. We also examined whether felt obligation to utilize

teammates' resources – the purported mechanism produced by the strength of social exchange – mediated the effects of TMX on performance under high or low quality information from the teammate and leader. Thus, whereas Study 1 tested Hypotheses 1a and 2a in simulated teams, Study 2 tested Hypotheses 1b and 2b in an experimental context. Both studies enabled us to test our entire theoretical model and to benefit from the strengths of each methodological approach.

STUDY 1 METHODOLOGY

Participants, Procedure, and Task Setting

We collected data for this study in an experiential, leadership and teamwork class at a large university in the Midwestern United States. The class was designed to simulate leadership and team dynamics, such that each team of undergraduate seniors was led by a second-year MBA (masters of business administration) student. Our sample involved 220 participants (179 team members and 41 leaders) nested within 41 teams. Our multilevel analyses were based on observations with no missing data, which reduced the sample size at level 1 to 168 observations. The average age of team leaders was 29 years (s.d. = 4.67 years) and 55 percent were male. The average age of team members was 22 years (s.d. = 2.95 years) and 51 percent were male.

To mirror leadership and teamwork challenges encountered in real organizations, leaders were fully responsible for selecting and recruiting team members, composing their teams, engaging in team building, developing team members' task skills, and performing with members in a series of team decision-making simulations over the course of a fifteen-week semester. In this regard, MBA students served as the legitimate team leader and occupied the position at the top of the team's authority structure. Further, because performance on these simulations directly contributed (20%) to leaders' and members' course grades, all parties were motivated to engage in the team task in order to do well in the course. Much like real organizational teams, teams

interacted extensively outside of class, both for social reasons and to formulate strategies to maximize team performance in the decision-making simulations. These interactions not only enabled TMX relationships to form over time, but also provided opportunities for individuals to exchange and utilize information from each other to perform their roles within the team task.

Each high information-intensity simulation lasted approximately an hour and a half, and involved networked team tasks originally developed to train Air Force officers on leadership and team concepts. In these simulations, team members played the role of Staff Officers, whose job was to manage a large number of intelligence and operations assets within a specific region or function to discover and neutralize enemy targets. Officers did not share computer screens with other officers in the team and could not directly manipulate the actions of other team members. Hence, individuals had to accurately interpret the information they alone were privy to and communicate task-relevant information to others in the team, as well as act upon the information they received from their leader and fellow teammates to inform and carry out their own task roles and responsibilities. In the simulations, team leaders played the role of the Commander. Like hierarchical teams in real organizations, the commander's role was to oversee and edit all actions taken by the team during the simulation. Leaders were responsible for gathering, interpreting, and communicating task information to members in order to execute team performance strategies. Thus, both fellow teammates and leaders acted as sources of task information that could potentially enhance individual member performance, although leaders had the additional feature of being the authority figure on the team.

Measures

We assessed team members' and leader's cognitive abilities at the beginning of the semester, approximately five weeks prior to team formation. Teams were formed the sixth week of the semester, and we assessed the quality of TMX six weeks after team formation. Task

performance was measured after nine weeks of interaction and approximately three weeks after TMX was reported. Unless noted otherwise, all items were rated on a 5-point scale (1 = strongly disagree, 5 = strongly agree).

Teammates' and leader's cognitive ability. Cognitive ability was measured using the Wonderlic Personnel Test (From IV), which contains 50 questions assessing verbal, math, and logic proficiency, such that higher scores represent the number of items answered correctly within a 12-minute window, with reliabilities ranging from .88 to .94 (Wonderlic & Associates, 1983). The leader's cognitive ability was operationalized as his or her Wonderlic score, and teammates' cognitive ability was operationalized as the average of members' Wonderlic scores, excluding the leader's and the focal individual's scores.

Team-member exchange (TMX). Team members rated the strength of TMX with their team using the ten-item scale developed by Seers (1989). Example items included, "I often make suggestions about better work methods to other team members" and "Other members of my team are willing to help finish work that was assigned to me." Coefficient alpha was .92.

Member task performance. Leaders rated each member's task performance using a four-item measure developed by Liden, Wayne, and Stilwell (1993). Example items included, "The overall level of performance that I have observed for this team member is outstanding" and "Overall, I feel that this team member has been effectively fulfilling his or her roles and responsibilities." Coefficient alpha was .94.

Control variables. When assessing the performance benefits of TMX, we controlled for one's own conscientiousness and cognitive ability because these are among the most important predictors of individual task performance (Barrick & Mount, 1991; Bobko, Roth, & Potosky, 1999). We measured conscientiousness with 10 items from the NEO personality inventory

(NEO-PI-R; Costa & McCrae, 1992) approximately five weeks prior to team formation. Example items for conscientiousness included, "I am always prepared" and "I make plans and stick to them." Cronbach's alpha was .83. One's own cognitive ability was measured by the Wonderlic.

We also controlled for leader-member exchange (LMX), as LMX has been shown to positively associate with leader-rated performance (Martin, Guillaume, Thomas, Lee, & Epitropaki, 2014) and with TMX (Banks et al., 2014). Team members rated the strength of their leader-member relationship using the seven-item LMX-7 scale (Graen & Uhl-Bien, 1995) four weeks after team formation. Example items included, "This team leader recognizes my potential" and "This team leader and I have an extremely effective working relationship." Coefficient alpha was .94. Relatedly, because performance may arise as a function of teammates' simultaneous LMX and TMX relationships within the team, we also controlled for their interactive effects in our analyses. Finally, we controlled for variation in teammates' TMX (operationalized as the standard deviation of teammates' TMX scores), average teammate cognitive ability, and variation in teammates' cognitive ability to partial out potential confounds arising from differential TMX relations and cognitive resource compositions across teams.

Analyses and Results

Descriptive statistics, reliability coefficients, and correlations are reported in Table 1. To examine the construct distinctiveness of our focal survey measures, we ran confirmatory factor analyses (CFA) accounting for the dependent nature of our data in MPLUS (utilizing the Type = Complex analysis). A three factor model, which specified LMX, TMX, and task performance as unique constructs, fit the data well as indicated by the comparative fit index (CFI) and the standardized root mean squared residual (SRMR): CFI = 0.91, SRMR = 0.05. The three-factor structure fit the data significantly better than alternative nested models.

Given the nested nature of our data (e.g., members nested within teams), we utilized random slopes hierarchical linear modeling (HLM; Raudenbush & Bryk, 2002) to test our hypotheses. A null model for members' task performance revealed that 35% of variance was between teams and 65% was within teams, necessitating the use of HLM. We group mean centered all level 1 variables (member cognitive ability, member conscientiousness, TMX, LMX) because doing so effectively controls for between-team confounds and allows for a cleaner investigation of within-team associations (Hofmann & Gavin, 1998). All level 2 variables were grand mean centered.

Although the bivariate correlations in Table 1 suggested that TMX was positively and significantly correlated with team member performance (r =.16, p <.05), TMX was no longer significantly related to performance in the presence of member cognitive ability (see Table 2). As such, we had preliminary evidence that contingency effects were at play. Also, the robust main effect we found for member cognitive ability on performance (B = .02, p <.05) supported our arguments for its importance as an attribute proxy for performance-enhancing resources.

Shown in Table 2, the cross-level interaction between TMX (at level 1) and teammates' cognitive ability (at level 2) was significant (B =.09, p <.05) and Figure 1 portrays the shape of this interaction. Supporting Hypothesis 1a, the relationship between TMX and member performance was more positive when teammates' cognitive ability was high (vs. low). Simple slopes analyses (Preacher, Curran, & Bauer, 2006) revealed that the slope for high values of teammates' cognitive ability was positive and significant (B = 0.30; z = 2.12, p <.05) but not for low teammates' cognitive ability (B = -0.23, z = - 1.78, p > .05). Hypothesis 2a proposed that the positive effect of TMX on member performance would be stronger when leader's cognitive ability was low (vs. high). Shown in Table 2, the cross-level interaction term between TMX (at

level 1) and leader cognitive ability (at level 2) was significant (B = -.03, $p < .05$). Figure 2 portrays this interaction. Simple slopes analyses revealed that the relationship between TMX and performance was positive and significant when leader cognitive ability was low (B = .22, z = 2.10, $p < .05$) but not high (B = -0.16, z = -0.96, $p > .05$). Thus, Hypothesis 2a was supported.

Study 1 Supplementary Analyses

As noted above, we controlled for LMX in order to examine the effects of TMX on performance under varying teammate and leader resource conditions. However, this raises the question of whether LMX interacts similarly with different resources conditions as TMX does to affect performance. We did not expect this to be the case for two reasons. First, based on the nature of supervisor-subordinate role relations found in authority-differentiated team structures, leaders are afforded a certain degree of legitimate "right" to advise members in matters of the task, and at the same time places social pressure on members to demonstrate their compliance by utilizing information provided by authority figures (Katz & Kahn, 1966). Second, the positional differentiation between leaders and members in hierarchical decision-making teams also may render individuals more likely to utilize task information from leaders, simply because they assume that the resources leaders provide may result in better individual outcomes and relying on authority figures to provide guidance for action may operate as a "convenient shortcut" to instrumental gains (Cialdini, 2009; Wilson et al., 2010). For these reasons, individuals may not need strong LMX or exchange-based obligations to utilize resources from their leader, thus rendering LMX a less powerful predictor of utilization obligations and less likely to interact with different resource conditions to impact performance. In contrast, the expected compliance associated with authority differentiation are less characteristic of peer-to-peer relationships, nor are fellow teammates likely to have the positional benefits of leaders (Wilson et al., 2010). Thus,

when it comes to utilizing teammates' resources, members have far greater discretion, leaving more room for TMX to shape this process.

Nonetheless, we investigated the possibility that LMX might interact with different resource conditions to predict member performance or conditionally shape the effects of TMX on performance. In theory, if LMX produced obligations to utilize resources from the leader, we should observe a significant two-way interaction between LMX and leader cognitive ability in predicting performance. However, this two-way interaction was not significant (B = 0.01, n.s.), indicating that the relationship between LMX and performance did not – like TMX – depend on the quality of exchange partner resources. We also sought to see if the two-way interaction we observed between TMX and leader cognitive abilities depended on the quality of LMX. In theory, if LMX produced competing obligations to utilize resources from the leader, we should observe a significant three-way interaction, where the TMX-performance relationship depends on both the leader's cognitive ability and LMX. However, this three-way interaction was not significant (B = 0.03, n.s.), suggesting that the interaction between TMX and leader's cognitive ability was not subject to the influences of LMX. These analyses indicate that LMX may be less sensitive to resource contingencies compared to TMX in our context.

Study 1 Discussion

Study 1 provided support for our predictions that TMX enhances performance when teammates' resources are of high quality or when leader's resources are of low quality. Additionally, we found that high TMX appears to have a "constraining" effect in that it marginally lowers performance when teammates' cognitive ability is low or when leaders' cognitive ability is high. This suggests that individuals in high TMX relationships may over-utilize teammates' resources even when they are of low quality, or underutilize leader's

resources even when they are of high quality. Overall, these findings support the arguments of social capital theory that strong exchange relationships are beneficial when one's exchange partner possesses high quality resources or when others in the environment do not.

Despite the strengths of Study 1 (e.g., realistic team nature and naturally observed exchange relations), there were several limitations which we sought to address in Study 2. First, in Study 1, TMX and teammates' cognitive ability referenced the team in the aggregate. Second, although cognitive ability, TMX, and member performance were assessed from different sources and measured at different time points, the ability to make causal inferences and internal validity are limited. Third, we assumed that higher cognitive ability was associated with higher quality informational resources, but did not capture information quality directly. Fourth, although our integrative framework suggests that strong TMX produces obligations to utilize information provided by teammates, we did not assess this mediator directly. Finally, leaders rated individual performance, making this measure vulnerable to various rater biases.

In Study 2, we addressed these issues by creating a decision-making scenario experiment in which the participant receives information of varying quality from a teammate and a leader to perform the task. To address causality concerns, we manipulated the strength of TMX as well as the quality of information provided by the teammate and leader. We also examined felt obligation to utilize information from the teammate as the underlying mechanism explaining the effects of TMX on performance. Importantly, in employing a decision-making scenario with an objective performance standard, we were able to capture individual performance without threats of subjective biases. Finally, for the theoretical and empirical reasons mentioned in the supplementary analyses of Study 1, we did not manipulate LMX in Study 2.

STUDY 2 METHODOLOGY

Sample, Design, and Procedure

We collected data in Study 2 from 436 undergraduate business majors (55.7% women and 44.3% men, mean age = 21.23 years, SD = 1.76) enrolled at a large, Midwestern university in the United States. Subjects voluntarily participated in the study for extra credit in a 2 (TMX: high vs. low) x 2 (leader resources: high vs. low) x 2 (teammate resources: high vs. low) between-subjects scenario experiment, and were randomly assigned across the eight conditions, averaging 54.5 individuals per condition. After indicating their consent, each participant was presented with the scenario experiment through an online survey and instructed to imagine that they were part of a three-member marketing consulting task force in the business school, composed of a leader (J.P.) and a fellow undergraduate (their teammate Pat). Participants read that, on a previous assignment, they had worked intensively with Pat to plan a retreat for the business school. Participants were then presented with a description of their working relationship with Pat that either corresponded to high or low TMX.[1] After reading this description, participants completed a perceptual measure of TMX as a manipulation check.

Participants then read an email from their leader, J.P, about a new assignment that required reading about an open-ocean survival situation and then rank ordering 10 items that could aid survival. Participants were told the task followed a two-part process – they would first generate their initial rankings individually, and then after receiving task information from J.P. (their leader) and Pat (their teammate), provide a second, final set of rankings. This two-part process enabled us to capture both participants' initial performance prior to receiving any information from J.P. or Pat as a baseline, as well as participants' final performance, which should in theory be affected by the extent to which participants utilized high or low quality

[1] Scenario materials are available upon request from the first author.

information from Pat and J.P. The task described in J.P.'s email was an adapted version of the team decision-making exercise, *Lost at Sea* (used in Littlepage, Robison, & Reddington, 1997).

After reading about the task, participants answered several questions gauging their interest in completing the ranking task and the realism of the overall scenario. Then, without the aid of outside materials, participants provided their initial rankings of the 10 items. Next, participants "received" two emails – one from J.P. and one from Pat – containing the manipulations for high or low quality leader and teammate information, respectively. Participants then generated a final ranking of the 10 items, after which they answered several questions about their felt obligation to use the information provided by Pat, their teammate. Finally, participants responded to several demographic items, were thanked, and dismissed.

Manipulations and Manipulation Checks

TMX manipulation. The TMX manipulation described either a high (strong) or low (weak) exchange relationship between the participant and Pat, based on Seers (1989). For high TMX, participants read that they and Pat readily help each other out, with confidence the other will repay the favor; are very open to giving and receiving feedback from each other; and recognize and celebrate each other's unique strengths as teammates. For low TMX, participants read that they and Pat sometimes help each other out, but favors are not always returned; are not very open to giving and receiving feedback from each other; and do not recognize or celebrate each other's unique strengths as teammates. Manipulations were identical in word count.

TMX manipulation check. For TMX, participants indicated how strongly they agreed with the 10-item measure of TMX from Seers (1989), adapted to reference Pat. Across the eight conditions, 49.3% and 50.7% of subjects received the high and low TMX manipulations, respectively. With the Seer's (1989) TMX measure as the outcome, analysis of variance tests

indicated a main effect for the TMX manipulation, such that $M_{\text{high TMX}} = 4.00$, $M_{\text{low TMX}} = 2.39$, $F(1, 434) = 609.11$, $p < .01$, $\eta^2 = .58$. These results provide strong evidence for the efficacy and validity of the TMX manipulation featured in our scenarios. Further, because we expected perceptions of TMX rather than manipulations of TMX to more proximally affect participants' behavior in the scenario, we elected to retain perceptions of TMX as our independent variable.

Leader and teammate quality of task information manipulation. The leader and teammate task information manipulations contained "hints" from J.P. and Pat, respectively, about five of the ten items on the list. Each set of task information provided unique information about four items and shared information about one item (i.e., if in one condition J.P. provided task information about items 1, 3, 5, 7, and 10, then in that same condition Pat provided information about items 2, 4, 6, 9, and 10). We chose this design to reflect the reality that in team settings, leaders and team members often have unique but sometimes shared information that individuals can draw upon (Hollenbeck et al., 1995). Also, because shared information can signal accuracy (Gigone & Hastie, 1993), we ensured that across all conditions, both sets of information about item 10 always contained accurate information. Importantly, because unique information was provided about eight of the ten items, the accuracy of participants' final rankings depended on how they prioritized task information from J.P. or Pat about specific items. To ensure there were no item-specific effects (i.e., high quality information about items 1, 3, 5, 7, and 10 might enhance performance more than high quality information about items 2, 4, 6, 9, and 10), we counterbalanced the source of the information (J.P. or Pat) across conditions.

The high quality task information condition signaled whether each item should be ranked in the top or bottom half of the rankings following objective ranking standards and rationales provided by Coast Guard experts. For example, the shaving mirror – which was ranked number 1

on the Coast Guard's list – was listed as an item in "the top half" of J.P.'s/Pat's rankings in the high quality information condition, and was accompanied by the rationale, "Helpful for reflecting the sun and signaling across far distance." In contrast, in the low quality condition, information signaled whether each item should be ranked in the top or bottoms half of the rankings, *in reverse* of the objective ranking standard provided by the Coast Guard, and reflected bogus rationale that might be commonly held by the public but did not coincide with the ratings of real survival experts. For example, in the low quality information condition, the shaving mirror was listed as an item in "the bottom half" of J.P.'s/Pat's rankings, and was accompanied by the rationale, "Having a mirror to maintain personal grooming is not immediately useful for increasing survival." Rationale for each item was equivalent in word count, and the order of information presented from J.P. or Pat was counterbalanced across conditions.

Leader and teammate information quality manipulation check. We pilot tested our manipulations to ensure that high and low leader and teammate information quality operated as we expected. A separate sample of 186 undergraduate students was recruited in similar manner as those in our main sample and were randomly assigned to the 2 (TMX: high vs. low) x 2 (leader resources: high vs. low) x 2 (teammate resources: high vs. low) between-subjects design scenario experiment, averaging 23.25 individuals per condition. Participants in our pilot sample were subject to the same manipulations and were asked to perform the same tasks as those in our main sample. We assessed whether participants in the high-high conditions – i.e., high quality information from the leader (J.P.) and teammate (Pat) – provided more accurate final rankings compared to those in the high-low/low-high or low-low conditions. Note that lower deviation scores from the objective standard represent higher performance. Analysis of variance tests indicated that those in the high-high condition performed better (i.e., had lower deviation scores)

than those in the high-low/low-high conditions ($M_{\text{high-high}} = 10.74$, $M_{\text{high-low/low-high}} = 16.01$, F (1, 142) = 27.79, $p < .01$, $\eta^2 = .16$) and low-low condition ($M_{\text{high-high}} = 10.74$, $M_{\text{low-low}} = 19.88$, F (1, 90) = 58.23, $p < .01$, $\eta^2 = .39$); additionally, those in the high-low/low-high conditions performed better (i.e., had lower deviation scores) than those in the low-low condition ($M_{\text{high-low/low-high}} = 16.01$, $M_{\text{low-low}} = 19.88$, F (1, 134) = 14.02, $p < .01$, $\eta^2 = .10$). As such, we had evidence that the manipulations of high and low quality information operated as we had intended.

Scenario realism check. Participants completed a series of questions assessing the realism of the scenario adapted from Chen, Sharma, Edinger, Shapiro, and Farh (2011). 81.7% of participants agreed with the item, "It is realistic that I might work with a teammate like Pat" (1 = strongly disagree, 5 = strongly agree) (M = 3.88, SD = .68), and 73.9% agreed with the item, "It is realistic that I might work with a team leader like J.P." (M = 3.76, SD = .75). Additionally, in referencing the scenario as a whole, 82.1% agreed with the item, "At some point during my career I will probably encounter a situation like the one described above" (M = 3.91, SD = .60). These manipulation checks indicated that participants found the scenario to be realistic.

Measures

Descriptive statistics, internal consistency coefficients, and correlations of our core variables are reported in Table 4. Unless noted otherwise, all items were rated on a 5-point Likert-type scale (1 = strongly disagree, 5 = strongly agree).

TMX. Participants rated the strength of TMX with their teammate Pat using the ten-item scale developed by Seers (1989). Sample items were, "I often make suggestions about better work methods to Pat," and "Pat usually lets me know when I do something that makes Pat's job easier (or harder)" ($\alpha = .96$).

Felt obligation to utilize teammates' resources. To assess participants' felt obligation to rely on the task information they received from Pat, we adapted four items from Eisenberger et al.'s (2001) felt obligation scale. Adapted items were, "I feel a personal obligation to use the advice Pat gave me," "I owe it to Pat to utilize the advice Pat provided to make my rankings," "I have an obligation to rely on Pat's advice in making my rankings," and "I would feel guilty if I did not incorporate Pat's advice into my decision making" (α = .91). These items are consistent with our conceptualization of felt obligation to utilize teammates' resources, as opposed generalized obligations such as feelings of indebtedness and the need to reciprocate. Further, so as not to prime participants to use or not use information from Pat, we asked these felt obligation items *after* participants made their final decisions.

Performance. Participants' decision-making performance was assessed according to how closely their ranking of the 10 items matched the objective ranking standard provided by the Coast Guard. The accepted way of calculating this for the *Lost at Sea* exercise is to subtract the rank given for each item from its correct ranking, with performance being the sum of the absolute value of deviations across the 10 items. For ease of interpretation, these deviation scores were reverse coded, such that higher performance accrued to lower deviations from the objective ranking. Two indices of performance were calculated – initial (control) and final (outcome).

Control variables. Given our objective to assess the benefits of TMX above and beyond one's own performance abilities, we controlled for initial performance. As mentioned above, initial performance was measured as the sum of absolute value of deviations across the 10 items, prior to receiving any task information. We reverse coded deviation scores, such that higher initial performance reflected lower deviations from the objective ranking standard.

Analyses and Results

Descriptive statistics, internal reliability coefficients, and correlations are reported in Table 3. Confirmatory factor analyses showed that a two factor model for felt obligation to utilize teammates' resources and TMX fit the data well (CFI = 0.94, SRMR = 0.03), and significantly better than a one factor model. The bivariate correlations show that TMX was significantly correlated with felt obligation to utilize teammates' resources (r = .18, p < .05), but neither TMX nor felt obligation to utilize teammates' resources correlated with performance. In contrast, both leader and teammate information quality were correlated with final performance (r = .13 and .17, p < .05), thus providing additional support for the effectiveness of our information quality manipulation. Initial performance was highly correlated with final performance (r = .48, p < .05), indicating that it was important to control for initial performance when examining the effects of TMX and leader and teammate's information quality on performance.

Hypothesis 1b proposed that the relationship between TMX and performance via felt obligation to utilize teammates' resources would be more positive when the quality of task information provided by one's teammate was higher rather than lower. We found that TMX was positively related to felt obligation to utilize teammates' resources (B = .14, p < .01), and the interaction term between felt obligation to utilize teammates' resources and teammate information quality was significant (B = 1.68, p < .01). When the teammate provided high quality information, felt obligation to utilize teammates' resources was positively related to performance (B = .99, p < .05), whereas under low levels of teammate information quality, felt obligation to utilize teammates' resources was not related to performance (B = -.69, *n.s.*). Using the methods recommended by Preacher and Hayes (2008), we estimated the conditional indirect effects of TMX on performance via felt obligation to utilize teammates' resources in MPLUS

(Muthén & Muthén, 2007). The indirect effect was positive and significant under high (B = .14, $p < .05$; 95% C.I. = .03, .33) but not under low quality task information from the teammate (B = -.10, *n.s.*; 95% C.I. = -.27, .01), and the difference between these conditional indirect effects was significant (B = -.24, $p < .05$; 95% C.I. = .08, .52), supporting Hypothesis 1b.

Hypothesis 2b proposed that the relationship between TMX and performance via felt obligation to utilize teammates' resources would be more positive when the quality of information provided by the leader was lower rather than higher. We found that TMX was positively related to felt obligation to use teammates' resources (B = .14, $p < .01$), and the interaction between felt obligation to utilize teammates' resources and leader information quality was significant (B = -1.22, $p < .05$). Under low quality leader information, felt obligation to use teammates' resources was positively related to performance (B = .76, $p < .05$), but not under high quality leader information (B = -.46, *n.s.*). Conditional indirect effects of TMX on performance via felt obligation to use teammates' resources were positive and significant under low (B = .11, $p < .05$; 95% C.I. = .01, .30) but not high leader information quality (B = -.07, *n.s.*; 95% C.I. = -.27, .04). The difference between these conditional indirect effects was significant (B = -.18, $p < .05$; 95% C.I. = -.48, -.03), supporting Hypothesis 2b.

Study 2 Supplementary Analyses

Our integrative theoretical model featured felt obligation to utilize teammates' resources as our mediator of interest, but we also examined other mediators. In particular, as social exchange relationships are characterized by generalized exchange obligations and trust (Blau, 1964), it is possible that these constructs may interact with the quality of teammates' or leader's informational resources to predict performance. To assess these possibilities, we captured generalized exchange obligations, cognitive trust, and affective trust immediately after

participants were exposed to the TMX manipulation. Generalized exchange obligations were measured using four items developed by Colquitt, Baer, Long, and Halvorsen-Ganepola (2014; α = .87) reflecting the sentiments of Blau (1964) – that exchange relationships prompt diffuse obligations, trust, commitment, and significance. We measured affective and cognitive trust with six items adapted from McAllister (1995, α = .94 for affective trust, α = .83 for cognitive trust).

Our results showed that all alternative mediators – generalized exchange obligations (B = .71, p <.01), affective trust (B = 1.07, p <.01), and cognitive trust (B = .56, p <.01) – were positively predicted by TMX. However, none of these variables demonstrated significant interactions with the quality of teammate or leader information to predict performance. Furthermore, the interactions between felt obligation to utilize teammates' resources with teammate information quality (B = 1.89, p <.01) and leader information quality (B = -1.18, p <.05) held above and beyond the main effects of generalized exchange obligations, affective trust, and cognitive trust, and also the interactions between these mediators and teammate and leader information quality. These results provide evidence that felt obligation to utilize teammates' resources was uniquely responsible for transmitting TMX's effects onto performance under various conditions of resource quality from teammates and leaders. This may have been the case because generalized obligations and trust do not specify obligations toward the resources provided by the exchange partner, whereas the felt obligation to utilize teammates' resources is likely a more proximal predictor of actual resource utilization (Lin, 2008). More importantly, these results show that felt obligation to utilize teammates' resources provides additional insights into resource exchange relationships and helps to rule out alternative explanations for our findings.

Study 2 Discussion

Overall, the results of Study 2 extended Study 1 in several important ways. First, Study 2 provided causal evidence that TMX enhances performance via felt obligation to use teammates' resources when (a) the teammate provides high quality task information, or when (b) the leader provides low quality task information. These findings generally replicated the findings of Study 1, particularly with regard to showing support for the hypothesized resource conditions under which TMX enhances performance. Second, Study 2 demonstrated that felt obligation to use teammates' resources acts as a critical mediator of these effects, thus providing support for our theoretical arguments that strong TMX relationships produce obligations to utilize teammates' resources. Indeed, although Study 1 found that TMX helps individual performance when teammates possess higher cognitive ability, Study 2 showed that having a combination of strong TMX *and* high quality information from the teammate does not automatically predict higher performance – rather, it is through felt obligation to utilize teammates' resources that TMX affects performance at varying levels of resource quality from teammates and leaders. Thus, together, the two studies lend credence to our theoretical model, which held across different contexts, tasks, and operationalizations of teammate and leader resources.

GENERAL DISCUSSION

Theoretical Implications

By integrating perspectives from social exchange and social capital theories, our resource-based contingency model contributes new insights on when TMX relationships help member performance in teams. Deviating from the predominant view that strong TMX and effort-based mechanisms are sufficient for enhancing performance, we advance a new perspective in which the performance benefits of TMX depend on the quality of resources provided by teammates and leaders. Specifically, we show that this contingency occurs because

TMX produces obligations to utilize teammates' resources – however, because teammates vary in the quality of resources that they provide, these obligations to utilize teammates' resources only pay off when those resources are of high quality. In this regard, our study concurs with prior research suggesting that not all exchange relationships are equal in their potential benefit (e.g., Tangirala et al., 2007; Venkataramani et al., 2010), and we extend this work by articulating the teammate-related resource conditions that make TMX relationships beneficial for performance. Doing so also helps explain why prior research that focused only on the strength of TMX but failed to consider resource quality may have produced inconsistent findings on the TMX-performance relationship (e.g., Kamdar & Van Dyne, 2007).

Beyond accounting for the quality of resources provided by teammates, our findings point to an additional resource contingency – the quality of resources available from *other* actors in the proximal team context such as leaders. Indeed, we find that when the quality of resources from leaders is low, TMX enhances performance because the heightened obligations to use teammates' resources can protect individuals from over-utilizing low quality resources from leaders. The implication to consider both teammates' *and* leaders' resources as contingencies of the TMX-performance relationship is an important shift, as prior TMX research has tended to focus on the exchange relationship itself, rather than the role of others outside of the relationship (Banks et al., 2014). Our approach accounts for the reality that individual members often make task decisions based on available information from teammates and team leaders (Hollenbeck et al., 1995), and thus provides a more comprehensive account of how TMX operates in relation to the configuration of resources from key stakeholders in the team to predict performance.

A critical aspect of our theoretical contribution was to introduce felt obligation to utilize teammates' resources as the mechanism that transmits the effects of TMX on performance under

varying teammate and leader resource quality conditions. To date, most research on TMX has relied on effort-based reciprocity mechanisms to explain its effects on member outcomes (Farmer et al., 2014; Liao et al., 2010, Seers et al., 1995). We deviate from this perspective by showing that obligations to utilize teammates' resources are uniquely responsible for the relationships we find, above and beyond generalized exchange obligations or trust. Identifying this mechanism and its interaction with the quality of teammates' or leaders' resources provides a novel understanding of why TMX alone may or may not benefit performance in team decision-making contexts. Moreover, we show that depending on the quality of information provided inside versus outside of the TMX relationship, the obligation to utilize resources from teammates can help facilitate performance by preventing members from over-utilizing low quality information from leaders.

Practical Implications

Although numerous benefits can be accessed through strong TMX relationships (e.g., social support, affirmation, assistance), our findings suggest that individuals should be careful not to haphazardly forge TMX relationships without considering the potential quality of task information those teammates can provide. This is because, once TMX relationships are forged, obligations to rely on teammates' task information are heightened – but as we show, those obligations to utilize teammates' resources enhance performance only when teammates provide high quality information, or when alternative sources (e.g., leaders) do not. For this reason, individuals seeking to enhance performance through TMX should build exchanges with those who are privy to high quality information or possess attributes reflecting the capacity to generate that information (like high cognitive ability). Because neither task expertise nor cognitive ability is easily observable from the moment of team formation (Littlepage et al., 1997), however,

individuals must be proactive in their role-making processes to discover this information. Likewise, given that expertise is task-specific (Nebus, 2006), one must be realistic that the benefits of a TMX relationship may not be sustained if the information provided by that teammate loses relevance over time in dynamic task environments.

From a managerial perspective, our findings suggest that organizations should not simply promote strong TMX relationships in teams, but also make sure that TMX relationships are configured to involve those who are capable of providing valuable resources. One way to ensure this is by composing teams of individuals with higher cognitive ability (as shown in Study 1), or to invest in training such that all members are able to provide high quality task information (as shown in Study 2). Additionally, our finding that high TMX buffers against over-relying on leaders' low quality informational resources suggests that enhancing TMX may act as a potential source of resilience in the face of an incompetent leader – a common problem encountered by employees everywhere (Darioly & Schmid Mast, 2011; Gallo, 2011; Useem, 2001).

Strengths, Limitations, and Directions for Future Research

A key strength of our two study design was to establish the validity of our findings and demonstrate our phenomenon of interest using two different operationalizations of teammates' and leader's resources (cognitive ability and quality of task information). Our replicated findings across different contexts and research designs provide confidence that our theoretical model likely holds elsewhere. Still, both studies relied on student samples. Although limitations associated with student samples are mitigated when the study has a clear theoretical contribution, high psychological realism, and measures of actual behavior such as ours (Berkowitz & Donnerstein, 1982; Colquitt & Zapata-Phelan, 2007), we nevertheless invite future research to

replicate our model in organizational settings involving full-time employees, multiple sources, and different samples (Peterson & Merunka, 2014).

Relatedly, we acknowledge that in our exclusive focus on informational resources, there are likely situations where one cannot know the actual content of information and thus be unable to assess whether the quality of information provided by leaders or teammates is objectively good or bad, equally informative or potentially misleading, or independent or of complementary relevance for performance. Thus, future research is needed to understand how our theoretical model unfolds when the quality of resources received from teammates and/or leaders is ambiguous in nature. We also recommend future work to identify partner attributes beyond cognitive ability and resources other than task information that may be relevant for performance in team contexts – for instance, partner attributes conferring resources like prominence or centrality may be important for individual effectiveness in innovation contexts (Ibarra, 1993).

A natural extension of our study is to examine other performance-relevant implications of TMX through other mediators (Blau, 1964). Our focus on obligations to utilize resources from teammates was informed by social exchange and social capital theory, but obligations to reciprocate with one's own energy, time, and resources may also mediate the TMX effects on performance. Indeed, research has employed resource perspectives to explain when helping behavior might be depleting (Koopman, Lanaj, & Scott, 2015) at the expense of one's own performance (e.g., Nielsen, Bachrach, Sundstrom, & Halfhill, 2012). There is also evidence that giving help and attending to the needs of coworkers can increase one's positive affect (Koopman et al., 2015) and replenish one's regulatory resources because such actions represent "heedful relating" that spawns personal thriving at work (Spreitzer, Sutcliffe, Dutton, Sonenshein, &

Grant, 2005). Future research may examine these possibilities and consider how the various obligations associated with TMX combine to exert net influences on performance.

Finally, future research can examine whether the principles we uncovered here might extend to other types of exchange relationships. In particular, it is plausible that LMX may interact with the quality of leader resources to further enhance the performance benefits of LMX. We did not find evidence of such effects, potentially because the hierarchical structure of our teams and the emphasis on decision-making made our empirical context were less sensitive to differences in LMX. Future research may pursue this question, with special attention to other valuable resources leaders can provide – such as social standing (Lind & Tyler, 1992; Smith, Tyler, Huo, Ortiz, & Lind, 1998; Wilson et al., 2010) – that can enhance performance outside of decision-making contexts. More broadly, future work can assess a larger array of exchange relationships individuals forge beyond teammates or leaders, and consider how an individual's relationships with other parties within and external to the team – and the resources they offer – might yield different performance implications (Oh, Labianca, & Chung, 2006). Future research can examine how individuals strategically juggle these relationships and their associated resources to benefit performance across different tasks, times, and circumstances.

Conclusion

By integrating social exchange and social capital theories, we developed and tested a resource-based contingency model of when TMX exchange relationships will help member performance. We find across two studies that, depending on the distribution of the quality of resources across teammates and leaders in the team environment, TMX can enhance performance (via felt obligation to utilize teammates' resources) when teammates provide high quality resources or when leaders do not. We hope that our work will serve as a stepping stone to advance understanding of when and why TMX benefits individual performance.

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TABLE 1

Means, Standard Deviations, and Correlations among Variables in Study 1

	(a) Individual (Level 1) Variables	**M**	***sd.***	**1**	**2**	**3**	**4**	**5**
1	Member cognitive ability	24.49	3.04	-				
2	Member conscientiousness	3.96	0.24	.09	*(.83)*			
3	LMX	4.36	0.38	.23*	.10	*(.94)*		
4	TMX	4.30	0.33	.16*	.18*	.56**	*(.92)*	
5	Member task performance	4.21	0.56	.28*	.05	.24*	.16*	*(.94)*
	(b) Team(Level 2) Variables	**M**	***sd.***	**1**	**2**	**3**	**4**	
1	Teammates' cognitive ability	24.49	3.04	-				
2	Leader's cognitive ability	28.34	5.44	.22	-			
3	Team's average TMX	4.30	0.33	.28	.19	-		
4	Teammates' variation in cognitive ability	5.32	2.02	.11	-.04	.01	-	
5	Teammates' variation in TMX	0.45	0.23	-.20	-.14	-.28	-.02	-

Level 1 N based on listwise deletion = 168. Level 2 N = 41. Correlations among level 1 variables are within-group correlations (variables were group mean-centered before bivariate correlations were computed). Means and standard deviations are based on between-group scores. Reliability estimates (coefficient alpha) appear on the diagonal;
*p <.05,
**p <.01.

TABLE 2

Main and Interaction Effects of TMX, Team, and Leader Cognitive Ability in Study 1[a]

	DV: Member Task Performance					
Variables	**B**	**s.e.**	**t**	**B**	**s.e.**	**T**
Intercept (b_{00})	4.19	0.10	42.84**	4.19	0.10	42.09**
Level 2 predictors						
Teammates' Cognitive Ability (b_{01})				0.01	0.03	0.51
Leader Cognitive Ability (b_{02})				0.01	0.02	0.48
Team's average TMX (b_{03})				0.30	0.32	0.95
Teammates' variation in Cognitive Ability (b_{04})				0.01	0.04	0.19
Teammates' variation in TMX (b_{05})				0.12	0.38	0.31
Level 1 predictors						
Member Cognitive Ability (b_{10})	0.02	0.01	2.65*	0.03	0.01	2.96*
Member Conscientiousness (b_{20})	-0.02	0.09	-0.28	-0.03	0.09	-0.38
Leader Member Exchange (b_{30})	0.22	0.10	2.17*	0.24	0.09	2.54*
Team–Member Exchange (b_{40})	0.02	0.12	0.19	0.03	0.11	0.30
TMX x LMX (b_{50})	0.18	0.23	0.78	0.16	0.25	0.63
Cross-level interactions						
TMX x Team Cog Ability (b_{41})				0.09	0.03	3.39*
TMX x Leader Cog Ability (b_{42})				-0.03	0.02	-2.27*

a. All level 1 predictors were group mean centered and level 2 predictors were grand mean-centered. Level 1 n based on listwise deletion = 168. Level 2 N = 41. Coefficients (Bs) reflect unstandardized effect sizes.

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

TABLE 3

Means, Standard Deviations, and Correlations among Variables in Study 2

Variables		M	*sd.*	1	2	3	4	5
1	Initial performance	25.55	6.93	-				
2	TMX	3.21	1.05	.03	*(.96)*			
3	Felt obligation to utilize teammates' resources	2.53	0.84	-.02	.18**	*(.91)*		
4	Teammate information quality	0.49	0.50	.00	.03	.10*	-	
5	Leader information quality	0.53	0.50	.07	.02	-.00	.01	-
6	Final performance	29.53	6.55	.48**	-.01	.02	.17**	.13**

n = 436. Reliability estimates (coefficient alpha) appear on the diagonal;
*p <.05, **p <.01.

TABLE 4

Main and Interaction Effects of TMX, Teammate's, and Leader's Information Quality in Study 2[a]

	DV: Felt Obligation to Utilize Teammates' Resources		DV: Final Performance	
Variables	Model 1	Model 2	Model 3	Model 4
Intercept (b_0)	2.45*	2.46*	27.75*	27.67*
Initial performance (b_1)	-.00	-.00	.45*	.46*
Felt obligation to utilize teammates' resources (b_2)			.15	-.03
Teammate information quality (b_3)	.17*	.16*	2.16*	2.12*
Leader information quality (b_4)	-.00	-.01	1.34*	1.38*
TMX (b_5)		.14*	-.20	-.24
Felt obligation to utilize teammates' resources x Teammate information quality (b_6)				1.68*
Felt obligation to utilize teammates' resources x Leader information quality (b_7)				-1.22*
R-squared	.01	.04	.27	.29
R-squared change	--	.03	--	.02*

n = 436. Coefficients (Bs) reflect unstandardized effect sizes.
*p <.05, **p <.01.

FIGURE 1

The Moderating Role of Teammates' Cognitive Ability on the Relation between TMX and Performance in Study 1 (H1a)

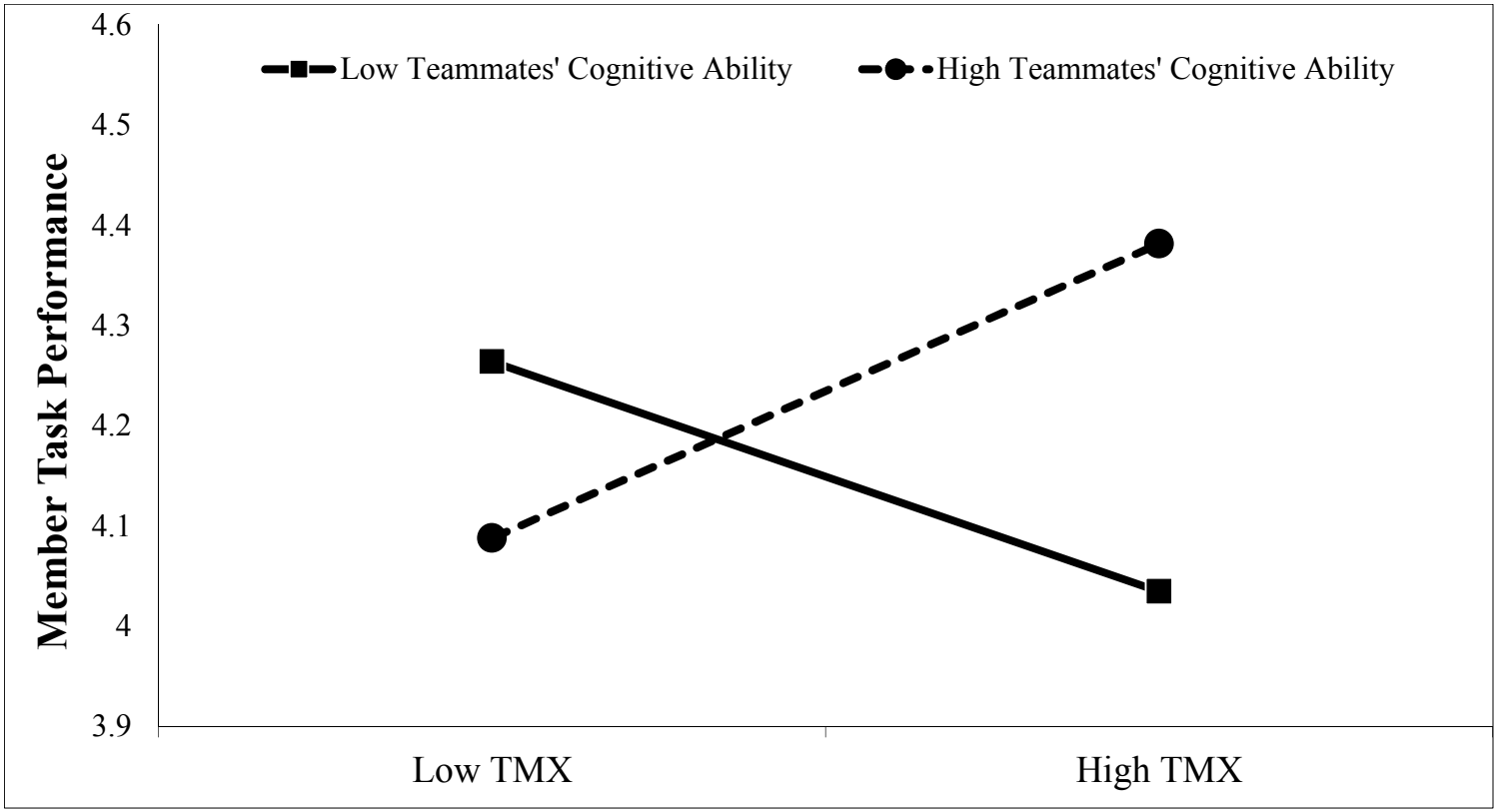
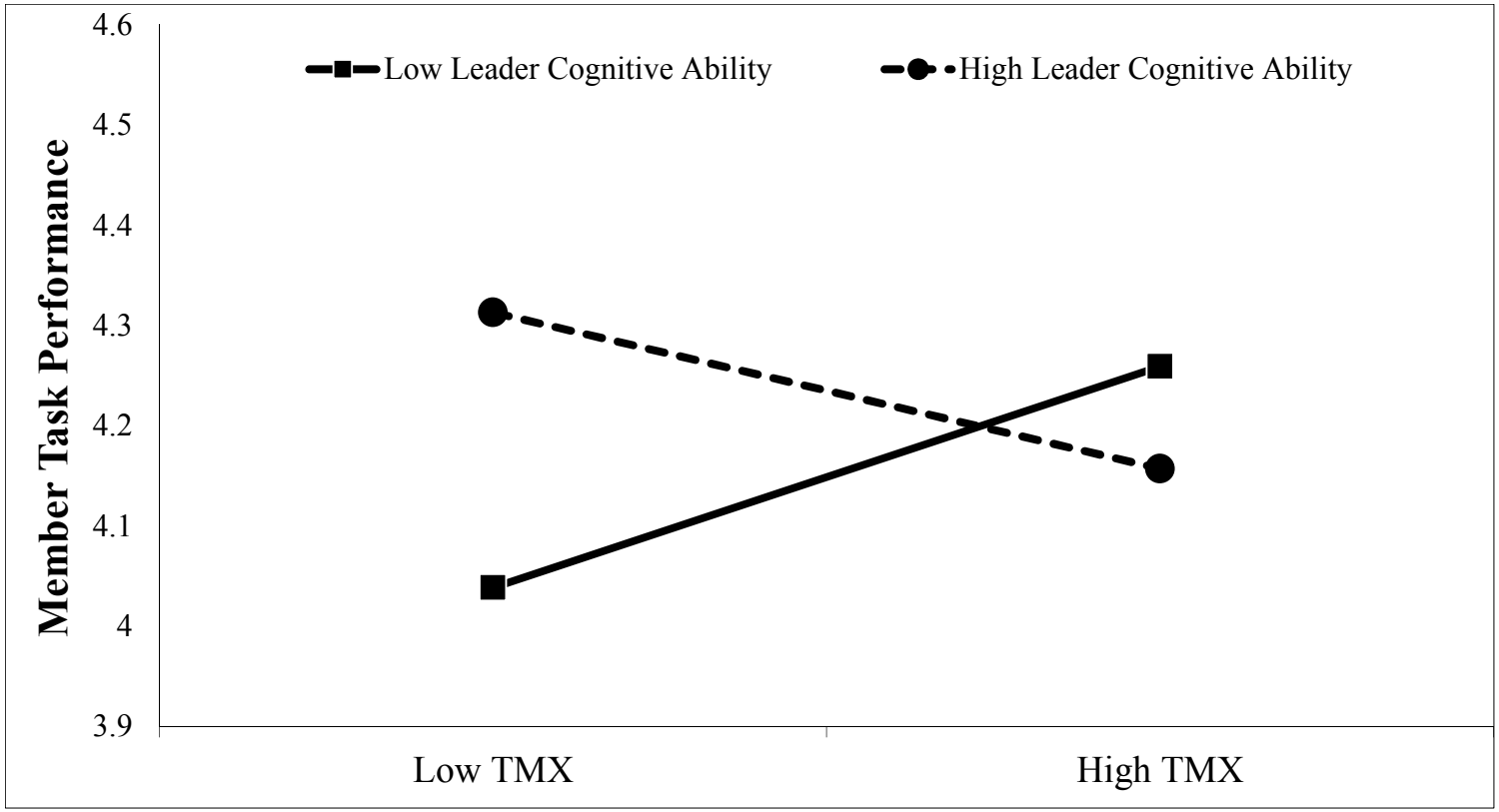


FIGURE 2

The Moderating Role of Leader's Cognitive Ability on the Relation between TMX and Performance in Study 1 (H2a)



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