WORKPLACE SOCIAL EXCHANGE: SUBSTITUTES AND NEUTRALIZERS OF LMX AND TMX IN TEAM CONTEXTS

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ABSTRACT

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The purpose of this dissertation is to develop an integrated theoretical model of the simultaneous interplay of social exchange relationships with a supervisor (leader-member exchange: LMX) and fellow team members (team-member exchange: TMX) in organizational contexts. The model extend current theories related to LMX and TMX by integrating ideas from self-determination theory, identity-orientation theory, and a theory of team types to describe how these two relational variables combine to influence work outcomes. In 3 field studies, using longitudinal, multisource data from 815 employees on 111 teams, results show that a substitute effect in which high TMX buffers the negative effects of low-quality LMX on job satisfaction and job performance. Moreover, both a low relational identity and low authority differentiation within the team demonstrate a neutralize effect on the otherwise positive effects of high LMX. In contrast, both a high collective identity and high skill differentiation within the team show a substitute effect on the otherwise negative effects of low TMX.

To my grandma and grandpa, whose love has inspired me and shaped my life.

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INTRODUCTION

Leadership has long been one of the central concerns in the field of organizational behavior (Judge, Woolf, Hurst, & Livingston, 2008). Leadership theory and research have, however, gone through multiple stages over the years; beginning with the focus on leader traits, then behaviors, then the moderating effects of situational contexts, follower characteristics, and finally the dyadic relationship between leaders and followers (Bass & Bass, 2008). Numerous empirical studies have yielded the conclusion that leadership can affect the individual, group, and organizational level performance, sometimes in profound ways (Gerstner & Day, 1997).

Early research on leadership development adopted a trait-based approach which focused on the dispositions and other traits that make an effective leader. These studies identified several key leader traits related to personality, demographics, intelligence, and task competence (e.g., Eagly, Karau, & Makhijani, 1995; Judge, Bono, Ilies, & Gerhardt, 2002; Judge, Colbert, & Ilies, 2004; Mumford, Campion, & Morgeson, 2007). For example, conclusive empirical evidence has drawn on the Big Five personality traits in their predictive power of leaders' performance motivation and leader behaviors (Judge et al., 2002; Bono & Judge, 2004). Trait theories of leadership, however, were not without their detractors. For example, Stogdill (1963) questioned the utility of trying to predict leadership effectiveness by mechanically summing up scores on relatively distal trait-based constructs.

In reaction to these and other criticisms, behavioral approaches were developed that focused more specifically on how a leader’s actions influenced leadership effectiveness. Two of the most studied types of leader behaviors are initiating structure and consideration (Shartle, 1950). Initiating structure represents task-oriented leader behaviors that clarify the work roles to facilitate task completion. Consideration is relationship-oriented leader behaviors that focuses on

the trust, respect, and support for the followers (Bass & Bass, 2008; Kerr , Schriesheim, Murphy, & Stogdill, 1974). The predictive power of these two behaviors has been validated in the literature and a meta-analysis found that both were related to member satisfaction, leader effectiveness and group performance (Judge et al., 2004). The behavioral approach to leadership was also the foundation of other influential theories of leadership including Fiedler's (1967) contingency model.

Although trait and behavioral approaches may seem like alternative conceptual frameworks for understanding leadership, they are depicted as an “average leadership style” approach by Graen and his colleagues (Dansereau, Graen, & Haga, 1975; Graen, 1976; Graen & Cashman, 1975) due to the assumption shared by both of these approaches that leaders treat all subordinates in a uniform way (e.g., Schriesheim, Castro, & Cogliser, 1999). However, this is unlikely to happen in real organizational contexts. In comparison, leader-member exchange (LMX) theory was built upon the premise that leaders differentiate in their exchange relationships with subordinates (Dansereau et al., 1975; Gerstner & Day, 1997; Liden, Sparrowe, & Wayne, 1997). Drawing on norms of reciprocity (Gouldner, 1960) and social exchange theory (Blau, 1964), the LMX approach focused on the development and consequences of dyadic relationships between leaders and their subordinates. High LMX is marked by social support and exchange of resources beyond the formal employment contract. In contrast, low LMX is purely an economic exchange within the range of material required for the task completion.

The LMX approach has advanced our understanding of leadership by revealing the nature of leader-follower exchange and the implications of relationship quality for organizations. Furthermore, LMX theory allows researchers to investigate the followers' role in the leadership process instead of only looking at the leader's influence. LMX has also been found to be related

to subordinates' role clarity and role conflict, organizational citizenship behaviors, performance, job satisfaction, commitment, and turnover intentions across numerous empirical studies (Gerstner & Day, 1997; Ilies, Nahrgang, & Morgeson, 2007).

Although leadership has long been a major topic of study in organizational behavior, in more recent years increasing emphasis has been directed toward teams and teamwork (Ilgen, Hollenbeck, Johnson, & Jundt, 2005). Global competition, consolidation, and innovation have led to the increased prevalence of team-based organization structures in the United States and around the world (Kozlowski & Bell, 2003). As a consequence, research attention has also been directed beyond just the relationship between the team members and their leader; it has begun to focus on the relationship between the team member and their team. In the context of teams, employees are embedded in a web of horizontal social relationships with co-workers, not just vertical relationships with supervisors. Moreover, in semi-autonomous or self-managing team-based structures, employees' working relationships with other team members, termed "team member exchange" (TMX), may be even more important than their vertical relationship with their leader (Seers, 1989). High TMX relationships involve the horizontal exchange of resources such as work-related expertise, feedback, social support, and shared power that results in perceptions of personal empowerment and that one is competently performing meaningful work (Liden, Wayne & Sparrowe, 2000).

Although the literature has identified these two key social relationships at work – LMX and TMX – the field has yet to fully theoretically integrate the interplay of how these two different relational variables work together simultaneously in organizational contexts. The relatively recent recognition of TMX and the small size of this literature (relative to the literature on LMX) have hampered this integration. Indeed, as will be shown in more detail in a

subsequent section of this thesis, only 14 studies have measured both LMX and TMX in the same sample, and the estimated true score correlation between these two variables (corrected for both sampling error and measurement unreliability, see Hunter & Schmidt, 1990) is a mere .21 (k = 13, N = 3,475). The small size of this correlation suggests that the two critical relational aspects of work are largely independent, and thus any individual could be simultaneously high on both, low on both – or most critically – high on one but low on the other. Despite the independent nature of these two relational variables, there has been no comprehensive theoretical integration of how they compete with or complement each other, and not a single empirical study has ever examined their interaction.

This omission in the literature is serious given the potential game changing nature that TMX might have on the relationship between LMX and team member outcomes. For example, in the LMX literature, Gerstner and Day's (1997)'s meta-analysis that examined LMX in isolation demonstrated a positive relationship of .41 (.55 corrected for LMX unreliability) between leader reports of LMX and member performance ratings. If instead of studying LMX in isolation, one also considered the simultaneous role of TMX, one could test the possibility that TMX amplifies or attenuates the LMX-performance relationship or the alternative possibility that TMX simply adds additional variance explained in performance over and above LMX. Moreover, the psychological dynamics associated with individuals who feel empowered because of their relationship to their leader versus those that feel the same way because they are empowered by their team have yet to be explored. In particular, the lack of relationship between the two variables means that in close to half of the cases, a person who is above the mean on one of these variables is below the mean on the other. The implications associated with cases where the two relationships go in opposite directions (members who have high TMX but low LMX or low

TMX but high LMX) are non-obvious and unexplored, but these cases may be widespread and have critical implications for the study of leadership and teamwork.

The purpose of this dissertation is to develop an integrated theoretical model of the simultaneous interplay of LMX and TMX in organizational contexts. The model will extend current theories related to LMX and TMX by integrating ideas from self-determination theory, identity-orientation theory, and a theory of team types to describe how these two relational variables combine to influence outcomes such as intrinsic motivation, job satisfaction, job performance, and retention. More specifically, self-determination theory will be employed to argue that both TMX and LMX have the potential to meet the same employee needs and thus act as substitutes when it comes to predicting critical outcomes. The implication of this substitution proposition is that one will experience positive work outcomes if one is high on *either of these two* relational variables.

In contrast, identity orientation theory will be employed to argue that the effects of LMX are contingent upon one's "relational identity" and that the effects of TMX are contingent upon one's "collective identity." A low "relational identity" will neutralize the otherwise positive effects of LMX and a low "collective identity" will neutralize the otherwise positive effects of TMX. The implication of this neutralization proposition is that one will experience positive work outcomes only if one is *high on both* LMX and "relational identity" or *high on both* TMX and "collective identity".

Similarly, with respect to team types, the model stipulates that the effects of LMX are contingent upon the team's "authority differentiation" and that the effects of TMX are contingent upon the teams "skill differentiation." Low authority differentiation within the team will neutralize the otherwise positive effects of LMX and a low level of skill differentiation within

the team will neutralize the otherwise positive effects of TMX. The implication of this neutralization proposition is that one will experience positive work outcomes only if one is *high on both* LMX and team authority differentiation or *high on both* TMX and team skill differentiation. The model shown in Figure 1 depicts this integrated theoretical model schematically.

In order to accomplish the purpose laid out above, this dissertation will first review the literature on LMX and TMX. This literature review will establish in more specific detail that LMX and TMX are rather weakly related and are, for the most part, independent relational variables. This literature review will also establish why this is the case, by showing that the literature has largely identified different antecedents for each of these variables. In contrast, this literature review will document that, despite their different antecedents, LMX and TMX tend to have the same effects on various work outcomes. These effects tend to be highly contingent on other factors, however, and that many other variables either substitute or neutralize the effects of LMX and TMX.

Following this literature review, the dissertation will review the core elements of self-determination theory to establish why LMX and TMX are likely to *substitute* for each other when it comes to the ability to meet team members' needs for relatedness, competence and autonomy. The ability to substitute either LMX or TMX to meet these needs has implications for predicting outcomes for these individuals, and it will be argued specifically that LMX and TMX, in turn, act as substitutes for predicting individual outcomes.

This dissertation will then review the core elements of theories related to identity orientation and team types to show how characteristics of the person and the team act in different ways to *neutralize* the impact of LMX and TMX on work outcomes. The impact of LMX on

outcomes is likely to be neutralized for individuals who are low in relational identity and in teams that are low in authority differentiation. The impact of TMX on outcomes is likely to be neutralized for individuals who are low on collective identity and in teams that are low on skill differentiation. Expressed another way, LMX will have the most impact on individuals who have relational identities in teams with high authority differentiation, whereas TMX will have the most impact on individuals who are high in collective identify working in teams that are high in skill differentiation.

Following the exposition of propositions laying out the main and interactive effects of LMX, TMX, identity-orientations and team types, this dissertation proposal will describe the methods associated with an empirical test of these propositions and the model depicted in Figure 1. The final part of this section will lay out the data analytic scheme for analyzing this study's results, along with the structure of the tables and figures that would emanate from this analysis.

LITERATURE REVIEW

In this chapter, selected literature pertaining to LMX and TMX are reviewed in order to develop an integrated model of the simultaneous interplay of LMX and TMX.

Construct Definition and Measurement

The purpose of this section of this proposal is to define LMX and TMX constructs, and describe the most widely used measures for the operationalization of these constructs. This section begins with a brief introduction of LMX and TMX constructs, including the origin and development history of each construct and their commonly used measures. Following this is a meta-analytic review which further explicates the relationship between measures of LMX and TMX. The major conclusions that emanate from this section are that LMX and TMX are largely independent constructs and that their measures are not highly correlated. An important implication from the findings is that it is meaningful to discuss simultaneous joint impact of these variables, especially in cases where members are high on one exchange and low on the other.

LMX: History of the Construct and Measures

LMX refers to the reciprocal exchanges between an individual and her or his leader based on obligations, trust, and respect (Graen & Uhl-Bien, 1995). As a departure from other leadership approaches, LMX theory suggests that, rather than treating all subordinates in the same way, leaders develop differential exchange relationships with their subordinates ranging from contract-based exchange to high-quality socio-emotional exchange (Dansereau, Graen, & Haga, 1975).

Role theory and social exchange theory form the primary theoretical foundations of the LMX theory (Graen, 1976; Sparrowe & Liden, 1997). According to role theory, the quality of a leader-member relationship is the result of role 1976; Graen & Cashman, 1975; Graen, Orris, &

Johnson, 1973). Specifically, LMX development can be viewed as a sequence of role making episodes during which leaders offer subordinates task assignments, assess subordinates' task behaviors and fulfillment of task requirements, and further decide the boundary of exchange based on the evaluation (Graen & Scandura, 1987). On the other hand, social exchange theory provides rationales for LMX concerning why leader and subordinates initiate and maintain their relationships. Social exchange theorists posit that an exchange relationship is not limited to the aspect of economic exchange, but also contains a psychological aspect (Foa & Foa, 1974). In the case of LMX, the commodities exchanged between the leader and subordinates range from specific material goods (e.g., services, advice, and information) to emotional support and friendship (see Wilson, Sin, & Conlon, 2010 for a review). To this end, a broader scope and higher quantities of exchange in the process of role making will cause a higher quality LMX relationship. High-quality LMX featured by dyad members' perception of reciprocal contribution and liking to their paired members will propel the development of loyalty and professional respect to the counterpart in the dyad (Liden & Masyln, 1998), and thus preserve the exchange relationship.

Since its introduction, LMX research has gone through several stages of development. Graen and Uhl-Bien (1995) summarized the four stages of LMX theory development. The beginning stage is the origination of LMX concept through the vertical dyad linkage (VDL) theory. Graen and his colleagues (Dansereau et al., 1975; Graen, 1976; Graen & Cashman, 1975) first challenged the traditional average approaches of leadership theories by introducing the vertical dyad linkage concept. They argued that instead of forming uniform relationships with subordinates, leaders develop qualitatively heterogeneous exchange relationships with each one of them. Dansereau et al. (1975) further validated their view by finding that in-group (or high

LMX) members generally received more supervisory attention than out-group (or low LMX) members.

Following this was the second stage, when researchers began to focus on the characteristics of LMX and its relationship with other organizational variables. Studies at this stage greatly enriched our understandings of LMX characteristics by looking into the dyadic role-making processes (e.g., Graen, Orris, & Johnson, 1973; Graen, 1976), communication frequency (e.g., Schiemann & Graen, 1984), leader-member value agreement (Graen & Schiemann, 1978; Ashkanasy & O'Connor, 1994), as well as the antecedents of LMX (e.g., Graen, 1976; Steiner, 1988; Liden, Wayne, & Stilwell, 1993).

On the other hand, a meta-analytic review published by Gerstner and Day (1997) summarized the work on LMX outcomes and found that LMX has significant impacts on various outcome variables, including subordinates job performance (e.g., Dansereau, Alutto, Markham, & Dumas, 1982; Scandura & Graen, 1984), job satisfaction (e.g., Graen, Novak, & Sommerkamp, 1982), organizational commitment(e.g., Nystrom, 1990), role conflict and role clarity, career progress (e.g., Wakabayashi & Graen, 1984; Graen, Wakabayashi, Graen, & Graen, 1990), and turnover intentions (e.g., Vecchio, 1985). Other important organizational outcomes such as organizational citizenship behavior (e.g., Wayne & Green, 1993; Wayne, Shore, & Liden, 1997), job climate (Kozlowski & Doherty, 1989), empowerment (e.g., Uhl-Bien & Graen, 1993), justice perceptions (e.g., Bell, 1994), and workplace innovation (Scott & Bruce, 1994) has also been found related to LMX.

The third stage of LMX theory development is marked by the leadership-making theory and exploration of dyadic relationship development. That is, the focus of LMX research has shifted to the building of effective LMX relationships. While original VDL suggests leaders have

to identify some members as out-group members due to the limited managerial attention, researchers at this stage began to realize that mangers should make the initial offer to develop LMX partnerships to each subordinates in an equitable manner. Thus, the model depicting the purposeful development of dyadic partnership by leaders, or the so-called leadership-making model was developed (Bauer & Green, 1996; Graen & Uhl-Bien, 1991; Uhl-Bien & Graen, 1993).

In recognition that leaders and their members often work together as interactive collectivities, later studies began to adopt a systems-level perspective, which led to the fourth stage of LMX theory development identified by Graen and Uhl-Bien (1995). The conceptualization at this stage is characterized by the expansion of dyadic LMX partnership to collective level within and beyond the organizational systems (e.g., Graen & Scandura, 1987).

Along with the evolvement of LMX research scope are the changes in its conceptual definitions and measurements (Schriesheim, Castro, & Cogliser, 1999). At its very first introduction, LMX (or alternatively, vertical dyad linkage), was defined as the "negotiating latitude" that supervisors provide to their subordinates in exchange for desired outcomes (Dansereau et al., 1975), and measured as member's flexibility in evolving changes in his or her job activity structure *and* the member's chance to use the supervisor's power to solve his or her work related problems.

Later, as researchers validated the existence of LMX differentiation and began to delve into the characteristics of LMX relationship, its conceptual definition and measurements began to flourish. Some chose to emphasize the rational and self-interested aspect of the exchange relationship and defined high-level LMX as member's "higher degrees of involvement in the unit's function. This included greater time and energy expenditures than required by the formal

contract, acceptance of greater responsibility, and a vested interest in the success of unit functioning" in exchange for supervisor's "positional resources" such as privileged information and challenging projects (Graen, Novak, & Sommerkamp, 1982: p. 111). Other researchers focused more on the relational aspect of the exchange relationship. By integrating Blau's (1964) social exchange theory into LMX definition, high-level LMX was defined as "higher-quality exchanges [that] are friendly working relationships typified by mutual trust and support…, interpersonal attraction…, loyalty and bi-directional influence" (Deluga, 1994: p. 316).

In spite of the richness of the LMX definition during this period, the lack of commonality among these definitions and measures largely confine the ability of researchers to synthesize the past study results. This issue was largely alleviated after Scandura and Graen's (1984) seven-item LMX scale (or LMX-7) emerged and became the dominant measure of global LMX. According to Graen and Uhl-Bien (1995), LMX-7 was designed as unidimensional, and it had the strongest consistency reliability among all LMX measures. Later, this point was empirically confirmed by Gerstner and Day's (1997) meta-analysis. Both articles recommended LMX-7 as the instrument for LMX in the future studies.

However, LMX-7 is not without critiques. Several researchers took a multidimensional perspective of the LMX conceptualization and argued that LMX should be calibrated by four subdimensions: *affect/liking* (or the interpersonal attraction and mutual affections between both parties of the dyad), *loyalty*, perceived *contribution* to the exchange relationship, and *professional respect* for work-related capabilities and perceived competence (Liden & Maslyn, 1998). Correspondingly, they abandon the LMX-7 for its unidimensionality and instead developed a 12-item LMX multidimensional measure (or LMX-MDM). Liden and Maslyn reported a high correlation between LMX-MDM and LMX-7, and a few additional studies have

supported its reliability and validity (e.g., Kraimer, Wayne, & Jaworski, 2001; Maslyn & Uhl-Bien, 2001; Sparrowe, Soetjipto, Soetjipto, 2006).

TMX: History of the Construct and Measures

TMX is defined as an "individual member's perception of his or her exchange relationship with the peer group as a whole" (Seers, 1989: p. 119). According to Seers (1989; 1995), the quality of TMX evaluates the reciprocity between a member and other members in the team. TMX measures a member's willingness to assist, contribute ideas, and provide feedback to other members, and in return, the help, information, and recognition he or she receives from other team members.

Similar to LMX, TMX construct is also rooted in the role theory (Katz & Kahn, 1978) and social exchange theory (Jacobs, 1970). Therefore, TMX may also be depicted by the three-phase role process model developed to describe LMX, which consists of role taking, role making, and role routinization phases (Graen & Scandura, 1987). The only difference is that this process occurs among team members as opposed to between the supervisor and subordinates. TMX contributes to the development of role making phase within a team; notably, a team member's focal role is the result of his or her interactions with the rest of team. Such TMX interactions facilitate role development and strengthen roles within the team.

From the perspective of social exchange theory, TMX relies on reciprocity between the focal employee and his/her peers, ranging from material resources to socio-emotional supports that both parties supply during the exchange. Furthermore, it is important to investigate the contents of exchange, or the "gives" and "receives" between the employee and the rest of the team. According to the nature of social exchanges, the work team must provide something of value to the employee to get him or her to initiate and maintain a team-member exchange. Liden

et al (1997) broadly pointed out the currencies or contents of exchange that they believed were salient in the LMX context: affect, loyalty, contribution, and professional respect.

Given that LMX and TMX share similar theoretical roots, it is possible that the benefits employees get from the TMX relationships are similar and can also be included the same dimensions. To reciprocate the “receives,” social exchange theorists have noted the “gives” with regard to the positive employee behaviors and attitudes of employees experiencing high quality exchange relationships with their teams. These behaviors and attitudes are what the employee "gives" to promote or reciprocate benefits (the "receives") provided by the other team members.

For example, Seers (1989) reported that higher quality TMX was associated with higher performance ratings. However, this finding was moderated by peer motivation, suggesting that high peer motivation could compensate for low TMX. The results of this study showed that the relationship between a team member and the rest of their work team can be measured and lead to outcomes. In a sum, TMX is undergirded by two building stones: organizational role theory, which explains how the working relationship in a team helps team role making processes, and social exchange theory, which explains how and what to exchange in a working group.

Only beginning to gain its popularity about two decades ago, TMX literature has not accumulated a comparable amount of studies relative to the bulk of LMX research. As a result of limited work in this area, TMX has rare variations regarding to its construct definition and measurement. Existing work in this area generally adopts Seer’s (1989) seminal piece for TMX definition and measures. Fortunately, the reliability of this scale is satisfying, reported as high as .88 from Liden et al. (2000) and .84 alpha from Murillo and Steelman (2004). During its short history, the TMX research focus is more on the differentiation between the TMX concept and

other team constructs such as group cohesiveness *as well as* the initial development of a nomological network, as summarized below.

Group cohesiveness is one of the most widely studied constructs in team research since the 1950s. Group cohesiveness was first defined as the desire of individuals to maintain their membership in a group (Festinger, Schachter, & Back, 1950). Festinger (1950) first defined group cohesiveness as the result of three forces—member attraction, attractiveness of group activities, and group prestige—that altogether build the group members' decision to remain in the group. Based on this, some researchers differentiated between the interpersonal attraction, task commitment, and group pride in their study of cohesiveness (Beal, Cohen, Burke, & McLendon, 2003; Mullen & Copper, 1994). Some others instead suggest a two-dimensional model of cohesiveness (Gross & Martin, 1952; Widmeyer, Brawley, & Carrón, 1985; Zaccaro, 1991); the first, known as task cohesiveness, refers to the commitment to the group goals and objectives, and the latter, known as social or interpersonal cohesiveness, refers to the interpersonal attraction, liking, or positive attitudes among group members. Finally, some researchers define group cohesiveness a unitary construct, focusing on one of the three facets in Festinger's (1950) model. For example, Lott and Lott (1965) defined cohesiveness as "group property which is inferred from the number and strength of mutual positive attitudes among the members of a group" (p.259), in order to emphasize the critical role of interpersonal attractiveness in group cohesiveness.

Although bearing some similarities, TMX is not synonymous with cohesiveness as it focuses on support provided by peers through social exchange relationships. It relies on reciprocity between parties in the social exchange among peers. While TMX focuses on the employee's ongoing process of a reciprocation relationship with his or her work team, group

cohesiveness is an emergent affective state bonding members to the team (Kozlowski & Ilgen, 2006). For example, a member in the high cohesiveness group, who would label him or herself sticking together and remaining united with the group, may behave in a fashion that is only loosely coupled to that group with low social exchange quality.

On the other hand, a member high on team-member exchange would interact with other group members in a relatively tightly coupled manner, but may or may not refer to the group as united and attractive. Greater team cohesion is a likely consequence of greater team-member exchange. Cohesiveness involves the perception of the group as a whole while team-member exchange quality involves the perception of one's role within the group (Sears, 1989). Further, Seers, Patty and Cashman (1995) gave a close scrutiny of TMX and group cohesiveness concept at both individual-level and group-level. They asserted that at the individual-level analysis, TMX involves the individual employee's perception of his or her reciprocity with other team members, while assessments of cohesiveness at this level reflect the employee's perception of the attractiveness of the group by way of contrast. At the group level, TMX means the average reciprocity across the group that reflects the extent of teamwork in that group. Aggregated cohesiveness should reflect the relative capacity of the group to induce member conformity. Finally, Seers (1989) used a principle components factor analysis to show that the TMX scale and cohesion scales loaded on separate factors. The result suggests that TMX is distinct from cohesion.

Although still remaining largely unexplored, previous studies on TMX has shed some light on its nomological map. Up to now, research on TMX has already touched upon antecedents such as team environment and consequences such as team effectiveness. Murillo and Steelman (2004) investigated the antecedents and consequences of TMX. The antecedent in this

study was the feedback environment, while the consequences were organizational citizenship behaviors (OCBs) and job performance. Results suggested that TMX has a strong positive relationship with the feedback environment as an antecedent and OCBs as an outcome, however, TMX is not related to job performance. They also demonstrated that TMX is a full mediator between the feedback environment and OCBs.

Subsequent research expanded upon the set of predictors associated with TMX. Liden, Wayne, and Sparrowe (2000) examined how empowerment affects TMX but did not find any connection between empowerment variables and TMX. Furthermore, their results indicated a positive relationship between TMX and organizational commitment as well as TMX and job performance. Alge, Wiethoff, and Klein (2003) examined how temporal scope (i.e., the degree to which teams expect to have a future together and the degree to which teams had a past together) and communication mode (i.e., computer mediated teams vs. face to face teams) independently and interactively influence TMX. They found that teams that have a past together exhibit higher TMX ratings as well as teams that would work in the future. In addition, computer mediated teams show lower TMX ratings than face to face teams. They also found that TMX is positively related to decision making effectiveness, information sharing, and trust. More recently, Liao, Liu, and Loi (2010) found TMX has a unique indirect effect beyond LMX on creativity via self-efficacy. More research on TMX is necessary for a better understanding of work relationships' effects on team outcomes.

LMX and TMX: Evidence of their Relationship

One main research interest in the area of social exchange relationships in teams is to study the relationship between TMX and LMX. TMX was developed by Seers (1989) on the basis of LMX literature, and thus the two constructs share many similarities. For example, both

of them are the role negotiating constructs, and both are built on the interpersonal relationship perspective instead of the formal organizational structural perspective. Moreover, two genres of research both conclude that high-quality interpersonal relationship could provide employee with job-related resources and social support (Murphy, Wayne, Liden, & Erdogan, 2003).

Nevertheless, there is a fundamental difference between LMX and TMX that distinguishes the two construct: LMX reflects the dyadic exchange between supervisor and subordinate where balanced reciprocation develops between the two ends of the dyad, while TMX reflects the "generalized exchange" one has with all the other members in the team where patterns of reciprocation develop across a group of people (Keup, Bruning, & Seers, 2004).

To further clarify the relationship between TMX and LMX, I have conducted a meta-analysis in this dissertation. First, a literature research was conducted using Social Science Citation Index with the keywords 'team-member exchange' and 'TMX', and 23 studies were identified as quantitative and relevant. A further scrutiny showed that 14 studies examined both LMX and TMX in their topic of interest and were selected for analysis, and the other 9 studies have only TMX and were discarded. Among the 14 studies that were finally selected, the reported Pearson correlations between LMX and TMX ranges from -.36 (lowest) to .68 (highest). Moreover, using the Schmidt–Hunter psychometric meta-analysis method (Hunter & Schmidt, 1990), the estimated true score correlations were corrected for both sampling error and measurement unreliability. All the included studies provided the reliabilities of the measured scores that used to compute the reported correlations. As shown in Table 1, the estimated mean population correlation between TMX and LMX was ρ=0.21 (k=13, N=3,475). The 95% confidence interval did not include zero, suggesting that the relationship was relatively weak but statistically significant (See Table 1).

In order to further compare LMX and TMX, the selected literature on antecedents and consequences of the two constructs is reviewed in the next section.

Unique and Countervailing Antecedents of LMX and TMX

The purpose of this section of this proposal is to review the variables that have been identified in the literature as being antecedents to LMX and TMX. This section will illustrate that one reason why LMX and TMX are weakly related is that they tend to share few common antecedents, at least as is depicted in the current literature. LMX tends to stem from follower characteristics (e.g. follower competence and personality), leader characteristics (e.g., leader personality and behavior), and interpersonal relationship characteristics (e.g., liking/trust and follower ingratiation), whereas TMX tends to stem from workplace friendship and feedback environment. Although some common antecedents have been identified, such as value similarity and the extent of telecommuting, even these variables tend to show countervailing impacts on LMX and TMX (See Table 2).

Unique Antecedents of LMX

Recent meta-analysis on LMX literature by Dulebohn and his colleagues classified three categories of LMX predictors— (1) follower characteristics, (2) leader characteristics, and (3) interpersonal relationship characteristics—that have been empirically examined in prior works (Dulebohn, Bommer, Liden, Brouer, & Ferris, 2011).

Follower characteristics: Competence. While LMX is formed and evolved through role making episodes between leaders and subordinates, leaders' initial perceptions of subordinates' skills, competence, and personality traits tend to influence LMX first and foremost. Based on the norms of reciprocity, subordinates' competence is presented by their capability to accomplish their roles assigned influence leaders' decision on the width and depth of the exchange in the

next role making episodes during LMX development such that competent subordinates are more likely to be given more support and authority (Graen & Scandura, 1987; Uhl-Bien & Maslyn, 2003). The meta analysis by Dulebohn et al. (2011) showed that subordinate's competence had the highest predictive power with respect to LMX relative to other subordinate's characteristics (ρ=.38).

Follower characteristics: Personality. Past studies have investigated personality variables, including extraversion, locus of control, positive affectivity, and negative affectivity, as predictors of LMX quality. *Extraversion*, one of the big five characteristics, has been found to be positively related to LMX quality in that subordinates who are extraverts are more likely to be engaged in higher quality LMX (Phillips & Bedeian, 1994). Another personality variable examined as an antecedent to LMX is *locus of control*, which refers to the extent to which one perceives he/she has control of events by him/herself (internal locus) or by powerful others (Rotter, 1966). Subordinates high in internal locus of control are more likely to proactively communicate with their supervisor for feedback and engage in role negotiation since they believe they are in charge of their work setting. Following this line of logic, several studies have proposed a positive relationship between subordinate's internal locus of control and LMX (Harris, Harris, & Eplion, 2007; Kinicki & Vecchio, 1994; Martin, Thomas, Charles, Epitropaki, & McNamara, 2005; Phillips & Bedeian, 1994). While most studies found a positive relationship, Phillips and Bedeian (1994)'s results suggest there is no linear relationship between the two. Most recently, Dulebohn et al. (2011)'s meta-analysis drew the conclusion that the relationship between a follower's locus of control and LMX is moderate and positive (ρ=.26).

Further, a subordinate's *negative affectivity* disposition has also been found to influence LMX quality from the follower's perspective; in other words, subordinates high in negative

affectivity are less likely to develop a high-quality LMX (Hui, Law, & Chen, 1999). In addition, Dulebohn et al. (2011) found that other subordinates' characteristics, including a subordinate's *positive affectivity* (ρ=.31), *agreeableness* (ρ=.19), and *conscientiousness* (ρ=.20), all significantly influenced LMX.

Leader characteristics: Personality. As the dominant party in the leader-subordinate dyad, leaders are influential in determining LMX quality and their personality traits and behaviors have been found to impact the quality of LMX relationships (Erdogan & Liden, 2002; Liden et al., 1997). Although researchers have recognized the important role of leaders' personality traits in leadership development processes (Bono & Judge, 2004), research on the connection between leader dispositions and LMX still remains underdeveloped. One exception is *leader agreeableness*. Nahrgang and her colleagues (2009) found that leader agreeableness had a positive effect on LMX quality at the initial interaction in a longitudinal study. Confirming this, another study by Sears and Hackett (2011) found that leader agreeableness predicted LMX quality through the mediation mechanism of subordinates' affect toward their leaders.

However, Dulebohn et al. (2011)'s meta-analysis failed to find a significant relationship between leader agreeableness and LMX. Instead, their findings support a positive relationship between *leader extraversion* and LMX (ρ=.18). This effect size was based on 4 studies that included those discussed above as well as several other studies.

Leader characteristics: Behaviors. Beyond leader traits, leader behaviors (such as leader reward behaviors and transformational leadership behaviors) also serve as antecedents to LMX quality (Yukl, 2006). For example, *supervisor-contingent rewards* have been found to positively relate to LMX (Wayne, Shore, Bommer, & Tetrick, 2002). Similarly, Wang and his colleagues (2005)'s study of 162 leader-follower dyads within organizations located in China showed that

transformational leadership behaviors and LMX are positively related. Further, leaders showing high expectations of subordinate success initially are more likely to develop higher equality LMX (Wayne, Shore, & Liden, 1997). Consistent with the above studies, Dulebohn et al.'s (2011) meta-analysis suggested that LMX are significantly predicted by leader's contingent rewards behavior (ρ=.73), transformational leadership behavior (ρ=.73), and supervisor's expectations of follower success (ρ=.37). This meta analysis included the three studies mentioned above plus several other studies.

Finally, from a relational perspective, *leaders' on and off work relational ties and networks* also influence their exchange relationships with subordinates. Research has found that leaders who were central in their peer networks and engaged in higher quality relationship with their bosses were more likely to develop higher quality relationships with their subordinates (Venkataramani, Green, & Schleicher, 2010). Beyond the workplace ties, a leader's family support has also been found to exert influence on the quality of LMX (Bagger & Li, 2011).

Interpersonal relationships. Interpersonal relationships affect leaders and subordinates' perceptions and evaluations of the other party, further influencing the LMX development. *Perceived similarity*, an important characteristic of an interpersonal relationship, has been found to positively predict LMX through a similarity-attraction mechanism (Engle & Lord, 1997). Moreover, researchers have proven that the more similar subordinates and supervisors were in terms of personality, competence, and negative affectivity dispositions, the more they would engage in higher-quality LMX (Engle & Lord, 1997; Goodwin, Bowler, & Whittington, 2009).

Other perceptual factors of interpersonal relationship that plays a part in LMX development include *liking* (Engle & Lord, 1997; Liden, Wayne, & Stilwell, 1993; Wayne & Ferris, 1990) and *trust* (Brower, Lester, Korsgaard, & Dinnen, 2009; Gomez & Rosen, 2001).

Finally, Dulebohn et al. (2011) examined the behavioral antecedents of LMX relating to interpersonal relationships including: *follower ingratiation, follower self-promotion influence tactics*, and *follower assertiveness influence tactics*. The meta-analysis results suggest that the supervisors and subordinates reported ingratiation, and self-promotion influence tactics are positively related to LMX (ρ=.27, .27, and .45, respectively), while follower assertiveness influence tactic negatively correlated with LMX (ρ=-.12).

Unique Antecedents of TMX

Compared to the prevalence of studies on the antecedents of LMX, the antecedents of TMX are far less examined. First, Tse & Dasborough (2008) found that employee's *workplace friendship* within the team context may facilitate the social exchanges with other teammates and determine the quality of TMX. Their findings open up the opportunities to integrate friendship ties into TMX research, for example, how newly formed friendship benefits the development TMX within team context.

Second, Murillo and Steelman (2004) investigated how the *feedback environment* affects TMX in a team setting. The feedback environment is defined as daily interactions between members of an organization regarding the way feedback is presented, received, and used (Steelman, Levy, & Snell, 2004). Positive feedback environment may enhance TMX quality in two ways: (1) feedback exchanges promote higher communication and this communication initiates the building of TMX; (2) the motivational aspect of positive feedback environment fosters the interactions among team members, which would align goals within the team together. Team members share resources and ideas openly with each other through these frequent interactions. This form of sharing ideas and resources are key ingredients found in the reciprocal relationship of TMX. Thus, Murillo and Steelman (2004) argued that having a favorable

feedback environment could lead to high TMX. Their findings suggested that feedback environment (coworker dimension) did have a positive relationship with TMX (r = .89, p = .05). Moreover, TMX was positively associated with all seven sub-facets of the feedback environment. Most importantly was source credibility (r = .84, p = .05) and feedback quality(r = .83, p = .05)

Countervailing Antecedents of LMX and TMX

Value Similarity. Dose (1999) examined the relationship between the quality of group members' social exchange relationships and their value similarity in a sample of residence hall staff from a university in the Midwest. Evidence from previous studies demonstrated positive relationships between value similarity and LMX quality; for example, Gessner (1992) showed the positive relationship between high LMX and similarity on work value scale. However, Dose (1999) claimed this study as the first one to investigate the relations between TMX and work values. Furthermore, she examined three different types of work values from Dose (1997)'s framework to compare different types of social values and their social exchange qualities. The three work values are: (1) work environment preferences (e.g., job achievement and security from personal–preference quadrant of Dose framework; 1997), ethical values (e.g., relativism and idealism from social consensus–moral quadrant), and work ethic (operationalized by Mirels and Garrett from personal–moral quadrant; 1971).

Based on the nature of different types of work values, Dose first proposed that moral values, viewed as the objective standards held strongly by the public, play a more important role in predicting an individual member's acceptance by the leader and the group with high exchange relationships. This is because individual members' shared moral values tending to be considered positively by either the leader or other group members. On the other hand, Dose argued that

preference value similarity had less impact on both exchange relationship qualities (LMX and TMX) because preference values are considered to be individual choices.

Second, Dose proposed that the similar values of personal preference for the work environment have a stronger relationship with both TMX and LMX than social consensus similarity. Dose argued that individuals vary in personal preferences, which matters more to the working relationships because of their role in building the procedural norms and facilitating the work process. In contrast, there is not much variance for people from the same culture in terms of social consensus value; thus its potential power on relationship quality is relatively weaker given that it's possible for people to suppose others share similar social consensus values.

Third, Dose proposed the different effects between actual and perceived similarity on quality exchange relationships (both LMX and TMX). Dose argued that the perceived similarity will have stronger exchange relationships because it is based on the characteristics of other people that is recognized and significant to influence individuals' view of similarity to the leader or the other team members. Overall, the research proposed the same antecedents, value similarity, to both LMX and TMX.

However, the result of the study shows the countervailing influences of perceived versus actual similarity on LMX and TMX: LMX did not have significant relationships with any measures of actual work values or actual demographic similarity, but two of three perceived similarities on work ethic and work environment positively predicted LMX. In contrast, actual value similarity, but not the perceived similarity, was related to TMX, For example, actual similarities of values (team work orientation, preference for surroundings, work ethic, and preference for security) positively predicted TMX.

There are several explanations of the actual versus perceived similarities on TMX and LMX: frequent interactions, shared same living condition, and educational background provided more opportunities to understand other team members' values because they are associated with that situation; thus, actual value similarity predicts TMX. On the other hand, a subordinate may be less likely to know her or his supervisor's actual values, and thus relies less on reality than perceptions. As a result, perceived value similarity, rather than actual value similarities, predicts LMX.

The extent of telecommuting. Golden (2006) examined the mediating roles of LMX and TMX in between the relationship of extent of telecommuting and job satisfaction in a sample from 294 telecommuting workers of a large telecommunications corporation. Compared with the traditional place of work, telecommuters often work from home and rely on technology to communicate, such as through email and telephone. Because technology-enabled media includes fewer informational cues for the full interpretation of the interaction, telecommuters less effectively communicate with those in the office. For example, with decreased social information cues and limited social interactivity, telecommuters are more likely to correspond ambiguously and be stripped of vital conversations on sensitive issues. Also, telecommuting constrains the social-emotional type resource exchange among individuals such that the support from others may be lacking (Wiesenfeld, Raghuram, & Garud, 2001). As a result, interpersonal relationships tend to be negatively impacted because of the inadequate social interactions at work.

Based on this logic, it is difficult for telecommuters to build and maintain the affective component of the relationship with their manager without adequate face-to-face interaction (Lengel & Daft, 1988). Golden (2006) expected that, because the extent of telecommuting rises, the more cumulative and negative the impact of social isolation will be to the quality of the

relation between the manager and the telecommuter, causing lower quality of LMX. Also, Golden developed the parallel argument for TMX that visualizes a cumulatively negative influence of telecommuting on quality of TMX.

Inconsistent with the hypotheses, telecommuting impacted LMX and TMX in different directions. The relationship between the extent of telecommuting and LMX was linear and positive (β = .22, p < .05), whereas the relationship between the extent of telecommuting and TMX was linear and negative (β = -.20, p<.05). The effect size is relatively similar but in a different direction. Golden (2006) provided one plausible explanation: telecommuters prioritize and work extra hard to compensate the informational cues lost in the fewer face-to-face interactions with supervisors with including the affective constituents of the relationships into their exchange processes. However, Golden (2006) believes that telecommuters viewed connections with their coworkers as less important, such that they are less likely to maintain close contacts in these relationships by remaining less vigilant in communicating effectively with the coworkers.

Common Consequences of LMX and TMX

The purpose of this section of this proposal is to review how LMX and TMX relate to outcome variables in a main effect sense. That is, these relationships are not contingent on third variables or moderator variables, but instead reflect simply direct effects. This section will illustrate that even though LMX and TMX share few common antecedents, they tend to impact many work outcomes the same way. That is, both LMX and TMX have been found to be directly related to self-efficacy, (new technology) perceived usefulness, job satisfaction, organizational commitment and creativity.

Self-efficacy. Self-efficacy is defined as "an individual's belief in one's capability to organize and execute the course of action required producing given attainments" (Bandura, 1997: p.3). Liao, Liu, and Loi (2010) presented theoretical and empirical support documenting that LMX and TMX had unique indirect impacts on employee creativity mediated by self-efficacy. Drawing from social cognitive theory, they explained the reason for LMX and TMX contributing distinctively nonredundant information cues and resources to foster self-efficacy.

According to Bandura (1982), individuals base four main sources of information to judge their self-efficacy: social persuasion, physiological state, vicarious experience, and mastery experience. Liao and colleagues (2010) argued that LMX has a unique impact on a member's social persuasion, whereas TMX has a unique influence on a member's vicarious experience. In addition, both types of relationships may play similar roles in providing team members with two other sources of self-efficacy: mastery experience and physiological arousal. Overall, Liao et al. (2010) expected individuals with both high LMX and TMX to a have a stronger level of self-efficacy than those with low LMX and TMX. In a sample of 828 employees in 116 teams, they supported the argument that LMX and TMX are both positively associated with self-efficacy. The effect size of LMX ($\beta = .13$, $p < .05$) was almost twice as large as TMX ($\beta = .07$, $p < .05$).

Perceived Usefulness of New Technology. Within the technology acceptance literature, Magni and Pennarola (2008) proposed that users' perception of their social relationships with their supervisors (LMX), the team members (TMX), and the organization as a whole (that is perceived organization support or POS) predicted their acceptance of a newly introduced technology. Individuals with high LMX quality are more willing to adapt to uncertainty, more flexible, and less resistant to change (Illies, Nahrang, & Morgeson, 2007). Illies et. al argued that the reason is because the members believed that they can count on the support from supervisors.

Particularly, they argued that supervisors would deliver more information on the benefit from new technology adoption to the individuals with high LMX. As such, they proposed a positive relationship between employees' LMX and their perceived usefulness towards to the new technology. Similarly, for individuals with high TMX quality, authors expected that the frequent information sharing with other team members would increase the members' knowledge about the new technology use. Hence, there may be a positive relationship between employees' TMX and their perceived usefulness towards to the new technology.

Empirical findings supported these hypotheses. Both LMX and TMX were the predictors of (new technology) perceived usefulness. Together these suggest that support and guidance benefited from the both high LMX and TMX relationship quality in a changing environment.

Job Satisfaction. The Gerstner and Day (1997) meta-analytic study of LMX showed consistent linear relationships between LMX quality and job satisfaction. Liden, Wayne, and Sparrowe (2000) examined the mediating role of empowerment in relations between job characteristics, work relationships (LMX and TMX), and work outcomes. Contrary to the hypotheses, empowerment did not mediate the relations between LMX, TMX, or the outcome variables; rather, both LMX and TMX were positively related to work satisfaction with similar effect sizes (LMX: $\beta = .13$, $p < .05$; TMX: $\beta = .10$, $p < .05$)

Organizational Commitment .In a sample of 337 employees and their immediate supervisors of 60 work groups in three Midwestern states, Liden, Wayne, and Sparrowe (2000) found that both LMX and TMX predicted employees' organizational commitment in a similar fashion. The result showed that LMX was positively related to organizational commitment ($\beta = .19$, $p < .01$), and TMX was also positively related to organizational commitment with a similar effect size ($\beta = .17$, $p < .01$).

Creativity .An employee's creativity is defined as the development of novel and useful ideas about products, practices, services, or procedures (Amabile, 1996). An individual's creativity level has been considered a key element for organizational innovation, which increases the organizational flexibility and development (Tierney, Farmer, & Graen, 1999). Liao, Liu, and Loi (2010) provided theoretical and empirical support on how work relationships (both LMX and TMX) impacted a team member's creativity. In a sample of 828 employees in 116 teams, their findings showed that TMX and LMX had indirect impacts on creativity mediated by self-efficacy.

First, drawing from social cognitive theory, they explained the reason for additive contributions of LMX and TMX to self-efficacy. Next, they argued that elevated self-efficacy makes employees have stronger beliefs and more confidence in their own capabilities, which collectively facilitate their intense and persistent efforts to overcome the difficulties with uncertainty and potential obstacles to accomplish a creative task. Their findings supported the hypotheses that both LMX and TMX were both positively related to employee's creativity with similar effect size (LMX: $\beta = .15$, $p < .05$; TMX: $\beta = .11$, $p < .05$). In addition, they found the significant indirect impacts of TMX and LMX on creativity mediated by self-efficacy.

Although LMX and TMX are related to similar outcomes, it is also true that the relationships between these relational variables and outcomes have been found to be contingent upon third variables that serve as moderators. Indeed, the literature of LMX and TMX tends to reveal many such contingency variables that either substitute for or neutralize the effects of LMX and TMX on outcomes.

Moderators of LMX and TMX: Substitutes and Neutralizers

Moderator variables tend to come in two broad categories. Some moderator variables "substitute" for a predictor variable in the sense that an outcome can be positive if either the predictor variable or the moderator variable is high. Figure 2 depicts the classic case of a substitution effect where the dependent variable (Y) is high if either X1 (the predictor) is high or X2 (the moderator) is high. In the case of substitution, Y is only low when X1 and X2 are both low, and each of the variables is sufficient, but not necessary for generating a positive outcome.

In contrast, some moderator variables "neutralize" the impact of a predictor variable in the sense that an outcome can only be positive when both the predictor variable and the moderator variable are high. Figure 3 depicts the classic case of a neutralization effect. In this case, high levels of both of the variables are necessary to generate a positive effect on the dependent variable. The literature on LMX and TMX reveals that many variables act as substitutes and neutralizes when it comes to how each of these variables relates to certain outcomes.

Variables that Substitute for LMX

Extraversion. Bauer, Erdogan, Liden, and Wayne (2006) examined how extraversion moderated the relationships between LMX and executive actual turnover, turnover intentions, and performance in a longitudinal survey of 116 new executives in a Fortune 500 pharmaceutical organization. After they proposed the main effects of LMX-performance and LMX-withdrawal, they chose one of the key individual difference personality factors, extraversion, as one of the theoretical and empirically related construct to investigate.

As demonstrated in personality research, individuals with high extraversion are gregarious and talkative, and tend to look for more interaction opportunities with others (Costa &

McCrae, 1992). Furthermore, individuals' high LMX relationships and extraverted type of personality share a very similar impact on executive success. The LMX literature has shown that individuals with high-LMX relationships are associated with frequent social interactions (Bauer & Green, 1996), challenging tasks and a wide variety of job responsibilities (Liden et al., 2000). Given that personality theory characterized extroverts as people who enjoy social interaction, seek new information, and desire challenging tasks, authors argue that extroverts possess similar characteristics as those with high LMX relationships. For this reason, Bauer, Erdogan, Liden, and Wayne (2006) expected a weak relation between LMX and performance for extraverts due to the presumption that extraverts are capable of performing well at executive jobs despite the their LMX quality. On the contrary, Bauer and his colleagues argued that LMX should be strongly associated with performance for introverts. The personalities of introverts are not suitable for the new executives' roles in proactive socialization behaviors such as seeking feedback and building relationship. As such, introverts depend more on the benefits from the established high LMX qualities than do the extraverts. In addition to job performance, Bauer and his colleagues also proposed that the relations between LMX and intentional and actual turnovers is moderated by extraversion, such that, LMX is negatively related to intentional and actual turnovers for individuals low on extraversion (introverts), LMX is not associated with intentional and actual turnovers for those high on extraversion (extraverts).

Empirical findings supported these moderation effects. First, extraversion substitutes for low LMX in explaining job performance. LMX was positively related to job performance only for individuals low in extraversion (introverts; $\beta = .58$, $p < .01$); however, LMX was not related to job performance for individuals high in extraversion ($\beta = -.01$, $p > .05$). Second, extraversion substitutes for low LMX in explaining turnover intentions. LMX was negatively related to

turnover intentions for individuals low in extraversion (introverts; β = -.53, p < .01); however, LMX was not related to turnover intentions for individuals high in extraversion (β = -.03, p > .05). Third, extraversion substitutes for low LMX in explaining actual turnover. LMX was not related to hazard rate for individuals high in extraversion (B = 0.06, Wald = 0.04, p >.05), but there was a negative relationship between LMX and hazard rate for individuals low in extraversion (B = -1.02, Wald = 11.92, p < .01).

Traditionality. Hui, Lee, and Rousseau (2004) studied how POS and personal relations with the leader (LMX) predict Chinese workers' organizational citizenship behavior (OCB) and their affective commitment to the organization. They define traditionality as the "degree to which individuals endorse traditional Chinese values" (p.234). According to Yang and colleagues (1989), several key dimensions of traditionality comprise respect to authority and submission to authority. Traditional Chinese individuals consider the authority figures as important as father substitutes, so that they show complete loyalty and compliance (Yang, 1993). Traditional Chinese greatly value the relationship with superiors (the leaders) in organizations; likewise, authors argued that such values and relationships would form their attitudes and behaviors. For this reason, Hui, Lee, and Rousseau (2004) proposed that traditionality serves as moderator between LMX and citizenship behavior and affective commitment. Specifically, when individuals are high in traditionality, LMX strongly related to affective commitment and OCB, whereas such relations become weaker for those who were low in traditionality.

However, the empirical results only partially supported the hypothesis: the interaction between LMX and traditionality only significantly predicted OCB but not organizational commitment. In a large, reformed, state-owned Chinese steel firm, they conducted the field study with 605 workers and their supervisors. Most interestingly, the direction of the moderation was

paradoxical to expectations: the sign of the interaction term was negative (β = -.09, p < .01). Such negative moderation indicated that traditionality substitutes for low LMX in explaining OCB. For the less-traditional Chinese, OCB increased significantly as LMX increased. But for more-traditional Chinese, OCB was generally at a high level and did not increase or decrease significantly corresponding to LMX. Hence, traditionality substitutes the impact of an individual's high quality relationship with the leader (LMX) on citizenship behavior (OCB).

Role perception. Role perception refers to the degree to which employees consider certain types of organizational citizenship behavior as extra-role behavior against in-role behavior (Tepper, Lockhart, & Hoobler, 2001; Tepper &Taylor, 2003). Van Dyne, Kamdar, and Joireman (2008) investigated the nature of interaction between role perceptions and LMX to predict different types of OCB (voice and helping).

Van Dyne et. al (2008) proposed that in-role perceptions would substitute for low-quality LMX to predict helping. They expected higher LMX would cause higher helping when helping is considered as extra-role behavior. In contrast, when helping is considered as in-role behavior, there would be no relationship between LMX and helping. The empirical findings supported hypotheses in both field studies. In study 1 with 218 engineers and their supervisors in an oil refinery in India, the findings showed that in-role perceptions served as substitute for low LMX in explaining helping behavior aimed at supervisors. When helping was considered as in-role behavior, there was no relationship between LMX and helping (β =.13, p >.05). However, there was a positive relationship between LMX and helping when helping was considered as extra-role behavior (β = .58, p< .001). In study 2 with 234 administrative and clerical workers from three multinational banks in Singapore, a similar nature of interaction was discovered between LMX and role perception to predict helping. LMX was not related to helping when helping was

considered as in-role behavior (Help-S: β =.07, p >.05; Help-O: β =.08, p >.05). However, LMX was positively associated with helping when it was considered as extra-role behavior (Help-S: β =.27, p <.001; Help-O: β =.30, p <.001).

Empowerment. To answer the call in Liden et al. (2000)'s study (p.141), Harris, Wheeler, and Kacmar (2009) studied how the empowerment moderated the relationships between LMX and various outcomes variables, such as, organizational citizenship behaviors, job performance, turnover intentions and job satisfaction. According to Spreitzer (1995), psychological empowerment is the improvement in task motivation by influencing four cognitions: self-determination, impact, competence, and meaning.

Based on job characteristics theory, Harris, Wheeler, and Kacmar (2009) explained the reason why empowerment was an important motivator to direct employee's behavior that eventually leads to good outcomes (e.g., increased job performance and lower turnover intention). When empowerment is high from the job itself, they argued that the relationship with the leader (LMX) might not be very essential to employees. This is due to the fact that the motivation generated from the empowerment would already provide positive outcomes to the employees. However, when the empowerment level is low, employees might naturally seek support and benefit from other sources, for example, from the quality of the relationship with the leader (LMX). They argued that when the motivation is lacking for the work itself (low empowerment), high quality exchange with the leader would become especially important in order to relate to the employee's positive outcomes. Based on these arguments, Harris and colleagues (2009) proposed that LMX is positively related to desired job outcomes (job satisfaction, turnover intention, job performance, and OCB), and such relations become strongest when there is low empowerment,

In general, the empirical findings from the two field studies supported the expected pattern of moderation between empowerment and LMX. In study 1, from a sample of 244 alumni of a private Midwestern university, they found that LMX was strongly and positively related to job satisfaction for people with low empowerment. In contrast, for people with high empowerment, the slope of the line to predict job satisfaction was nearly unchanged. Reframed, high empowerment would substitute for low LMX in explaining job satisfaction. Similar substitution was also identified in predicting job performance and OCB in study 2, with 158 full-time employees at a state agency.

Variables that Neutralize for LMX

*Role perception.*This type of moderation was named neutralization because an individual's extra-role perception neutralizes the relationship between LMX and voice behavior from *significantly* related to *not* related. Van Dyne et.al (2008), drawing from McAllister and colleagues (2007)'s work, proposed that in-role perceptions would enhance the relationship between LMX and voice. They argued that both an individual's in-role perception of voice behavior and the leader's support (high LMX) of voice behavior are necessary conditions for voice to occur. Based on such reasoning, they expected that voice would be high only when both conditions are met, that is, workers regard voice as in-role behavior and LMX is high. Again, the result from both field studies supported the hypothesis. For example, from study 1 (n=218), extra-role behavior role perceptions neutralized the relationship between LMX and voice. When voice was considered as in-role behavior, LMX was positively associated with voice (β =.61, p <.001). However, when voice was considered as extra-role behavior, LMX was not associated with voice (β =.03, p >.05).

Supervisor's organizational embodiment. According to Liden, Wayne, and Sparrowe (2000), employees' affective commitment to the organization is one of the most frequently studied outcomes of LMX. However, a meta-analysis of LMX showed a wide range of variation in the effect size associated with that relationship (Gerstner & Day, 1997). To explain the large unexplained variance in the relationship between the two variables, Eisenberger, Karagonlar, and colleagues (2010) proposed a concept called supervisor's organizational embodiment (SOE): the degree to which employees identify their supervisor with the organization. In the eyes of employees, the higher the SOE, the more the supervisor represents the organization, and the more the employees' relationship with the supervisor is considered as a reference for the exchange relationship with the organization. However, when employees perceive SOE as low, they consider their supervisor more as a free agent representing him or herself. This implies that the employees would be less likely to consider treatment from the supervisor equal to the treatment from the organization.

Based upon this reasoning, Eisenberger et.al proposed the moderating impact for SOE on the LMX-organizational commitment relationship. For high SOE, employees generalized the good treatment from the high quality relationship with the supervisor (LMX) to the organization. These employees would respond to the benefits from the high quality LMX relation in three ways: enhance positive mood, fulfill socioemotional needs and reciprocate aimed at favorable treatment; the result being that their affective commitment to the organization is improved. Study one of Eisenberger, Karagonlar, and colleagues (2010) demonstrated how low SOE neutralized the relationship between LMX and an employee's organizational commitment. Surveys from 251 workers in social service sector evidenced that at high SOE, there was a positive relationship

between LMX and affective organizational commitment (β = 0.45, p<.01), but no relationship at low SOE (β = 0.07, p >.20).

Supervisor's leader-leader exchange. The influence of LMX on attitudinal and behavioral outcomes not only depend on employees' role perception and SOE, but also may be conditioned upon supervisor's relationship quality with her or his own boss. According to the social exchange theory perspective (Blau, 1964) and the influence of LMX on subordinates, the quality of exchange relationships between the supervisor and his or her leader have a substantial impact on the resources and emotional support that the supervisor would acquire and further distribute to subordinates. The more a supervisor acquires from his or her leader, the more discretion he or she has in developing LMX with subordinates.

Based on this logic, Tangirala and his colleagues argued that leader-leader exchange (LLX)—a group-level construct defined as a supervisor's exchange relationship with his or her own leader—moderates the relationship between employees' attitudes toward the customers they serve and the organization. When LLX is higher, such relationships are stronger (Tangirala, Green, & Ramanujam, 2007). Specifically, they probed three dependent variables: organizational identification, perceived organizational support, and depersonalization toward customers in their study. This study documented the moderating effects of LLX on LMX's relationship with each variable. Specifically, the supervisor's LLX served as a neutralizer for both LMX-organizational identification and LMX-depersonalization toward customer relationships. LMX is only marginally related to organizational identification (r =.105, p =.06) at low levels of LLX but positively associated with it (r =.271, p =.01) at high levels of LLX. Similarly, LMX is not significantly associated with depersonalization toward customers at low levels of LLX (r=.008, p

=.10), but negatively associated with it when LLX was high (r = –.178, *p* =.01). Thus low LLX neutralized the relationship between LMX and organizational identification.

Supervisor's perceived organizational support. Similar to a supervisor's relationship quality with the leader, the supervisor's exchange relationship with the organization could also influence LMX's effects on employees' attitudes and behaviors. Based on social exchange theory, Erdogan and Enders (2007) studied how the level of perceived organization support (POS) a supervisor received from the organization would moderate the LMX's relationship with employees' job satisfaction and job performance. They contended that the tangible and intangible resources a supervisor could provide to his or her employees' depend on the level of that supervisor POS, such that a supervisor with high levels of POS could provide more resources and support to the employees with whom he or she develops high LMX, and vice versa. Consequently, they proposed that supervisor POS positively moderates LMX-job performance and LMX-job satisfaction relationships.

Toward this end, they collected data from 38 supervisors and 210 subordinates serving in a grocery-store chain to test their hypotheses. The findings supported the moderating effects of supervisor POS on both relationships in that the relationship between LMX and job satisfaction turns out to be more positive at higher levels of supervisor POS. Also supervisor POS neutralized the relationship between LMX and job performance such that the relationship was non-significant at low levels of supervisor POS ($p > .05$) while significant and positive at high levels of supervisor POS ($p < .05$).

Safety climate. Beyond the employees' and supervisor's conditional effects, factors at the organizational level such as climate could also have a role in moderating LMX and its consequences. Hofmann and his colleagues (Hofmann, Morgeson, & Gerras, 2003) studied the

moderating effect of safety climate on the relationship between LMX and "subordinates' safety citizenship role definitions." Hofmann et. al argued that safety climate, described as the extent to which safe performance is regarded as valued, rewarded, and expected (Zohar, 2000), would affect the degree to which employees' regard safety as a way to reciprocate high LMX and subsequently expand their safety role definitions. When there is a stronger safety climate in organizations, employees with high LMX tend to expand their safety role definitions in order to repay their supervisors, while less will be done in organizations with a weaker safety climate. In a study of 127 transportation employees serving in the U.S. army, they conducted a simple slopes analysis (Aiken & West, 1991), and found that safety climate neutralizes the relationship between LMX and employees' regard safety definitions such that the two are not significantly related at low levels of safety climate (simple slope= -.33; p >.05) but significantly and positively related at high levels of safety climate (simple slope=1.22, p <.01).

LMX differentiation. LMX differentiation, defined as the distinctiveness of the interpersonal relationships that exists among leaders and subordinates, has received extensive research attention in group-level research on LMX (Erdogan & Liden, 2002; Graen & Uhl-Bien, 1995). Taking a social comparison perspective, Liao and colleagues explored how LMX differentiation moderated the relationship between LMX and self-efficacy (Liao et.al, 2010).

Applying social cognitive theory, Liao et. al (2010) argued that employees with high-quality LMX are assigned more challenging tasks and given higher expectations that cultivate their efficacy beliefs through social persuasion. In addition, employees with high LMX experienced more trust, respect, and socio-emotional support that improve their efficacy beliefs through positive psychological arousal. Finally, supervisors generally give more instructions and performance feedback to those employees who are closely related to them, during which these

employees accumulate mastery experience that forms the most important source of efficacy beliefs.

Based on all above arguments, Liao et al. (2010) proposed that LMX is positively related to team members' self-efficacy. Further, they applied a social comparison perspective to argue that members compare their LMX quality with that of others when evaluating efficacy beliefs. The more LMX disperses in the team, the more members with high LMX would be aware of their better status. Therefore, they posited that the positive relationship between LMX and self-efficacy would be stronger at a higher level of LMX differentiation. In a field study, they validated that LMX differentiation serves as neutralizer of the LMX and self-efficacy relationship such that the relationship is non-significant at low levels of LMX (r =.00, n.s.) and significant and positive at high levels of LMX (r =.04, $p < .01$).

Variables that Neutralize for TMX

TMX differentiation. Compared to the moderators for LMX's relationship with outcome variables, fewer studies have been done on the moderators of TMX and its consequences. Up to date, only one neutralizer has been found for TMX's relationship with outcome variables: TMX differentiation as a moderator of TMX-self-efficacy relationship.

Similar to LMX differentiation, TMX differentiation refers to the degree of variation in terms of TMX among team members (Liao et al., 2010). Liao et al. (2010) argued that like LMX, TMX also cultivates employees' efficacy beliefs through mastery experience and positive psychological arousals. But unlike LMX, TMX does not affect self-efficacy through a social persuasion channel, but through vicarious experience. That is, members high in TMX are likely to take their coworkers as role models due to the physical proximity, common goals, and similar resources (Seers, 1989). This vicarious learning functions as an important source of efficacy

beliefs (Bandura, 1982). Based on such logic, Liao et al. (2010) proposed a positive relationship between TMX and self-efficacy. Further, they added that TMX differentiation has a positive moderating effect on this relationship in the same way as LMX differentiation positively moderates LMX-self-efficacy relationship. Their empirical results support this contention by finding a positive relationship between TMX and self-efficacy at high levels of TMX differentiation (r = -.01, n.s.), but no relationship between the two at low levels of TMX (r =.14, p <.01).

THEORETICAL EXTENSIONS AND MODEL DEVELOPMENT

The literature review provided above establishes the case that LMX and TMX are largely separate and independent constructs that have unique antecedents. It also indicates that despite this, LMX and TMX have been found to relate to a set of common outcomes, although the effects for each tend to be contingent on other variables that act to substitute for or neutralize the effects of LMX and TMX. This section of the proposals reviews theoretical developments in three different areas including self-determination, identity orientation and team types. These theories will be reviewed with the purpose of developing a model that stipulates LMX and TMX's interact with each other and characteristics of a person and his or her team to influences outcomes such as intrinsic motivation, job satisfaction, job performance, and retention.

The first sub-section below will examine the main effects of LMX and TMX separately to predict the four work outcomes of interests. The second sub-section will review the core elements of self-determination theory to establish why LMX and TMX are likely to *substitute* for each other when it comes to the ability to meet team members' needs for relatedness, competence and autonomy. The ability to substitute either LMX or TMX to meet these needs has implications for predicting outcomes for these individuals, and it will be argued specifically that LMX and TMX, in turn, act as substitutes for predicting individual outcomes. The third sub-section will then review the core elements of theories related to identity orientation to show how characteristics of the person act in different ways to *neutralize* the impact of LMX and TMX on work outcomes. The impact of LMX on outcomes is likely to be neutralized for individuals who are low in relational identity and the impact of TMX on outcomes is likely to be neutralized for individuals who are low on collective identity. The fourth sub-section will then review theories of team types and show how characteristics of the team act in different ways to *neutralize* the impact of LMX and TMX on work outcomes. The impact of LMX on outcomes is likely to be

neutralized in teams that are low in authority differentiation and the impact of TMX on outcomes is likely to be neutralized for in teams that are low on skill differentiation.

Main Effects

Intrinsic Motivation

LMX and Intrinsic Motivation. Intrinsic motivation refers to "the doing of an activity for its inherent satisfaction rather than for some separable consequence" (Ryan & Deci, 2000: p. 56). When internally motivated, a person is driven by fun or the challenge entailed in the goal (Loewenstein, 1999) rather than external pressures or rewards for achieving the goal. Due to this, Deci (1975) stated that intrinsic motivation is "self-sustained" and "valued for its own sake." In contrast, extrinsic motivation is typically linked to monetary compensation or other forms of incentives that satisfy a person's needs indirectly.

Deci et.al proposed that intrinsic motivation plays a larger role in terms of inspiring employees relative to pay-for-performance incentive systems. This is especially true when the task requires creativity or learning (Amabile 1996, 1998; Deci & Flaste 1995; Schwartz, 1990). To date, only a handful studies have connected leadership theory to intrinsic motivation and so far no study has directly examined LMX as an antecedent of intrinsic motivation. In the following paragraphs, I will utilize the job characteristic model to argue that LMX quality affects employees' intrinsic motivation by influencing their perceptions on the core job characteristics.

The job characteristics model was developed by Hackman and Oldham (1976, 1980) in an effort to explain how employees could be intrinsically motivated by job design that creates high-level person-environment fit. Specifically, Hackman and Oldham (1980) identified five key job characteristics: (1) *skill variety* (the degree to which a job requires the use of different skills and talents of the person in carrying out the work), (2) *task identity* (the degree to which a job

requires the completion of a whole, identifiable piece of work, or doing a job from the start point till the end with a visible outcome), (3) *task significance* (the degree to which a job substantially influences other members' lives or the life of people in the world at large), (4) *autonomy* (the degree to which a job provides freedom, independence, and discretion regarding to work schedule and/or determining work procedures), and (5) *feedback* (the degree to which a job provide direct and clear performance information). According to job characteristics theory, these five core characteristics generate positive psychological states such as experienced meaningfulness, experienced responsibility, and knowledge of results. Finally, these positive psychological states determine the level of intrinsic motivation (Hackman & Oldham, 1976). Many studies has supported the positive connection between the five core job characteristics and intrinsic motivation. Fried and Ferris (1987) in their meta-analysis found that the correlation between two variables ranging from .22 (low) to .52(high) among over 200 studies.

I argue that LMX could affect intrinsic motivation either by directly changing or crafting the core job characteristics, or by shaping members' perception on their job characteristics. First, when a leader develops high-level LMX with a subordinate, he or she is more likely to grant more discretion to that subordinate with respect to that members' job content, autonomy, and decision making latitude during the role negotiation. That is, members are more likely to engage in job crafting with their leaders and successfully enrich their job if there is a high level of social exchange between them. This notion has been reiterated by several researchers (e.g., Bauer & Green, 1996; Graen, Liden, & Hoel, 1982; Keller & Dansereau, 1995; Liden, Wayne, & Stilwell, 1993) and has received considerable support.

Second, leaders may shape members' subjective job perceptions without changing objective job characteristics. According to the social information processing model by Salancik

and Pfeffer (1978), individuals rely on informational cues from their social contexts when assessing their work environments. In the team context, the leader is an important information source and carries substantial weight in shaping members' perception of their job characteristics (Griffin, Bateman, Wayne, & Head, 1987). In this vein, team members are likely to take into consideration their LMX quality when making sense of their job characteristics, since the exchange process itself conveys substantial confirmation from leaders. In the context of high-quality relationships, team members experience trust, emotional support, and encouragement from their supervisors, and therefore are more likely to frame their jobs in a positive way. For those who are in the low-quality LMX, they receive less confirmation from leaders. As a result these members are more likely to perceive their jobs in a negative way. Consequently, team members' perception on job characteristics determines the potential level of intrinsic motivation. From above, I hypothesize that:

Hypothesis 1(a): Leader-member exchange will be positively associated with a follower's intrinsic motivation.

TMX and Intrinsic Motivation. Similar to LMX, TMX could also affect intrinsic motivation by directly influencing the objective job characteristics or by shaping members' subjective perceptions of their job characteristics. As reviewed in chapter 2, the development of TMX can be described by a role process model that includes three phases: role taking, role making, and role routinization, respectively. During the process, individuals negotiate their role with other team members. Those with high-quality TMX are more likely to gain more work-related expertise and feedback, and subsequently enjoy more positive job feedback and skill variety. Liden et al. (2000) argued, that by exchanging work-related advice and resources with other team members, an individual perceives a higher level of control over one's job and

experiences a higher level of autonomy. On the other hand, TMX may influence a member's sense-making process when assessing job characteristics in a similar way as LMX directs its influence. Specifically, high TMX tends to lead to a member's more positive perception on job characteristics, while low TMX is more likely associated with negative perception on job characteristics. Finally, through the direct and indirect influences on job characteristics, TMX quality exerts its influence on follower's intrinsic motivation. Thus:

Hypothesis 1 (b): Team-member exchange will be positively associated with a follower's intrinsic motivation.

Job Satisfaction

LMX and Job Satisfaction. Job satisfaction has both a cognitive (Brief & Weiss, 2002) and affective (Locke, 1976) components. Locke defined job satisfaction as "a pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences" (p. 1304). It is well established in the literature that overall job satisfaction is positively associated with LMX (Gerstner & Day, 1997).

Empirically, a positive relationship was found between an employee's LMX and job satisfaction. For example, in a study of government employees, Graen et al. (1982) demonstrated that training supervisors with enhanced LMX quality improved employee-rated job satisfaction. With a sample of supervisory-subordinate dyads in a manufacturing organization, Wilhelm, Herd, & Steiner (1993) found that LMX quality was highly positively associated with subordinate job satisfaction. In a recent study, Erdogan and Enders (2007) found that a high-quality LMX relationship created a positive environment for employees by providing them intangible benefits such as understanding and friendliness as well as tangible benefits such as decision influence, empowerment, career advancement, and salary increases. This positive

environment led to higher job satisfaction. In a sample of grocery store chains in Northwestern United States, results demonstrated a high association between subordinates' rated LMX quality and job satisfaction.

In high LMX relationships, supervisors maintain a good work environment by having a trust-based relationship (Bauer & Green, 1996) and providing benefits such as open and respectful communication (Hofmann & Morgeson, 1999; Yrle, Hartman, & Galle, 2002). All such factors remove the barrier that prevents individual employee job satisfaction. Second, unlike extrinsic needs, intrinsic or motivator needs refer to the nature and consequence of work and include contributing factors such as desirable and challenging work assignments, recognition of achievement, responsibility, and advancement. In high LMX relationships, leaders are expected to provide subordinates with decision influence (Scandura, Graen, & Novak, 1986), empowerment (Liden, Wayne, & Sparrowe, 2000), career advancement (Wakabayashi, Graen, Graen, & Graen, 1988), and salary progress (Wayne, Liden, Kraimer, & Graf, 1999). Therefore, it is hypothesized:

Hypothesis 2(a): Leader-member exchange will be positively associated with a follower's job satisfaction.

TMX and Job Satisfaction. In high TMX relationships, coworkers offer work-related expertise, feedback, and support. Liden et al. (2000) indicated that such benefits are more likely to facilitate an employee's work, establishing the necessary conditions for the employee's enhanced perception of meaning, impact, and competence. Also, the sharing of power and authority in team task completion would result in enhanced self-determination of the employee. Overall, the feeling of meaning, impact, competence, and self-determination are the four dimensions of intrinsic task motivation (Thomas and Velthouse, 1990). According to Deci, the

fulfillment of intrinsic or motivator needs in an employee's work environment leads to increased job satisfaction. Thus, a high TMX relationship is more likely to result in an employee's high job satisfaction. Limited research has studied the relationship between job satisfaction and team-member exchange given the size of TMX literature. Some evidence has shown a positive relationship between the TMX and job satisfaction (Major et al., 1995; Seers, 1989; Seers et al., 1995).

The literature on work group cohesiveness also provides evidence of a relationship between TMX and job satisfaction. O'Reilly and Caldwell (1985) found that job satisfaction is positively related to cohesiveness. It is more likely to develop behavioral norms that offer a support system to all members in cohesive groups (Hackman, 1992). Such a support system should reduce role strain. Furthermore, cohesive groups can offer emotional support for group members, which in turn become a direct source of satisfaction (Lott & Lott, 1965). Thus:

Hypothesis 2 (b): Team-member exchange will be positively associated with a follower's individual job satisfaction.

Job Performance

LMX and Job Performance. Individual job performance is an often studied behavioral outcome that has been used to assess the influence of LMX. Social exchange theory (Blau, 1964) and the norm of reciprocity (Gouldner, 1960) have been used to explain the association between LMX and job performance. High LMX relationship quality with the supervisor, beyond the formal job description, is characterized by high levels of trust, interaction, support, and formal and informal rewards (Dienesch & Liden, 1986). Such high quality social exchange with the supervisor generally creates a feeling of obligation on the part of the employee to reciprocate

(Gouldner, 1960). Thus, employees may be expected to perform at an elevated level in order to repay the supervisor such that the exchange is balanced and mutually advantageous.

This positive relationship between LMX and job performance has been documented empirically. For example, in a sample of large firms in the United States, Wayne, Shore, and Liden (1997) demonstrated that LMX was significantly and directly associated with employees' performance. They explained such results from a social exchange perspective where employees reciprocate high quality relationships with the supervisor by performing over and beyond normal job expectations. For employees with high quality LMX relationships, Wayne et. al showed that they value the relationship and consider high job performance as an obligation to their supervisor. Thus, for high quality LMX relationship, employees should enhance their job performance to fulfill role requirements.

Further evidence for the relationship between LMX and job performance has been found in a meta-analytic study by Gerstner and Day (1997) who found that the mean sample-weighted correlation between member performance (leader-rated) and LMX (leader reported) was .41.This meta-analytic review further provided two reasons for such high correlation. First, the LMX relationship develops partly from a follower's capability, loyalty, and interpersonal compatibility, which are strong predictors of work performance (Graen & Scandura, 1987). Second, once a high LMX relationship established, leaders tend to maintain the high performance expectations for those high LMX followers, resulting in biased but higher performance evaluations towards them (Duarte, Goodson, & Klich, 1994). According to Cleveland and Murphy (1992), it is not clear that the high performance ratings are due to the supervisors simply match the quality of the relationship to their performance ratings or the high LMX subordinates truly have better performance. Nevertheless, Duarte, Goodson, and Klich

(1994) found that high LMX followers had higher performance ratings controlling for their tenure with their supervisor and objective performance levels.

Therefore, it is hypothesized:

Hypothesis 3 (a): Leader-member exchange will be positively associated with a follower's job performance.

TMX and Job Performance. According to social exchange theory, employees develop an obligation to reciprocate when they perceive that they obtain trust, support, and other benefits from their team (Gouldner, 1960). In a high TMX, therefore, employees are likely to perform at high levels in order to return their obligations to the team. Despite the size of TMX literature, there are only three studies thus far examining the relationship between TMX and individual performance. In a sample of blue-collar industrial workers, Seers (1989) found that TMX positively predicted performance. Seers (1989) explained the result by noting that followers with high relationship quality with the leader were traditionally considered to be the role senders; but employees with high TMX relationship quality spent more time interacting with their coworkers, who must have been acknowledged as role senders as well. When team members have high quality exchanges relationships among themselves, members are offered with more chances to meet the performance expectations of the work unit role senders. In addition, Seers et al. (1995) suggested that reciprocal behavior may assist the coordination among members' efforts, resulting in better performance. Seers et al. found that changes in levels of TMX over time were associated with higher departmental production efficiency (Seers et al., 1995). Liden and colleagues (2000) also found that TMX was related to job performance in their study of a sample of 337 employees from several major divisions of a large service organization in Midwest.

Finally, the literature on work groups also indirectly implies that the quality of team member exchange will influence performance. Campion, Papper, and Medsker (1996) found that a variety of key work group characteristics, such as interdependent feedback, communication and cooperation within the group, workload sharing, and social support, were all positively related to group effectiveness. In addition, Campion, Medsker, and Higgs (1993) demonstrated that workload sharing, communication, and cooperation within groups were positively associated with managerial assessment of group effectiveness. Thus, to the extent of the team effectiveness is a product of the individual level effectiveness. This implies that TMX is positively related to individual level performance as well. Thus,

Hypothesis 3(b): Team-member exchange will be positively associated with a follower's individual job performance.

Retention

LMX and Retention. Maertz and Griffeth's (2004) framework for turnover motives implies a possible impact of LMX on turnover intentions. In their comprehensive model on turnover motives, Maertz and Griffeth concluded that there are eight motivational forces that work independently and interactively in employees' turnover decision processes. Among them, affective forces, calculative forces, contractual forces, and constituent forces are the most likely motivational mechanisms that link LMX to turnover intentions. In the following paragraphs, I will explicate why LMX quality is negatively related to the turnover intentions through these four motivational forces.

First, as argued earlier in this paper, employees high in LMX are more likely to achieve a higher level of job satisfaction, which in turn develops into an affective attachment to their organization. These positive feelings associated with the current organization may serve as

affective forces for members to remain (Meyer & Allen, 1991). On the other hand, employees with low-level LMX are more likely to be exposed to psychological discomfort in their working environment and consequently are more likely to consider the option of quitting in order to avoid the displeasure.

Second, with regards to long-term career development, employees with high-quality LMX enjoy priorities in many aspects such as task autonomy, mentorship, training, and promotion opportunities. As a result of rational calculation on these benefits, members of high exchange relationships with their leaders are likely to expect a bright future and career goal achievements at the current organization. On the contrary, employees in poor relationships with their supervisors are driven to leave by the calculative forces, expecting less probability to acquire either short-term job-related or long-term career advancement resources from their current organization.

Third, employees' LMX quality may affect their perceptions with respect to a breach of the psychological contract. The psychological contract refers to the terms and conditions of a reciprocal exchange agreement between employees and their organization and is based upon the perceived mutual obligations on the part of both employees and their organizations (Robinson & Rousseau, 1994; Rousseau, 1995). A psychological contract breach is defined as "the cognition that one's organization has failed to meet one or more obligations within one's psychological contract in a manner commensurate with one's contributions" (Morrison & Robinson, 1997: p.230). Dulac and his colleagues argued that employees high in LMX tend to perceive the unmet obligation owed to them by their organizations as the natural lapse in the reciprocation processes rather than a psychological breach; consequently, these employees are more likely to stay in the current organizations. Employees low in LMX tend to take the opposite view and in turn, are

more likely to generate turnover intentions (Dulac, Coyle-Shapiro, Henderson, & Wayne, 2008). Supporting this view, they found that a psychological contract breach partially mediates the LMX-turnover intentions relationship in a longitudinal field setting.

Finally, at the individual level, employees' personal affective attachment to their supervisor also plays an important role in their turnover decision process. According to Maertz and Griffeth (2004), an employee's relationship with his or her constituents, such as individuals or groups within the organization, predicts turnover intentions beyond the effect of the employee's affection for the organization. In a team setting, an employee's direct supervisor has great impact on one's work life through task assignment, resource allocation, performance assessment and feedback, emotional support, and many other ways. Hence, the supervisor should be regarded as a significant person who influences turnover cognition among employees in the team. As affect or liking is an important dimension of LMX construct, positive affect (based on interpersonal attraction) may exist between an employee and the supervisor when they are in a high-quality exchange relationship (Dienesch & Liden, 1986; Liden & Maslyn, 1998). Employees' positive affect toward their supervisor comprises an essential force that motivates them to remain in the organization.

Given the inadequate empirical research on the relationship between turnover intentions and LMX, the result of a meta-analysis show that LMX is negatively associated with turnover intentions (Gerstner & Day, 1997, ρ = -.31). Indirect evidence can also be found in the socialization literature on the association between turnover intentions and interpersonal interaction. For instance, using longitudinal three waves of data, researchers found the association between relationship building and turnover intentions (Kammeyer-Mueller & Wanberg, 2003).

Employees who are capable of establishing high quality relationships at work, such as LMX, may become more embedded in their company because they obtain more feedback from their supervisors (Kramer, 1995), and feel more supported (Liden, Wayne, & Sparrowe, 2000; Kacmar, Carlson, & Brymer, 1999). If employees are willing to maintain high quality LMX, they tend to psychologically more committed to the company and have lower turnover intentions.

Therefore, it is hypothesized:

Hypothesis 4(a): Leader-member exchange will be positively associated with a follower's retention.

TMX and Retention. Maertz and Griffeth (2004)'s framework can also be applied to explain the TMX-turnover intentions relationship. All rationales for the affective forces, calculative forces, and contractual forces can be applied in the same way as the above argument for LMX-turnover intentions except for the constituent forces, as I will describe below.

Employees in a team environment, especially those who are high on TMX, are embedded in a group of people with whom they coordinate frequently. In order to accomplish their role requirements, employees need to exchange materials, information, and other kinds of resources with their coworkers. Therefore, coworkers also comprise an important component for employees' functioning in the team. For employees high in TMX, the corresponding constituent force arising from their affective attachment to coworkers may prevent them from withdrawing from their current organizations. But for employees who suffer from low-quality relationships with other members, the constituent force arising from dislike of other members may drive them away from the organization. In this way, TMX is negatively related to turnover intentions through constituent forces.

Two studies found the negative association between TMX and turnover intentions. In a sample of 248 new hires assessed before entry and at an average of 4 weeks after entry, Major, Kozlowski, Chao, and Gardner (1995) found that TMX significantly predicted lower turnover intention for employees. In a more recent study, Neff (2008) documented that the correlation between TMX and intention to leave was negative although not statistically significant with a sample of 153 workers and salaried employees from three industrial distribution workplaces. Thus,

Hypothesis 4(b): Team-member exchange will be positively associated with a follower's individual retention.

LMX and TMX as Substitutes: Self-Determination Theory

Current research literature lacks an understanding of the influence of the interaction between two exchange relationships (LMX and TMX) on an employee's work outcomes. An increasing amount of empirical support shows that high LMX and high TMX would independently increase employees' job satisfaction and job performance and decrease employee' turnover intention. However, as indicated in the meta-analysis described earlier in this proposal, only a handful studies have included both forms of social exchanges relationships in one empirical investigation. As a result, there is not enough support for the impact of one type of social exchange in the existence of the other type of social exchange. Especially, does the presence or absence of TMX make the relationship between LMX and individuals' work outcome variables weaker or stronger? Thus, it is important to study both theoretically and empirically how an individual's social exchange relationships in a workgroup, with both the team leader and teammates, simultaneously influence the individual's outcomes.

The purpose of the current study is to fill this gap by using the self-determination theory (SDT: Deci & Ryan, 2000) as a main framework to develop a model that integrates social exchange and needs fulfillment to examine the interaction impact of LMX and TMX on employee outcomes

According to SDT, there are three basic needs: autonomy, competence, and relatedness. The need for autonomy reflects how one senses volition in his or her actions, fully and truly expresses his or herself, and acts as the initiator of his or her own behavior. The need for competence reflects a felt sense of confidence in one's efforts and capability to achieve the desired outcomes. The need for relatedness involves a sense of connection, belonging, and understanding by others. When these needs are fulfilled, individuals experience positive well-being (Gagné & Deci, 2005). One of the key assumptions of the SDT perspective on needs is that need fulfillment stems from certain optimal social contexts. Applying SDT theory to the work domain, I argue that TMX and LMX substitute for each other when it comes to cultivating employees' need fulfillment; in particular, each TMX and LMX can offer similar contributions to the basic needs: autonomy, competence, and relatedness.

Relationship quality and need for autonomy

The need for autonomy refers to individuals' inherent desire to feel volitional and to experience psychological freedom and a sense of choice when performing an activity (deCharms, 1968; Deci & Ryan, 2000). According to SDT, the social context could either contribute to one's perceived sense of autonomy or detract from it. When the social context is experienced as supporting autonomy, individuals have a sense of choice and volition, which promotes positive outcomes. According to Gagne´ and Deci (2005), of all the contextual support for needs, autonomy support is considered to be the most important social-contextual factor to predict an

individual's intrinsic motivation. In particular, autonomy includes individuals considering support providers as "taking their perspective, encouraging initiation, supporting a sense of choice, and being responsive to their thoughts, questions, and initiatives" (Deci & Ryan, 2008: p. 18). Because LMX and TMX are two major, but different forms of social exchanges in which an individual gets involved, I will treat the team leader and peers as distinct sources of autonomy support and examine how both the leader and the other team members can contribute to a focal member's need for autonomy in the team context.

A high quality LMX relationship between a leader and a follower is depicted by high level of mutual respect and trust (Graen & Uhi-Bien, 1995). In high quality social exchange relationship, the leader provides the "personal, intangible, and open ended" (Kamdar & Dyne, 2007: p.1289) support and resources to a "high LMX" follower. Through the role-making and role-taking process, "high LMX" followers are granted with greater autonomy and freedom to choose their roles (Graen & Scandura, 1987). For example, Dansereau et al. (1975) found that "high LMX" followers felt their roles were more congruent with their own preferences. Also, because there is more trust between a leader and the "high LMX" followers over time, Basu and Green (1997) pointed out that the leader may even trust the "high LMX" members to supervise group operation and to solve within group problems. Empirically, Graen and Cashman (1975) found that high LMX followers had more chances to involve in negotiation differences with their leaders on matters regarding the group in a longitudinal study. In addition, in a sample from a medium-sized bank with 45 dyads, Vecchio and Gobdel (1984) found that a high LMX was related to greater latitude and degrees of freedom in work situations, whereas, followers with low LMX were limited by what the supervisor preferred and ordered from them. As a result,

increased decision latitude and influence on work outcomes will enable team members with high LMX to fulfill their need for autonomy.

There is not as much research on autonomy and support from one's peers in comparison to autonomy and support from a person in high status, such as the leader. Beyond the leader's influence, I argue that autonomy and support from other team members constitutes another important source to fulfill an employee's need for autonomy. Other team members may influence the focal employee's need fulfillment through collaboration and sharing of information, materials, and expertise between the group members. With a high TMX, the focal member receives information, help, and recognition from other team members that extends beyond what is necessary for task completion. High social support, in return, enhances the focal employee's perception that his or her behavior makes a difference and has an impact on the work environment (Seers, 1989; Seers, Petty, & Cashman, 1995). Moreover, high TMX includes sharing power, expertise, and authority among team members in the completion of tasks such that high social support from peers in a team supports the focal member's perception of self-determination (Liden, Wayne, and Sparrowe, 2000). Indeed, positive social exchanges with peers (TMX) is also likely to fulfill the employee's need for autonomy.

Thus, I argue that both high LMX and TMX will fulfill the employee's need for autonomy, and hence, TMX substitutes for LMX, such that outcomes are positive if either LMX or TMX is high.

Relationship quality and need for competence

The need for competence refers to an individuals' inherent desire to feel effective in interacting with the environment (Deci & Ryan, 2000; White, 1959). The motivational impact of one's need for competence is determined by the availability of social support in the environment

(Deci & Ryan, 1985). SDT indicates that individuals feel competent when they are provided with clear performance expectations (Grolnick & Ryan, 1987) and positive performance feedback administered in a non-controlling manner (Vallerand & Reid, 1984). Such contextual support for competence is named "structure" in the educational psychology literature. According to Grolnick, Deci and Ryan (1997), structure consists of behaviors by authority figures that communicate information about the relationship between behavior and outcomes. In such way, it shows individuals the path to desired outcomes and helps them overcome the frustration.

In a high quality LMX relationship, the leader usually holds positive expectations for the "high-LMX" follower (Zalesny & Graen, 1987). Also, the leader would probably encourage the follower to undertake more difficult task assignments (Erdogan & Liden, 2002). Such intellectual challenges may focus on an individual's problems, challenge their assumptions, and encourage them to try different and better approaches. Both high performance expectations and intellectual challenges acknowledge the followers' past performance and confirm their ability for future performance. As such, a high LMX fulfills the employee's need for competence. For example, in an empirical study with a sample of 104 interns and 81 of their respective supervisors in an 8-week summer job training program, Murphy and Ensher (1999) found that high LMX was associated with an increase in job self-efficacy during the course of the internship, especially for those initially low in self-efficacy.

According to Bandura (1982), there are four primary sources on which people can base their beliefs about self-efficacy: social persuasion, vicarious experience, physiological state, and mastery experience. Vicarious experience refers to the experiences that a person gains by observing and learning from social models, especially those who are similar to them (Bandura, 1982). Because individuals in the same team have a physical closeness to each other and share

collective team goals and interdependent tasks, they tend to choose teammates as social models from which to observe and learn. With high TMX relationship quality, an individual interacts with the rest of the team adequately. Other team members may notify the focal individual of expectations of different tasks and the ways for dealing with challenging and intimidating situations. High TMX relationship quality, as a result, facilitates the building of the focal individual's sense of self-efficacy (Liao et al., 2010). For example, in a longitudinal study with a sample of 828 technicians employed by a Chinese iron and steel manufacturing company, Liao et. al (2010) found that high initial TMX was positively related to the self-efficacy measured two months later.

Thus, I argue that both high LMX and TMX will fulfill the employee's need for competence. And hence, TMX substitutes for LMX, such that outcomes are positive if either LMX or TMX is high.

Relationship quality and need for relatedness

The need for relatedness is refers to individuals' inherent propensity to feel connected to others (Baumeister & Leary, 1995). The need for relatedness is fulfilled when people develop intimate and close relationships with others and experiences a sense of unity (Deci & Ryan, 2000). In applications of SDT in the contexts of education and athletics, relatedness is represented by the concept of involvement. Involved authority figures dedicate time to a person and demonstrate an interest in their well-being (Connell & Wellborn, 1991; Grolnick, Deci, & Ryan, 1997). Also, the idea of involvement is very similar to the acknowledgement of feelings, which is a contextual support for self-determination mentioned in Deci, Eghrari, Patrick, and Leone (1994)'s study, where they argued that managers relieved the tension associated with the boring job by acknowledging the employees' feelings (Deci et al, 1994).

For LMX, the trust, respect, empathy and openness shown in a high quality LMX relationship may serve as important contextual support to fulfill an employee's need for relatedness. Specifically, the individualized care and support—including developmental and nurturing behaviors that focus on each individual follower's needs, concerns, and growth potential—are likely to convey the leader's concern about the welfare of the follower. In this way, the leader may build strong connections and emotional bonds with followers and fulfill their need for relatedness.

Similarly for TMX, high TMX members receive increased social emotional support from peers and this may help satisfy an employee's need for relatedness. High quality exchange relationships with peers provide the member a protected and supportive network (Boies & Howell, 2006), which helps to reduce the aversive states of physiological arousal such as fear, anger, and distress. For example, Tse, Dasborough, and Ashkanasy (2008) argued that members with high TMX relationships' were better able to cope with aversive somatic and emotional arousal in performing new and challenging tasks. For this reason, members with high TMX will be psychologically more attached and dependent on the group because of the social support and responsiveness received from the positive relationship with peers (TMX). The social exchange with peers (TMX) is also likely to fulfill employee's need for relatedness.

Thus, I argue that both high LMX and TMX will fulfill the employee's need for relatedness, and hence, TMX substitutes for LMX, such that outcomes are positive if either LMX or TMX is high.

As demonstrated above, both LMX and TMX relationships have similar influences on an employee's three basic psychological needs: autonomy, competence, and relatedness. SDT postulates that satisfaction of basic psychological needs provides the nutriments for intrinsic

motivation and internalization. Also, once the basic needs are fulfilled, there is substantial evidence for positive relationships between a composite score of need satisfaction (i.e., aggregated across the three needs) and employees' favorable attitudes (i.e., decreased turnover intentions), work-related well-being (i.e., job satisfaction), and high performance (see Gagé & Deci, 2005; Van den Broeck, Vansteenkiste, & De Witte, 2008, for overviews).

On one hand, high-TMX individuals are garnered with frequent social attention and interaction from the team; and may perform well in their position without the need of to develop high-quality social exchange relationships with their supervisor. High-LMX relationships are depicted by frequent interaction (e.g., Liden & Graen, 1980; Kramer, 1995) and high TMX individuals desire interaction (Seers, Petty & Cashman, 1995). High LMX individuals are given great latitude and support from the leader (e.g., Liden et al., 2000) and high-TMX individuals also enjoy necessary work-related expertise and feedback from other team members. In essence, the behavioral tendencies and benefits that characterize LMX parallel the qualities of TMX. Therefore, I expect that for high –TMX individuals, LMX and work outcomes (e.g., intrinsic motivation, job satisfaction, job performance, and retention) should be weakly or not related, because high-TMX individuals could accomplish well at their positions despite of the social exchange relationships with their leader. That is, TMX substitutes for LMX, such that outcomes are positive if either LMX or TMX is high.

On the other hand, low-TMX individuals are in an apparently rootless condition because the social support from the team is not enough to fulfill their three basic needs. Without a high-LMX relationship, low-TMX individuals might consider it hard to obtain necessary resources and information and to navigate complex social networks. Hence, LMX relationships become essential to accomplish the work for low-TMX individuals. It could hard for low-TMX members

to perform at a high level if there are no benefits from high-LMX relationships. However, low-TMX individuals who are capable of effectively build and sustain high-LMX relationships could gain benefits comparable to those granted by high –TMX relationships. Therefore, I expect that for low –TMX individuals, LMX is essential for them to achieve high work outcomes. Thus, for low-TMX individuals, LMX should be positively related to their work outcomes (e.g., intrinsic motivation, job satisfaction, job performance, and retention). That is, TMX substitutes for LMX, such that outcomes are positive if either LMX or TMX is high.

For this reason, LMX and TMX may constitute two alternate forms of social support, one substituting for the other's absence to influence employees' work outcomes such as intrinsic motivation, job satisfaction, job performance, and retention. In this case, individuals fail to achieve positive work outcomes, only when they have poor social relationship quality with both the leader (LMX) and the team (TMX), and either is sufficient to produce positive outcomes.

"Substitution" Evidence in Social Exchange Theory

Current perspectives in social exchange theory indicate that the effects of one form of social support may partly depend on the level of support from other exchange relationships (Cropanzano & Mitchell, 2005). According to Cropanzano and Mitchell (2005), resources are valuable to the degree that they are unattainable from alternate sources. In this line of reasoning, I expect that not all employees value LMX equally because employees tend to place special value on unattainable resources:

A high TMX individual may render the support from the relationship with the leader (high LMX) somewhat redundant to fulfill his/her three needs of satisfaction. These individuals with high TMX tend to already have needs for autonomy, needs for competence, and needs for relatedness fulfilled; thus, they feel indebted to the team and they repay such obligation with

positive work outcomes (e.g., increased intrinsic motivation, job satisfaction, job satisfaction, and retention), as mandated by the norm of reciprocity (Gouldner, 1960). In this way, I expect that high TMX will become a substitute for LMX to fulfill individuals' basic psychological needs which in turn contribute to their work outcomes.

In contrast, employees experiencing poor-quality relationships with their coworkers in a team (low-quality TMX) suffer from lower support from their team for fulfillment. Thus, they have reason to value an important form of support from the leader through an LMX relationship. LMX aids low-TMX employees by providing the accommodations they might not obtain otherwise to fulfill their need satisfaction. An employee who views a leader as otherwise unsupportive may respond especially favorably when granted with a social exchange relationship with the leader. Thus, these low-TMX individuals enjoy little coworker support and appreciation, rendering LMX especially valuable. For these reasons, I expect that LMX will substitute for the absence of coworker support in low-TMX employees, satisfying their basic needs, thus encouraging their reciprocation in the form of positive work-related outcomes.

"Substitution" Evidence in Substitutes for Leadership Theory

According to Kerr and Jermier (1978), leadership substitutes are defined as "a person or thing acting or used in place of another" and they would make "leadership not only impossible but also unnecessary." Substitutes reduced leaders' ability to influence subordinate criterion variables effectively replacing the leader influence. In Kerr and Jermier (1978)'s study, the findings suggested that the "close-knit, cohesive work group" can serve as the substitute for both "relational oriented" and "task oriented" leadership. Specifically, they pointed out that task-relevant feedback from other cohesive group members may render the formal leader's performance feedback function quite trivial. Moreover, cohesive work groups provide the

important sources of "affiliative need satisfaction" to employees as well. This argument is consistent with my expectation that TMX substitutes for the role of LMX's influence on employee's work outcomes. For instance, though high LMX relationship leads to an individual's high job performance, it is possible that a high TMX relationship can also lead to the person's high job performance despite a poor LMX relationship. From this perspective, high TMX would substitute for low LMX to predict high levels of individual's work outcomes, such as, intrinsic motivation, job satisfaction, job performance, and retention. In another words, work outcomes should thus be low only when his/her both LMX and TMX are low.

In sum, I expect that LMX and TMX are substitutes in nature to influence an employee's work outcomes. Thus, I hypothesize:

Hypothesis 5(a): TMX moderates the relationship between LMX and intrinsic motivation, such that, LMX is significantly positively related to intrinsic motivation when TMX is at a low level; but LMX is not related to intrinsic motivation when TMX is at a high level.

Hypothesis 5(b): TMX moderates the relationship between LMX and job satisfaction, such that, LMX is significantly positively related to job satisfaction when TMX is at a low level; but LMX is not related to job satisfaction when TMX is at a high level.

Hypothesis 5(c): TMX moderates the relationship between LMX and job performance, such that, LMX is significantly positively related to job performance when TMX is at a low level; but LMX is not related to job performance when TMX is at a high level.

Hypothesis 5(d): TMX moderates the relationship between LMX and retention, such that, LMX is significantly positively related to retention when TMX is at a low level; but LMX is not related to retention when TMX is at a high level.

Characteristics of Individuals that Neutralize LMX and TMX: Identity Orientations

Individual's Self Concept

According to Lord, Brown, and Freiberg (1999), "core aspects of the self are chronically accessible and highly stable schemas" (p. 169), thus, a *chronic self-concept* refers to the relatively stable (i.e., trait-like) characteristic of a particular person. Brewer and Gardner (1996) further identified self-concept as multifaceted, consisting of three fundamental loci of self-definition: the self as an individual, as an interpersonal being, and as a group member. The three loci of self-definition represent distinct identity orientations, each with their own social motivation, source of self-worth, and type of significant self-knowledge (Brewer & Gardner, 1996).

An individual with a *personal identity orientation* views a person as a unique individual (Brewer & Gardner, 1996). At this level, self-worth stems from favorable interpersonal comparisons to others in terms of personal characteristics (e.g., traits, abilities, goals and aspirations, experiences, and interests) and functions as a way to distinguish oneself from others. At this level, behavior is motivated by self-interest.

An individual with a *relational identity orientation* is based on the extent to which the individual defines the role or position in terms of dyadic connections and specific relationships with significant others. At this level, self-worth is derived from appropriate role behavior and the self-representation relies on the process of reflected appraisal from the significant other in the relationship (Markus & Kitayama, 1991). One's behavior is driven by the welfare of the significant other.

An individual with a *collective identity orientation* involves self-definition based on one's social group memberships. The self-worth relies on the favorable intergroup comparisons,

contrasting the group to which one belongs (i.e., the in-group) with relevant out-groups. At this level, individuals are motivated to protect or enhance the benefits of the groups to which they belong (Brewer & Gardner, 1996).

The Moderating Role of Identity Orientation-based Individual Differences

To examine how characteristics of the person act in different ways to neutralize the impact of LMX and TMX on work outcomes, I choose individual difference constructs which describe the extent to which an individual's *general tendency* to think of oneself as an relational partner or group member are especially important. This is because an individual with either relational identity orientation or collective identity orientation are also likely to differ in their preference to different forms of social exchange. For example, Flynn (2005) proposed those employees' preferences of different forms of social exchange aligns with their identity orientations.

Relational Identity Orientation and LMX

Flynn (2005) noted that a person with relational identity orientation would prefer a reciprocal exchange to other forms of social exchange. Reciprocal exchanges are dyadic exchange relations in which contributions are made unilaterally in separate episodes (Emerson, 1976). In a reciprocal exchange, two actors have the implicit expectation of the reciprocity without negotiating on the nature and timing of the reciprocation (Heath, 1976). Because individuals with relational identity orientation are motivated by the other party's welfare in their dyadic exchange relations, they are expected to always react to the other's needs and expectations even though the reciprocation from the other party may not be necessarily immediate. For this reason, Flynn (2005) argued that employees with relational identity orientation prefer reciprocal exchange to other forms of exchange; based on norm of reciprocity,

they can trust the other party to pay back in the future even if the timing and value of such reciprocation are unknown.

LMX fits into the form of reciprocal exchange for the following reasons. First, LMX is the exchange relationship at a dyadic level, which is a “one to one” interpersonal relationship between a supervisor and a subordinate. Second, as it is well documented in LMX literature (i.e., Sparrowe & Liden, 1997), this dyadic exchange relation is based on the norms of reciprocation. When a leader or employee provides benefits to the other party that is not required in the provider's work role, reciprocity should come into play. In a high-quality LMX relationship, the employee would feel obligated not only to perform the job adequately but to engage in behaviors that directly benefit the leader and are beyond the scope of usual job expectations. Likewise, the leader would feel obligated to reciprocate such actions by providing the employee with rewards and privileges. For these two reasons, LMX relation represents a form of reciprocal exchange. Therefore, employees with relational identity orientation fit the form of reciprocal exchange, which is the character of a leader-member exchange relationship.

The employee may consider the leader to be a *significant other* because of the interaction between the two parties and the potentially powerful influence that the leader has on the follower. Thus, employees with relational identity orientation would have the tendency to value the interpersonal relationships with the leader and view themselves in terms of role relationships with the leader. Also, they seek direction, self-validation, and satisfaction from personal relationships with the leader. Thus, I expect that employees with more relational identity orientation will prefer a social exchange relationship with the leader (LMX) compared to other types of social exchange.

For this reasoning, when individuals have a high relational identity orientation, LMX relationship quality will be valued to a greater extent, and consequently, they will be more likely to increase work outcomes as a legitimate way to reciprocate high quality social exchange relationships with the leader. In this case, both a high level of relational identity orientation and high LMX relationship quality are necessary to promote individual's work outcomes, such as, intrinsic motivation, job satisfaction, job performance, and retention.

Under the condition of a low relational identity orientation, there is reduced value on LMX relationship quality. In spite of high LMX, members will be unlikely to view improved work outcomes as an opportunity to reciprocate the implied obligation to the leader. Thus, they will be unlikely to increase the work outcomes, such as intrinsic motivation, job satisfaction, job performance, and retention. Therefore, the impact of LMX on outcomes is neutralized for individuals with low relational identity orientation. Based on the arguments above, I made the following hypothesis:

Hypothesis 6(a): An individual's relational identity orientation moderates the relationship between LMX and intrinsic motivation, such that, LMX is significantly positively related to intrinsic motivation when relational identity orientation is at a high level; but LMX is not related to intrinsic motivation when relational identity orientation is at a low level.

Hypothesis 6(b): An individual's relational identity orientation moderates the relationship between LMX and job satisfaction, such that, LMX is significantly positively related to job satisfaction when relational identity orientation is at a high level; but LMX is not related to job satisfaction when relational identity orientation is at a low level.

Hypothesis 6(c): An individual's relational identity orientation moderates the relationship between LMX and job performance, such that, LMX is significantly positively

related to job performance when relational identity orientation is at a high level; but LMX is not related to job performance when relational identity orientation is at a low level.

Hypothesis 6(d): An individual's relational identity orientation moderates the relationship between LMX and retention, such that, LMX is significantly positively related to retention when relational identity orientation is at a high level; but LMX is not related to retention when relational identity orientation is at a low level.

Collective Identity Orientation and TMX

Flynn (2005) posited that a person with collective orientation would prefer generalized exchange to other forms of social exchange. According to Yamagishi and Cook (1993), in generalized exchange, the giving and receiving of benefits occurs not between two individuals at dyadic level but among three or more people who share the same membership of a social group. The reciprocation is indirect in this case, for example, given persons A, B, C, and D in the same group, person A would receive some benefits from B but A may reciprocate the favor to C instead of directly back to B. Person B may anticipate reciprocation from someone in the group other than A or C. Thus, generalized exchange motivates the reciprocation of a favor, but not necessarily from the original recipient to the original giver. Flynn (2005) further argued that individuals with a collective identity orientation would prefer such form of generalized exchange. People with a collective identity orientation focus on group interests and may even be willing to sacrifice their personal interests for the benefit of the group. For this reason, when they contribute to the group by offering assistance to other group members, they are less likely to closely monitor their target of contributions and other's direct reciprocation. Nevertheless, they still expect a payback for the help they give, but they do not necessarily expect it from those whom they have helped.

TMX is compatible with this notion of generalized exchange for the following reasons. First, TMX differs from LMX in that it is not dyadic; indeed, TMX is defined as an "individual member's perception of his or her exchange relationship with the peer group as a whole" (Seers, 1989: p. 119). Thus, it is a “one to the group” kind of social exchange which is between an employee and those he or she categorizes as a member of the same social group. Second, Keup, Bruning, and Seers (2004) suggested that TMX reflects the form of generalized exchange. I argue that since the group is made up of many individuals, the employees do not have a relationship with one individual representing the "group" that is comparable to the relationship with the leader. Nonetheless, employees consider the group to be an entity with which they have exchange relationships. I expect that feelings of obligation underlying TMX are based on a history of previous exchanges with other group members, some of which were made by group mate A, others of which by group mate B, and still others, by group mate C. Such a history of exchanges would generate feelings of obligation toward the group as a whole, but not with one group mate in particular.

Therefore, employees with collective identity orientation fit the form of generalized exchange, which is the character of a team-member exchange relationship. People who identify at the collective level have general concerns for others, evaluate their self-worth as the extent to which they become part of their social group. They also have self-esteem and satisfaction based on group achievements and comparisons with other groups. Therefore, I expect that employees with more collective identity orientation will prefer and value the social exchange relationship with the group (TMX) more compared to other types of social exchange.

As a result, when individuals have a high collective identity orientation, TMX relationship quality will be valued to a greater extent, and as a result, they will be more likely to

increase work outcomes as a legitimate way to reciprocate high quality TMX relationships. Therefore, both high level of collective identity orientation coupled with high TMX relationship quality are necessary conditions to promote individual's work outcomes, such as, intrinsic motivation, job satisfaction, job performance, and retention.

When individuals are low in collective identity orientation, there is a reduced value on TMX relationship quality. In spite of high TMX, members will be unlikely to view improved work outcomes as an opportunity to reciprocate the implied obligation resulting from the high-quality social exchange with coworkers in the team. As a consequence, they will be less likely to increase their work outcomes, such as intrinsic motivation, job satisfaction, job performance, and retention. Therefore, the impact of TMX on outcomes is neutralized for individuals with low collective identity orientation. That is, outcomes will only be positive when both TMX and collective identity orientation are both high. Thus, I propose the following hypotheses:

Hypothesis 7(a): An individual's collective identity orientation moderates the relationship between TMX and intrinsic motivation, such that, TMX is significantly positively related to intrinsic motivation when collective identity orientation is at a high level; but TMX is not related to intrinsic motivation when collective identity orientation is at a low level.

Hypothesis 7(b): An individual's collective identity orientation moderates the relationship between TMX and job satisfaction, such that, TMX is significantly positively related to job satisfaction when collective identity orientation is at a high level; but TMX is not related to job satisfaction when collective identity orientation is at a low level.

Hypothesis 7(c): An individual's collective identity orientation moderates the relationship between TMX and job performance, such that, TMX is significantly positively

related to job performance when collective identity orientation is at a high level; but TMX is not related to job performance when collective identity orientation is at a low level.

Hypothesis 7(d): An individual's collective identity orientation moderates the relationship between TMX and retention, such that, TMX is significantly positively related to retention when collective identity orientation is at a high level; but TMX is not related to retention when collective identity orientation is at a low level.

Characteristics of Teams that Neutralize LMX and TMX: Team Type

After investigating the individual and interactive effects of LMX and TMX, the next focus is on whether these two types of exchange relationship carry the same amount of impact in all kinds of team settings. Taking the view of the structural contingency theory (Hollenbeck, Beersma &Schouten, 2012), I posit that the influences of a team member's relationship quality with the leader and team members on his or her attitudinal, behavioral and performance consequences depend on the structure of the team that he or she serves.

Extensive evidence has shown that team structural dimensions such as task interdependence and power distance have a powerful impact on team functioning processes and performance (Hackman & Wageman, 1995). For example, LePine, Piccolo, Jackson, Mathieu, and Saul (2008) found that task interdependence has a moderating effect on the relationships between teamwork processes and team performance such that the relationships are stronger for teams whose structure are characterized by a higher level of tasks interdependence. However, the lack of consensus upon the team taxonomic systems in this literature has cast a shadow on the accumulation of our knowledge base. Therefore, it is imperative to adopt an integrated framework of team dimensions when studying the contingency effect of team structure.

This study draws from Hollenbeck et. al (2012)'s newly developed conceptual framework describes three fundamental dimensions of team structural dependence: skill differentiation, authority differentiation, and temporal stability. Based on their work, I define skill differentiation as "the degree to which members have specialized knowledge or functional capacities that make it more or less difficult to substitute members" (Hollenbeck et al., 2012: p. 84). This definition emphasizes the interdependence between team members in terms of performance achievement and the lack of substitutability among team members. Skill here has a broader meaning to include factors such as educational background, gender, and other kinds of diversity exhibited in the teams that relate to the team processes and performance.

Another structural dimension under investigation is authority differentiation, which is defined by Hollenbeck et al. (2012) as "the degree to which decision-making responsibility is vested in individual members, subgroups of the team, or the collective as a whole" (p. 84). Authority differentiation depicts the vertical power distribution in the team.

Finally, drawing from the same work, temporal stability is defined as "the degree to which team members have a history of working together in the past and an expectation of working together in the future" (p .84). This construct illustrates the temporal scope of the structural linkages. Teams high in temporal stability have had some history and plan on having a stable future together. In the next section, I will show how teams vary in the degree of authority differentiation dimension and skill differentiation dimension in different ways to neutralize the impact of LMX and TMX on work outcomes. Temporal stability is not included in this proposal, because the implications of temporal stability for LMX and TMX is not theoretically clear relative to the implications associated with skill differentiation and authority differentiation.

The Moderating Role of Team Type Differences

Team structural dimensions

Authority Differentiation and LMX

Whereas skill differentiation describes the horizontal structure of a team, authority differentiation highlights the team's vertical structure. The power to make decisions in the face of disagreement or conflict is held by leaders in teams at the high end of the authority differentiation continuum. In contrast, for teams with a low level of authority differentiation (e.g., self-managing teams) no specific individual can take charge of decision responsibility. Instead, the team needs to develop consensus or vote on decisions in order to settle disputes. In teams characterized by high levels of authority differentiation such as judge-advisor systems, there is a formal leader who stands on top of the authority pyramid and unilaterally makes team decisions. Leaders in such teams are able to provide high LMX subordinates with more resources and endow them with greater latitude of role autonomy as well as clearer performance expectations and performance feedback. Consequently, members supported by powerful leaders are more likely to fulfill the members' needs for autonomy, competence, and relatedness compared to members supported by weaker leaders. At the same time, members are less able to obtain similar support through exchange relationships with their team members since they have less or no power in making important decisions, making LMX even more salient to members.

On the other hand, leaders in teams low in authority differentiation are less powerful in terms of role-making, resource allocation, and performance assessment. In the emergent teams, for example, members have very limited capability to acquire supports from their informal emergent leaders. Also, leaders in self-managing teams has less impact on decision authority, but instead, the teams themselves are characterized by high autonomy, as well as self-reinforcement,

self-criticism, self-goal-setting, or self-evaluation (Manz & Sims,1987). In such cases, team members are less able to fulfill their needs via their high-quality LMX. As a result, the resources and support one can harvest from his or her relationship with the leader is lower relatively to what they can achieve from his or her coworkers. As such, LMX is less salient to team members in the context of low authority differentiation.

At a high level of authority differentiation, the relationship between LMX and employee's work outcomes becomes significant and members supported by strong leaders are more likely to acquire abundant resources and benefits in directing their work. In contrast, for teams low in authority differentiation, relationship quality with the leader is less relevant since in such circumstances high-quality LMX could not bring members any extra resources in directing their work.

Given the points above, I argue that the positive relationship between LMX and its consequences is neutralized at a low level of authority differentiation.

Hypothesis 8 (a): A team's authority differentiation moderates the relationship between LMX and intrinsic motivation, such that, LMX is positively related intrinsic motivation at a high level of authority differentiation, but there is no relationship between the two at a low level of authority differentiation.

Hypothesis 8 (b): A team's authority differentiation moderates the relationship between LMX and job satisfaction, such that, LMX is positively related job satisfaction at a high level of authority differentiation, but there is no relationship between the two at a low level of authority differentiation.

Hypothesis 8 (c): A team's authority differentiation moderates the relationship between LMX and job performance, such that, LMX is positively related job performance at a high level

of authority differentiation, but there is no relationship between the two at a low level of authority differentiation.

Hypothesis 8 (d): A team's authority differentiation moderates the relationship between LMX and retention, such that, LMX is positively related retention at a high level of authority differentiation, but there is no relationship between the two at a low level of authority differentiation.

Skill Differentiation and TMX

When a team is composed of members from diversified functional and knowledgeable backgrounds, team members' coordination and communication become critical for the fulfillment of the team's work (Bunderson & Sutcliff, 2002). This has several implications for the team processes and consequences. High in skill differentiation reduces the shared knowledge that individuals have of others' work and functional backgrounds. Thus, there is an amplified demand for communication and knowledge sharing among members in order to elaborate relevant information for the task (van Knippenberg, De Dreu, & Homan, 2004). Not only do new team members have to learn a specialized role, they also have to learn how their role fits in with the workflow of the entire team. Also, the scope of such information exchange may expand from work information to professional advice and further emotional support among team members. On the other hand, in teams with low skill differentiation, such as in the Behavioral Teams (Stewart & Barrick, 2000), almost all the team members can pick up the skills quickly because of the low scope of the tasks. In this case, there is less need for communication and knowledge sharing among team members. In addition, there may be only an occasional need for the exchange of material resources among team members.

Moreover, in teams characterized by high skill differentiation, members typically have unique roles in the team which require narrow and specialized abilities. As members' roles become less substitutable in teams of high skill differentiation, they tend to be more interdependent on others to accomplish the tasks that require collective action in order to be completed successfully. According to Kiggundu (1981), such high horizontal interdependence builds strong lateral ties between team members by giving and receiving information and resources to and from other team members. For this reason, as a result of high interdependence requirements, the need for coordination and mutual support become substantive for members of the teams such that they place a premium on TMX over other types of social exchange relationships. On the contrary, in teams that are less skill differentiated, low interdependence requirements, and subsequently low needs for coordination and mutual support make TMX relationships less essential for team members. For example, Drach-Zahavy (2004) found that decreased horizontal interdependence among individuals in teams is associated with decreased team support because individuals no longer feel responsible for the team as a whole.

From the above, we can see that TMX has a broader and deeper role in the team structural context featured by a high level of skill differentiation. As such, in teams with higher-level skill differentiation, members high in TMX are able to acquire much more resources and support from coworkers than members low in TMX. While in teams with a lower level of skill differentiation, there would not be any significant differences between low-TMX members and high-TMX members in terms of resources and support that members can acquire from coworkers. Thus, I argue that the positive relationship between TMX and its outcomes will be neutralized in the contingency of low-level skill differentiation in the teams.

I thus posit that:

Hypothesis 9(a): A team's skill differentiation moderates the relationship between TMX and intrinsic motivation, such that, TMX is positively related intrinsic motivation at a high level of skill differentiation, but there is no relationship between the two at a low level of skill differentiation.

Hypothesis 9(b): A team's skill differentiation moderates the relationship between TMX and job satisfaction, such that, TMX is positively related job satisfaction at a high level of skill differentiation, but there is no relationship between the two at a low level of skill differentiation.

Hypothesis 9(c): A team's skill differentiation moderates the relationship between TMX and job performance, such that, TMX is positively related job performance at a high level of skill differentiation, but there is no relationship between the two at a low level of skill differentiation.

Hypothesis 9(d): A team's skill differentiation moderates the relationship between TMX and retention, such that, TMX is positively related retention at a high level of skill differentiation, but there is no relationship between the two at a low level of skill differentiation.

METHODOLOGY

This chapter describes the sample, procedures, and methodology that are used in three field studies in Beijing and Shanghai to test the hypotheses. This chapter has four parts. The first part describes the characteristics of the sample and the data collection procedures used. The second part reviews the data screening process. The third part presents the measurements of the constructs in the model. The fourth part discusses the statistical techniques that are used to analyze the data.

Research Setting

To test the causal relationships specified in the hypotheses, I collected longitudinal data from employees and their supervisors working for three companies in China. To solicit participation, I made multiple telephone calls about the purposes and benefits of my research project to the contact person of each company. With their strong support and endorsement, I was able to conduct a two-phase longitudinal data collection.

The first sample was from Company A, which is a subsidiary held by a state-owned enterprise (SOE) in Shanghai. This company was China's first domestic enterprise that pioneered the research and manufacture of semiconductors and LED-related products. The second sample was from Company B, which is a large, textile state-owned enterprise group in Beijing. This company mainly produces its own brand knitted underwear, children's clothing, and sportswear series. The third sample was from Company C, which is a public ground transportation company in Beijing.

Participants and Procedures

For the purpose of this study, I collected the data from employees and the immediate supervisors of intact work groups representing lower hierarchical levels of several major

departments of the three companies listed previously. For the two manufacturing companies A and B, participants were from intact work groups representing major departments of the company, such as operations (manufacturing), engineering, technology and facilities, operations materials, quality controls, information technology, customer service, human resource, finance, and administration. For the transportation company C, participants were from intact teams including bus drivers, ticket officers, and administrative employees.

Based on conversations with the contact people in the three companies, I found that teamwork is defined in terms of functional units and work sections, which are composed of three or more individuals working interdependently within a certain department or division in the listed companies. In general, team supervisors are responsible for a number of managerial tasks, such as hiring new members, planning and determining work assignment in work groups, evaluating performance, and managing poor performers.

The data collection process consisted of two phases (see Table 3). Time 1 involved a set of questionnaires for team members. The survey assessed an employee's LMX, TMX, identity orientation (in terms of relational identity and collective identity), and team type dimensions (in terms of authority differentiation and skill differentiation) as well as their demographic information. Two sets of questionnaires were used in Time 2: one set was for team members, the other for their immediate supervisors. The team members' questionnaires included the dependent variables: intrinsic motivation, job satisfaction, and retention. Their supervisors' questionnaires included the items to rate the direct reports' individual job performance.

Data collection was conducted in each of the three companies twice on working days in the spring of 2013. I made telephone calls to the contact person about two weeks before the specified date of the data collection to remind that person about the research study, to discuss the

survey procedure, and to answer any questions. Paper surveys were used to collect the data. In order to obtain high response rates, Dillman's (2007) Tailored Design Method was adopted in the survey administration process. First, one week prior to survey dates for questionnaire distribution, either pre-notice emails were sent or pre-notice meetings were held from the companies' human resource directors on behalf of me to the respondents informing them that a questionnaire for an important research study would be sent to them and that their participation in the study was voluntary. Second, in Time 1, a survey was administrated to the team members on-site during the regular working hour or lunch break. The cover letter was included in each questionnaire package informing the participants the purpose of the study and the consent information. Third, three days after Time 1, emails were sent to all respondents to thank those who had already completed the survey and to remind those who had not yet completed the survey to do so at their earliest convenience. Fourth, two weeks later (Time 2), a second survey was sent to direct reports to assess the outcome variables, and the same survey administration process for the employees was followed as noted above. Supervisors completed their surveys separately at the same time in their offices. Finally, five days after Time 2, reminder emails were sent to all respondents to remind them to turn in their survey if they had not done so.

Data Cleaning

For company A, first questionnaire was distributed to 228 employees at Time 1. Of them, 168 employees returned questionnaires, resulting a response rate of seventy-two percent. At Time 2, I asked the 168 responding employees to evaluate their work outcomes once again and received 137 evaluations, constituting response rate at eighty-one percent. For company B, out of 633 employees contacted at Time 1, 519 responded the survey, representing a response rate of eighty-two percent; 462 responded at Time 2, representing response rate at eighty-nine percent.

For company C, 256 out of 284 employees responded to survey at Time 1, representing a response rate at ninety percent; 243 responded at Time 2, yielding a response rate at ninety-five percent. Combining all three companies, 120 out of 128 leaders completed their surveys at Time 2, representing a response rate at ninety-four percent. 842 participants from 119 teams had completed data on both follower-rated variables (Time 1 and Time 2) and leader-rated variables (Time 2). Groups with only one or two respondent were deleted. For this reason, four participants in two teams were removed from the sample of company A.

Missing Data

There are two levels at which data are missing: at the item level and at the scale (variable) level. For the item-level missing data, Roth, Switzer, and Switzer (1999) suggested that the number of items with missing data should not exceed thirty percent to forty percent of the total number of items within a given scale. In the total combined three samples, there are thirty-nine participants who had more than one-third (thirty-three point three percent) missing items for certain variables. Two of the participants who had missing data on group-level variables belonged to the same team with only three members. This team from company B was deleted; otherwise the team's mean on group-level variables would have been based on only one member. In addition, there were five groups with a total 20 participants in total, whose group-level variables response rates were lower than fifty percent. Because less than half of the team members in those groups completed the survey, the responses might not represent the whole group. Therefore, those five groups were deleted. For the scale-level missing data, none of the variable has more than three percent missing cases.

Missing data was handled by using the expectation–maximization (EM) algorithm imputation option in PRELIS. This method assumes missing values are missing at random,

which is satisfied by conducting a missing value analysis, the Little's Missing Completely at Random (MCAR) test in SPSS. The SPSS result confirmed that the majority of items were missing at completely random, suggesting the EM algorithm imputation is appropriate to use in the dataset.

Final Samples Characteristics

For company A, the final sample was composed of 133 employees belonging to 32 teams. The employees had an average age of 27.94 years (SD = 5.60; range = 20-45), an average tenure of 2.58 years (SD = 2.26), and seventy percent had at least a bachelor's degree. Forty-seven point nine percent of the first sample was female. The first sample was composed of small teams with an average number of 4.16 employees of each group (SD = 1.22).

For company B, the final sample of 439 employees were part of 61 teams that had an average number of 7.20 employees of each group (SD= 2.79), an average age of 33.38 years (SD= 11.46; range = 17-60), and an average tenure of 9.59 years (SD = 10.75). Forty-nine point four percent of the sample was female, and thirty-seven point three eight percent has at least a bachelor's degree.

The final sample of company C consisted 243 participants from a total of 18 teams. The employee sample was forty-seven point seven percent female, with a mean age of 38.30 years (SD = 7.85; range = 22-57), and 7.30 years of tenure (SD = 3.32); fifty-four percent had at least a bachelor's degree. The third sample was composed of larger teams with an average of 13.5 people per team (SD = 2.23).

Measurement

Translation

The questionnaires administrated to Chinese team members and their supervisors were written in Chinese. In order to insure the equivalence of the measures between the English and Chinese versions, I used the back-translation procedure to develop the Chinese version of the measure in this study (Brislin, 1986). First, all measures were translated into Chinese by a PhD student. Then, the translated transcript was back -translated into English by a second PhD student, working independently. Third, I invited an OB-HR professor, who is bilingual in both English and Chinese, to compare the back-translated version with the original English version questionnaire to check the consistency between the two. Finally, I made the final refinements of the survey instrument based on the advice of the two PhD students and the professor.

Pre-test of Survey Instruments

A pretest was directed to assess the quality of the translated surveys to the respondent. The pretest was conducted on 26 employees and their direct supervisors in company D, which is a US multinational manufacturer of intelligent system solutions for steam, air, and hot water utility applications. Its manufacturing plant and training facility is based in Beijing, China. I asked the participants to complete the questionnaires and then conducted an in-depth, on-site interview with the participants. During the interview, employees were asked to provide detailed comments on the instruments. The employees were asked to recognize unclear items from the survey and to recommend any needed modifications. I used the feedback and comments from the pretest to make necessary changes to the questionnaire in order to rectify any problems before administering the full-scale questionnaire to the large sample groups of employees in the previous mentioned three Chinese companies.

Level of Construct

Klein, Dansereau, and Hall (1994) argued that “no construct is level free” (p. 198) with research in organization context furthermore that “to examine organizational phenomena is thus to encounter levels issues” (p.198). This study is not an exception. In the current study, both the antecedents (i.e., LMX and TMX) and outcomes (i.e., intrinsic motivation, job satisfaction, job performance, and retention) are conceptualized as individual constructs. There are two types of moderators: individual level and group level. Relational identity and collective identity are individual level constructs, whereas the two dimensions of work group type, authority differentiation and skill differentiation, are conceptualized as group level constructs.

The level of a construct is defined as the level "at which it is hypothesized to be manifest in a given theoretical model—the known or predicted level of the phenomenon in question" (Kozlowski & Klein, 2000, p. 27). Hence, the most important work in this multi-level research is “to define, justify, and explain the level of each focal construct that constitutes the theoretical system” (p. 27), as shown in Table 5.

Individual Level. According to Klein, Dansereau, and Hall (1994), when a theory is specified at the individual level, the researcher expects that the employees are free from the influence of the company. At the individual level, team association is unrelated to the constructs as variation of the construct is between individuals. Hence, in order to examine a theory that proposes individual independence, the researcher has to increase between individual variability. In this study, as shown in Table 5, personal characteristics and job attitudes have typically been studied at the individual level of analysis due to their idiosyncratic.

For example, the dependent variable, job satisfaction, is initially conceptualized at the individual level. This is because an individual’s cognitive evaluation and the affective reactions

to his/her job are largely based on the individual's own experiences and feelings at work. Second, the moderator variables of relational identity and collective identity are also conceptualized at the individual level because identity orientation is a relatively stable (i.e., trait-like) characteristic of a particular person's self-definition. Third, past research suggests that LMX is conceptualized as a dyadic relationship between a leader and a follower (Gerstner & Day, 1997), whereas TMX is conceptualized either at individual level as an individual employee's perception of his or her reciprocity with other team members or at team level as the average reciprocity across the group (Seers, Petty, & Cashman, 1995). In the current study, both the antecedents LMX and TMX are also conceptualized to operate at the individual level because it focuses on the social exchange made between the focal individual and supervisors or his or her coworkers in the same group. In other words, the receiver of the social support is the focal employee, not anybody else in the team or in the company. Employees may feel differently about LMX and TMX because of every employee's independent and different behavior, perceptions, attitudes, and relations with his/her supervisors or other group members. For instance, employees' perceptions of the relationship with the supervisor may be different from each other based on individual judgments of team leaders with whom they have direct interaction. Hence, the variance of the two antecedents, LMX and TMX is at between-individual variability. I not only expect to see differences in individual employees' perceptions of the two types of social exchanges that they are engaged in, but I am also interested in how these differences between individuals influence their work-related outcomes, such as job satisfaction and job performance. Therefore, these constructs are conceptualized at the individual level.

Group Level. According to Kozlowski and Klein (2000), unit-level constructs describe entities composed of two or more individuals: dyads, groups, functions, divisions, and/or

organizations. They further suggested that researchers need to differentiate three primary types of unit-level constructs: global unit constructs, shared unit constructs, and configural unit constructs.

Global unit constructs refer to "relatively objective, descriptive, and easily observable characteristics" (Kozlowski & Klein, 2000, p. 29). Global unit constructs do not derive from individuals' behaviors, interactions, demographics, attitudes, experiences, or perceptions but are a nature of the unit as a whole. Examples include unit size and function. *Shared unit constructs* "originate in experiences, attitudes, perceptions, values, cognitions, or behaviors that are held in common by the members of a unit" (Kozlowski & Klein, 2000, p. 30). Team norms or division climate are examples of shared unit constructs. *Confugural unit constructs* "capture the array, pattern, or variability of individual characteristics" (Kozlowski & Klein, 2000, p. 30) within a unit. Configural unit properties are not assumed to hold in common and converge among the members of a unit. Examples include network density, demographic diversity, and affective diversity.

In this study, two of the moderators, skill differentiation and authority differentiation capture the characteristics of the group context to which every group member is exposed to, and thus, they are conceptualized at the group level. Both of the two constructs are *shared unit constructs*. This is because employees from the same group must feel or perceive very similarly regarding these two constructs. For example, employees have similar feelings about the authority differentiation dimension that deals with power structure of the group since all of members are working under the impact of the same structure and system in the group. In fact, all employees are similarly influenced by these features of the context. Thus, the constructs skill differentiation and authority differentiation are characterized as variables that describe the group.

Level of Measurement

Level of measurement is different from *level of construct*. A level of construct is "the level at which it is hypothesized to be manifest in a given theoretical model" (Kozlowski & Klein, 2000). On the other hand, the level of measurement is the level at which data are collected to assess a given construct (Kozlowski & Klein, 2000). Kozlowski and Klein (2000) stated that individual level constructs (e.g., attitudes, dispositions, and behaviors) should be assessed with individual-level data. In this study, employees completed measures of their own intrinsic motivation, job satisfaction, intention to stay, LMX, TMX and identity orientation (both relational and collective identity). Because he or she had access to the relevant information (Campbell, 1955), a supervisor was asked to report the employee's performance behavior. Also, I used company's archival records to assess employees' demographic characteristics. In all cases, data was assigned to individuals and was considered individual-level data.

The level of measurement of unit-level variables is often more complex and more controversial than the level of construct. According to Kozlowski and Klein (2000), the global properties of a unit measurement have the minimum complication and controversy among three types of unit-level constructs. Because global properties are observable, descriptive characteristics of a unit, such as group size, which can be measured by a single rating from an expert source rather than questioning each member of a unit to depict its global properties. In contrast, shared properties of a group emerge from individual members' shared perceptions, affect, behaviors, and responses. For this reason, Kozlowski and Klein (2000) suggested shared unit construct to be measured at the individual member level first and then aggregated to describe the group as a whole.

Chan (1998) proposed a typology of five composition models for mapping the measures from the individual level to higher levels. He suggested five basic forms of composition models: (a) additive, (b) direct consensus, (c) referent-shift consensus, (d) dispersion, and (e) process composition. Among the five, the most popular model is the direct consensus approach. This type of model “uses within-group consensus of the lower level units as the functional relationship to specify how the construct conceptualized and operationalized at the lower level is functionally isomorphic to another form of the construct at the higher level” (Chan, 1998, p. 237). The referent-shift consensus model is very similar to the group consensus composition model, except that "in referent-shift consensus composition, the lower level attributes being assessed for consensus are conceptually distinct though derived from the original individual-level construct" (Chan, 1998, p. 238). Both the direct consensus and referent-shift consensus models of composition use within-group agreement as a precondition to composing an individual-level measure to a higher-level construct (Klein, Conn, Smith, & Sorra, 2001).

In this study, the referent-shift consensus model is the appropriate composition model for group characteristics (skill differentiation and authority differentiation). These two team type dimensions are a property of the work unit, not of the individual, and this difference is reflected in the shift in referent from the individual to the collective. As applied to team type dimensions, the referent-shift consensus model uses individual responses to measure skill differentiation and authority differentiation in work units. The focus is on what the individual believes are the degree of skill differentiation and authority differentiation for the team members in the respondent's work unit rather than on what the individual respondent thinks is expected of him or her personally. For example, to operationalize a referent-shift model of skill differentiation, I asked the each team member to rate the extent to which he or she agrees with the statement: “The

members of my group had unique skills *or* unique contacts with people inside *or* outside the organization" rather than "I had unique skills *or* unique contacts with people inside *or* outside the organization." Within-group consensus is then required to justify the aggregation of the individuals' beliefs about the skill differentiation and authority differentiation of work unit as a representation of the group-level construct.

Measures

This section describes the measures used in this dissertation. All of the items are listed in the Appendices (from Appendix A to Appendix H).

LMX. Each employee independently reported the quality of his or her relationship with the leader of the group with Graen and Uhl-Bien's (1995) seven-item scale (LMX-7). A sample item is "How well does your leader understand your job problems and needs?" The logic for Graen and Uhl-Bien's (1995) recommendation LMX-7 measure was that (1) it was designed to measure only a single factor (rather than larger instruments measuring intercorrelated multiple factors) (2) it has shown consistently the strongest reliability. A meta-analytic review has confirmed empirically that the LMX-7 measure is both unidimensional and reliable, with an average Cronbach's alpha of .89 and .78 for the member and leader scale versions, respectively (Gerstner & Day, 1997). Furthermore, Schaubroeck and Lam (2000) cross-culturally validated the LMX-7 scale, and found supports for the measurement invariance across the Chinese (Hong Kong) and US samples. The LMX-7 scale has also been employed in a number of other studies in China and the construct validity of this measure in Chinese samples is generally well accepted (e.g., Lam, Huang, & Snape, 2007). The Cronbach's alpha for this scale was .79, .87, and .79 in three samples respectively.

TMX. Each employee reported the quality of relationships with his/her peers in the team using the Seers, Petty, and Cashman (1995)'s ten-item scale TMX scale. Half of these items asked about the member's contributions to the team (e.g., "In busy situations, other team members ask me to help out") while the other half asked about what the member received from the team (e.g., "Other members of my team understand my problems and needs"). Kamdar and Van Dyne (2007) demonstrated the discriminant validity of the measure and the Cronbach's alpha of this scale was .89 in a sample from a multinational conglomerate company. Liao, Liu, and Loi (2010) also provided construct validity evidence of this 10-item measure in a Chinese context, documenting a Cronbach's alpha of .84 in their sample from a Chinese manufacturing company. The Cronbach's alpha for this scale was .83, .91, and .89 in three samples respectively.

Intrinsic motivation. Employees were asked to complete the scale developed by Hackman and Oldham (1974) to measure their intrinsic motivation. This measure was part of Hackman and Oldham (1974)'s Job Diagnostic Survey (JDS). Sample items are "I feel a great sense of personal satisfaction when I do this job well" and "My opinion of myself goes up when I do this job well." I used the six-item scale to measure employees' intrinsic work motivation in the current study. The Cronbach's alpha for this scale was .76, .68, and .72 in three samples respectively.

Job Satisfaction. The items to assess employee's job satisfaction were from The Job Descriptive Index (JDI), which was originally developed by Smith, Kendall, and Hulin (1969). The JDI was updated by Roznowski (1989) with the recognition of the changes in work atmosphere, job content, and work technologies. Items for the updated version of the JDI were used in the current study. The 18-item Satisfaction with the Work Itself scale from JDI was used. This measure focuses on evaluating employees' satisfaction with the work itself rather than other facets of job satisfaction, such as pay, promotion, supervision or coworkers. According to

Balzer, Kihm, Smith et al. (2000), for JDI measure, scale was scored by assigning values to each " Y (yes)", " N (no)" and "? (cannot decide)" response. Nearly half of the items in the scale were positively worded, with a "Y" response meaning satisfaction. For these items, "Y" responses were scored 3, "N" responses were given value 0, and "?" responses were assigned value 1. For the rest of negatively worded items, "Y" response suggests dissatisfaction. The unfavorable items were reverse scored, that is, with "N" receiving 3 points, a "Y" receiving 0 points, and the "?" receiving 1 point. Psychometric research has suggested that the "cannot decide" response tends to be closer to a "yes" satisfaction response than to a "no" dissatisfaction response (Smith, Kendall, & Hulin, 1969). For this reason, using a 3 instead of 2 score for satisfaction response has taken the effect into consideration. Scores of the scale was computed by summing the points obtained from an individual's responses to each item in the scale. The Cronbach's alpha for this scale was .78, .71, and .86 in three samples respectively.

Job Performance. Employees' job performance was measured using the 11-item scale from Tsui, Pearce, Porter, and Tripoli (1997). Each supervisor provided ratings for each of their direct reports. This measure focuses on evaluating employees' core task performance rather than activities not a part of the formal job requirements (e.g., citizenship behavior). The items cover a broad array of job performance indicators including quantity, quality, efficiency, overall ability, judgment, accuracy, job knowledge, and creativity in performing employees' assigned roles.

According to Tsui et al. (1997), this measure of job performance was developed in order to be generic rather than specific to one particular job. This fits the sample background in my current researching setting, given that the specific nature of employees' tasks varies widely between jobs, organizations, and industries in my target samples. Sample items include "This employee strives for higher quality work than required" and "This employee's efficiency is much

higher than average." Previous studies conducted in China have validated this measure of job performance. For example, in a sample of 72 supervisors and 201 immediate direct reports from a major pharmaceutical joint-venture in China, Walumbwa, Mayer, Wang, and colleagues (2011) provided the construct validity evidence of this 11-item job performance measure which had an internal consistency reliability of .92. In addition, Song, Tsui, and Law (2009) employed this measure (10-item with one item deleted) and demonstrated both construct validity evidence and reliability evidence in sample that consisted of 441 middle managers along with 141 top managers in 31 companies across various industries in China. The Cronbach's alpha for this scale was .93, .94, and .93 in three samples respectively.

Retention/Intention to stay. Employees' intention to stay was measured with the 4-item scale from Shore and Martin (1989). The internal consistency reliability of this measure was .78 and .74 in their professional and clerical samples, respectively. Sample items include "How important is it to you personally that you spend your career in this organization rather than some other organization?" and "If you were completely free to choose, would you prefer to continue working for this organization?". The Cronbach's alpha for this scale was .76, .71, and .76 in three samples respectively.

Identity orientation. The strength of employees' chronic levels of relational and collective self-concepts was measured using the Levels of Self-Concept Scale (LSCS; Selenta & Lord, 2005). This scale contains seven dimensions tapping three identity orientations: individual, relational, and collective. Selenta and Lord (2005) provided the evidence for the validity of the LSCS, including results from factor analyses and regression analyses that showed convergent and discriminant validity among the self-concept scales using constructs such as values

(Schwartz, 1992), self-consciousness (Scheier & Carver, 1985), masculinity-femininity (Spence & Helmreich, 1978), and individuals' sex (Gabriel & Gardner, 1999).

For the purpose of the current study, only two subscales were used. I used the *concern for others* subscale to assess employees' relational identity orientation and the *group achievement focus* subscale to assess employees' collective identity orientation. C*oncern for others* emphasizes relations with other people in terms of commitment, helping, and a caring, nurturing relationship (alpha = .82 in Selenta & Lord, 2005), and *group achievement focus* emphasizes making a contribution toward the proper functioning of the group (alpha = .74 in Selenta & Lord, 2005). An example item for *concern for others* is "It is important to me that I uphold my commitments to significant people in my life"; an example item for *group achievement focus* is "I feel great pride when my team or work group does well, even if I'm not the main reason for success." Additional evidence for both reliability and the validity of these two subscales is also provided by subsequent research that used this measure (Johnson, 2005; Johnson & Chang, 2005; Selenta, Lord, & Brown, 2004; Fehr & Gelfand, 2010). In the current study, the Cronbach's alpha for *concern for others* scale was .91, .90, and .81 in three samples respectively. The Cronbach's alpha for *group achievement focus* scale was .63, .86, and .85 in three samples respectively.

Team dimensions. I employed the long form of newly developed Team Descriptive Index (TDI) (Lee, Koopman, Hollenbeck, Wang, & Lanaj, in press) to measure *skill differentiation* and *authority differentiation*. The Team Descriptive Index (TDI) is an operationalization of the three dimensional scaling framework described by Hollenbeck et al. (2012). Evidence for the validity of the TDI was established using a two-step process. First, factor analytic evidence established the three dimensions and specific item–factor associations (5 items on temporal stability, 8 items

on authority differentiation, and 8 items on skill differentiation). Second, regression analyses incorporating team processes (Marks, Matthieu, & Zaccaro, 2001) and team characteristics, demonstrated the discriminant and convergent validity of TDI scales. For the two team dimensions relevant to this study, *skill differentiation* refers to the degree to which members have special knowledge or functional capacities that make it difficult to substitute one member for another. An example item is "Team members had unique skills and so it was impossible to substitute one member for another in terms of skills." *Authority differentiation* refers to the degree to which decision-making responsibility is vested in one individual versus the group as a whole. An example item includes: "The team leader made all of the team decisions." In the current study, the internal consistency reliability of *skill differentiation* was .97, 98 and .85; and *Authority differentiation* was .97, 97, and 94 in three samples respectively. Then, individual team members' ratings were averaged to form an overall team-level measure. ICC (1), ICC(2), and r_{wg} were used to justify the aggregation of individual ratings to the team level (Bliese, 2000).

Analytic Techniques

In the next section, I outlined the three empirical techniques that were applied to analyze the data and test the model: Confirmatory factor analyses (CFA), Aggregation analyses, and Hierarchical linear modeling (HLM).

Confirmatory Factor Analyses (CFA)

First of all, a series of confirmatory factor analyses (CFA) were conducted to test the factor structure of main constructs and to examine the dimensionality of the measures. In particular, CFA aims to verify whether the number of constructs and the factor loadings of measured items are consistent with the priori theoretical based structure. Drawing on LISREL 8.70, CFA analyzes the item-level covariance matrix to contrast a pre-established model against

alterative models after pre-processing through a PRELIS 2 program (Joreskog & Sorbom, 2004). Next, different fit indices were examined to evaluate the models' goodness of fit for contrasting models. The conventional null hypothesis significance test for the goodness of fit test is the chi-square test. In this view, chi-square is a measure of misfit of the model to the data. The chi-square goodness-of-fit statistic assesses how large the discrepancy is between the sample covariance matrix and fitted covariance matrices. Chi-square thus represents a badness-of-fit measure in that a large chi-square corresponds to a bad fit, a small chi-square to good fit, and a zero chi-square represents a perfect fit.

However, complete reliance on chi-square for this purpose is not recommended because of its sensitivity to sample size, thus other indices were also examined. For example, the comparative fit index CFI (Bentler, 1990) and the non-normed fit index TLI (Bentler & Bonett, 1980) are based on the comparison between a proposed model with a baseline model, in which there are no correlations among variables. For CFI and TLI, value can range between zero (no fit) and one (perfect fit). The higher the value, the better the fit. For example, a value of .90 is generally considered to be a good fit (Bentler & Bonett's, 1980). RMSEA is also an index of "close fit" (Browne & Cudeck, 1993) and is based on an estimate of difference between the model with the population covariance matrix. Values greater than .10 indicate poor fit, values between .08 and .10 indicate mediocre fit, values between .05 and .08 indicate reasonable fit, and values less than .05 indicate good fit (Browne & Cudeck, 1993). In addition, SRMR is an absolute measure of fit and a value of zero indicates perfect fit. The rule of thumb for SRMR is considered as .08 (Hu and Bentler, 1998), that is, when values less than .08 indicate good fit, yet, values greater than .08 can be interpreted as unacceptable.

In this study, I conducted three sets of CFA to confirm the distinctive of measures. The first CFA included self-rated individual measures at Time 1, which included the antecedents and individual level moderators in the theoretical model. These items are meant to represent four different constructs: LMX, TMX, relational identity orientation, collective identity orientation. The fit of four different factor structures was compared. The first was a one-factor model, in which all items were indicative of one large factor. The second was a three-factor model, with LMX and TMX collapsed into one factor. The third was another three-factor model, with relational identity orientation and collective identity orientation collapsed into one factor. The fourth model was a four-factor model with LMX, TMX, relational identity orientation, collective identity orientation each construct as a single factor. The results illustrated that the best fitting model is the four-factor model [χ^2 (318) = 2156.79, CFI = .95, TLI = .95, RMSEA = .090, SRMR = .055]. The worst fitting model is the one-factor model [χ^2 (324) = 6308.58, CFI = .85, TLI = .84, RMSEA = .182, SRMR = .139].

Next, I compared the fit of the four-factor model (Model 4) with a series of competing models (Model 1 to Model 3) using a chi-square difference test. For example, the difference in chi-square between the four-factor (Model 4) and three-factor (Model 2) models is 662.86, which is itself distributed as chi-square with (321 — 318 = 3) degrees of freedom. This value, if statistically significant, would suggest that the four-factor model is significantly better than the three-factor model. Again, the chi-square different tests in model comparison suggested that the four-factor model is better than any other proposed factor structure model listed above.

Second, I conducted a six-factor CFA of Time 1 measured individual level outcome variables: Self-rated intrinsic motivation, work satisfaction, supervisor satisfaction, coworker satisfaction, retention, and supervisor rated job performance. The CFA results demonstrated that

the six-factor model [χ^2 (2685) = 9102.96, CFI = .94, TLI = .94, RMSEA = .067, SRMR = .064] was a better fit for the data than the more parsimonious one-factor (all variables loaded on a single factor) model [χ^2 (2700) = 15600.85, CFI = .89, TLI = .88, RMSEA = .113, SRMR = .089].

The third CFA included self-rated group measures at Time 1, which includes the two group level constructs in the theoretical model (i.e., team authority differentiation and skill differentiation). A one-factor model with all items loading on one common factor, and a two-factor model with items loading on their respective hypothesized constructs were compared. The results showed that the two-factor model [χ^2 (103) = 558.66, CFI = .98, TLI = .98, RMSEA = .075, SRMR = .026] yielded a better fit than the one-factor model [χ^2 (104) = 9637.81, CFI = .70, TLI = .65, RMSEA = .446, SRMR = .364], by a significant decrease of chi-square at 9079.15 ($\Delta df = 1, p < .001$). In sum, these results from previous three CFAs support the discriminant validity of the measures.

Aggregation Analyses

As noted previously, skill differentiation and authority differentiation are shared unit constructs. According to Klein and Kozlowski (2000), in order to measure shared unit constructs, within-group agreement must be demonstrated before using group members' mean scores to characterize the group. Therefore, before individual rated variables could be aggregated to represent each group, there is a need to statistically validate aggregation by guaranteeing a high level of within group agreement on these two variables (James, Demaree, & Wolf, 1984).

For this reason, intraclass correlation coefficient ICC (1) and ICC(2), and $r_{wg\,(j)}$ (Bartko, 1976; James, 1982; James, Demaree, & Wolf, 1984, 1993) were calculated in order to justify the

appropriateness of aggregating individual assessments of team type dimensions, skill differentiation, and authority differentiation to the group level. These are three aggregation indices for multilevel research that assess the between-group variance and within-group agreement for each variable.

Intraclass Correlation Coefficients (ICCs). There are two ways to interpret ICC (1). For one, it provides an estimate of the proportion of the total variance of a variable that is explained by group membership (Bryk & Raudenbush, 1992). It may also be interpreted as an estimate of the extent to which raters are interchangeable—that is, the extent to which one rater from a group may represent all the raters within the group (James, 1982). For this reason, ICC (1) is recommended as a criterion for justifying aggregation (Bliese, 2000). Mathematically, ICC (1) is estimated as the ratio of between-group variance to total variance. There are two methods to calculate ICC (1). First, as for random coefficient models including hierarchical linear modeling (HLM) (Bryk & Raudenbush, 1992), lme for S-PLUS (Statistical Sciences, 1997), and MLn (Kreft & Deleeuw, 1998), ICC(1) can be computed using the variance estimates of the between-group and within-group components reported in output files. The formula is $r_{00}/ (r_{00} +\sigma^2)$, where r_{00} is the between-group variance, and σ^2 is the within-group variance (Hofmann, 1997). Second, from a one-way random-effect ANOVA model, ICC (1) is calculated from the Bartko (1976) formula: ICC (1) = MSB - MSW / MSB + [(k-1) * MSW], where MSB = between-group mean square, MSW = within-group mean square, and k = the number of raters per group. Expect the team size varies across groups, k is equal to the average group size. According to Bliese (2000), there is a major difference in the range between the ICC (1) estimated from an ANOVA model and the ICC (1) estimated from a HLM model, is that, the value of ICC(1) in the HLM model

ranges from 0 to +1, whereas in the ANOVA model is from -1 to +1. In this study, ICC (1) was calculated with the one-way random effect ANOVA model.

The second criterion commonly chosen for evaluating the appropriateness of aggregation is ICC (2), which offers an estimate of the reliability of the group means, rather than the reliability of a single group mean (Bartko, 1976). Mathematically, there are two ways to calculate the ICC (2) value: typically from a one-way random-effect ANOVA model using mean squares with the following formula (Bartko, 1976): ICC (2) =MSB-MSW/MSB. Alternatively, we can get ICC (2) as a function of ICC (1) using the Spearman-Brown formula: ICC (2) = k*ICC (1)/ 1+ (k-1)*ICC (1), given that ICC(1) represents a measure of the reliability associated with a single assessment of the group mean within a given sample (James, 1982), and k is the average group size in that sample.

Comparing the calculation methods described above, ICC (1) values do not vary as function of group size, whereas ICC (2) values are sensitive to the average numbers of group members across groups (Bliese & Halverson, 1998). However, note that the ICC (1) method cannot produce a result that exactly matches the ICC (2) value generated from the original Bartko (1976) formula if the team size is small. The cutoff value for ICC (1) is .05 and the cutoff value for ICC (2) is .50 to be considered sufficient for conducting aggregation analysis (Bliese, 2000; Klein, & Kozlowski, 2000). According to James (1982), in general, the ICC (1) values in past multilevel studies ranged from .00 to .50, with a median value of .12. In this study, the value of ICC (2) was calculated with the use of Spearman-Brown formula.

Within-Group Interrater Agreement (rwg). $r_{wg(j)}$ reflects the degree of within-unit agreement on a given variable (James, 1982; James, Demaree, & Wolfe, 1984; 1993). It averages the item-level agreement for each scale and each group and compares it to an expected random

variance. It does not offer an omnibus measure for the groups as a whole, but a measure of agreement for each group. Typically, an acceptable value of $r_{wg(j)}$ is .70 or higher. The range of $r_{wg(j)}$ value is between 0 and 1. A low value suggests absence of agreement among members of the group, whereas a high value suggests agreement among members of the group. (Klein & Kozlowski, 2000). $r_{wg(j)}$ is calculated according to the following formula suggested by James and colleagues (1984).

$$\mathrm{rwg(j)} = \frac{J * (1 - \frac{S^2_{.k}}{\sigma^2_{EU}})}{1 + (J-1) * (1 - \frac{S^2_{.k}}{\sigma^2_{EU}})} \quad (1)$$

Where, *J* is the number of items in a measure, $S^2_{.k}$ is the average variance of the *J* items in a group of k raters, and σ^2_{EU} is an expected variance that assumes all ratings are due to random responding.

As shown in Table 4, above three indices were calculated in all three samples. For all three samples, these results were sufficient grounds to aggregate individual ratings to team level.

Hierarchical Linear Modeling (HLM)

The Level of Statistical Analysis. In the section above I discussed the level of constructs and level of measurement issue in the current study. As it was pointed out by Klein et al. (1994), investigators should associate the analyses with the level of theory in order to enhance the quality of their research. In this section, I will discuss the selection of model and statistical techniques for testing the model in this study.

Theoretical models depict relationships among constructs (Kozlowski & Klein, 2000). According to Kozlowski and Klein (2000), three classes of models refer to single-level, cross-level, and homologous multilevel models. *Single-level model* specifies relationships between constructs at a single level of theory and analysis, including individual-level models or unit-level

models. C*ross-level model* describes relationships among constructs at different levels of analysis, including cross-level direct-effect models, cross-level moderator models, and cross-level frog-pond models. *Homologous multilevel models* specify that relationships between constructs at one level (e.g., individual level) are generalizable to constructs at another level (e.g., group level).

The models described as most relevant to the current study are both single-level models and one of the cross-level models: the cross-level moderator models. In this study, the single model involves specifying the direct effects of lower-level predictors on the lower-level outcome variable, which describes the relationship among only individual-level constructs. For example, an individual's LMX predicts his/her job satisfaction. The latter cross-level moderator model examines how the relationship between a lower-level predictor and the lower-level outcome variable is moderated by a higher-level characteristic. For example, the relationship between LMX (an individual-level independent variable) and job satisfaction (an individual level dependent variable) is moderated by a team's authority differentiation (a group-level variable).

The Logic of Statistical Analysis. As noted above, this study is a cross-level analysis, and the data are multilevel in nature, with eight variables at the individual-level and two variables at the group-level (see Table 5 in detail). The respondent employees are nested within teams. Employees working in the same team are exposed to similar stimuli within the group. Their responses, therefore, are not totally independent of each other. Hierarchical Linear Modeling (HLM; Raudenbush & Bryk, 2002; Hofmann, 1997) is a form of random coefficient model and is purposely aim to accommodate nested or multilevel data structure. Therefore, HLM was used as the main analytical technique in the current study.

Researchers can use HLM to conduct analyses at both the individual level and group level. The benefits of HLM over traditional Ordinary Least Squares (OLS) regression have been discussed in analyzing models with multiple levels of analysis. First, one of the assumptions of OLS regression is the independent observations. However, a similar effect within a group influence all members in the same group. Thus, this violates the independence of the observations assumption that underlies the OLS approach. HLM, on the other hand, explicitly recognizes the partial interdependence of individuals within the same group; that is, individuals within a particular group are under the same influence and therefore there may not be independent observations. Second, in dealing with the non-independent and multilevel data, HLM generates more accurate significance tests and parameter estimates. Because HLM models within-group, between-group variance, and covariance separately, it employs the correct standard errors for both within-group (i.e., individual-level) and between-group (i.e., group-level) effects (Gavin & Hofmann, 2002; Hofmann, 1997; 2002). For the hypotheses tested in the current study, HLM allows for more accurate and simultaneous estimation of: (a) the direct effects (H1, H2, H3, and H4) and moderation effect (H5, H6, and H7) within the individual-level, and (b) the cross-level moderation effect of a group-level variable on a relationship between two individual-level variables (H8 and H9).

Power. When analyzing data with a hierarchical structure as in the current study, statistical power is a major concern in employing Hierarchical Linear Modeling (HLM). Although there are no specific recommendations on how large the sample size should be (Bryk & Raudenbush, 1992), in general, HLM requires both relatively large numbers of groups as well as groups with a large number of members (Kreft, 1996). On one hand, the statistical power to detect HLM Level-l effects depends more on the total number of observations; on the other hand,

the statistical power to detect HLM Level-2 effects could be increased more by increasing the number of groups rather than by increasing the number of individuals of each group in the sample (Bassiri, 1988). Because the key hypotheses in this study concern both Level-1 and Level-2 effects, it is important to have both a large number of total observations and a large number of work groups. Further, according to Hofmann (1997), there may be sample size tradeoffs among between- and within-group observations. For instance, a large number of observations per group can compensate for a small number of groups, and vice versa. More specifically, some evidence in two studies suggest that it is essential to have a sample of thirty groups with thirty individuals each, so as to get sufficient power (.90) to detect cross-level interactions (Bassiri, 1988; Van der Leeden & Busing, 1994).

Centering. Regarding HLM, appropriate centering for level-1 predictors is important to avoid finding spurious results. The fundamental difference between the grand mean and group mean centering option is that, the former level 1 predictors explain both level 1 and level 2 variation, whereas the latter level 1 predictors explain level 1 variation only and the level 2 variance remains as is (Hoffmann & Gavin, 1998; Hoffmann, Griffin, & Gavin, 2000). Accordingly, with grand mean centering, the estimates of the level 2 predictors are adjusted for the level 1 predictor effects. With group mean centering, level 1 and level 2 predictors are independent and the effects of level 2 predictors are not adjusted for level 1 predictor effect. For this reason, Hoffmann and Gavin (1998) suggested that when examining the cross-level interaction effects, the group mean centering method should be used in order to avoid detecting a spurious cross-level interactive effect. Since part of my model involves cross-level interactive effects, I applied group mean centering method in testing Hypothesis 8 and 9. To examine the rest of the model, the grand mean centering method was used to reduce the potential collinearity

between level 2 intercept and slope terms and model the potential influence of both within and between group variance (Hoffmann & Gavin, 1998).

The Procedure of Statistical Analysis. Hypothesis 1a through 4a predicts that individual LMX would be positively related to four individual work outcomes (intrinsic motivation, job satisfaction, job performance, and retention); Hypothesis 1b through 4b predicts that individual TMX would be positively related to the same four individual work outcomes. Here an individual-level criterion is predicted by another individual variable. For the HLM procedure illustrated below, I use H2a, that is, LMX as independent variable and the dependent variable job satisfaction as an example. H2a is tested by three steps using HLM. First, a null model is specified to investigate the within-group variance and between-group variance of job satisfaction as the criterion, using the following equations:

$$\textbf{Level-1 Model} \quad Job\ Satisfaction_{ij} = \beta_{0j} + r_{ij} \tag{2}$$

$$\textbf{Level-2 Model} \quad \beta_{0j} = \gamma_{00} + u_{0j} \tag{3}$$

In order to evaluate whether an individual employee's job satisfaction varies between groups, HLM result shows a chi-square test of significance for τ_{00}, which is the group-level variance (variation of job satisfaction scores due to group differences). Note that "HLM does not provide a significance test for the within-group variance component (σ^2), but it does provide a significance test for the between-group variance (τ_{00}) (Hofmann, Griffin, & Gavin, 2000, p. 480). A significant between-group variance suggests statistically significant variability between groups. Additionally, an intraclass coefficient (ICC [1]) is calculated with the error terms of the related variance components. ICC (1) is the ratio of between-group variance in job satisfaction to total variance, as shown in the equation below:

$$\hat{\rho} = \frac{\hat{\tau}_{00}}{\hat{\sigma}^2 + \hat{\tau}_{00}} \quad (4)$$

Second, in order to test the H2a, the following two equations are specified in HLM, where employee LMX is entered as an individual-level predictor:

Level-1 Model: $Job\ Satisfaction_{ij} = \beta_{0j} + \beta_{1j}*(LMX_{ij}) + r_{ij}$ (5)

Level-2 Model: $\beta_{0j} = \gamma_{00} + u_{0j}$ (6)

$$\beta_{1j} = \gamma_{10} + u_{1j} \quad (7)$$

Since the regression coefficients β_{0j} and β_{1j} are modeled as random effects, these equations are named as *random-coefficient regression models.* The significance of these level-2 parameters, γ_{10} and $\gamma_{00,}$ suggests whether the average slope and mean across groups, correspondingly, are significantly different from 0. HLM result presents a t-test of the γ_{10} parameter in the output. The significant t-value indicates that the parameter is significantly from zero; in the current example, the significance of the γ_{10} suggests that LMX is associated with job satisfaction across groups. This t-test provides a direct test of Hypothesis 2a. Similarly, the same procedure is applied to test other direct effects in Hypothesis 1a through 4a and Hypothesis 1b through 4b. In general, the significance of the γ_{10} parameter suggests whether a relationship between an individual-level predictor and an individual-level outcome is significant. Note that HLM also provides a chi-square test for the two residual variances (i.e., τ_{00} and τ_{11}). These chi-square tests suggest whether the variance components differ significantly from zero. Put another way, these tests determine whether the intercepts and slopes vary across groups.

The moderation effects in Hypothesis 5, 6 and 7 are proposed at the individual-level. For instance, hypothesis 6 (b) states that an individual's relational identity orientation would moderate the relationship between his/her LMX and job satisfaction. In this case, it is an

individual-level variable (relational identity orientation) proposed to moderate the relationship between individual-level variables (LMX→ Job satisfaction). Hypothesis 6 (b) is then tested with two steps using HLM. In the first step, I regress both individual's LMX and relational identity orientation on job satisfaction.

$$\textbf{Level-1 Model: } Job\ Satisfaction_{ij} = \beta_{0j} + \beta_{1j}*(LMX_{ij}) + \beta_{2j}*(Relational\ Identity\ Orientation_{ij}) + r_{ij} \quad (8)$$

$$\textbf{Level-2 Model: } \beta_{0j} = \gamma_{00} + u_{0j} \quad (9)$$

$$\beta_{1j} = \gamma_{10} + u_{1j} \quad (10)$$

$$\beta_{2j} = \gamma_{20} + u_{2j} \quad (11)$$

In the second step, I add the interaction of an individual's LMX and relational identity orientation onto the above regression.

$$\textbf{Level-1 Model: } Job\ Satisfaction_{ij} = \beta_{0j} + \beta_{1j}*(LMX_{ij}) + \beta_{2j}*(Relational\ Identity\ Orientation_{ij}) + \beta_{3j}*(\text{LMX} * Relational\ Identity\ Orientation_{ij}) + r_{ij} \quad (12)$$

$$\textbf{Level-2 Model: } \beta_{0j} = \gamma_{00} + u_{0j} \quad (13)$$

$$\beta_{1j} = \gamma_{10} + u_{1j} \quad (14)$$

$$\beta_{2j} = \gamma_{20} + u_{2j} \quad (15)$$

$$\beta_{3j} = \gamma_{30} + u_{3j} \quad (16)$$

In the result, a significant γ_{30} parameter would suggest that the LMX by relational identity orientation interaction is significant to predict job satisfaction.

The moderators proposed in Hypothesis 8 and 9 are at group-level. For example, Hypothesis 8 (b) states that a team's authority differentiation moderates the relationship between

LMX and job satisfaction. In this case, a relationship between two individual-level variables (LMX → Job satisfaction) is moderated by a group-level variable (team's authority differentiation).

A precondition has to be established before testing the cross-level interaction effect. That is, there needs to a significant variability in the slopes, which is variability in the relationship between individual LMX and individual job satisfaction across groups. If the condition is met, then Hypothesis 8 (b) investigates the degree to which the team's authority differentiation as a group-level variable can explain this variability of slopes across groups. In the prior equations to test H2a, the variance of the level-2 residual $u_{1j,}$ τ_{11}reflects the variability of the slopes across groups. The chi-square test for τ_{11} suggests whether the variance in the slopes across groups is significantly different from zero. In this example, if the chi-square test is not significant, it implies that there is no variability in the slopes across groups relating individual LMX to individual job satisfaction. In this case, the precondition to test the cross-level interaction of Hypothesis 8 (b) is not met, thus, H8 (b) could not be tested meaningfully and therefore is not supported.

Given a significant variability in the slopes, then the subsequent stage is to examine whether that variability can be explained by a level-2 variable. The following model is known as *slopes-as-outcomes model*. This model tests a cross-level interaction because a level-2 variable is hypothesized to moderate the relationship between two individual-level variables. In this example, the next model is to test whether a team's authority differentiation structure moderates the relationship between individual LMX and individual job satisfaction. The following equations are used:

$$\textbf{Level-1 Model: } Job\ Satisfaction_{ij} = \beta_{0j} + \beta_{1j}*(LMX_{ij}) + r_{ij} \quad (17)$$

Level-2 Model: $\beta_{0j} = \gamma_{00} + \gamma_{01}*(Team\ Authority\ Differentiation_j) + u_{0j}$ (18)

$$\beta_{1j} = \gamma_{10} + \gamma_{11}*(Team\ Authority\ Differentiation_j) + u_{1j} \quad (19)$$

In this model, the significance of the γ_{11} parameter directly tests the moderation hypothesis. A significant γ_{11} parameter would indicate that a team's authority differentiation moderates the relationship between individual LMX and individual job satisfaction.

Lastly, all the significant interaction effects are plotted and the simple tests are conducted (Aiken & West, 1991). Preacher, Curran, and Bauer (2006) concluded that Aiken and West's (1991) simple slope test is valid and useful for all three statistical models: multiple linear regression, hierarchical linear modeling, and latent curve analysis. For example, in the context of HLM to test H8 (b) as shown above, the test of the coefficient γ_{11} is an omnibus test of the interaction effect. *LMX* as the focal predictor and *Team Authority Differentiation* as the moderator results in the following prediction:

$$E\{Job\ Satisfaction|(LMX, Team\ Authority\ Differentiation\} = \left(\hat{\gamma}_{00} + \hat{\gamma}_{01}\ Team\ Authority\ Differentiation\right) + \left(\hat{\gamma}_{10} + \hat{\gamma}_{11}\ Team\ Authority\ Differentiation\right) LMX \quad (20)$$

This arrangement emphasizes the simple intercept and slope of the regression of *Job Satisfaction* on *LMX* at specific values of *Team Authority Differentiation*. Using the simple slopes technique, next, I can further interpret and evaluate the simple slope, $\left(\hat{\gamma}_{10} + \hat{\gamma}_{11}\ Team\ Authority\ Differentiation\right)$, as indicated in this particularly example.

RESULTS

In this chapter, results from the hypothesis tests are reported. The variables' descriptive statistics and inter-correlations, as well as data sources and collection schedule, are presented in Table 6 for both the three samples combined. Each of the separate samples is displayed individually in Table 7 though Table 9.

Examining the correlation matrixes across three samples shows that, in general, the means were highest in Sample 3 and lowest in Sample 1, whereas standard deviations in Sample 3 were the lowest among three samples. Next, I examined the correlations among constructs across three samples. First, LMX correlated significantly with TMX and the relationships were strong in nature in all three samples, with the strongest in magnitude in Sample 2 ($\gamma = .50, p < .01$ in Sample 1; $\gamma = .68, p < .01$ in Sample 2; and $\gamma = .60, p < .01$ in Sample 3). The implication of these strong relationships would be important in the subsequent discussion of my research findings. Second, the correlation between relational identity and collective identity was positive and strong in nature in Sample 3 ($\gamma = .65, p < .01$), whereas the relationship between relational identity and collective identity was not significant in both Sample 1 ($\gamma = -.16, p > .05$) and Sample 2 ($\gamma = -.06, p > .05$). Third, the correlations between each two dependent variables were significant among four study outcomes and the relationships were moderate to strong in nature across three samples in a similar pattern.

Preliminary Analyses

First, the data were analyzed based on the combined three samples coded with two dummy variables (D1 and D2). As shown in Table 10, the regression coefficients for the dummy variables are listed in the first row, and the regression coefficients for the interaction between dummy variable and independent variable(s) are listed in the second row. First, for the main

effect hypotheses, such as (LMX→DV) and (TMX→DV), both dummy variables were multiplied by the main effect IV, for example: DV= D1 +D2+LMX+LMX xD1 + LMX xD2. Second, regarding the two-way interaction hypotheses, such as (LMX x TMX →DV), (LMX x Relational Identity →DV) and (TMX x Collective Identity →DV), both dummy variables were multiplied by the interaction effect, for example: DV= D1 +D2+LMX +TMX +LMX x TMX+ LMX x TMX x D1 + LMX x TMX x D2.

As displayed in Table 10, many of the regression coefficients for the dummy variables, as well as the regression coefficients of the interaction between dummy variables and independent variable(s) were significant. This indicates that for both the main effects and two-way interaction hypotheses, there were significant differences in terms of both intercepts and slopes across three samples. For this reason, the three samples were analyzed and interpreted separately.

Main Effects of LMX and TMX on Intrinsic Motivation

Hypotheses 1a posits that LMX is positively related to an employee's intrinsic motivation. Hypotheses 1b posits that TMX is positively associated to an employee's intrinsic motivation.

In *Sample 1*, the results of Table 11 show a positive relationship between LMX and intrinsic motivation ($\gamma = .49, p < .05$), when TMX was controlled for. In addition, the results show a positive relationship between TMX and intrinsic motivation ($\gamma = .34, p < .05$), when LMX was controlled for.

In *Sample 2*, the results of Table 19 show a positive relationship between LMX and intrinsic motivation ($\gamma = .34, p < .01$), when TMX was controlled for. Furthermore, the results show a positive relationship between TMX and intrinsic motivation ($\gamma = .27, p < .01$), when LMX was controlled for.

In *Sample 3*, the results of Table 27 show a positive relationship between LMX and intrinsic motivation ($\gamma = .52, p < .05$), when TMX was controlled for. Moreover, the results show a positive relationship between TMX and intrinsic motivation ($\gamma = .21, p < .01$), when LMX was controlled for. In sum, Hypotheses 1a and 1b were supported in all three samples.

Main Effects of LMX and TMX on Job Satisfaction

Hypotheses 2a posits that LMX is positively related to an employee's job satisfaction. Hypotheses 2b posits that TMX is positively associated to an employee's job satisfaction.

In *Sample 1*, the results of Table 12 show a positive relationship between LMX and job satisfaction ($\gamma = 5.80, p < .01$), when TMX was controlled for. In addition, the results show a positive relationship between TMX and job satisfaction ($\gamma = 3.76, p < .05$), when LMX was controlled for.

In *Sample 2*, the results of Table 20 show a positive relationship between LMX and job satisfaction ($\gamma = 3.94, p < .01$), when TMX was controlled for. Furthermore, the results show a positive relationship between TMX and job satisfaction ($\gamma = 2.96, p < .01$), when LMX was controlled for.

In *Sample 3*, the results of Table 28 show a positive relationship between LMX and job satisfaction ($\gamma = 10.81, p < .01$), when TMX was controlled for. Moreover, the results show a positive relationship between TMX and job satisfaction ($\gamma = 4.94, p < .01$), when LMX was controlled for. In sum, Hypotheses 2a and 2b were supported in all three samples.

Main Effects of LMX and TMX on Job Performance

Hypotheses 3a posits that LMX is positively related to an employee's job performance. Hypotheses 3b posits that TMX is positively associated with an employee's job performance.

In *Sample 1*, the results of Table 13 show a positive relationship between LMX and job performance ($\gamma = .66, p < .01$), when TMX was controlled for. However, the results show that TMX was not significantly related to job performance ($\gamma = -.10, p > .05$), when LMX was controlled for.

In *Sample 2*, the results of Table 21 show a positive relationship between LMX and job performance ($\gamma = .35, p < .01$), when TMX was controlled for. Also, the results show a positive relationship between TMX and job performance ($\gamma = .23, p < .01$), when LMX was controlled for.

In *Sample 3*, the results of Table 29 show a positive relationship between LMX and job performance ($\gamma = .97, p < .01$), when TMX was controlled for. However, the results show that TMX was not significantly related to job performance ($\gamma = -.03, p > .05$), when LMX was controlled for. In sum, Hypotheses 3a was supported in all three samples. Hypothesis 3b was only supported in Sample 2, but was not supported in Sample 1 and Sample 3.

Main Effects of LMX and TMX on Retention

Hypotheses 4a posits that LMX is positively related to an employee's retention. Hypotheses 4b posits that TMX is positively associated with an employee's retention.

In *Sample 1*, the results of Table 14 show a positive relationship between LMX and retention ($\gamma = .52, p < .01$), when TMX was controlled for. However, the results show that TMX was not significantly related to retention ($\gamma = .09, p > .05$), when LMX was controlled for.

In *Sample 2*, the results of Table 22 show a positive relationship between LMX and retention ($\gamma = .47, p < .01$), when TMX was controlled for. However, the results show that

TMX was not significantly related to retention ($\gamma = .06, p > .05$), when LMX was controlled for.

In *Sample 3*, the results of Table 30 show a positive relationship between LMX and retention ($\gamma = .69, p < .01$), when TMX was controlled for. Also, the results show a positive relationship between TMX and retention ($\gamma = .15, p < .05$), when LMX was controlled for. In sum, Hypotheses 4a was supported in all three samples. Hypothesis 4b was only supported in Sample 3, but was not supported in Sample 1 and Sample 2.

In all three samples, the results show consistent support for the unique, positive impact of LMX and TMX on employee's intrinsic motivation and job satisfaction. But, the results for the predictions for job performance and retention did not follow a similar pattern across the three samples. Controlling for LMX, the positive link between TMX and job performance received support only in Sample 2; whereas the positive link between TMX and retention received support only in Sample 3.

Moderation Effects of LMX and TMX (LMX x TMX)

Hypotheses 5a through 5d predict that an employee's TMX would substitute for the positive relationship between LMX and individual's intrinsic motivation (H5a), job satisfaction (H5b), job performance (H5c), and retention (H5d).

Study 1 Results

In *Sample 1*, the results show that the interaction between TMX and LMX was not associated with *intrinsic motivation* ($\gamma = -.42, p > .05,$ see Table 11) nor *job performance* ($\gamma = -.16, p > .05,$ see Table 13). Thus, both hypotheses 5a and 5c were not supported.

On the other hand, the interaction between LMX and TMX was negatively associated with *job satisfaction* ($\gamma = -8.36, p < .01,$ see Table 12). I plotted this significant interaction

effect and conducted simple slope tests (Aiken & West, 1991). Figure 4 shows that with high TMX (1 standard deviation above the mean), LMX was not associated with job satisfaction ($\gamma = .45, p > .05$); with low TMX (1 standard deviation below the mean), LMX was positively associated with job satisfaction ($\gamma = 12.15, p < .01$). Therefore, Hypothesis 5b was supported, that is, high TMX substituted for the relationship between LMX and job satisfaction.

In addition, the interaction between LMX and TMX was negatively associated with *retention* ($\gamma = -.66, p < .01$, see Table 14). Figure 5 shows that with high TMX (1 SD above the mean), LMX was not associated with retention ($\gamma = .14, p > .05$); with low TMX (1 SD below the mean), LMX was positively associated with retention ($\gamma = 1.07, p < .01$). Thus, Hypothesis 5d was supported, that is, high TMX substituted for the relationship between LMX and retention.

Study 2 Results

In *Sample 2*, the results show that the interaction between LMX and TMX was significantly negatively associated with intrinsic motivation ($\gamma = -.26, p < .01$, see Table 19), job satisfaction ($\gamma = -1.05, p < .01$, see Table 20), job performance ($\gamma = -.27, p < .01$, see Table 21), and retention ($\gamma = -.11, p < .01$, see Table 22).

I plotted these negative moderating effects and conducted simple slope tests. For *intrinsic motivation*, Figure 6 shows that with high TMX (1 SD above the mean), LMX was not associated with intrinsic motivation($\gamma = .11, p > .05$); with low TMX (1 SD below the mean), LMX was positively associated with intrinsic motivation ($\gamma = .59, p < .01$). Therefore, Hypothesis 5a was supported, that is, high TMX substituted for the relationship between LMX and intrinsic motivation.

For *job satisfaction*, Figure 7 shows that with high TMX (1 SD above the mean), LMX was weakly associated with job satisfaction($\gamma = 3.21, p <.01$); with low TMX (1 SD below the mean), LMX was strongly associated with job satisfaction($\gamma = 5.19, p < .01$). Thus, TMX moderated the relationship between LMX and job satisfaction, that is, the positive relationship was stronger when TMX was lower. Therefore, Hypothesis 5b was partially supported.

For *job performance*, Figure 8 shows that with high TMX (1 SD above the mean), LMX was not associated with job performance($\gamma =.06, p > .05$); with low TMX (1 SD below the mean), LMX was positively associated with job performance ($\gamma =.57, p < .01$). Therefore, Hypothesis 5c was supported, that is, high TMX substituted for the relationship between LMX and job performance.

Last, for *retention*, Figure 9 shows that with high TMX (1 SD above the mean), LMX was weakly associated with retention ($\gamma =.38, p <.01$); with low TMX (1 SD below the mean), LMX was strongly associated with retention ($\gamma = .57, p < .01$). Thus, TMX moderated the relationship between LMX and retention, that is, the positive relationship was stronger when TMX was lower. Therefore, Hypothesis 5d was partially supported.

Study 3 Results

In *Sample 3*, the results show that the interaction between TMX and LMX was not associated with *intrinsic motivation* ($\gamma = -.22, p >.05,$ see Table 27) and *retention* ($\gamma = -.32, p >.05,$ see Table 30). Thus, both hypotheses 5a and 5d were not supported.

In contrast, the interaction between LMX and TMX was negatively associated with *job satisfaction* ($\gamma = -10.76, p <.01,$ see Table 28). Figure 10 shows that with high TMX (1 SD above the mean), LMX was not associated with job satisfaction ($\gamma = -.47, p >.05$); with low TMX (1 SD below the mean), LMX was positively associated with job satisfaction ($\gamma =$

$12.01, p < .01$). Therefore, Hypothesis 5b was supported, that is, high TMX substituted for the relationship between LMX and job satisfaction.

Furthermore, the interaction between LMX and TMX was negatively associated with *job performance* ($\gamma = -.92, p < .01$, see Table 29). Figure 11 shows that with high TMX (1 SD above the mean), LMX was not associated with job performance ($\gamma = .09, p > .05$); with low TMX (1 SD below the mean), LMX was positively associated with job performance ($\gamma = 1.15, p < .01$). However, Figure 11 shows that members with both high TMX and high LMX had lower job performance than members with low TMX and high LMX. Thus, Hypothesis 5c was partially supported, because high TMX was not sufficient for generating high job performance.

In sum, the "substitution" type of interaction between LMX and TMX predicted intrinsic motivation only in Sample 2. The "substitution" type of interaction between LMX and TMX predicted job satisfaction in Sample 1 and Sample 3. The "substitution" type of interaction between LMX and TMX predicted job performance only in Sample 2. The "substitution" type of interaction between LMX and TMX predicted retention only in Sample 1.

Moderation Effects of LMX and Relational Identity (LMX x Relational Identity)

Hypotheses 6a through 6d state that an employee's relational identity would neutralize the positive link between LMX and individual's intrinsic motivation (H6a), job satisfaction (H6b), job performance (H6c), and retention (H6d).

Study 1 Results

In *Sample 1*, the results show that the interaction between LMX and relational identity was not associated with *intrinsic motivation* ($\gamma = .37, p > .05$, see Table 11) nor *job*

performance ($\gamma = .07, p > .05$, see Table 13). Thus, both hypotheses 6a and 6c were not supported.

In contrast, the interaction between LMX and relational identity was positively associated with *job satisfaction* ($\gamma = 7.01, p < .01$, see Table 12). Figure 12 shows that with high relational identity (1 SD above the mean), LMX was positively associated with job satisfaction ($\gamma = 15.27, p < .05$); with low relational identity (1 SD below the mean), LMX was not associated with job satisfaction ($\gamma = 1.53, p > .05$). Therefore, Hypothesis 6b was supported, that is, low relational identity neutralized the relationship between LMX and job satisfaction.

Similarly, the interaction between LMX and relational identity was positively associated with *retention* ($\gamma = .55, p < .01$, see Table 14). Figure 13 shows that with high relational identity (1 SD above the mean), LMX was positively associated with retention ($\gamma = 1.19, p < .05$); with low relational identity (1 SD below the mean), LMX was not associated with retention ($\gamma = .12, p > .05$). Therefore, Hypothesis 6d was supported, that is, low relational identity neutralized the relationship between LMX and retention.

Study 2 Results

In *Sample 2*, the results in Table 12 show that the interaction between LMX and relational identity was significantly positively associated with intrinsic motivation ($\gamma = .26, p < .01$, see Table 19), job satisfaction($\gamma = 2.30, p < .01$, see Table 20), job performance ($\gamma = .17, p < .05$, see Table 21) , and retention ($\gamma = .21, p < .01$, see Table 22).

I plotted these positive moderating effects and conducted simple slope tests. For *intrinsic motivation*, Figure 14 shows that with high relational identity (1 SD above the mean), LMX was strongly associated with intrinsic motivation ($\gamma = .76, p < .01$); with low relational identity (1 SD below the mean), LMX was weakly associated with intrinsic motivation ($\gamma = .21, p < .05$).

Therefore, low relational identity weakened, but did not totally neutralize the relationship between LMX and intrinsic motivation. Thus, Hypothesis 6a was partially supported. The result shows that relational identity moderated the relationship between LMX and intrinsic motivation, that is, the positive relationship was stronger when relational identity was higher.

For *job satisfaction*, Figure 15 shows that with high relational identity (1 SD above the mean), LMX was strongly associated with job satisfaction ($\gamma = 8.29, p < .01$); with low relational identity (1 SD below the mean), LMX was weakly associated with job satisfaction ($\gamma = 3.55, p < .01$). Therefore, low relational identity weakened, but did not totally neutralize the relationship between LMX and job satisfaction. Thus, Hypothesis 6b was partially supported. The result shows that relational identity moderated the relationship between LMX and job satisfaction, that is, the positive relationship was stronger when relational identity was higher.

For *job performance*, Figure 16 shows that with high relational identity (1 SD above the mean), LMX was strongly associated with job performance ($\gamma = .68, p < .01$); with low relational identity (1 SD below the mean), LMX was weakly associated with job performance ($\gamma = .33, p < .01$). Therefore, low relational identity weakened, but did not totally neutralize the relationship between LMX and job performance. Thus, Hypothesis 6c was partially supported. The result shows that relational identity moderated the relationship between LMX and job performance, that is, the positive relationship was stronger when relational identity was higher.

Last, for retention, Figure 17 shows that with high relational identity (1 SD above the mean), LMX was strongly associated with *retention* ($\gamma = .72, p < .01$); with low relational identity (1 SD below the mean), LMX was weakly associated with retention ($\gamma = .28, p < .01$). Therefore, low relational identity weakened, but did not totally neutralize the relationship between LMX and retention. Thus, Hypothesis 6d was partially supported. The result shows that

relational identity moderated the relationship between LMX and retention, that is, the positive relationship was stronger when relational identity was higher.

Study 3 Results

In *Sample 3*, the results show that the interaction between LMX and relational identity was not associated with *job performance* ($\gamma = .22, p > .05$, see Table 29). Hence, Hypothesis 6c was not supported.

In addition, contrary to expectations, the interaction between LMX and relational identity was negatively associated with *job satisfaction* ($\gamma = -4.98, p < .05$, see Table 28). Figure 18 shows that with high relational identity (1 SD above the mean), LMX was weakly associated with job satisfaction ($\gamma = 14.29, p < .01$); with low relational identity (1 SD below the mean), LMX was strongly to job satisfaction ($\gamma = 20.76, p < .01$). Hence, Hypothesis 6b was not supported. The result shows that relational identity moderated the relationship between LMX and job satisfaction, that is, the positive relationship was stronger when relational identity was lower.

In contrast, the interaction between LMX and relational identity was positively associated with *intrinsic motivation* ($\gamma = 1.25, p < .01$, see Table 27). Figure 19 shows that with high relational identity (1 SD above the mean), LMX was positively associated with intrinsic motivation ($\gamma = 1.14, p < .01$); with low relational identity (1 SD below the mean), LMX was not associated with intrinsic motivation ($\gamma = -.49, p > .05$). Therefore, Hypothesis 6a was supported, that is, low relational identity neutralized the relationship between LMX and intrinsic motivation.

In addition, the interaction between LMX and relational identity was positively associated with *retention* ($\gamma = .34, p < .01$, see Table 30). Figure 20 shows that with high relational identity (1 SD above the mean), LMX was strongly associated with retention ($\gamma =$

$.92, p < .01$); with low relational identity (1 SD below the mean), LMX was weakly associated with retention ($\gamma = .47, p < .05$). Therefore, low relational identity weakened, but did not totally neutralize the relationship between LMX and retention. Thus, Hypothesis 6d was partially supported. The result shows that relational identity moderated the relationship between LMX and retention, that is, the positive relationship was stronger when relational identity was higher.

In sum, the "neutralization" type of interaction between LMX and relational identity predicted intrinsic motivation only in Sample 3. The "neutralization" type of interaction between LMX and relational identity predicted job satisfaction only in Sample 1. The "neutralization" type of interaction between LMX and relational identity predicted job performance in none of the three samples. The "neutralization" type of interaction between LMX and relational identity predicted retention only in Sample 1.

Moderation Effects of TMX and Collective Identity (TMX x Collective Identity)

Hypotheses 7a through 7d predict that an employee's collective identity would neutralize the positive link between TMX and individual's intrinsic motivation (H7a), job satisfaction (H7b), job performance (H7c), and retention (H7d).

Study 1 Results

In *Sample 1*, the results show that the interaction between TMX and collective identity was not associated with *job satisfaction* ($\gamma = 1.03, p > .05$, see Table 12) and *retention* ($\gamma = -.16, p > .05$, see Table 14). Thus, both hypotheses 7b and 6d were not supported.

In contrast, the interaction between TMX and collective identity was positively associated with *intrinsic motivation* ($\gamma = .28, p < .05$, see Table 11). Figure 21 shows that with high collective identity (1 SD above the mean), TMX was positively associated with intrinsic motivation ($\gamma = .50, p < .05$); with low collective identity (1 SD below the mean), TMX was not

associated with intrinsic motivation ($\gamma = .11, p > .05$). Therefore, Hypothesis 7a was supported, that is, low collective identity neutralized the relationship between TMX and intrinsic motivation.

In addition, the interaction between TMX and collective identity was positively associated with *job performance* ($\gamma = .26, p < .05$, see Table 13). Figure 22 shows that with high collective identity (1 SD above the mean), TMX was positively associated with job performance ($\gamma = .46, p < .05$); with low collective identity (1 SD below the mean), TMX was not associated with job performance ($\gamma = .09, p > .05$). Therefore, Hypothesis 7c was supported, that is, low collective identity neutralized the relationship between TMX and job performance.

Study 2 Results

In *Sample 2*, the results in Table 13 show that the interaction between TMX and collective identity was not associated with *job satisfaction* ($\gamma = -.24, p > .05$, see Table 20). Hence, Hypothesis 7b was not supported.

In addition, contrary to expectations, the interaction between TMX and collective identity was negatively associated with *intrinsic motivation* ($\gamma = -.12, p < .01$, see Table 19). Hence, Hypothesis 7a was not supported. Figure 23 shows that with high collective identity (1 SD above the mean), TMX was weakly associated with intrinsic motivation ($\gamma = .12, p < .05$); with low collective identity (1 SD below the mean), TMX was strongly to intrinsic motivation ($\gamma = .37, p < .01$). Thus, The result shows that collective identity moderated the relationship between TMX and intrinsic motivation, that is, the positive relationship was stronger when collective identity was lower.

Furthermore, the interaction between TMX and collective identity was negatively associated with *job performance* ($\gamma = -.08, p < .05$, see Table 21). Thus, Hypothesis 7c was

not supported. Figure 24 shows that with high collective identity (1 SD above the mean), TMX was weakly associated with job performance ($\gamma = .30, p < .01$); with low collective identity (1 SD below the mean), TMX was strongly associated with job performance ($\gamma = .47, p < .01$). Thus, the result shows that collective identity moderated the relationship between TMX and job performance, that is, the positive relationship was stronger when collective identity was lower.

Last, the interaction between TMX and collective identity was negatively associated with *retention* ($\gamma = -.04, p < .05$, see Table 22). Thus, Hypothesis 7d was not supported. Figure 25 shows that with high collective identity (1 SD above the mean), TMX was weakly associated with retention ($\gamma = .19, p < .01$); with low collective identity (1 SD below the mean), TMX was strongly to retention ($\gamma = .27, p < .01$). Thus, the result shows that collective identity moderated the relationship between TMX and retention, that is, the positive relationship was stronger when collective identity was lower.

Study 3 Results

In *Sample 3*, the results show that the interaction between TMX and collective identity was not associated with *intrinsic motivation* ($\gamma = .49, p > .05$, see Table 27) nor *job performance* ($\gamma = .16, p > .05$, see Table 29). Thus, both hypotheses 7a and 7c were not supported.

In contrast, contrary to expectations, the interaction between TMX and collective identity was negatively associated with *job satisfaction* ($\gamma = -4.73, p < .05$, see Table 28). Hence, Hypothesis 7b was not supported. Figure 26 shows that with high collective identity (1 SD above the mean), TMX was weakly associated with job satisfaction ($\gamma = 7.94, p < .05$); with low collective identity (1 SD below the mean), TMX was strongly to job satisfaction ($\gamma = 12.20, p < .01$). Thus, the result shows that collective identity moderated the relationship between TMX

and job satisfaction, that is, the positive relationship was stronger when collective identity was lower.

In addition, the interaction between TMX and collective identity was positively associated with *retention* ($\gamma = .35, p < .05$, see Table 30). However, Figure 27 shows that with high collective identity (1 SD above the mean), TMX was not associated with retention ($\gamma = .48, p > .05$); with low collective identity (1 SD below the mean), TMX was still not associated with retention ($\gamma = .16, p > .05$). Therefore, Hypothesis 7d was not supported.

In sum, the "neutralization" type of interaction between TMX and collective identity predicted intrinsic motivation only in Sample 1. The "neutralization" type of interaction between TMX and collective identity predicted job satisfaction in none of the three samples. The "neutralization" type of interaction between TMX and collective identity predicted job performance only in Sample 1. The "neutralization" type of interaction between TMX and collective identity predicted retention in none of the three samples.

Cross-level Moderation Effects of LMX and Team Authority Differentiation (LMX x Team Authority Differentiation)

Hypotheses 8a through 8d posit that team authority differentiation would neutralize the positive link between LMX and individual's intrinsic motivation (H8a), job satisfaction (H8b), job performance (H8c), and retention (H8d).

Study 1 Results

In *Sample 1*, the results show that the interaction between LMX and team authority differentiation was not associated with *intrinsic motivation* ($\gamma = .28, p > .05$, see Table 15). Thus, hypotheses 8a was not supported.

In contrast, the interaction between LMX and team authority differentiation was positively associated with *job satisfaction* ($\gamma = 2.40\ p < .05$, see Table 16). Figure 28 shows that with high team authority differentiation (1 SD above the mean), LMX was positively associated with job satisfaction ($\gamma = 8.87, p < .01$); with low team authority differentiation (1 SD below the mean), LMX was not associated with job satisfaction ($\gamma = 3.15, p > .05$). However, Figure 28 shows that members with both high LMX and in teams with high authority differentiation had lower job satisfaction than members with high LMX but in teams with low authority differentiation. Thus, Hypothesis 8b was partially supported, because high level of both LMX and authority differentiation were not the only necessary condition for generating high job satisfaction. The result shows that authority differentiation moderated the relationship between LMX and job satisfaction, that is, the positive relationship was stronger when authority differentiation was higher.

In addition, the interaction between LMX and team authority differentiation was positively associated with *job performance* ($\gamma = .24, p < .05$, see Table 17). Figure 29 shows that with high team authority differentiation (1 SD above the mean), LMX was positively associated with job performance ($\gamma = .86, p < .01$); with low team authority differentiation (1 SD below the mean), LMX was not associated with job performance ($\gamma = .28, p > .05$). Therefore, Hypothesis 8c was supported, that is, low team authority differentiation neutralized the relationship between LMX and job performance.

Last, the interaction between LMX and team authority differentiation was positively associated with *retention* ($\gamma = .18, p < .05$, see Table 18). Figure 30 shows that with high team authority differentiation (1 SD above the mean), LMX was positively associated with retention ($\gamma = .67, p < .01$); with low team authority differentiation (1 SD below the mean), LMX was not

associated with retention ($\gamma = .25, p > .05$). However, Figure 30 shows that members with both high LMX and in teams with high authority differentiation had lower retention than members with high LMX but in teams with low authority differentiation. Thus, Hypothesis 8d was partially supported, because high level of both LMX and authority differentiation were not the only necessary condition for generating high retention. The result shows that authority differentiation moderated the relationship between LMX and retention, that is, the positive relationship was stronger when authority differentiation was higher.

Study 2 Results

In *Sample 2*, the results show that the interaction between LMX and team authority differentiation was positively associated with *intrinsic motivation* ($\gamma = .49, p < .01,$ see Table 23). Figure 31 shows that with high team authority differentiation (1 SD above the mean), LMX was positively associated with intrinsic motivation ($\gamma = .97, p < .01$); with low team authority differentiation (1 SD below the mean), LMX was not associated with intrinsic motivation ($\gamma = .05, p > .05$). Therefore, Hypothesis 8a was supported, that is, low team authority differentiation neutralized the relationship between LMX and intrinsic motivation.

In addition, the interaction between LMX and team authority differentiation was positively associated with *job satisfaction* ($\gamma = 2.81, p < .01,$ see Table 24). Figure 32 shows that with high team authority differentiation (1 SD above the mean), LMX was strongly associated with job satisfaction ($\gamma = 8.20, p < .01$); with low team authority differentiation (1 SD below the mean), LMX was weakly associated with job satisfaction ($\gamma = 2.90, p < .05$). Therefore, low team authority differentiation weakened, but did not totally neutralize the relationship between LMX and job satisfaction. Thus, Hypothesis 8b was partially supported.

The result shows that authority differentiation moderated the relationship between LMX and job satisfaction, that is, the positive relationship was stronger when authority differentiation was higher.

Furthermore, the interaction between LMX and team authority differentiation was positively associated with *job performance* ($\gamma = .52, p < .01$, see Table 25). Figure 33 shows that with high team authority differentiation (1 SD above the mean), LMX was positively associated with job performance ($\gamma = 1.03, p < .01$); with low team authority differentiation (1 SD below the mean), LMX was not associated with job performance ($\gamma = .06, p > .05$). Therefore, Hypothesis 8c was supported, that is, low team authority differentiation neutralized the relationship between LMX and job performance.

Last, the interaction between LMX and team authority differentiation was positively associated with *retention* ($\gamma = .29, p < .01$, see Table 26). Figure 34 shows that with high team authority differentiation (1 SD above the mean), LMX was strongly associated with retention ($\gamma = .78, p < .01$); with low team authority differentiation (1 SD below the mean), LMX was weakly associated with retention ($\gamma = .25, p < .05$). Therefore, low team authority differentiation weakened, but did not totally neutralize the relationship between LMX and retention. Thus, Hypothesis 8d was partially supported. The result shows that authority differentiation moderated the relationship between LMX and retention, that is, the positive relationship was stronger when authority differentiation was higher.

Study 3 Results

In *Sample 3*, the results show that the interaction between LMX and team authority differentiation was not associated with job performance ($\gamma = .50, p > .05$, see Table 33). Thus, hypotheses 8c was not supported.

In contrast, the interaction between LMX and team authority differentiation was positively associated with *intrinsic motivation* ($\gamma = .63, p < .05$, see Table 31). Figure 35 shows that with high team authority differentiation (1 SD above the mean), LMX was positively associated with intrinsic motivation ($\gamma = 1.02, p < .01$); with low team authority differentiation (1 SD below the mean), LMX was not associated with intrinsic motivation ($\gamma = .24, p > .05$). However, Figure 35 shows that members with both high LMX and in teams with high authority differentiation had the same level of intrinsic motivation as members with high LMX but in teams with low authority differentiation. Thus, Hypothesis 8a was partially supported, because high level of both LMX and authority differentiation were not the only necessary condition for generating high intrinsic motivation. The result shows that authority differentiation moderated the relationship between LMX and intrinsic motivation, that is, the positive relationship was stronger when authority differentiation was higher.

In addition, the interaction between LMX and team authority differentiation was positively associated with *job satisfaction* ($\gamma = 12.99, p < .01$, see Table 32). Figure 36 shows that with high team authority differentiation (1 SD above the mean), LMX was positively associated with job satisfaction ($\gamma = 21.93, p < .01$); with low team authority differentiation (1 SD below the mean), LMX was not associated with job satisfaction ($\gamma = 5.82, p > .05$). Therefore, Hypothesis 8b was supported, that is, low team authority differentiation neutralized the relationship between LMX and job satisfaction.

Last, the interaction between LMX and team authority differentiation was positively associated with *retention* ($\gamma = 1.43, p < .01$, see Table 34). Figure 37 shows that with high team authority differentiation (1 SD above the mean), LMX was positively associated with retention ($\gamma = 1.47, p < .01$); with low team authority differentiation (1 SD below the mean), LMX was

not associated with retention ($\gamma = -.30, p > .05$). Therefore, Hypothesis 8d was supported, that is, low team authority differentiation neutralized the relationship between LMX and retention.

In sum, the "neutralization" type of interaction between LMX and authority differentiation predicted intrinsic motivation only in Sample 2. The "neutralization" type of interaction between LMX and authority differentiation predicted job satisfaction only Sample 3. The "neutralization" type of interaction between LMX and authority differentiation predicted job performance in Sample 1 and Sample 2. The "neutralization" type of interaction between LMX and authority differentiation predicted retention only in Sample 3.

Cross-level Moderation Effects of TMX and Team Skill Differentiation (TMX x Team Skill Differentiation)

Hypotheses 9a through 9d predict that team skill differentiation would neutralize the positive link between TMX and individual's intrinsic motivation (H9a), job satisfaction (H9b), job performance (H9c), and retention (H9d).

Study 1 Results

In *Sample 1*, the results show that the interaction between TMX and team skill differentiation was negatively associated with *intrinsic motivation* ($\gamma = -.33, p < .05$, see Table 15). Thus, Hypothesis 9a was not supported. Figure 38 shows that with high team skill differentiation (1 SD above the mean), TMX was not associated with intrinsic motivation ($\gamma = .22, p > .05$); with low team skill differentiation (1 SD below the mean), TMX was positively associated with intrinsic motivation ($\gamma = 1.00, p < .01$). Thus, high team skill differentiation substituted for the relationship between TMX and intrinsic motivation.

In addition, the interaction between TMX and team skill differentiation was negatively associated with *job satisfaction* ($\gamma = -4.26, p < .01$, see Table 16). Thus, Hypothesis 9b was

not supported. Figure 39 shows that with high team skill differentiation (1 SD above the mean), TMX was not associated with job satisfaction ($\gamma = 1.44, p > .05$); with low team skill differentiation (1 SD below the mean), TMX was positively associated with job satisfaction ($\gamma = 11.50, p < .01$). However, Figure 39 shows that members with both high TMX and in teams with high skill differentiation had lower job satisfaction than members in teams with low skill differentiation and with high TMX; thus, high skill differentiation was not sufficient for generating high job satisfaction. The result shows that skill differentiation moderated the relationship between TMX and job satisfaction, that is, the positive relationship was stronger when skill differentiation was lower.

Furthermore, the interaction between TMX and team skill differentiation was negatively associated with *job performance* ($\gamma = -.36, p < .01,$ see Table 17). Thus, Hypothesis 9c was not supported. Figure 40 shows that with high team skill differentiation (1 SD above the mean), TMX was not associated with job performance ($\gamma = -.24, p > .05$); with low team skill differentiation (1 SD below the mean), TMX was positively associated with job performance ($\gamma = .61, p < .01$). However, Figure 40 shows that members with both high TMX and in teams with high skill differentiation had lower job performance than members in teams with low skill differentiation and with high TMX; thus, high skill differentiation was not sufficient for generating high job performance. The result shows that skill differentiation moderated the relationship between TMX and job performance, that is, the positive relationship was stronger when skill differentiation was lower.

Last, the interaction between TMX and team skill differentiation was negatively associated with *retention* ($\gamma = -.27, p < .01,$ see Table 18). Thus, Hypothesis 9d was not supported. Figure 41 shows that with high team skill differentiation (1 SD above the mean),

TMX was not associated with retention ($\gamma = .05, p > .05$); with low team skill differentiation (1 SD below the mean), TMX was positively associated with retention ($\gamma = .69, p < .01$). Thus, high team skill differentiation substituted for the relationship between TMX and retention.

Study 2 Results

In *Sample 2*, the results show that the interaction between TMX and team skill differentiation was negatively associated with *intrinsic motivation* ($\gamma = -.29, p < .01$, see Table 23). Thus, Hypothesis 9a was not supported. Figure 42 shows that with high team skill differentiation (1 SD above the mean), TMX was not associated with intrinsic motivation ($\gamma = .09, p > .05$); with low team skill differentiation (1 SD below the mean), TMX was positively associated with intrinsic motivation ($\gamma = .64, p < .01$). Thus, high team skill differentiation substituted for the relationship between TMX and intrinsic motivation.

In addition, the interaction between TMX and team skill differentiation was negatively associated with *job satisfaction* ($\gamma = -2.76, p < .01$, see Table 24). Thus, Hypothesis 9b was not supported. Figure 43 shows that with high team skill differentiation (1 SD above the mean), TMX was not associated with job satisfaction ($\gamma = .53, p > .05$); with low team skill differentiation (1 SD below the mean), TMX was positively associated with job satisfaction ($\gamma = 5.83, p < .01$). Thus, high team skill differentiation substituted for the relationship between TMX and job satisfaction.

Furthermore, the interaction between TMX and team skill differentiation was negatively associated with *job performance* ($\gamma = -.42, p < .01$, see Table 25). Thus, Hypothesis 9c was not supported. Figure 44 shows that with high team skill differentiation (1 SD above the mean), TMX was not associated with job performance ($\gamma = -.08, p > .05$); with low team skill differentiation (1 SD below the mean), TMX was positively associated with job performance

($\gamma = .73, p < .01$). However, Figure 44 shows that members with both high TMX and in teams with high skill differentiation had lower job performance than members in teams with low skill differentiation and with high TMX; thus, high skill differentiation was not sufficient for generating high job performance. The result shows that skill differentiation moderated the relationship between TMX and job performance, that is, the positive relationship was stronger when skill differentiation was lower.

Last, the interaction between TMX and team skill differentiation was negatively associated with *retention* ($\gamma = -.27, p < .01,$ see Table 26). Thus, Hypothesis 9d was not supported. Figure 45 shows that with high team skill differentiation (1 SD above the mean), TMX was not associated with retention ($\gamma = -.13, p > .05$); with low team skill differentiation (1 SD below the mean), TMX was positively associated with retention ($\gamma = .40, p < .01$). Thus, high team skill differentiation substituted for the relationship between TMX and retention.

Study 3 Results

In *Sample 3*, the results show that the interaction between TMX and team skill differentiation was negatively associated with *intrinsic motivation* ($\gamma = -.87, p < .05,$ see Table 31). Thus, Hypothesis 9a was not supported. Figure 46 shows that with high team skill differentiation (1 SD above the mean), TMX was not associated with intrinsic motivation ($\gamma = .22, p > .05$); with low team skill differentiation (1 SD below the mean), TMX was positively associated with intrinsic motivation ($\gamma = .75, p < .01$). Thus, high team skill differentiation substituted for the relationship between TMX and intrinsic motivation.

In addition, the interaction between TMX and team skill differentiation was negatively associated with *job satisfaction* ($\gamma = -18.98, p < .01,$ see Table 32). Thus, Hypothesis 9b was not supported. Figure 47 shows that with high team skill differentiation (1 SD above the mean),

TMX was weakly associated with job satisfaction ($\gamma = 4.92, p < .05$); with low team skill differentiation (1 SD below the mean), TMX was strongly associated with job satisfaction ($\gamma = 16.31, p < .01$). Thus, the result shows that skill differentiation moderated the relationship between TMX and job satisfaction, that is, the positive relationship was stronger when skill differentiation was lower.

Furthermore, the interaction between TMX and team skill differentiation was negatively associated with *job performance* ($\gamma = -1.25, p < .05$, see Table 33). Thus, Hypothesis 9c was not supported. Figure 48 shows that with high team skill differentiation (1 SD above the mean), TMX was not associated with job performance ($\gamma = .08, p > .05$); with low team skill differentiation (1 SD below the mean), TMX was positively associated with job performance ($\gamma = .83, p < .01$). Thus, high team skill differentiation substituted for the relationship between TMX and job performance.

Last, the interaction between TMX and team skill differentiation was negatively associated with *retention* ($\gamma = -1.45, p < .01$, see Table 34). Thus, Hypothesis 9d was not supported. Figure 49 shows that with high team skill differentiation (1 SD above the mean), TMX was not associated with retention ($\gamma = .05, p > .05$); with low team skill differentiation (1 SD below the mean), TMX was positively associated with retention ($\gamma = .92, p < .01$). Thus, high team skill differentiation substituted for the relationship between TMX and retention.

In sum, the "substitution" type of interaction between TMX and skill differentiation predicted intrinsic motivation in all three samples. The "substitution" type of interaction between TMX and skill differentiation predicted job satisfaction only in Sample 2. The "substitution" type of interaction between TMX and skill differentiation predicted job performance only in

Sample 3. The “substitution” type of interaction between TMX and skill differentiation predicted retention in all three samples.

DISCUSSION

The main purpose of the dissertation was to investigate whether, when and how two types of social exchange relationships (LMX and TMX) influence an individual's work outcomes. First, by drawing on self-determination theory, the study investigated whether TMX substitutes for LMX in predicting individuals' potential outcomes by allowing them to fulfill their needs for autonomy, competence, and relatedness. To accomplish this, I developed and tested a series of predictions that relate the interaction of LMX and TMX to a broad range of positive outcomes, such as intrinsic motivation, job satisfaction, job performance, and retention. In general, the results show a negative interaction between LMX and TMX predicting these critical outcomes. Specifically, results from the three samples all suggest that high quality TMX serves as a substitute for low LMX to predict employee job satisfaction. Thus, job satisfaction was low only when both LMX and TMX were low.

Second, drawing on identity orientation theory, I predicted that the effects of LMX would be contingent upon one's "relational identity" and that the effects of TMX would be contingent upon one's "collective identity." In general, the results show a positive interaction effect between LMX and relational identity when predicting critical outcomes. Particularly, the results from three samples all indicate that low relational identity can neutralize the positive effect of LMX when predicting employee's retention. Reframed, retention was higher only when both employees were high in relational identity and had high quality LMX. On the other hand, the results show mixed findings regarding the direction of the interaction effect between TMX and collective identity for predicting outcomes. For example, with intrinsic motivation, the "neutralization" type of interaction between TMX and collective identity was found in sample one, whereas the "substitution" type of interaction between TMX and collective identity was found in sample two.

Third, regarding team types, I further hypothesized that the effects of LMX would be contingent upon the team's "authority differentiation" and that the effects of TMX would be contingent upon teams "skill differentiation." For LMX, the nature of the interaction was consistent with the prediction that low authority differentiation within the team can neutralize the positive effects of LMX in predicting critical outcomes. For example, employees experience a high level of intrinsic motivation only when both LMX and team authority differentiation were high. Contrary to expectations, the interaction effects between TMX and the team's skill differentiation was negative. That is, high team skill differentiation substituted for low quality TMX in predicting employees' outcomes. For instance, employees experience lower work outcomes only when they had both low quality TMX and were in teams with low skill differentiation. In sum, the results suggested that LMX had the most impact on individuals in teams with high authority differentiation, whereas TMX had the most impact on individuals in teams with low skill differentiation. As such, these results offer some valuable theoretical and managerial insights.

Implications for Research

The theoretical implications of this research are manifold. First, this study is one of the first to investigate the effects of both LMX and TMX on employees' critical work outcomes in a team setting. Extensive research in the leadership literature has established the positive influence of LMX on employees' outcomes, such as empowerment (k = 11, N = 4296, $\rho = .67$); general job satisfaction (k = 88, N = 22520, $\rho = .49$); job performance (k = 108, N = 25322, $\rho = .34$) and turnover intentions (k = 38, N = 11790, $\rho = -.39$) (for recent meta-analytic reviews, see Dulebohn, et al., 2011). However, the role of TMX in driving individual outcomes had yet to be

explored. Particularly, the field has yet to fully theoretically integrate the interplay of how both forms of social exchange relationships work together simultaneously in team contexts.

On the one hand, the findings reported here corroborate the idea that LMX and TMX can both offer unique contributions to employees' critical work outcomes (as seen in the main hypotheses). On the other hand, high TMX can serve as substitute for the positive influence of LMX. That is, an employee with low LMX would need the benefits from high-TMX relationships, whereas an employee with high LMX already has fulfilled psychological needs. Employees would rely on such a leader only owing to the absence of substitute sources of feedback, support, and guidance. Even though it is generally believed that low LMX has a negative effect on employee outcomes, this is not the case when TMX is high. This argument is consistent with theories of leadership substitution (e.g. Kerr & Jermier, 1978), which suggest that subordinates' high quality exchange relationships with team members might serve as a substitute for leadership. Thus, this research contends that more scholarly attention should be focused on the horizontal exchange relationships among team members at the same level of the organization in order to foster a more complete application of both vertical and horizontal forms of social exchange to employees in team settings.

Second, beyond confirming the significant role of team members, this research also clarifies the boundary conditions for LMX influence. To this point, the main effect for LMX with respect to relating to different outcomes has been well studied in the field. Nevertheless, LMX theory has been criticized for failing to consider moderators and boundary conditions for relationships (e.g., Schriesheim, Castro, & Yammarino, 2000; Chang & Johnson, 2010; Erdogan & Liden, 2006). In particular, LMX scholars have continuously called for the study of individual-difference moderators to influence important work outcomes such as those of

performance and turnover (e.g., Gerstner & Day, 1997; Erdogan & Liden, 2002; Bauer, Erdogan, Liden & Wayne, 2006). Echoing these calls, and keeping in mind prior research that emphasizes the crucial role of follower's self-identity in leadership-related processes (Lord & Brown, 2004), this research shows how relational self-identity, as a trait-like characteristic, moderates the LMX-outcomes relationship. The results suggest that employees are likely to experience positive work outcomes only if they are high on both LMX and relational identity. Thus, followers actually benefit from high LMX only when they also have a strong relational identity. On the other hand, if followers have low relational identities, they have low propensity to relate to and trust their leaders in the leader–follower dyads, thereby making them less willing to accrue the benefits inherent in high-quality LMX relationships (e.g., guidance, social support, or promotion preferences). Typically, followers are assumed to always accept and value the benefits given by the leader via a high quality exchange relationship. Even though it is generally believed that LMX has positive effects, this is not true when a follower's relational identity is low. Therefore, this study refines the current consensus on the positive effects of LMX.

Third, uncovering significant moderating effects for the two team-type measures contributes to the growing, but still limited research on the investigation of cross-level interaction effects between interpersonal exchange relationships and team-level constructs (e.g., Cogliser & Schriesheim, 2000; Tse, Dasborough, & Ashkanasy, 2008; Liao, Liu, & Loi, 2010). Specifically, these results suggest that the effects of LMX are contingent upon team "authority differentiation" and that the effects of TMX are contingent upon team "skill differentiation." The results show that the team's authority and skill differentiation play opposite moderating roles, in that low authority differentiation neutralizes the positive effect of LMX (consistent with

the hypotheses), whereas high skill differentiation substitutes for the positive effect of TMX (inconsistent with the hypotheses).

Contrary to expectations, individuals with low TMX experienced higher levels of work outcomes when the teams' skill differentiation was high. In fact, the nature of the results was exactly opposite of what had been predicting that high team skill differentiation substituted for the positive relationship between TMX and work outcomes. Although speculative at this point, it may be the case that these results can be explained via the substantive research on interdependence in the literature.

In teams characterized by high skill differentiation, members typically possess unique skills and backgrounds that they use to complete a well-defined component of the team task, thus, they tend to be more interdependent on others to accomplish the tasks that require collective action in order to be completed successfully (Hollenbeck et al., 2002). Also, several other studies all suggest that high functional specialization in teams is generally related with high task interdependence (Kiggundu,1983; Morgeson & Humphrey, 2006; Van der Vegt, Van de Vliert & Oosterhof, 2003). This is because increasing functional specialization among team members makes it difficult for team members to complete each other's work. Thus, in teams with high skill differentiation, the horizontal interdependence among team members increases due to the non-substitutability of individual team members' work.

The positive relationship between horizontal interdependence and support or helping behavior among team members has long been reported in the literature (e.g., Anderson & Williams, 1996; Wageman & Baker, 1997; Drach-Zahavy, 2004). The explanations for this positive relationship are that, with high levels of functional specialization in teams, the interdependence nature of task itself increases (a) individuals feeling of accountable for other

members' outcomes (Kiggundu, 1983), (b) the need for helping to solve problems that arise (Anderson & Williams, 1996), and (c) the demands for communication and coordination (Thompson, 1967; Bunderson & Sutcliff, 2002).

According to Kiggundu (1981), high horizontal interdependence builds strong lateral ties between team members who need to give and receive information and resources to and from other team members. Also, high levels of interpersonal contact among team members and the interdependent nature of the workflow may make the identity of the team more salient to team members, thus increasing their psychological commitment to the team. Empirical evidence shows that individual-level task interdependence is positively associated with individual team commitment (Van der Vegt, Emans, & Van de Vliert, 2000, 2001).

Hence, the incremental contribution of a high quality TMX relationship should be higher for individuals in teams with low skill differentiations compared to individuals in teams with high skill differentiation, who must interact and exchange work-related expertise and feedback with other team members. Therefore, high skill differentiation substitutes for the positive influence of TMX when predicting employees' outcomes, that is, the outcomes are positive if either TMX or team skill differentiation is high.

In summary, the theoretical contributions of this research are twofold. First, the well-accepted consensus regarding many of the relationships between LMX and outcomes change when one also examines TMX, relational identity, and authority differentiation simultaneously. Second, the generally accepted consensus regarding the relationships between TMX and outcomes also change when one also examines LMX, collective identity, and skill differentiation simultaneously.

Implications for Practice

The results of the current study provide implications for how human resources (HR) practices could help to initiate, nurture, and extend employees' relationships with supervisors and peers at work.

Selection and Socialization Practices

LMX and TMX are two types of social exchange relationships not formally documented in job descriptions or organizational charts, hence, HR practices cannot force employees to interact and establish relationships with their supervisors or coworkers. Yet, HR practices can create conditions where those interactions are more likely to develop. First, HR can shape individual interaction patterns through selection criteria. Prior research has suggested that extraverts are more likely to seek interactions and interpersonal relations with others (Phillips & Bederian, 1994), and agreeableness is positively associated with cooperation, helping behavior, and adaptive social behaviors (Graziano, Habashi, Sheese, & Tobin, 2007). Accordingly, organizations should incorporate these personality factors and similar criteria, such as interpersonal skills, into their selection processes.

Moreover, my findings show that employees' low relational identity can neutralize the positive effect of LMX. Because of this, organizations should only select candidates with high relational identity in teams with high authority differentiation where the quality of relationship with the team leader (LMX) matters.

In addition, HR practices can help newly hired employees build relationships with their teammates (TMX) in a number of ways, especially in situations when LMX might be low. For example, during orientation, organizations should assign mentors (current employees in the team) to new team members. Such bonding opportunities help new team members become

socialized and lower the risk of isolation from the team. In the long run, the socialization process may lead to long-term high quality relationships between the newly hired employees and their teammates.

Trust Building Practices

High quality social exchange relationships (Blau, 1964) in terms of LMX and TMX, require trust between individuals. Therefore, organizations should design HR practices that increase employees' perceptions of trust towards their supervisors and teammates.

To build strong relationships with supervisors (LMX), previous research suggests that the degree to which performance appraisal procedures follow principles of procedural justice has a positive influence on employees' trust in their supervisors (Korsgaard & Roberson, 1995;Whitener, 1997; Whitener, Brodt, Korsgaard, & Werner, 1998). Hence, organizations should establish procedurally fair HR policies and offer leadership training to team supervisors. For example, when team supervisors appraise employees' performance, they need to provide regular and timely feedback, communicate openly and clearly, and incorporate employees' input into performance appraisal.

In addition, building strong relationships with the team (TMX) requires that people trust their teammates. In order to enhance trust between group members, the organization should provide group collaborative training to the group as a whole, because group training can help members to build both social and cognitive connection with each other. First, involvement in the group training, instead of individual training, enhances opportunities to interact with other group members. Second, group training promotes the development of transactive memory systems, which enables group members to create a shared awareness of who knows what in the team (Moreland & Myaskovsky, 2000). If group members need information or advice, they know

exactly from whom to seek help. In this way, group training provides an opportunity to increase the understanding and confidence in others' knowledge and skill, resulting in an increase in competence-based trust towards other group members. In addition, training may include content on general teamwork skills, such as adaptability, closed-loop communication, team leadership, back-up behavior, interpersonal relations, and conflict resolution (Salas & Cannon-Bowers, 2000). These skills may help employees proactively build up their own network of reciprocal social exchange relationships with other group members.

Placement Practices

Over the past decade, researchers have developed a structurally based, integrated theory of person-organization fit (Hollenbeck, 2000; Hollenbeck, Moon, Ellis, and colleagues, 2002). Their approach to fit identifies the need for achieving both a good internal fit between the person and the team structure as well as a good external fit between the team structure and its task environment.

Using the fit-approach, in the current study, *internal fit* means matching social exchange relationships (vertical LMX versus horizontal TMX) with people's identities (relational identity oriented versus collective identity oriented). On the other hand, *external fit* means matching social exchange relationships (vertical LMX versus horizontal TMX) with team structure (authority differentiation versus skill differentiation). For any type of social exchange relationship (either LMX or TMX) to have positive impact, it needs to be aligned both internally, in terms of who performs the work, and externally, in terms of the structure of the team in which the work takes place. Therefore, webs of social exchange relationships (vertical LMX versus horizontal TMX) serve as the central link between internal fit and external fit.

For internal fit, the current results imply that if employees have low relational identity orientation, the positive effects of LMX would diminish or even disappear. That is, LMX only matters for individuals with high relational identity orientation. As noted earlier, building and maintaining high quality social exchange relationships with the leader requires members to place a premium on the relationships they form. Therefore, a good internal fit requires high LMX members who also have high relational identity orientation.

For external fit, these results suggest that high LMX only matters for teams that have high authority differentiation, as high team authority differentiation increases the importance of the leader. In contrast, TMX only matters in teams with low skill differentiation. For example, when group members need certain information for work but cannot recall it themselves or mistrust their own memory, they can turn to each other for help. Therefore, when staffing teams with high authority differentiation, one should build teams with high LMX members. On the other hand, when staffing teams with low skill differentiation, one should build teams with high TMX members.

Supplemental Analyses

Two supplemental analyses were conducted. The objective of the first one is to examine more closely the impact of interactions between LMX and TMX controlling for team level nesting effects. Second, predictors are treated differently in HLM analyses by considering their relative, rather than absolute, influences on outcome variables.

First, across three samples, the ICC values for LMX and TMX were high only in Sample 2. As shown in Table 35, ICC (1) of LMX equals .37, which indicating that 37% of variance residing in between teams and members sharing a similar quality with their leader within a team. ICC (1) for TMX equals .58, which indicating that 58% of variance residing between teams and

members maintain a comparable quality of exchange relationships with other members in the team. Within-group consensus were reached for both LMX and TMX only in Sample 2, which means that the leader in Company B may have a strong leadership style across subordinates and that the team members share perceptions related to team cohesiveness. Thus, I aggregated LMX to group-level labeled as "Team-level LMX" and TMX to group-level labeled as "Team-level TMX". Regarding the influence of "Team-level LMX" and "Team-level TMX" on changes in intrinsic motivation, job satisfaction, job performance and retention, it is possible that the "Team-level LMX" or "Team-level TMX" may have impact on these outcomes. In other words, the "Team-level LMX" or "Team-level TMX" may have been driving a lot of the variance, thus not leaving much variance to reveal the interactive effects of LMX and TMX. Thus, I re-tested my Hypotheses 5 taking into account team-level LMX and team-level TMX as control variables.

Level-1 Model: $Job\ Satisfaction_{ij} = \beta_{0j} + \beta_{1j}*(LMX_{ij}) +$

$$\beta_{2j}*(TMX_{ij}) +$$

$$\beta_{3j}*(LMX * TMX_{ij}) + r_{ij} \quad (21)$$

Level-2 Model: $\beta_{0j} = \gamma_{00} + \gamma_{01}*(Team\text{-}level\ LMX_j) + \gamma_{02}*(Team\text{-}level\ TMX_j) + u_{0j}$ (22)

$$\beta_{1j} = \gamma_{10} + u_{1j} \quad (23)$$

$$\beta_{2j} = \gamma_{20} + u_{2j} \quad (24)$$

$$\beta_{3j} = \gamma_{30} + u_{3j} \quad (25)$$

As shown in Table 36, neither "Team-level LMX" nor "Team-level TMX" had any main effects on outcomes. Furthermore, the interactive effect between LMX and TMX did not differ substantively from the original analyses. In this alternative analysis, the interactive effect between LMX and TMX were the same as the original analyses for predicting intrinsic

motivation, job performance, and retention, whereas the effect size increased ($\gamma = -1.12, p < .01$) for predicting job satisfaction.

The second supplemental analysis I conducted involved using alternative centering of LMX and TMX in testing for both the main effects and the moderated influence of LMX and TMX on outcomes. I changed the way in which predictors are treated in HLM analyses by considering their relative, rather than absolute, effects on outcomes. My original tests of the interactive effect of LMX and TMX utilized grand-mean centering of predictors; though, this does not consider within-group differences in terms of such predictors. For example, in determining the influence of LMX on group member outcomes, any relative standing for an individual to the LMXs of coworkers within the team is not taken into account.

In this supplemental analysis, I instead used group-mean centering of both LMX and TMX in order to take such within-team differences into account and thereby examine the relative impact on outcomes. By group-mean centering LMX, it measured a focal individual's LMX relative to the LMXs of coworkers within the team (relative LMX, or RLMX). On the other hand, by group-mean centering TMX, it measured a focal individual's TMX relative to the TMXs of coworkers within the team (relative TMX, or RTMX).

Table 37 shows the results for the main effects of RLMX and RTMX on outcomes. After group-mean centering LMX and TMX, the main effects of RLMX became not significant with respect to both intrinsic motivation ($\gamma = .45, p > .05$) and job satisfaction ($\gamma = 3.06, p > .05$) in Sample 1. And the main effect of RTMX was not significant to predict job satisfaction ($\gamma = 1.63, p > .05$) in Sample 2 and retention in Sample 3 ($\gamma = .10, p > .05$). Table 38 shows the results for the interactive effects of RLMX and RTMX on outcomes. In contrast to the original analysis, after group-mean centering LMX and TMX, the interaction between RLMX and RTMX was

significant with respect to intrinsic motivation (γ=-.98,p<. 05) in Sample 1. However, the interaction effect became not significant with respect to job performance (γ=-.20,p>.05) and retention (γ=-.12,p>.05) in Sample 2.

Although it is difficult to draw the conclusion on which predictors centering methods work better in terms of the criterion-related validity based on the results in Table 37 and Table 38, I believe it suggests a very interesting finding.

Limitations

Although a number of interesting findings arose from this study, several limitations remain. First, in this study, data were obtained from three companies in China. Although replicating the general pattern of relationships across three settings shows the strength of the study, there are limitations with regards to the findings' generalizability to other countries and settings. The participants in this study were from China, a country where cultural values are different from countries in the West (e.g., Hofstede & Hofstede, 2005). Thus, it is worth considering the extent to which the findings are culturally specific.

For example, supervisor-subordinate relationships in Chinese work contexts place more emphasis on the hierarchical role relations with large power distance. Western interpersonal networks typically have lower power distance between dyadic members (Cheng & Rosett, 1991). According to Yang and colleagues (1989), people with strong traditional Chinese values display more respect and submission to authority. They would generalize their attitudes towards their head of family to the heads of organizations or larger social units in a paternalistic fashion (Fahr, Warley & Lin, 1997).

As such, traditional Chinese employees would see their general manager or their immediate supervisor as a parent figure, and give them complete submission and faithfulness as

sons and daughters (Yang, 1993). In return, employees believe that their superviosrs should offer support, protection, respect and trust in the way similar to a father (Hui, Lee, & Rousseau, 2004). For this reason, it is reasonable to expect that the contents and dimensions of LMX in China would be different from its Western counterpart. Indeed, when developing an indigenous measure of LMX in China, Wang, Liu, and Law (2007) found that there are three etic dimensions that are common to the results in Western literature (i.e., contribution, liking, and loyalty, see Liden & Maslyn, 1998). Two emic dimensions that are specific to the Chinese organizational context were closeness and personal interaction. The former was defined as the ability of two parties in a dyad to easily interact. The latter referred to the potential for the interaction between dyadic members in their private lives (Wang, Liu, & Law, 2007). These two emic dimensions were considered to capture the specific influence of the traditional Confucianism on interpersonal relationships between supervisors and subordinates in Mainland China. In the West, such a paternalistic or otherwise overly personal relationship would often be considered intrusive by the employee and would likely hurt the supervisor-subordinate relationship (Pellegrini & Scandura, 2006). Thus, differences are likely to exist between Western and Chinese employees' receptions of LMX, as well as those in other higher power distance societies (Pellegrini & Scandura, 2006). For this reason, future studies that aim to replicate my findings in other cultures would be useful.

Second, all variables in Hypotheses 1 through 9, except for job performance, were measured from the subordinates' subjective perceptions. One major concern associated with using self-report measures is that self-ratings may be biased. On the one hand, for the predictors such as LMX, although no study has quantified the amount of "true" LMX captured by self-ratings as compared to other ratings, a recent meta-analytic study by Sin, Nahrgang, and

Morgeson (2009) shed some light on this issue. Sin and colleagues found that the overall true score correlation between leaders' and members' ratings of LMX was moderate ($\rho = .37$). They further summarized the factors that influence the extent of leader–member congruence in their LMX ratings. For example, the extent of LMX agreement increased as the length of relationship tenure and intensity of dyadic interactions increased, but there was only weak support for the notion that supervisors generally inflated their LMX ratings. In my study, LMX was measured only from subordinates' perspective, as time limitations for completing the survey did not allow the measurement of LMX from the supervisor's perspective. Future research should seek to measure LMX from both the employee and managerial perspectives. The use of standardized measures will facilitate valid comparisons across countries and enable the isolation of cultural effects and other moderators.

On the other hand, for outcome variables such as job performance, among the three broad types of factors that influence performance ratings (namely, the ratee's actual job performance, various rater biases in the perception and recall of that performance, and measurement error, see Wherry & Bartlett, 1982), the influence of the latter two factors on self-ratings may be larger than their influence on other-ratings of job performance. Ideally, the rating variance associated with the performance of the ratee should be large relative to the variance associated with the bias of the rater. However, using two large data sets of managers who received developmental ratings on three performance dimensions (human. technology and administrative) from seven raters (two bosses, two peers, two subordinates, and oneself), Scullen, Mount, and Goff (2000) found that idiosyncratic rater effects accounted for over half of the rating variance (62% in sample one, and 53% in sample two). Although all types of ratings were fairly idiosyncratic in nature, their findings showed that idiosyncratic variance was to a lesser extent in supervisor ratings, compared

with in peers, subordinate, and self-ratings. In the current study, subordinates' job performance was measured from supervisor's perspective. Again, time and organizational limitations prevented access to performance measurement from external sources, such as customers and suppliers or from objective indicators.

One related concern of using self-rated measures of dependent variables (intrinsic motivation, job satisfaction, and intention to stay) is that employees might be inclined to over-report their work outcomes due to social desirability. Overall, inflated ratings would likely result in range restriction for self-reported scores. A lack of variance would then attenuate the estimated relationship between these three dependent variables and other variables. However, this bias is not likely to be a severe problem in this study because the scale statistics were generally consistent with those reported in previous studies that used the same self-ratings measures (e.g., for *intrinsic motivation*, see Piccolo & Colquit, 2006; for *job satisfaction*, see Liden, Wayne & Sparrowe, 2000; for *intention to stay*, see Shore & Martin, 1989). Also, self-rated measures of intrinsic motivation, job satisfaction, and intention to stay each showed significant relationships with theoretically related variables (e.g., LMX), including the variable (e.g., job performance) obtained from another source (i.e., supervisor). Hence, this provides some support for the validity of self-rated measures.

Another criticism of using self-report measures is their susceptibility to common method bias (Crampton & Wagner, 1994). To address this concern, a two-phase data collection was conducted with LMX, TMX, and identity orientations (relational and collective) collected at time one, and work outcomes variables (intrinsic motivation, job satisfaction, intention to stay) collected at time two. Temporal spacing such as this can assist to decrease the threat of common method variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Also, this issue is somewhat

mitigated by the focus on interactions, which are less vulnerable to same-source bias relative to main effects. (Schriesheim & DeNisi,1981).

Furthermore, this study explicitly proposed individual-level between-person relationships. Given that both LMX and TMX quality were theorized to develop over a series of testing episodes through repeated interactions between both parties (Graen & Scandura, 1987; Seers, 1989), it would be interesting to test whether the findings replicate within individuals (Liden, Wayne, & Stilwell, 1993). Perhaps the perceptions of LMX and TMX quality vary over time based on discrete events and interactions that elicit within-individual changes in work outcomes. For example, a longitudinal study of new recruits could help to establish the developmental trajectory of both LMX and TMX over time. Using quadratic growth-curve analysis, the level of relationship quality at the initial interaction (intercept) could be assessed, as well as the rate of change in the relationship quality over time (e.g., a linear growth). If relationship quality with other team members (TMX) is more dynamic than the relationship quality with the team leader (LMX), there may be greater within-person variance in outcome variables (e.g. intrinsic motivation) corresponding to the fluctuations in members' perceptions of TMX.

Finally, another limitation to be noted is the relative strong relationship between LMX and TMX in all three samples. One major object of this dissertation is to study the substitutive type of interaction effect between LMX and TMX to predict work outcomes, however, a very strong correlation between these two variables limits the degree to which one can detect the interaction effect in certain contexts. When testing the interaction effect of LMX and TMX, the product of LMX*TMX is quite strongly correlated with either LMX or TMX, because the interaction term is completely determined by LMX and TMX. Also, if LMX and TMX are

highly correlated with each other, there is substantial "overlap" among three explanatory variables in the equation as below.

$$E(y) = \alpha + \beta_1 LMX + \beta_2 TMX + \beta_3 LMX * TMX \quad (26)$$

Since considerable overlap occurs in the variation in y that is explained by LMX, TMX and also by LMX*TMX, the partial variability explained by each is relatively small. For instance, much of the predictive power contained in the product term LMX*TMX is also contained in LMX and TMX. The unique contribution of the interaction effect of LMX*TMX to the model is relatively small and nonsignificant, when LMX and TMX are in the model. Furthermore, the substantial "overlap" between LMX*TMX and other predictors in the model would inflate the standard errors for estimates of regression parameter β_3 in the model. The standard error of the estimator of the coefficient of LMX*TMX (β_3) equals as the equation below,

$$se = \frac{1}{\sqrt{1-R^2_{LMX*TMX}}}\left[\frac{s}{\sqrt{n-1}s_{LMX*TMX}}\right] \quad (27)$$

Where $S_{LMX*TMX}$ is the sample standard deviation of the interaction term LMX * TMX, and $R_{LMX*TMX}$ is the multiple correlation from the regression of the interaction term LMX*TMX on the other predictor. Because LMX *TMX overlaps substantially with the predictors (LMX, TMX), $R^2_{LMX*TMX}$ is large for predicting LMX* TMX using the other predictors (LMX, TMX). As such, the standard error of the estimator of the coefficient of LMX*TMX (β_3) is relatively large. Then the confidence interval for β_3 is wide, and the test of H_0: $\beta_3 = 0$ has large P-value unless the sample size is very large. Hence, a very strong relationship between LMX and TMX make it difficult to assess the partial effect of the interaction LMX*TMX, especially when the sample size is very small.

To understand why the correlations between LMX and TMX across the three samples were so high, I conducted a phone interview with the HR manager from Company B, whose sample had the highest correlation between LMX and TMX. Company B is a traditional state-owned enterprise in China where all the decisions and planning are made by the managers in the upper echelons of the hierarchy and lower-level managers have little authority to make decisions. In order to efficiently communicate in a top-down manner, Company B encourages lower-level managers to build good relationships with "core members" in their group, who are the most active ones interacting with other group members. Leadership in this case means the process of influencing the group through peer pressure from the "core members" of the group, who also serve as the important intermediate link to help facilitate the acceptance and implementation of orders from the manager while avoid any confrontations from other group members. Thus, for any member, good relations with the rest of the team become a necessity to be close to the group leader. "Indeed, for any group member to be considered for a promotion or pay raise, relations with other group members are a key factor" the HR manager said. Thus, these reasons above may be a possible explanation for the high correlation between LMX and TMX from the sample of Company B.

Among the thirteen studies that were finally selected for the meta-analytic review of past research, the reported Pearson correlations between LMX and TMX varied from -0.36 (lowest) to 0.68 (highest). Also, the Q statistic reported ($Q = 220.51$, $p < .01$) suggests that the relationships summarized between LMX and TMX varied across samples, which indicates that moderators might be present. Thus, I examined the possible moderating effects of some potential differences in these thirteen studies, for example, the cultural characteristics of participant locations.

High Power Distance versus Low Power Distance Studies Hofstede's (1991) power distance index and classification (normed from 0 to 100 with a score of 100 representing a high degree of power distance). Across thirteen countries in which the studies were conducted, India, Mainland China and Hong Kong all ranked high on power distance, whereas, the United States and Australia ranked low on power distance. Italy ranked at the middle, because Northern Italy was low on power distance and southern Italy was high. The results showed that the estimated correlation between LMX and TMX was stronger in high power distance samples (ρ=. 21, k=4, N=1,706; CI = .04, .38) than in low power distance samples (ρ= .14, k=8, N=1,580; CI = -.07, .34). This difference, however, was not statistically significant as indicated by the overlap in confidence intervals.

Collectivism versus Individualism Studies Hofstede's (1991) individualism index and classification (normed from 0 to 100 with a score of 100 representing a high degree of individualism). Countries classified as having collectivist cultures were those that scored low (35 or below, such as Mainland China and Hong Kong), while countries classified as having an individualist culture scored high (60 or above, such as United States and Australia). One study from India was scored with a rather intermediate score of 48, which suggests a society with both collectivistic and individualistic traits. The results showed that the estimated correlation between LMX and TMX was stronger in the individualism samples (ρ=. 22, k=9, N=1,769; CI = -.02, .46) than in the collectivism samples (ρ= .16, k=2, N=1,245; CI = -.08, .40). However, the confidence interval overlapped, which means that the difference was not statistically significant based on whether the culture was collectivism or individualism.

Therefore, the results of the moderator analyses suggest that neither of the potential cultural characteristics moderators tested above accounted for the significant variance in the

relationship between LMX and TMX. Because the meta-analytic result indicated that significant variation existed between LMX and TMX, more future research needs to be conducted to follow-up analyses searching for the moderators for the relationship between LMX and TMX.

Future Research

Several issues should be investigated in future research. First, drawing on self-determination theory, I argued that both TMX and LMX have the potential to meet the same employee needs and thus act as substitutes when it comes to predicting critical outcomes. Underlying these predictions is the notion that needs fulfillment can explain the black box between social exchange relationships and its consequences, providing a social psychological explanation for the benefits of LMX and TMX in teams. Future research needs to directly examine how needs fulfillment mediates the impact of TMX and LMX on members' work outcomes. Further, as individuals exhibit differences in their reactions to different types of social exchange relationships, this may have important consequences for how individuals fulfill their three basic psychological needs in different team structures. Thus, more effort in this regard needs to study the boundary conditions that qualify the links between social exchange relationships and needs fulfillment. For example, I can propose that the indirect effect of LMX on work outcomes via needs fulfillment is moderated by team authority differentiation.

The Moderating Role of Team Authority Differentiation In a team with high authority differentiation, the decision-making responsibility is vested in the formal leader (Hollenbeck, Beersma, & Schouten, 2012). When team leaders have more power, they will be able to benefit more from a relatively high LMX relationship. For example, a powerful leader can offer economic resources (e.g., superior work assignments and career opportunities) to a high LMX member. Hence, leaders who control discretionary rewards and have decision authority are more

likely to show high LMX members the path to desired outcomes and assistant them overcome the frustration through difficulties. This enhances high LMX members' belief on successfully performing a specific task or achieving higher work goals, which fulfill their need for competence. In addition, a powerful leader is more capable to mobile organizational resources to sponsor a work idea or plan generated by a high LMX member. This gives high LMX members' greater latitude and degrees of freedom at work, which fulfill their need for autonomy.

Instead, in a team with low authority differentiation, team members all basically possess equal amounts of power (Hollenbeck, Beersma & Schouten, 2012). Leaders in such teams have less power to allocate organizational resources or make personal preference decisions for high LMX members (e.g., promotion, pay raise, etc.). What leaders may offer are mainly social emotional supports, such as respect, praise and trust, which merely fulfill high LMX member need for relatedness, but not the others two needs. Thus, in low authority differentiation teams, high LMX members are not in position to receive valuable organizational resources from their leaders, such that, members are likely to attribute less value to the benefits offered through these social exchange relations. As a result, LMX may not have a strong effect on employees' needs fulfillment because low team authority differentiation would neutralize the positive effects of high LMX.

On the other hand, for low LMX members, there were no differences between those in teams with high authority differentiation and teams with low authority differentiation. Members with low LMX are unlikely to gain any benefits from leaders whether the leaders are powerful or not. Thus, there should be no difference in their psychological needs fulfillment that low LMX members would experience. In both teams, low LMX members are unlikely to have needs fulfilled from social exchange relationships with the leader. Therefore, members will experience

needs fulfillment only if they are high on both LMX and high in authority differentiation. Thus, I would propose: *A team's authority differentiation moderates the relationship between LMX and needs fulfillment, such that, the positive relationships is stronger when the team's authority differentiation is higher.*

According to self-determination theory (Deci & Ryan, 1985), needs fulfillment can be perceived as psychological nutrition that allows individuals to flourish. Once the basic needs are fulfilled, in work domain, there are substantial supports for the positive relationships between needs fulfillment and work outcomes, for example, intrinsic motivation (e.g., Richer, Blanchard, & Vallerand, 2002), job satisfaction (e.g., Ilardi, Leone, Kasser & Ryan,1993), job performance (e.g., Baard, Deci &Ryan, 2000) and retention (e.g., Vansteenkiste, Neyrinck, Niemiec, Soenens, Witte & Van den Broeck, 2007). Thus, it is reasonable to further expect that the needs fulfillment caused by the positive interaction between LMX and team authority differentiation in turn contributes to work outcomes above. Putting these arguments together, I can expect that team authority differentiation to moderate the indirect effect of LMX on a team member's work outcomes via needs fulfillments. Thus, I would further propose: *The indirect effect of LMX on work outcomes (intrinsic motivation, job satisfaction, job performance, and retention) via needs fulfillment is moderated by team authority differentiation, such that, the indirect effect is more positive when team authority differentiation is high than when it is low.*

Second, as suggested above, any individual could be simultaneously high on both LMX and TMX, low on both–or most critically–high on one but low on the other. This study focused on the nature of interaction between LMX and TMX to predict outcome variables; however, the ultimate focus is on antecedents to explain the level of members' LMX and TMX, especially with those where the two relationships go in opposite directions (members who have high TMX

but low LMX or low TMX but high LMX). These issues have yet to be explored. Thus, future research on LMX-TMX incongruence would be interesting to pursue, in order isolate the causes and meanings attached to situations where a person is tightly linked their leader, but not their team, or tightly linked to the team but not their leader.

Third, whereas current study focuses on individual-level relationships, future research ought to also examine LMX and TMX at the team level. For example, LMX and TMX variability within-team (LMX differentiation and TMX differentiation) may trump or neutralize the strength of the relationships between social exchange relationship (LMX and TMX) and outcomes at the individual-level.

Fourth, beyond LMX and TMX, examining the quality of relationship with the organization (perceived organizational support, POS), is a natural evolution of research on workplace social exchange relationships. The field clearly needs an integrative, cross-level theory for understanding the influence and interactions between the three domains social exchanges in the workplace.

Finally, future research should test if the results in this study could be generalized to other countries with different cultures. As argued previously, the theoretical perspectives in this study were not limited to a specific country, and its variables and measures are likely to be helpful in cross-cultural and cross-national studies. Thus, it is meaningful to verify the cross-cultural validity of the theories in multiple studies conducted in various national or cultural contexts. The current study provides a stimulus for future research to further increase our knowledge of leadership and its substitutes.

APPENDICES

APPENDIX A: Tables and Figures

Table 1 Meta-Analysis Results for TMX-LMX Relationship

Variable	k	N	r	ρ	SD_ρ	90% CV Lower	90% CV Upper	95% CI Lower	95% CI Upper
TMX – LMX	13	3,475	.18	.21	.28	-.15	.58	.06	.37

Notes: k = number of correlations. N = combined sample size. ρ = estimated true score correlation. SD_ρ = standard deviation of true score correlation. CV = Credibility interval. CI = Confidence interval.

Table 2 Summary of the antecedents and consequences of LMX and TMX

Antecedents	Consequences
Common:	**Common:** • Self-efficacy • (New Technology) Perceived usefulness • Job Satisfaction • Organizational commitment • Creativity
Unique(LMX): • Follower characteristics (e.g., competence and personality) • Leader characteristics (e.g., personality and behavior) • Interpersonal relationship characteristics (e.g., liking/trust and follower ingratiation)	**Unique(LMX):**
Unique(TMX): • Workplace friendship • Feedback environment	**Unique(TMX):**
Countervailing: • Actual *vs.* Perceived value similarity • The extend of telecommuting	**Countervailing:**

Table 3 Research Design Review

	Measured in Phase 1	Measured in Phase 2
Antecedents:		
• LMX • TMX	**X**	
Outcomes:		
• Intrinsic Motivation • Job Satisfaction • Job Performance • Retention		**X**
Moderators:		
• Authority Differentiation • Skill Differentiation • Relational Identity • Collective Identity	**X**	

Table 4 ICC (1), ICC (2), $r_{wg(j)}$ for the TDI Long Form

Measure	ICC (1)	ICC (2)	$r_{wg(j)}$ (mean)
Sample 1			
(N=133 at level 1; N = 32 at level 2)			
Authority Differentiation	.48	.79	.93
Skill Differentiation	.48	.79	.83
Sample 2			
(N=439 at level 1; N = 61 at level 2)			
Authority Differentiation	.49	.87	.78
Skill Differentiation	.43	.84	.81
Sample 3			
(N=243 at level 1; N = 18 at level 2)			
Authority Differentiation	.29	.85	.85
Skill Differentiation	.39	.90	.98

Table 5 Level of Constructs and Measurement

Construct	Level of Construct	Level of Measurement	Aggregation Involved
Antecedents:			
LMX	Individual	Individual	No
TMX	Individual	Individual	No
Outcomes:			
Intrinsic Motivation	Individual	Individual	No
Job Satisfaction	Individual	Individual	No
Job Performance	Individual	Individual	No
Retention	Individual	Individual	No
Moderators:			
Relational Identity	Individual	Individual	No
Collective Identity	Individual	Individual	No
Authority Differentiation	Group	Individual	Yes
Skill Differentiation	Group	Individual	Yes

Table 6 Individual-level Descriptive Statistics, and Intercorrelations among Measures, and Data Sources and Collection Schedule

Variable	Data Source	M	SD	1	2	3	4	5	6	7	8
Level 1 variables											
1. Intrinsic Motivation	Follower T2	5.18	0.78								
2. Job Satisfaction	Follower T2	35.35	10.29	.39**							
3. Job Performance	Leader	5.40	0.84	.37**	.37**						
4. Intention to Stay	Follower T2	3.79	0.83	.35**	.68**	.33**					
5. LMX	Follower T1	3.80	0.66	.45**	.58**	.47**	.58**				
6. TMX	Follower T1	5.57	0.88	.42**	.57**	.42**	.49**	.68**			
7. Relational Identity	Follower T1	5.41	1.07	-.06	.15**	.05	.27**	.14**	-.09*		
8. Collective Identity	Follower T1	5.86	0.88	.36**	.46**	.29**	.45**	.52**	.66**	.18**	
Level 2 variables											
1. Authority Differentiation	Follower T1	3.55	1.26								
2. Skill Differentiation	Follower T1	3.55	1.25	-.19**							

Note. Combined 3 Samples: n = 815 at level 1; n= 111 at level 2. * $p < .05$. ** $p < .01$ (2-tailed).

Table 7 Individual-level Descriptive Statistics, and Intercorrelations among Measures, and Data Sources and Collection Schedule (Sample 1)

Variable	Data Source	M	SD	1	2	3	4	5	6	7	8
Level 1 variables											
1. Intrinsic Motivation	Follower T2	5.11	1.07								
2. Job Satisfaction	Follower T2	31.06	10.47	.40**							
3. Job Performance	Leader	5.48	.72	.43**	.31**						
4. Intention to Stay	Follower T2	3.45	.75	.36**	.63**	.25**					
5. LMX	Follower T1	3.51	.60	.42**	.48**	.56**	.48**				
6. TMX	Follower T1	5.46	.70	.33**	.39**	.24**	.22**	.50**			
7. Relational Identity	Follower T1	5.13	.98	-.09	-.06	-.10	.01	.03	-.49**		
8. Collective Identity	Follower T1	5.90	.70	.34**	.43**	.16	.39**	.38**	.57**	-.16	
Level 2 variables											
1. Authority Differentiation	Follower T1	3.21	1.61								
2. Skill Differentiation	Follower T1	2.77	1.56	-.26**							

Note. Sample 1: n = 133 at level 1; n = 32 at level 2. . * $p < .05$. ** $p < .01$ (2-tailed).

Table 8 Individual-level Descriptive Statistics, and Intercorrelations among Measures, and Data Sources and Collection Schedule (Sample 2)

Variable	Data Source	M	SD	1	2	3	4	5	6	7	8
Level 1 variables											
1. Intrinsic Motivation	Follower T2	5.16	.74								
2. Job Satisfaction	Follower T2	33.39	8.96	.38**							
3. Job Performance	Leader	5.20	.88	.37**	.26**						
4. Intention to Stay	Follower T2	3.53	.71	.34**	.54**	.20**					
5. LMX	Follower T1	3.67	.68	.48**	.52**	.39**	.51**				
6. TMX	Follower T1	5.30	.94	.48**	.54**	.40**	.41**	.68**			
7. Relational Identity	Follower T1	5.03	1.03	-.13**	-.18**	-.12*	-.11*	-.15**	-.49**		
8. Collective Identity	Follower T1	5.61	1.01	.41**	.43**	.24**	.36**	.49**	.61**	-.06	
Level 2 variables											
1. Authority Differentiation	Follower T1	3.52	1.26								
2. Skill Differentiation	Follower T1	3.43	1.30	-.26**							

Note. Sample 2: n = 439 at level 1; n = 61 at level 2. . * $p < .05$. ** $p < .01$ (2-tailed).

Table 9 Individual-level Descriptive Statistics, and Intercorrelations among Measures, and Data Sources and Collection Schedule (Sample 3)

Variable	Data Source	M	SD	1	2	3	4	5	6	7	8
Level 1 variables											
1. Intrinsic Motivation	Follower T2	5.26	.63								
2. Job Satisfaction	Follower T2	41.24	9.95	.44**							
3. Job Performance	Leader	5.70	.72	.38**	.47**						
4. Intention to Stay	Follower T2	4.45	.69	.47**	.73**	.38**					
5. LMX	Follower T1	4.18	.45	.52**	.55**	.51**	.45**				
6. TMX	Follower T1	6.11	.58	.46**	.56**	.32**	.41**	.60**			
7. Relational Identity	Follower T1	6.24	.65	-.05	.28**	-.01	.36**	.16*	.28**		
8. Collective Identity	Follower T1	6.30	.45	.29**	.45**	.17**	.43**	.48**	.66**	.65**	
Level 2 variables											
1. Authority Differentiation	Follower T1	3.80	0.95								
2. Skill Differentiation	Follower T1	4.18	0.41	-.43**							

Note. Sample 3: n = 243 at level 1; n = 18 at level 2.. * $p < .05$. ** $p < .01$ (2-tailed).

Table 10 Moderated Regression Analysis Results

	Intrinsic Motivation		Job Satisfaction		Job Performance		Intention to Stay	
	D1	D2	D1	D2	D1	D2	D1	D2
Variables	β	β	β	β	β	β	β	β
Main	.16**	.16**	-.11**	-.11**	.13**	-.07	-.25**	-.36**
Interaction: D x LMX	.01	-.13	-.10*	-.25**	-.04	-.18*	-.03	-.09
Main	.09*	.18**	-.16**	-.06	.01	-.11*	-.32**	-.35**
Interaction: D x TMX	-.00	-.12	-.10**	-.31**	-.05	-.03	-.08*	-.15*
Main	.20**.	.19**	-.12**	-.12**	.07	-.10*	-.22**	-.37**
Interaction: D x LMX x TMX	-.22**	-.31*	-.12**	-.07	-.04	-.12	-.13**	.08
Main	.16**	.20**	-.12**	-.09*	.10*	-.09	-.20**	-.26**
Interaction: D x LMX x Relational Identity	.10**	.20*	.00	-.05	-.02	.06	.03	-.02
Main	.03	.19**	-.20**	-.09*	-.03	-.12**	-.31**	-.32**
Interaction: D x TMX x Collective Identity	.03	-.41*	-.06	-.44**	.04	-.32	-.11**	-.60**

Note. [a] n = 815. * $p < .05$. ** $p < .01$
Sample 1 (D1=1, D2=0); sample 2 (D1=0, D2=1); sample 3 (D1=0, D2=0)

Table 11 HLM Results: Main and Interaction Effects of LMX, TMX, and the Identity Constructs (Sample 1)

	Intrinsic Motivation						
	Model	Model	Model	Model	Model	Model	Model
Variables	1	2	3	4	5	6	7
Intercept	5.15**	5.33**	5.17**	5.05**	5.21**	4.97**	5.16**
Level-1 Independent Variables							
LMX	.49* **(H1a)**	.33	.79**		.62**		.58**
TMX	.34* **(H1b)**	.41**		.30		.66**	.65**
Relational Identity			.01			.10	.15
Collective Identity				.40*	.34**		.19
Level-1Interactions							
LMX x TMX		-.42**(H5a)**					-1.25**
LMX x Relational Identity			.37 **(H6a)**				-.17
TMX x Collective Identity				.28* **(H7a)**			.60**
LMX x Collective Identity					-.35		-.19
TMX x Relational Identity						-.41	-.26

Note.
Sample 1: n = 133 at level 1; n = 32 at level 2. * $p < .05$. ** $p < .01$

Table 12 HLM Results: Main and Interaction Effects of LMX, TMX, and the Identity Constructs (Sample 1)

	Job Satisfaction						
	Model	Model	Model	Model	Model	Model	Model
Variables	1	2	3	4	5	6	7
Intercept	30.54**	32.20**	30.47**	30.34**	31.10**	30.23**	30.85**
Level-1 Independent Variables							
LMX	5.80** **(H2a)**	6.30**	8.40**		6.99**		5.84**
TMX	3.76* **(H2b)**	4.01**		4.76*		8.01**	4.55*
Relational Identity			.41			1.64	1.56
Collective Identity				4.20*	4.08**		1.79
Level-1Interactions							
LMX x TMX		-8.36** **(H5b)**					-6.02*
LMX x Relational Identity			7.01** **(H6b)**				4.01*
TMX x Collective Identity				1.03**(H7b)**			.51
LMX x Collective Identity					-1.65		1.30
TMX x Relational Identity						-.80	-1.82

Note.
Sample 1: n = 133 at level 1; n = 32 at level 2. * $p < .05$. ** $p < .01$

Table 13 HLM Results: Main and Interaction Effects of LMX, TMX, and the Identity Constructs (Sample 1)

	Job Performance						
	Model	Model	Model	Model	Model	Model	Model
Variables	1	2	3	4	5	6	7
Intercept	5.52**	5.56**	5.54**	5.46**	5.54**	5.46**	5.52**
Level-1 Independent Variables							
LMX	.66** **(H3a)**	.68**	.55**		.65**		.82**
TMX	-.10 **(H3b)**	-.13		.27		.28*	-.05
Relational Identity			-.03			.01	-.10
Collective Identity				.08	-.02		-.03
Level-1Interactions							
LMX x TMX		-.16 **(H5c)**					-.48**
LMX x Relational Identity			.07 **(H6c)**				-.12
TMX x Collective Identity				.26***(H7c)**			.22
LMX x Collective Identity					-.00		-.06
TMX x Relational Identity						-.14	-.02

Note.
Sample 1: n = 133 at level 1; n = 32 at level 2. * $p < .05$. ** $p < .01$

Table 14 HLM Results: Main and Interaction Effects of LMX, TMX, and the Identity Constructs (Sample 1)

	Retention						
	Model	Model	Model	Model	Model	Model	Model
Variables	1	2	3	4	5	6	7
Intercept	3.40**	3.56**	3.41**	3.44**	3.50**	3.39**	3.47**
Level-1 Independent Variables							
LMX	.52** **(H4a)**	.61**	.65**		.60**		.62**
TMX	.09 **(H4b)**	.15		.18		.42**	.04
Relational Identity			.08			.11	.08
Collective Identity				.31*	.23*		.17
Level-1Interactions							
LMX x TMX		-.66**(H5d)					-.49**
LMX x Relational Identity			.55** **(H6d)**				.28
TMX x Collective Identity				-.16 **(H7d)**			-.06
LMX x Collective Identity					-.34*		.04
TMX x Relational Identity						-.03	-.19

Note. Sample 1: n = 133 at level 1; n = 32 at level 2. * $p < .05$. ** $p < .01$

Table 15 HLM Results: Main and Interaction Effects of LMX, TMX, and the Team Type Constructs (Sample 1)

	Intrinsic Motivation						
	Model	**Model**	**Model**	**Model**	**Model**	**Model**	**Model**
Variables	1	2	3	4	5	6	7
Intercept	5.15**	5.33**	5.14**	5.14**	5.14**	5.13**	5.26**
Level-1 Independent Variables							
LMX	.49*	.33	.71**		.76**		.26
TMX	.34*	.41**		.61**		.62**	.41*
Level-2 Independent Variables							
Authority Differentiation			-.11			-.11	-.01
Skill Differentiation				.12	.12		.00
Level-1Interactions							
LMX x TMX		-.42					-.53
Cross-level Interactions							
LMX x Authority Differentiation			.28**(H8a)**				.23
TMX x Skill Differentiation				-.33** **(H9a)**			.03
LMX x Skill Differentiation					-.22		.07
TMX x Authority Differentiation						.16	.02

Note. Sample 1: n = 133 at level 1; n = 32 at level 2. * $p < .05$. ** $p < .01$

Table 16 HLM Results: Main and Interaction Effects of LMX, TMX, and the Team Type Constructs (Sample 1)

	Job Satisfaction						
	Model	Model	Model	Model	Model	Model	Model
Variables	1	2	3	4	5	6	7
Intercept	30.54**	32.20**	30.85**	30.80**	30.83**	30.82**	31.42**
Level-1 Independent Variables							
LMX	5.80**	6.30**	6.01**		6.73**		2.10
TMX	3.76*	4.01**		6.47**		7.24**	5.63**
Level-2 Independent Variables							
Authority Differentiation			-2.61**			-2.59*	-2.94**
Skill Differentiation				.66	.67		-.76
Level-1Interactions							
LMX x TMX		-8.36**					-4.39*
Cross-level Interactions							
LMX x Authority Differentiation			2.40***(H8b)**				2.42**
TMX x Skill Differentiation				-4.26** **(H9b)**			-4.79**
LMX x Skill Differentiation					-2.45**		1.64
TMX x Authority Differentiation						.82	-2.39**

Note. Sample 1: n = 133 at level 1; n = 32 at level 2. * $p < .05$. ** $p < .01$

Table 17 HLM Results: Main and Interaction Effects of LMX, TMX, and the Team Type Constructs (Sample 1)

	Job Performance						
	Model	Model	Model	Model	Model	Model	Model
Variables	1	2	3	4	5	6	7
Intercept	5.52**	5.56**	5.50**	5.49**	5.50**	5.49**	5.50**
Level-1 Independent Variables							
LMX	.66**	.68**	.57**		.62**		.62**
TMX	-.10	-.13		.19		.19	-.21*
Level-2 Independent Variables							
Authority Differentiation			-.06			-.06	-.01
Skill Differentiation				.03	.04		-.04
Level-1Interactions							
LMX x TMX		-.16					-.10
Cross-level Interactions							
LMX x Authority Differentiation			.24* **(H8c)**				.01
TMX x Skill Differentiation				-.36** **(H9c)**			-.04
LMX x Skill Differentiation					-.24*		-.10
TMX x Authority Differentiation						.29**	.09

Note. Sample 1: n = 133 at level 1; n = 32 at level 2. * $p < .05$. ** $p < .01$

Table 18 HLM Results: Main and Interaction Effects of LMX, TMX, and the Team Type Constructs (Sample 1)

	Retention						
	Model	Model	Model	Model	Model	Model	Model
Variables	1	2	3	4	5	6	7
Intercept	3.40**	3.56**	3.44**	3.44**	3.45**	3.44**	3.52**
Level-1 Independent Variables							
LMX	.52**	.61**	.46**		.51**		.37**
TMX	.09	.15		.37**		.42**	.21*
Level-2 Independent Variables							
Authority Differentiation			-.14			-.14	-.11
Skill Differentiation				.10	.10		.03
Level-1Interactions							
LMX x TMX		-.66**					-.45**
Cross-level Interactions							
LMX x Authority Differentiation			.18* **(H8d)**				.20*
TMX x Skill Differentiation				-.27** **(H9d)**			-.20**
LMX x Skill Differentiation					-.13		.05
TMX x Authority Differentiation						.03	-.17**

Note. Sample 1: n = 133 at level 1; n = 32 at level 2. * $p < .05$. ** $p < .01$

Table 19 HLM Results: Main and Interaction Effects of LMX, TMX, and the Identity Constructs (Sample 2)

	Intrinsic Motivation						
	Model	Model	Model	Model	Model	Model	Model
Variables	1	2	3	4	5	6	7
Intercept	5.20**	5.24**	5.22**	5.22**	5.25**	5.16**	5.22**
Level-1 Independent Variables							
LMX	.34** **(H1a)**	.35**	.48**		.41**		.36**
TMX	.27****(H1b)**	.16*		.25**		.41**	.08
Relational Identity			-.00			.06	.00
Collective Identity				.10	.14**		.08
Level-1Interactions							
LMX x TMX		-.26** **(H5a)**					-.10
LMX x Relational Identity			.26****(H6a)**				.23
TMX x Collective Identity				-.12** **(H7a)**			.00
LMX x Collective Identity					-.19**		-17*
TMX x Relational Identity						-.04	-.11

Note.
Sample 2: n = 439 at level 1; n = 61 at level 2. * $p < .05$. ** $p < .01$

Table 20 HLM Results: Main and Interaction Effects of LMX, TMX, and the Identity Constructs (Sample 2)

	Job Satisfaction						
	Model	Model	Model	Model	Model	Model	Model
Variables	1	2	3	4	5	6	7
Intercept	33.78**	34.11**	34.02**	33.90**	34.36**	34.39**	35.29**
Level-1 Independent Variables							
LMX	3.94** **(H2a)**	4.20**	5.92**		5.70**		4.87**
TMX	2.96** **(H2b)**	2.60**		4.22**		4.79**	1.63
Relational Identity			-.96*			.54	-.30
Collective Identity				.78	1.18		.60
Level-1Interactions							
LMX x TMX		-1.05** **(H5b)**					-.34
LMX x Relational Identity			2.30** **(H6b)**				1.75*
TMX x Collective Identity				-.24 **(H7b)**			-.02
LMX x Collective Identity					-1.91**		-1.70
TMX x Relational Identity						1.75	1.40

Note.
Sample 2: n = 439 at level 1; n = 61 at level 2. * $p < .05$. ** $p < .01$

Table 21 HLM Results: Main and Interaction Effects of LMX, TMX, and the Identity Constructs (Sample 2)

	Job Performance						
	Model	Model	Model	Model	Model	Model	Model
Variables	1	2	3	4	5	6	7
Intercept	5.29**	5.33**	5.28**	5.28**	5.30**	5.33**	5.38**
Level-1 Independent Variables							
LMX	.35****(H3a)**	.32**	.50**		.50**		.34**
TMX	.23****(H3b)**	.13*		.38**		.39**	.09
Relational Identity			-.05			.05	.01
Collective Identity				-.07	-.03		-.01
Level-1Interactions							
LMX x TMX		-.27** **(H5c)**					-.24**
LMX x Relational Identity			.17* **(H6c)**				.06
TMX x Collective Identity				-.08* **(H7c)**			.06
LMX x Collective Identity					-.23**		-.11
TMX x Relational Identity						.22**	.19*

Note.
Sample 2: n = 439 at level 1; n = 61 at level 2. * $p < .05$. ** $p < .01$

Table 22 HLM Results: Main and Interaction Effects of LMX, TMX, and the Identity Constructs (Sample 2)

	Retention						
	Model	Model	Model	Model	Model	Model	Model
Variables	1	2	3	4	5	6	7
Intercept	3.56**	3.58**	3.57**	3.57**	3.58**	3.59**	3.64**
Level-1 Independent Variables							
LMX	.47****(H4a)**	.48**	.50**		.49**		.50**
TMX	.06 **(H4b)**	.03		.23**		.31**	-.02
Relational Identity			-.00			.07	-.02
Collective Identity				.08	.06		.07
Level-1Interactions							
LMX x TMX		-.11****(H5d)**					-.03
LMX x Relational Identity			.21****(H6d)**				.19
TMX x Collective Identity				-.04***(H7d)**			-.02
LMX x Collective Identity					-.10*		-.09
TMX x Relational Identity						.11	.08

Note. Sample 2: n = 439 at level 1; n = 61 at level 2. * $p < .05$. ** $p < .01$

Table 23 HLM Results: Main and Interaction Effects of LMX, TMX, and the Team Type Constructs (Sample 2)

	Intrinsic Motivation						
	Model	Model	Model	Model	Model	Model	Model
Variables	1	2	3	4	5	6	7
Intercept	5.20**	5.24**	5.15**	5.15**	5.15**	5.15**	5.22**
Level-1 Independent Variables							
LMX	.34**	.35**	.51**		.45**		.35**
TMX	.27**	.16*		.36**		.42**	.22**
Level-2 Independent Variables							
Authority Differentiation			-.17**			-.17**	-.15**
Skill Differentiation				.12*	.12*		.02
Level-1Interactions							
LMX x TMX		-.26**					-.18**
Cross-level Interactions							
LMX x Authority Differentiation			.49** **(H8a)**				.23*
TMX x Skill Differentiation				-.29** **(H9a)**			.07
LMX x Skill Differentiation					-.39**		-.15
TMX x Authority Differentiation						.21**	-.14

Note. Sample 2: n = 439 at level 1; n = 61 at level 2. * $p < .05$. ** $p < .01$

Table 24 HLM Results: Main and Interaction Effects of LMX, TMX, and the Team Type Constructs (Sample 2)

	Job Satisfaction						
	Model	Model	Model	Model	Model	Model	Model
Variables	1	2	3	4	5	6	7
Intercept	33.78**	34.11**	33.36**	33.41**	33.40**	33.36**	33.35**
Level-1 Independent Variables							
LMX	3.94**	4.20**	5.55**		4.90**		4.55**
TMX	2.96**	2.60**		3.18**		3.78**	1.09
Level-2 Independent Variables							
Authority Differentiation			-3.08**			-3.05**	-2.62**
Skill Differentiation				2.17**	2.19**		.96
Level-1Interactions							
LMX x TMX		-1.05**					.25
Cross-level Interactions							
LMX x Authority Differentiation			2.81** **(H8b)**				1.84
TMX x Skill Differentiation				-2.76** **(H9b)**			-2.05
LMX x Skill Differentiation					-3.13**		.01
TMX x Authority Differentiation						1.80	-.55

Note. Sample 2: n = 439 at level 1; n = 61 at level 2. * $p < .05$. ** $p < .01$

Table 25 HLM Results: Main and Interaction Effects of LMX, TMX, and the Team Type Constructs (Sample 2)

	Job Performance						
	Model	Model	Model	Model	Model	Model	Model
Variables	1	2	3	4	5	6	7
Intercept	5.29**	5.33**	5.19**	5.19**	5.19**	5.19**	5.26**
Level-1 Independent Variables							
LMX	.35**	.32**	.54**		.44**		.35**
TMX	.23**	.13*		.32**		.41**	.14*
Level-2 Independent Variables							
Authority Differentiation			-.15*			-.15*	-.15
Skill Differentiation				.09.	.08		-.00
Level-1Interactions							
LMX x TMX		-.27**					-.18*
Cross-level Interactions							
LMX x Authority Differentiation			.52** **(H8c)**				.08
TMX x Skill Differentiation				-.42** **(H9c)**			-.01
LMX x Skill Differentiation					-.58**		-.28**
TMX x Authority Differentiation						.38**	-.00

Note. Sample 2: n = 439 at level 1; n = 61 at level 2. * $p < .05$. ** $p < .01$

Table 26 HLM Results: Main and Interaction Effects of LMX, TMX, and the Team Type Constructs (Sample 2)

	Retention						
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Intercept	3.56**	3.58**	3.52**	3.53**	3.53**	3.52**	3.50**
Level-1 Independent Variables							
LMX	.47**	.48**	.51**		.48**		.52**
TMX	.06	.03		.13*		.21**	-.03
Level-2 Independent Variables							
Authority Differentiation			-.19**			-.19**	-.18**
Skill Differentiation				.14*	.14*		.06
Level-1Interactions							
LMX x TMX		-.11**					.05
Cross-level Interactions							
LMX x Authority Differentiation			.29** **(H8d)**				.25**
TMX x Skill Differentiation				-.27** **(H9d)**			-.19*
LMX x Skill Differentiation					-.24**		.01
TMX x Authority Differentiation						.18*	.01

Note. Sample 2: n = 439 at level 1; n = 61 at level 2. * $p < .05$. ** $p < .01$

Table 27 HLM Results: Main and Interaction Effects of LMX, TMX, and the Identity Constructs (Sample 3)

	Intrinsic Motivation						
	Model	Model	Model	Model	Model	Model	Model
Variables	1	2	3	4	5	6	7
Intercept	5.32**	5.33**	5.19**	5.18**	5.29**	5.14**	5.19**
Level-1 Independent Variables							
LMX	.52* **(H1a)**	.32*	.33**		.44*		.03
TMX	.21** **(H1b)**	.20*		.38**		.04	-.23
Relational Identity			-.04			-.37**	.10
Collective Identity				-.17	.23		.27
Level-1Interactions							
LMX x TMX		-.22 **(H5a)**					.15
LMX x Relational Identity			1.25** **(H6a)**				3.80
TMX x Collective Identity				.49 **(H7a)**			1.76
LMX x Collective Identity					.44		-3.49
TMX x Relational Identity						1.09*	-1.24

Note.
Sample 3: n = 243 at level 1; n = 18 at level 2.* $p < .05$. ** $p < .01$

Table 28 HLM Results: Main and Interaction Effects of LMX, TMX, and the Identity Constructs (Sample 3)

	Job Satisfaction						
	Model	Model	Model	Model	Model	Model	Model
Variables	1	2	3	4	5	6	7
Intercept	42.29**	43.61**	42.42**	41.66**	43.98**	42.01**	45.72**
Level-1 Independent Variables							
LMX	10.81** **(H2a)**	5.77*	17.52**		13.18**		6.20*
TMX	4.94** **(H2b)**	5.87**		10.07**		13.73**	7.11**
Relational Identity			.62			-1.32	.87
Collective Identity				2.45	5.92*		7.91*
Level-1Interactions							
LMX x TMX		-10.76** **(H5b)**					-13.98**
LMX x Relational Identity			-4.98* **(H6b)**				6.14
TMX x Collective Identity				-4.73* **(H7b)**			1.83
LMX x Collective Identity					-11.35*		-2.47
TMX x Relational Identity						-5.75**	-11.94**

Note.
Sample 3: n = 243 at level 1; n = 18 at level 2.* $p < .05$. ** $p < .01$

Table 29 HLM Results: Main and Interaction Effects of LMX, TMX, and the Identity Constructs (Sample 3)

	Job Performance						
	Model	Model	Model	Model	Model	Model	Model
Variables	1	2	3	4	5	6	7
Intercept	5.75**	5.84**	5.71**	5.67**	5.74**	5.73**	5.80**
Level-1 Independent Variables							
LMX	.97**(**H3a**)	.62**	.89**		.92**		.38*
TMX	-.03 (**H3b**)	-.01		.51**		.43**	.12
Relational Identity			-.13			-.17	-.13
Collective Identity				-2.90	-.16		.24**
Level-1Interactions							
LMX x TMX		-.92** (**H5c**)					-1.08**
LMX x Relational Identity			.22(**H6c**)				1.01*
TMX x Collective Identity				.16 (**H7c**)			1.37**
LMX x Collective Identity					.06		-.93*
TMX x Relational Identity						.02	-1.16*

Note.
Sample 3: n = 243 at level 1; n = 18 at level 2.* $p < .05$. ** $p < .01$

Table 30 HLM Results: Main and Interaction Effects of LMX, TMX, and the Identity Constructs (Sample 3)

	Retention						
	Model	Model	Model	Model	Model	Model	Model
Variables	1	2	3	4	5	6	7
Intercept	4.57**	4.58**	4.55**	4.37**	4.58**	4.44**	4.65**
Level-1 Independent Variables							
LMX	.69**(**H4a**)	52**	.70**		.60*		.13
TMX	.15* (**H4b**)	.18*		.32		.29*	.07
Relational Identity			.13			.03	.19
Collective Identity				.23	.37*		.21
Level-1Interactions							
LMX x TMX		-.32 (**H5d**)					-1.14**
LMX x Relational Identity			.34** (**H6d**)				1.67**
TMX x Collective Identity				.35* (**H7d**)			1.66**
LMX x Collective Identity					.05		-1.24**
TMX x Relational Identity						.39**	-1.31**

Note. Sample 3: n = 243 at level 1; n = 18 at level 2.* $p < .05$. ** $p < .01$

Table 31 HLM Results: Main and Interaction Effects of LMX, TMX, and the Team Type Constructs (Sample 3)

	Intrinsic Motivation						
	Model	Model	Model	Model	Model	Model	Model
Variables	1	2	3	4	5	6	7
Intercept	5.32**	5.33**	5.27**	5.27**	5.27**	5.27**	5.33**
Level-1 Independent Variables							
LMX	.52*	.32*	63**		.64**		.29*
TMX	.21**	.20*		.49**		.49**	.18**
Level-2 Independent Variables							
Authority Differentiation			-.27**			-.27**	-.06
Skill Differentiation				.66**	.66**		.35
Level-1Interactions							
LMX x TMX		-.22					-.25
Cross-level Interactions							
LMX x Authority Differentiation			.63* **(H8a)**				.79
TMX x Skill Differentiation				-.87* **(H9a)**			.08
LMX x Skill Differentiation					-1.28*		.59
TMX x Authority Differentiation						.30	-.49

Note. Sample 3: n = 243 at level 1; n = 18 at level 2.* $p < .05$. ** $p < .01$

Table 32 HLM Results: Main and Interaction Effects of LMX, TMX, and the Team Type Constructs (Sample 3)

	Job Satisfaction						
	Model	Model	Model	Model	Model	Model	Model
Variables	1	2	3	4	5	6	7
Intercept	42.29**	43.61**	41.31**	41.33**	41.34**	41.29**	42.85**
Level-1 Independent Variables							
LMX	10.81**	5.77*	13.87**		14.89**		7.24**
TMX	4.94**	5.87**		10.62**		10.11**	5.00**
Level-2 Independent Variables							
Authority Differentiation			-1.56			-1.48	1.92
Skill Differentiation				5.67*	5.78*		8.35
Level-1Interactions							
LMX x TMX		-10.76**					-9.88**
Cross-level Interactions							
LMX x Authority Differentiation			12.99** **(H8b)**				4.78
TMX x Skill Differentiation				-18.98** **(H9b)**			5.51
LMX x Skill Differentiation					-22.56**		-8.92
TMX x Authority Differentiation						8.56**	.78

Note. Sample 3: n = 243 at level 1; n = 18 at level 2.* $p < .05$. ** $p < .01$

Table 33 HLM Results: Main and Interaction Effects of LMX, TMX, and the Team Type Constructs (Sample 3)

	Job Performance						
	Model	Model	Model	Model	Model	Model	Model
Variables	1	2	3	4	5	6	7
Intercept	5.75**	5.84**	5.72**	5.72**	5.72**	5.72**	5.88**
Level-1 Independent Variables							
LMX	.97**	.62**	.83**		.84**		,61**
TMX	-.03	-.01		.46**		.44**	-.09
Level-2 Independent Variables							
Authority Differentiation			-.21*			-.21*	.08
Skill Differentiation				.64*	.64*		.83
Level-1Interactions							
LMX x TMX		-.92**					-1.01
Cross-level Interactions							
LMX x Authority Differentiation			.50 **(H8c)**				-.21
TMX x Skill Differentiation				-1.25* **(H9c)**			1.74
LMX x Skill Differentiation					-1.14**		-1.17
TMX x Authority Differentiation						.52	.56

Note. Sample 3: n = 243 at level 1; n = 18 at level 2.* $p < .05$. ** $p < .01$

Table 34 HLM Results: Main and Interaction Effects of LMX, TMX, and the Team Type Constructs (Sample 3)

	Retention						
	Model	Model	Model	Model	Model	Model	Model
Variables	1	2	3	4	5	6	7
Intercept	4.57**	4.58**	4.46**	4.47**	4.47**	4.46**	4.51**
Level-1 Independent Variables							
LMX	.69**	.52**	.59**		.67**		,47**
TMX	.15*	.18*		.48**		.44**	.09
Level-2 Independent Variables							
Authority Differentiation			-.19			-.19	.02
Skill Differentiation				.50*	.51*		.55
Level-1Interactions							
LMX x TMX		-.32					-.27
Cross-level Interactions							
LMX x Authority Differentiation			1.43** **(H8d)**				.41
TMX x Skill Differentiation				-1.45** **(H9d)**			.12
LMX x Skill Differentiation					-2.61**		-1.87**
TMX x Authority Differentiation						.68**	.07

Note. Sample 3: n = 243 at level 1; n = 18 at level 2.* $p < .05$. ** $p < .01$

Table 35 ICC (1), ICC (2) for LMX and TMX

Measure	ICC (1)	ICC (2)
Sample 1		
(N=133 at level 1; N = 32 at level 2)		
LMX	.20	.50
TMX	.11	.32
Sample 2		
(N=439 at level 1; N = 61 at level 2)		
LMX	.37	.80
TMX	.58	.91
Sample 3		
(N=243 at level 1; N = 18 at level 2)		
LMX	.30	.86
TMX	.15	.71

Table 36 HLM Results: Moderation Effects (LMX *TMX) Controlling for Team-level LMX and Team-level TMX

Variables	Intrinsic Motivation	Job Satisfaction	Job Performance	Retention
Intercept				
Sample 2	5.25**	34.08**	5.33**	3.58**
Team-level LMX				
Sample 2	.15	1.39	-.02	.02
Team-level TMX				
Sample 2	-.19	.37	.02	.03
LMX				
Sample 2	.34**	3.85**	.32**	.46**
TMX				
Sample 2	.22**	2.20*	.13	.00
LMX x TMX	**(H5a)**	**(H5b)**	**(H5c)**	**(H5d)**
Sample 2	-.26**	-1.12**	-.27**	-.11**

Note.
Sample 2: n = 439 at level 1; n = 61 at level 2
* $p < .05$ ** $p < .01$

Table 37 HLM Results: Main Effects

Variables	Intrinsic Motivation	Job Satisfaction	Job Performance	Retention
Intercept				
Sample 1	5.13**	30.79**	5.50**	3.44**
Sample 2	5.15**	33.45**	5.19**	3.53**
Sample 3	5.26**	41.29**	5.72**	4.46**
RLMX	**(H1a)**	**(H2a)**	**(H3a)**	**(H4a)**
Sample 1	.45	3.06	.72**	.38*
Sample 2	.36**	4.15**	.35**	.50**
Sample 3	.46*	11.53**	1.02**	.69**
RTMX	**(H1b)**	**(H2b)**	**(H3b)**	**(H4b)**
Sample 1	.42*	5.81**	-.14	.22
Sample 2	.29**	1.63	.21**	-.02
Sample 3	.23**	4.97**	-.06	.10

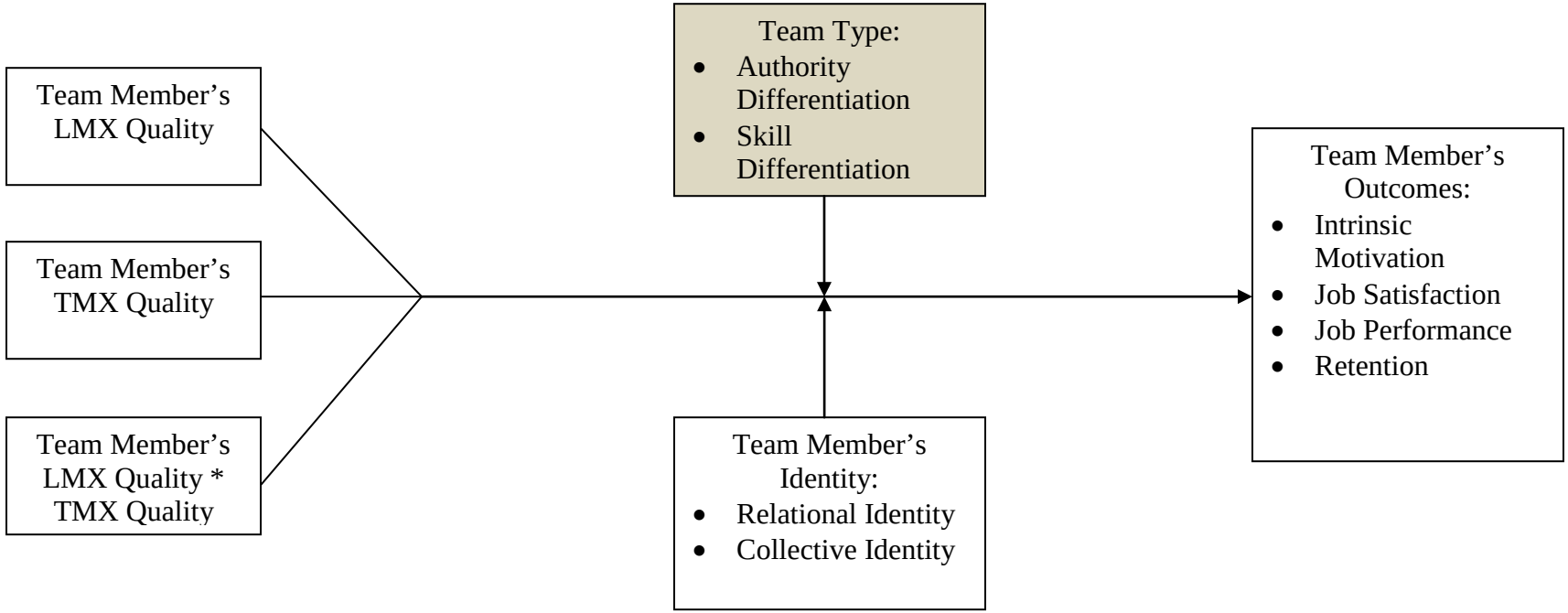
Note.
Sample 1: n = 133 at level 1; n = 32 at level 2. Sample 2: n = 439 at level 1; n = 61 at level 2. Sample 3: n = 243 at level 1; n = 18 at level 2.
* $p < .05$ ** $p < .01$

Table 38 HLM Results: Moderation Effects of Group Mean Center LMX and TMX

Variables	Intrinsic Motivation	Job Satisfaction	Job Performance	Retention
Intercept				
Sample 1	5.34**	31.69**	5.53**	3.49**
Sample 2	5.20**	33.84**	5.26**	3.55**
Sample 3	5.31**	42.44**	5.82**	4.47**
RLMX				
Sample 1	.47	3.64*	.65**	.42**
Sample 2	.32**	4.13**	.22**	.53**
Sample 3	.33	8.33**	.70**	.64**
RTMX				
Sample 1	.46**	5.63**	-.14*	.21
Sample 2	.27**	1.37	.13	-.00
Sample 3	.26**	6.00**	-.01	.14
RLMX x RTMX	**(H5a)**	**(H5b)**	**(H5c)**	**(H5d)**
Sample 1	-.98*	-7.66*	-.05	-.42*
Sample 2	-.34**	-2.21**	-.20	-.12
Sample 3	-.35	-10.84**	-.91**	-.15

Note.
Sample 1: n = 133 at level 1; n = 32 at level 2. Sample 2: n = 439 at level 1; n = 61 at level 2. Sample 3: n = 243 at level 1; n = 18 at level 2.
* $p < .05$ ** $p < .01$

Figure 1Theoretical Model[1]



[1] Shaded boxes present team-level constructs; white boxes present individual-level constructs.

Figure 2 Type of Moderator: Substitute

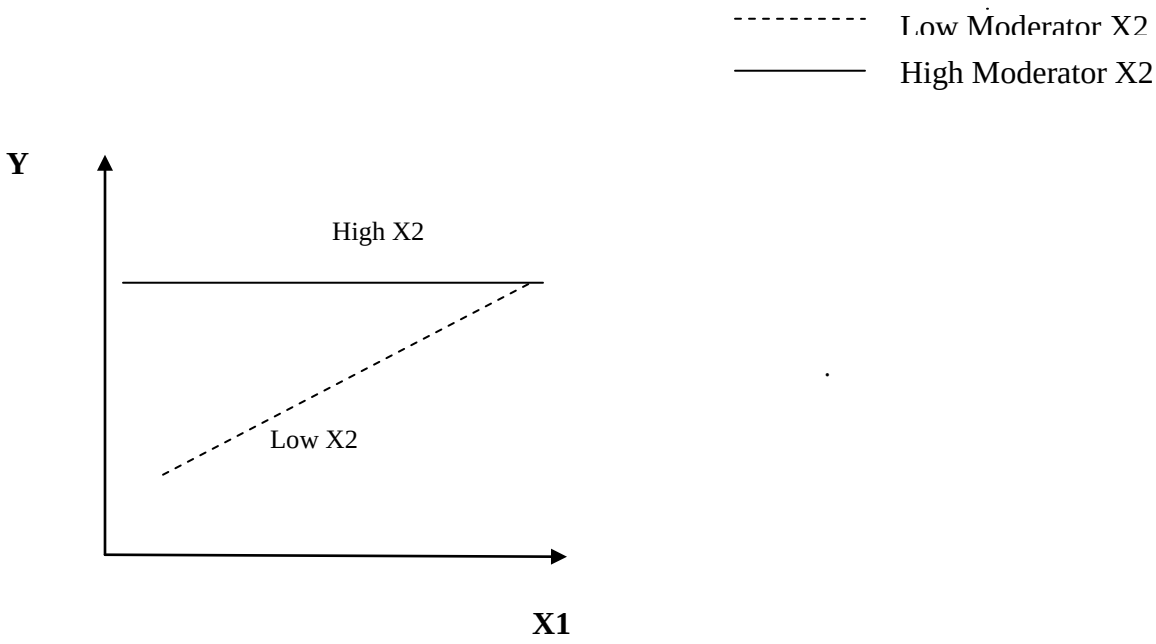


Figure 3 Type of Moderator: Neutralizer

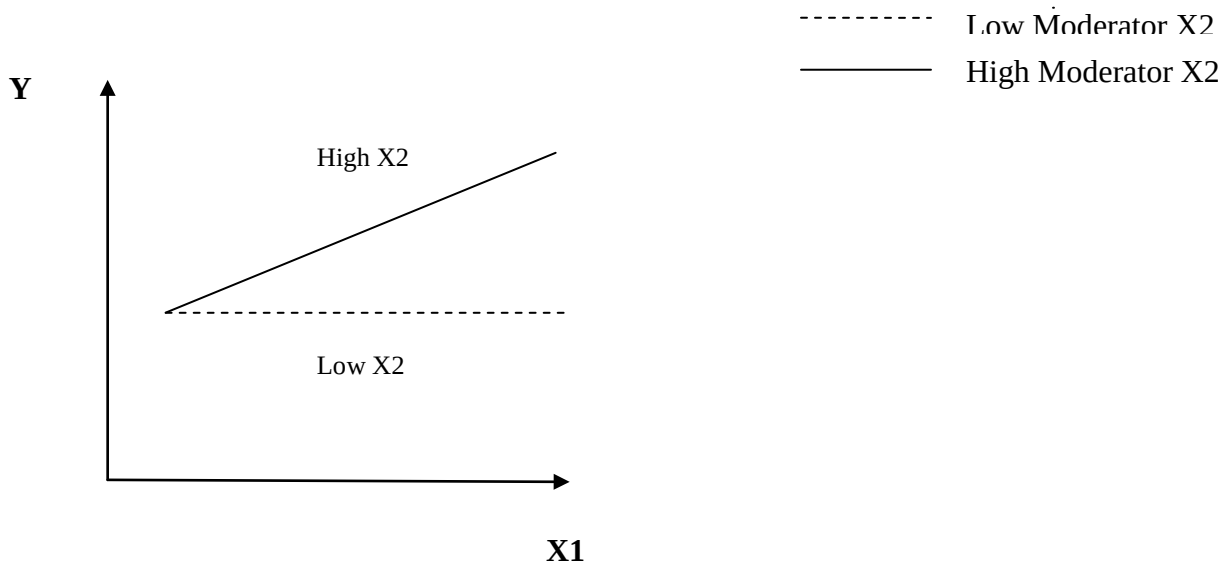


Figure 4 The Interaction Effect of TMX and LMX on Job Satisfaction (Sample 1)

Figure 5 The Interaction Effect of TMX and LMX on Retention (Sample 1)

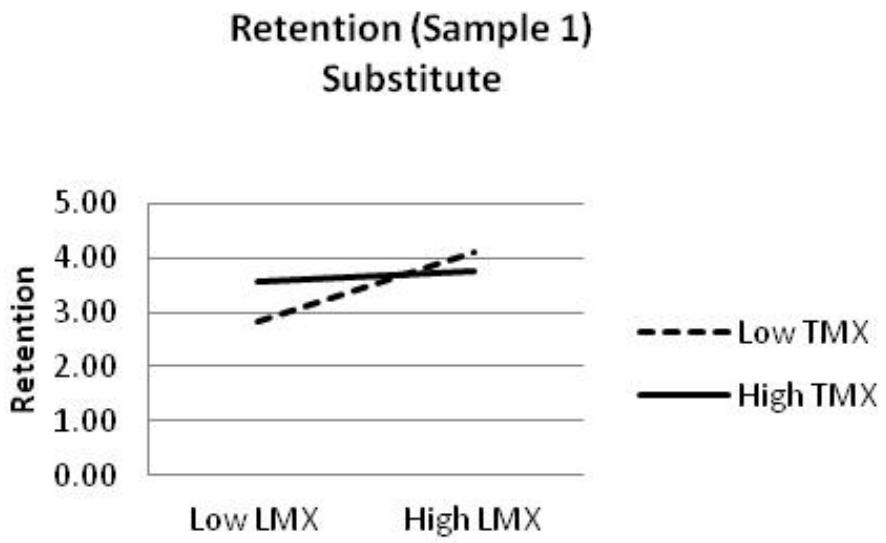


Figure 6 The Interaction Effect of LMX and TMX on Intrinsic Motivation (Sample 2)

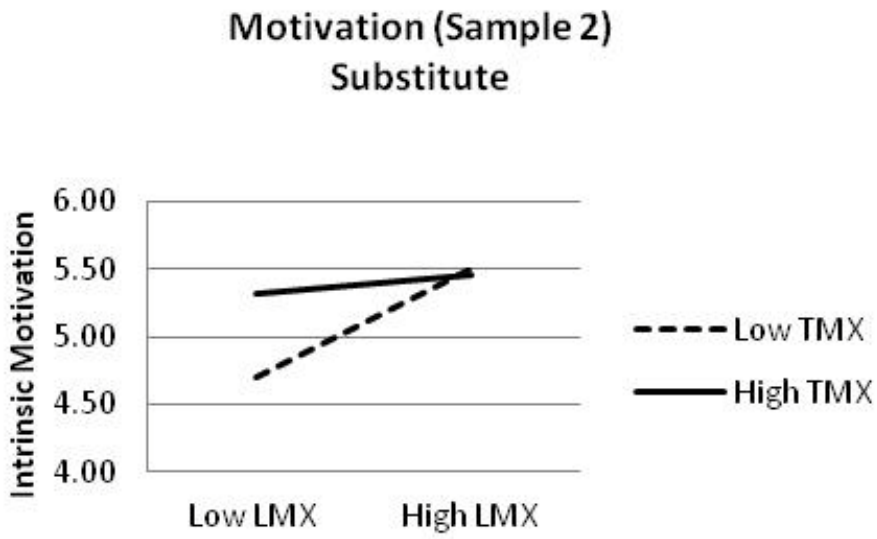


Figure 7 The Interaction Effect of LMX and TMX on Job Satisfaction (Sample 2)

Figure 8 The Interaction Effect of LMX and TMX on Job Performance (Sample 2)

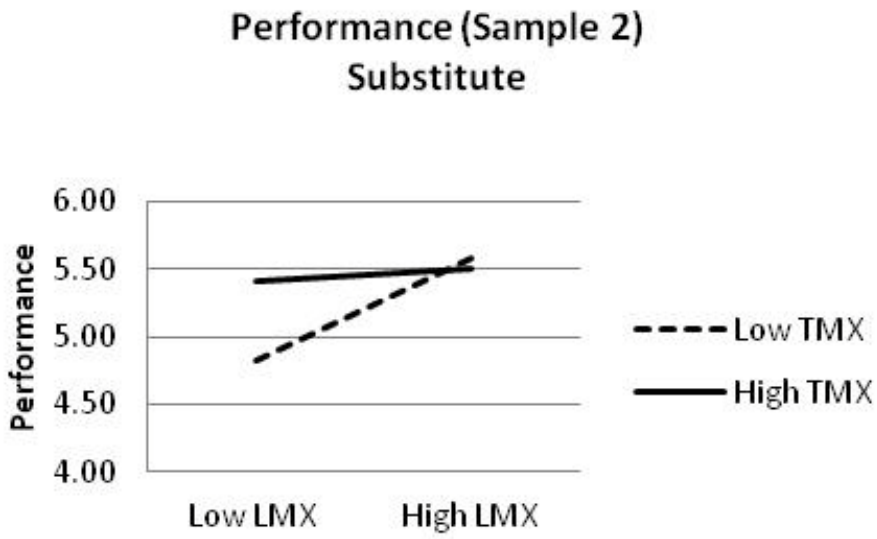


Figure 9 The Interaction Effect of LMX and TMX on Retention (Sample 2)

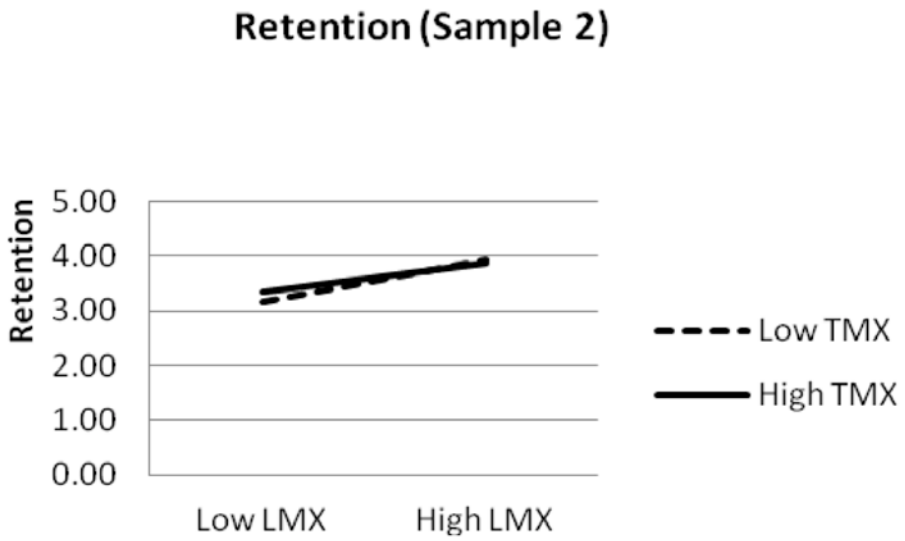


Figure 10 The Interaction Effect of LMX and TMX on Job Satisfaction (Sample 3)

Figure 11 The Interaction Effect of LMX and TMX on Job Performance (Sample 3)

Figure 12 The Interaction Effect of LMX and Relational Identity on Job Satisfaction (Sample 1)

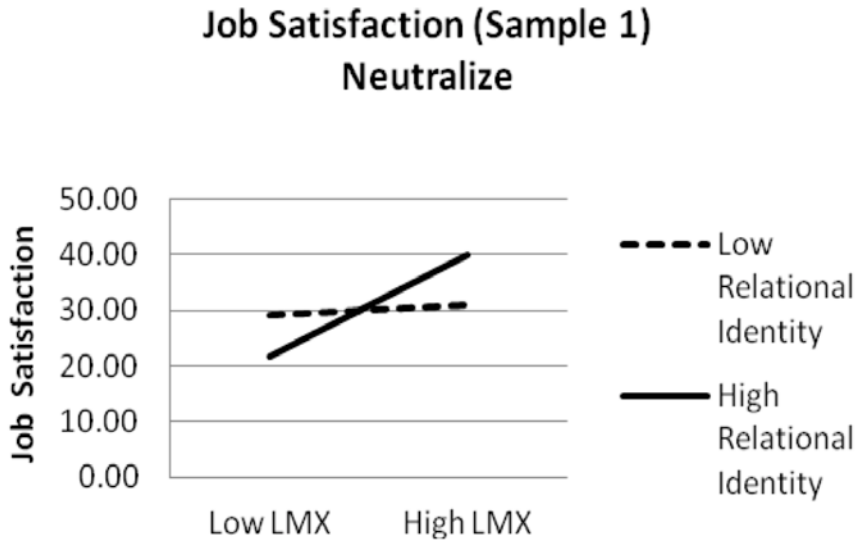


Figure 13 The Interaction Effect of LMX and Relational Identity on Retention (Sample 1)

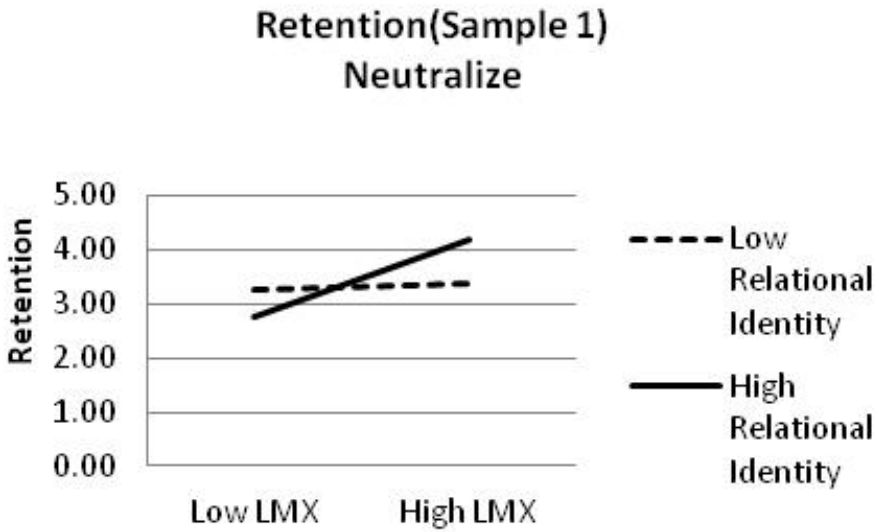


Figure 14 The Interaction Effect of LMX and Relational Identity on Intrinsic Motivation (Sample 2)

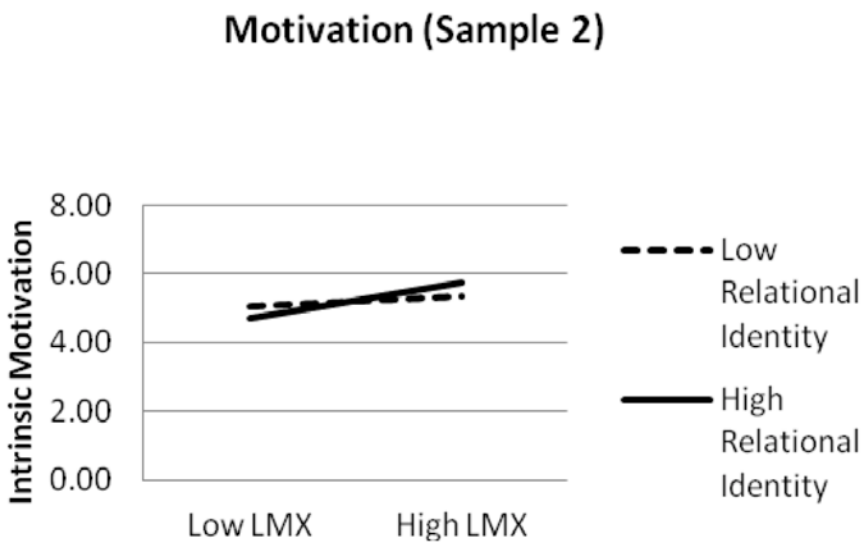


Figure 15 The Interaction Effect of LMX and Relational Identity on Job Satisfaction (Sample 2)

Figure 16 The Interaction Effect of LMX and Relational Identity on Job Performance (Sample 2)

Figure 17 The Interaction Effect of LMX and Relational Identity on Retention (Sample 2)

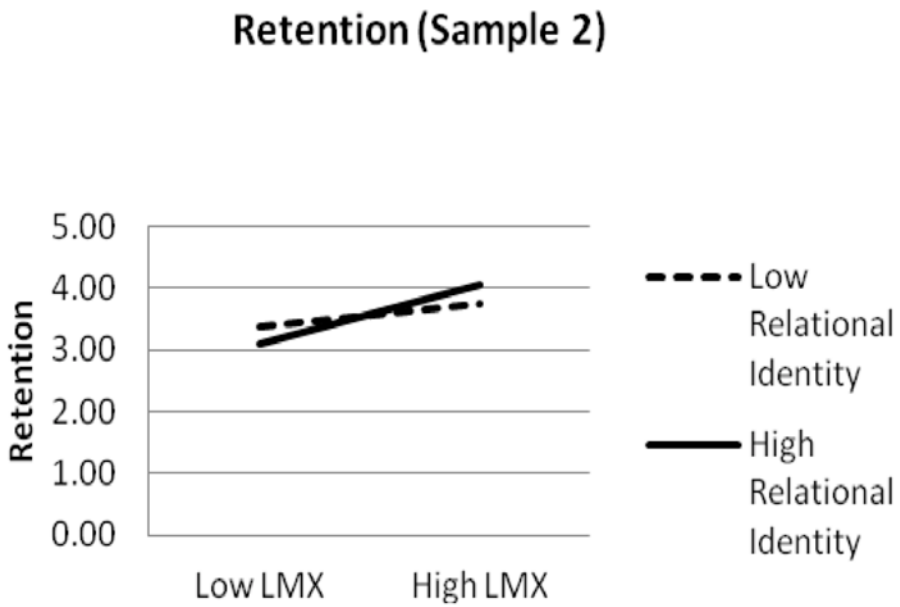


Figure 18 The Interaction Effect of LMX and Relational Identity on Job Satisfaction (Sample 3)

Figure 19 The Interaction Effect of LMX and Relational Identity on Intrinsic Motivation (Sample 3)

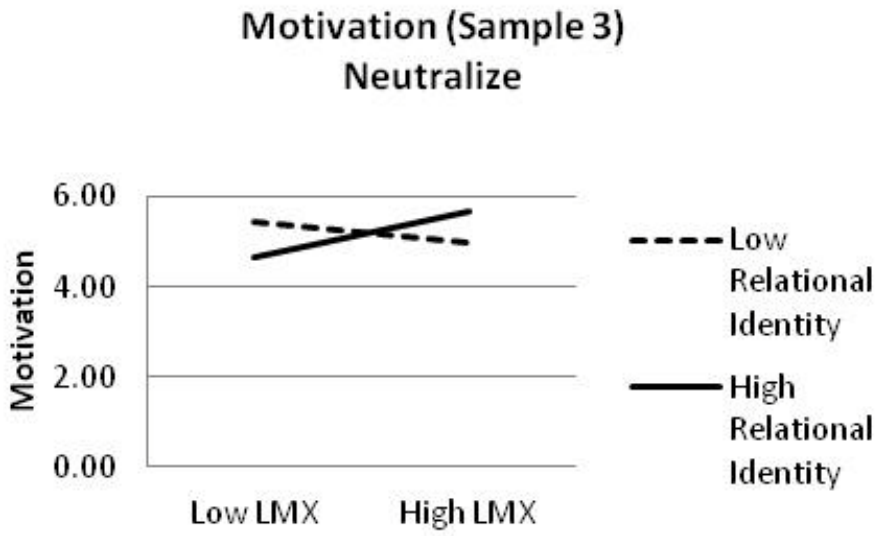


Figure 20 The Interaction Effect of LMX and Relational Identity on Retention (Sample 3)

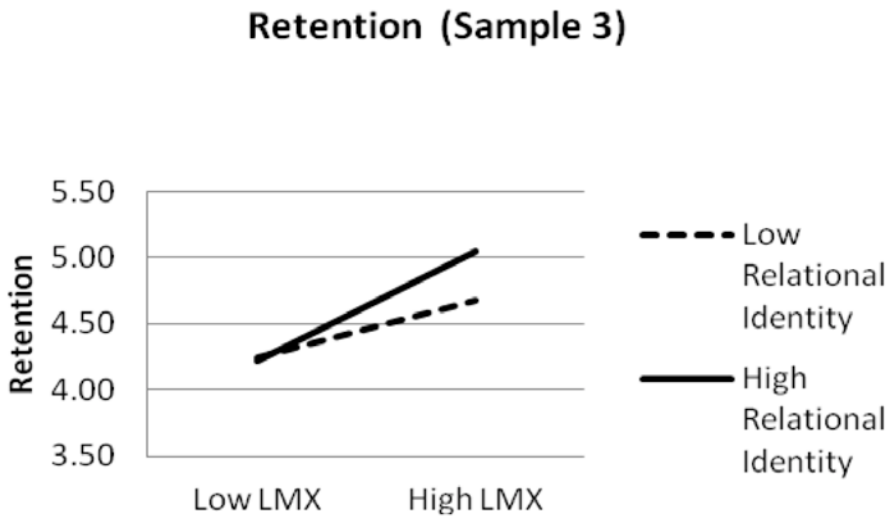


Figure 21 The Interaction Effect of TMX and Collective Identity on Intrinsic Motivation (Sample 1)

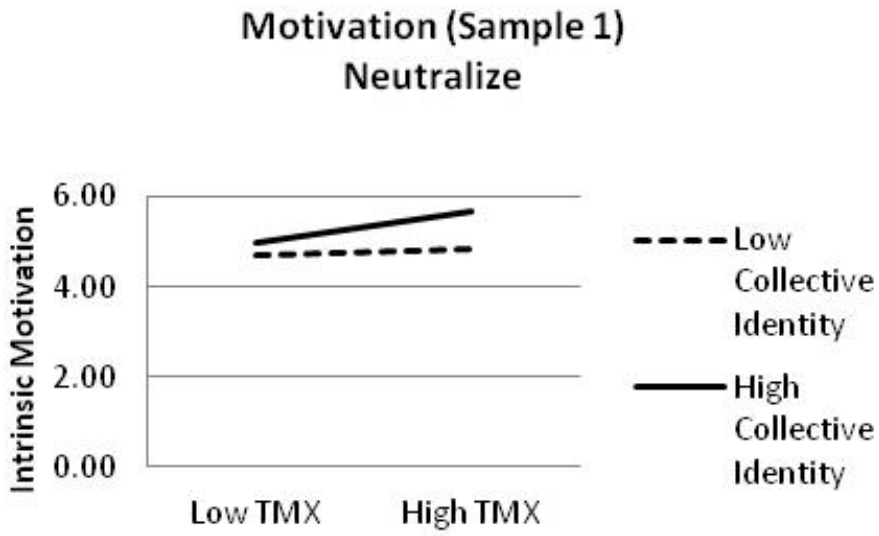


Figure 22 The Interaction Effect of TMX and Collective Identity on Job Performance (Sample 1)

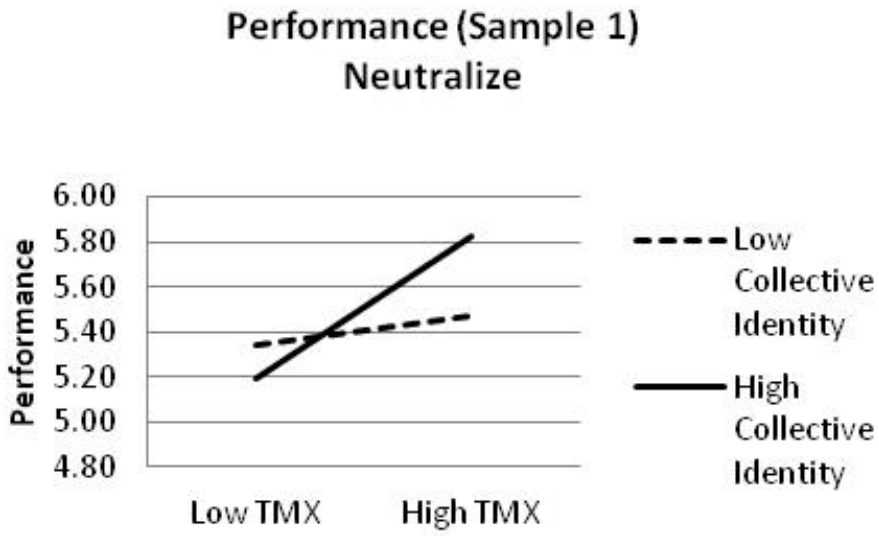


Figure 23 The Interaction Effect of TMX and Collective Identity on Intrinsic Motivation (Sample 2)

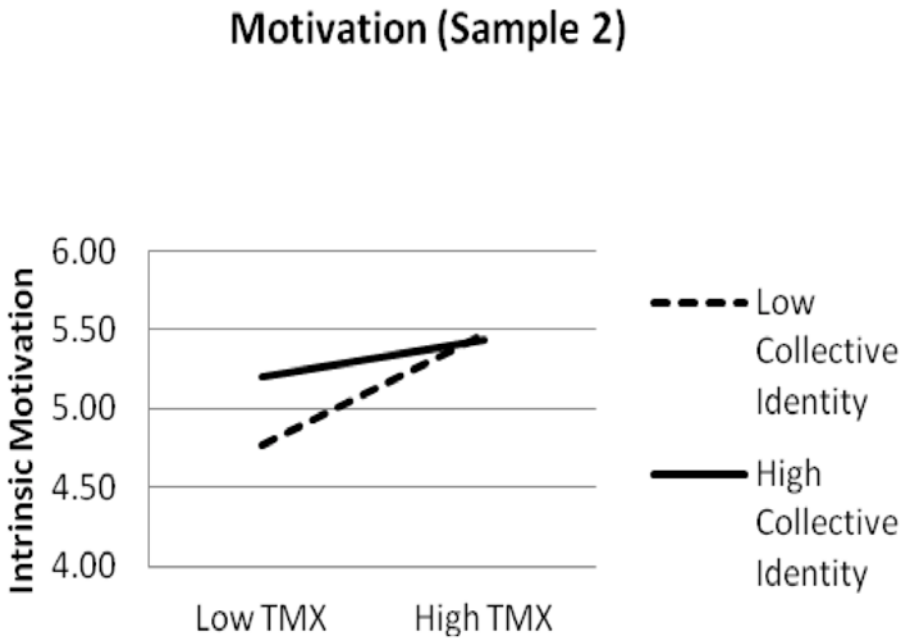


Figure 24 The Interaction Effect of TMX and Collective Identity on Job Performance (Sample 2)

Figure 25 The Interaction Effect of TMX and Collective Identity on Retention (Sample 2)

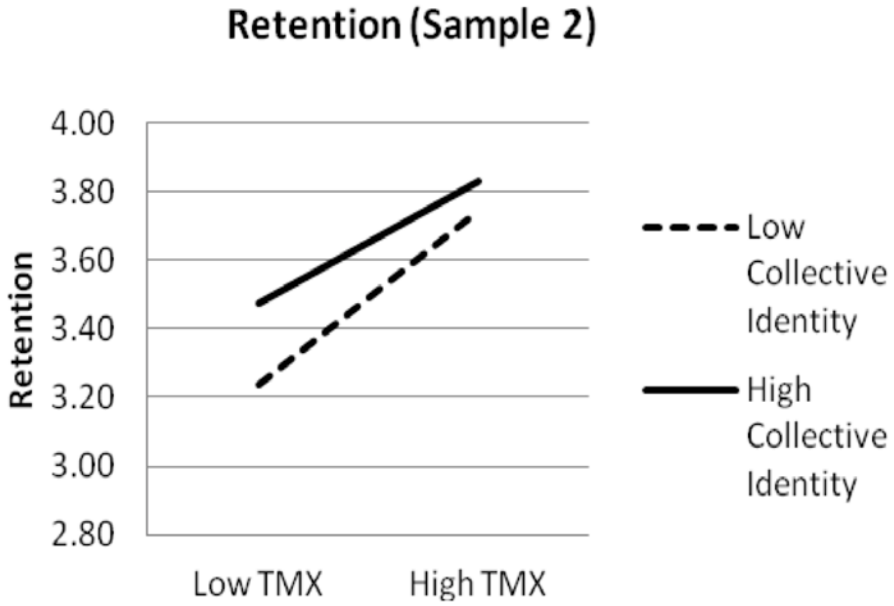


Figure 26 The Interaction Effect of TMX and Collective Identity on Job Satisfaction (Sample 3)

Figure 27 The Interaction Effect of TMX and Collective Identity on Retention (Sample 3)

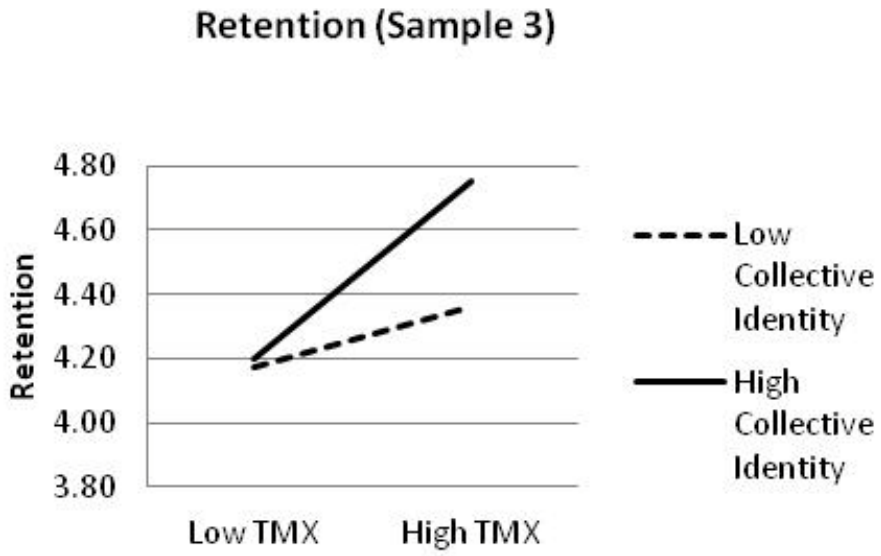


Figure 28 The Interaction Effect of LMX and Team Authority Differentiation on Job Satisfaction (Sample 1)

Figure 29 The Interaction Effect of LMX and Team Authority Differentiation on Job Performance (Sample 1)

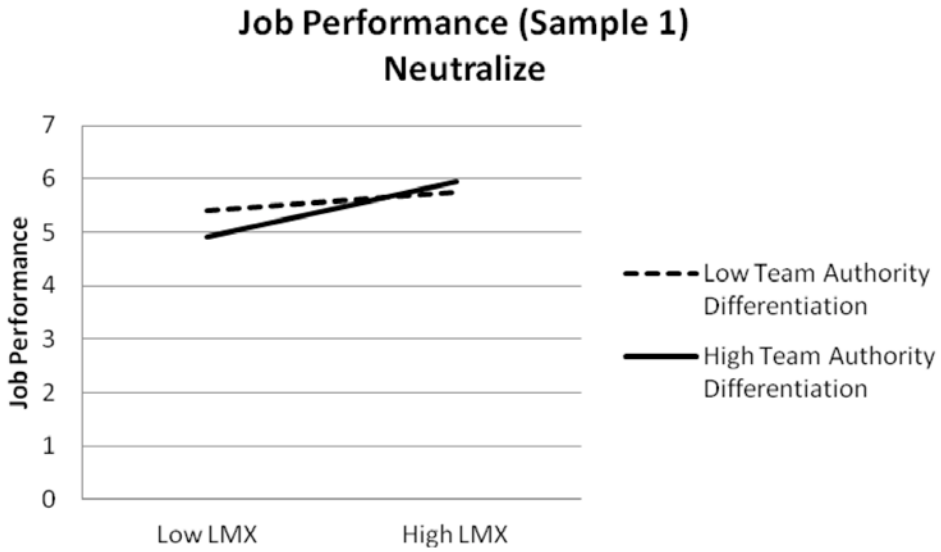


Figure 30 The Interaction Effect of LMX and Team Authority Differentiation on Retention (Sample 1)

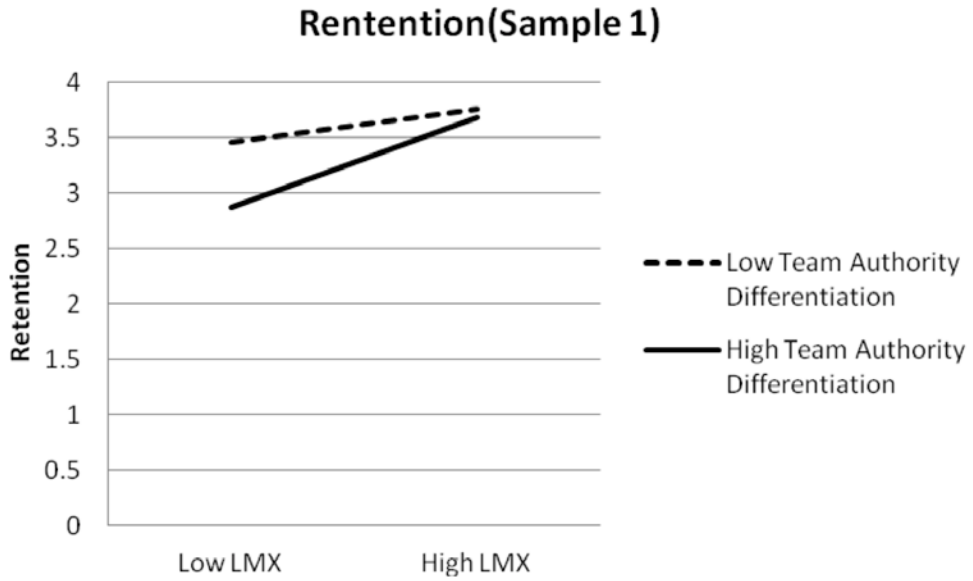


Figure 31 The Interaction Effect of LMX and Team Authority Differentiation on Intrinsic Motivation (Sample 2)

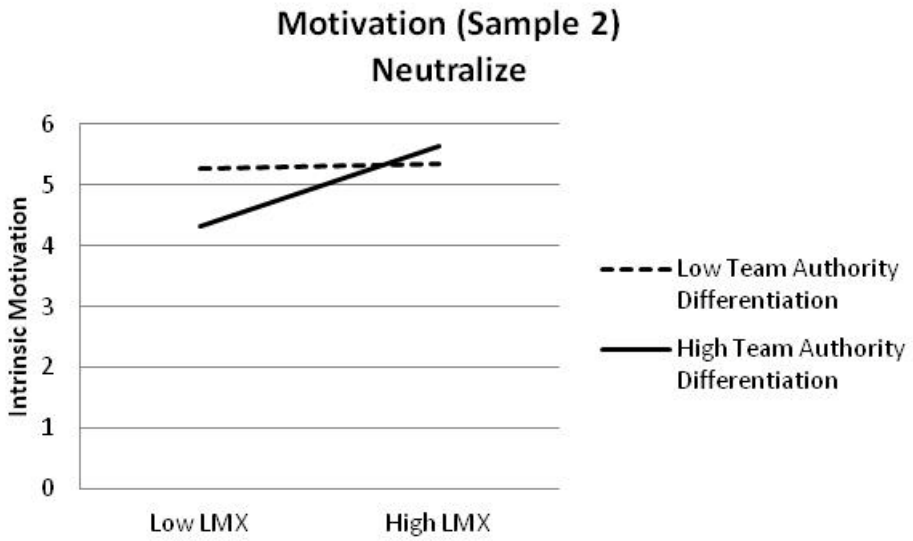


Figure 32 The Interaction Effect of LMX and Team Authority Differentiation on Job Satisfaction (Sample 2)

Figure 33 The Interaction Effect of LMX and Team Authority Differentiation on Job Performance (Sample 2)

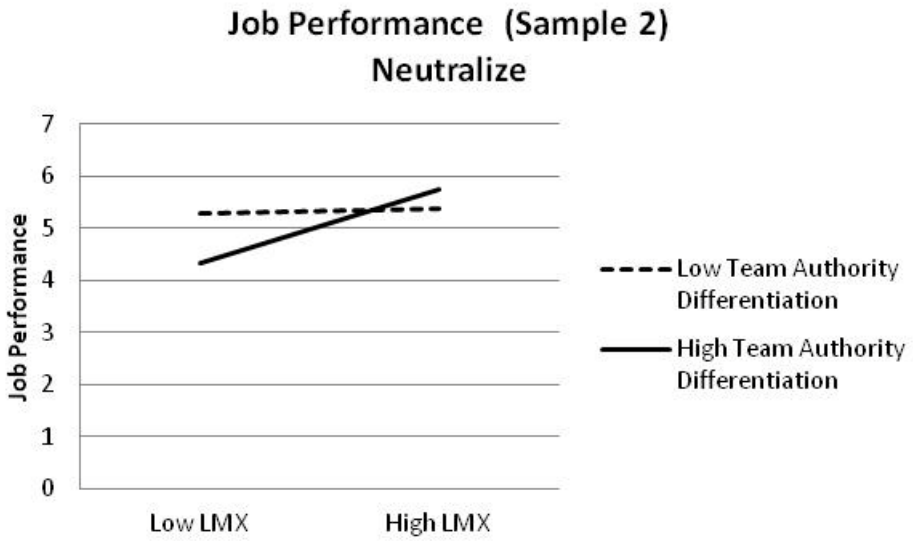


Figure 34 The Interaction Effect of LMX and Team Authority Differentiation on Retention (Sample 2)

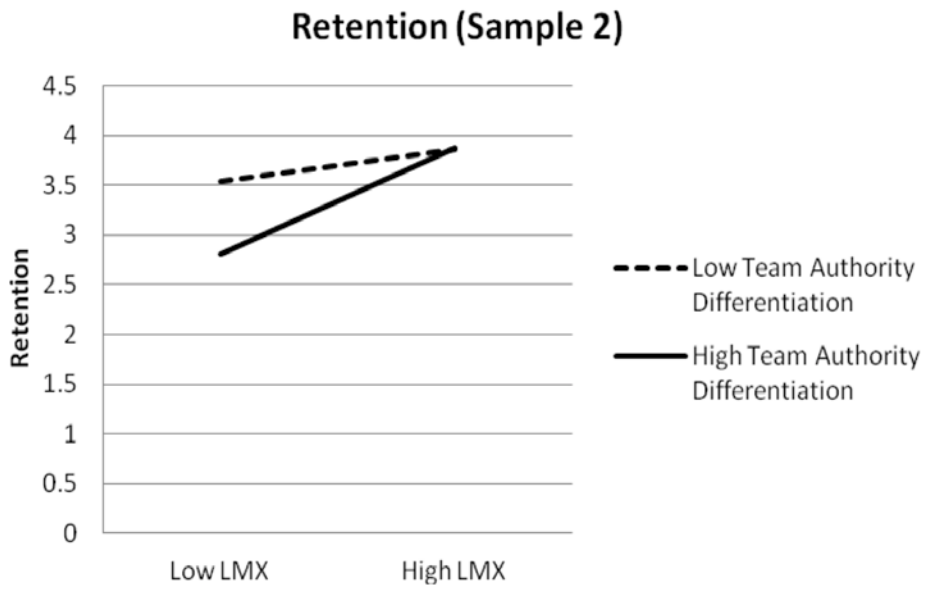


Figure 35 The Interaction Effect of LMX and Team Authority Differentiation on Intrinsic Motivation (Sample 3)

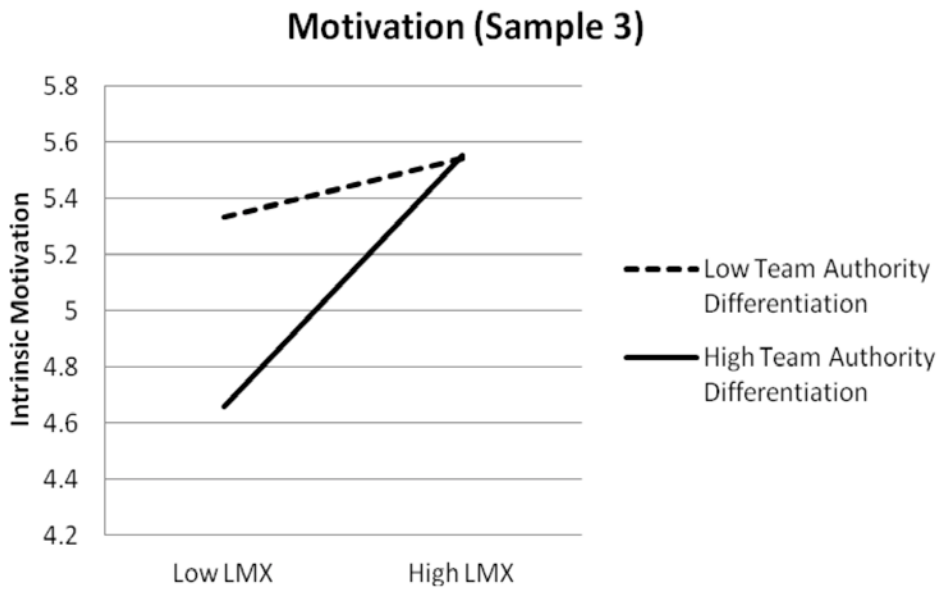


Figure 36 The Interaction Effect of LMX and Team Authority Differentiation on Job Satisfaction (Sample 3)

Figure 37 The Interaction Effect of LMX and Team Authority Differentiation on Retention (Sample 3)

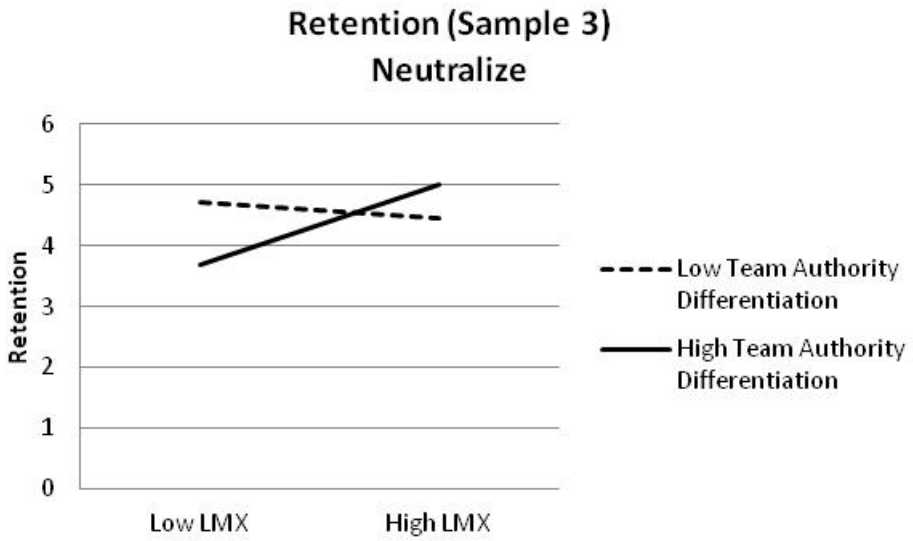


Figure 38 The Interaction Effect of TMX and Team Skill Differentiation on Intrinsic Motivation (Sample 1)

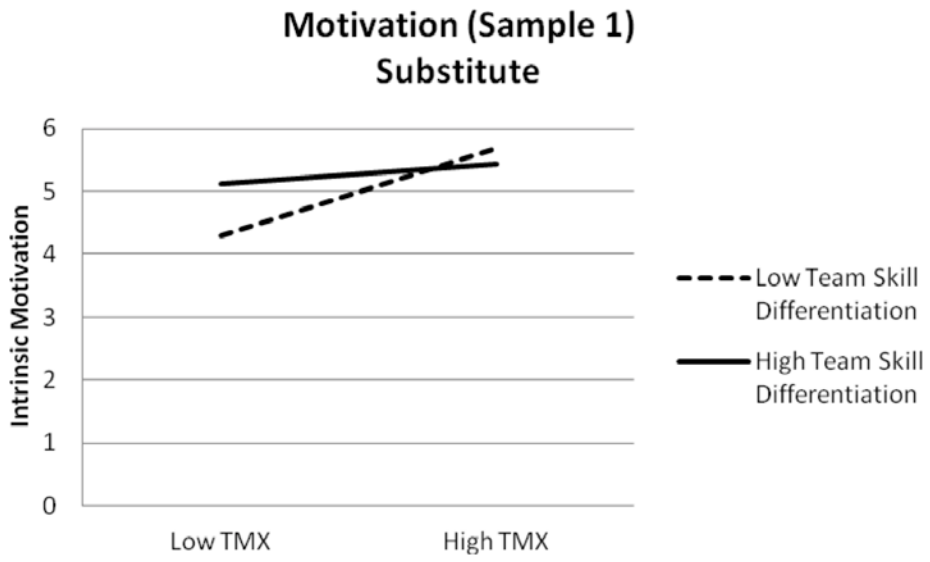


Figure 39 The Interaction Effect of TMX and Team Skill Differentiation on Job Satisfaction (Sample 1)

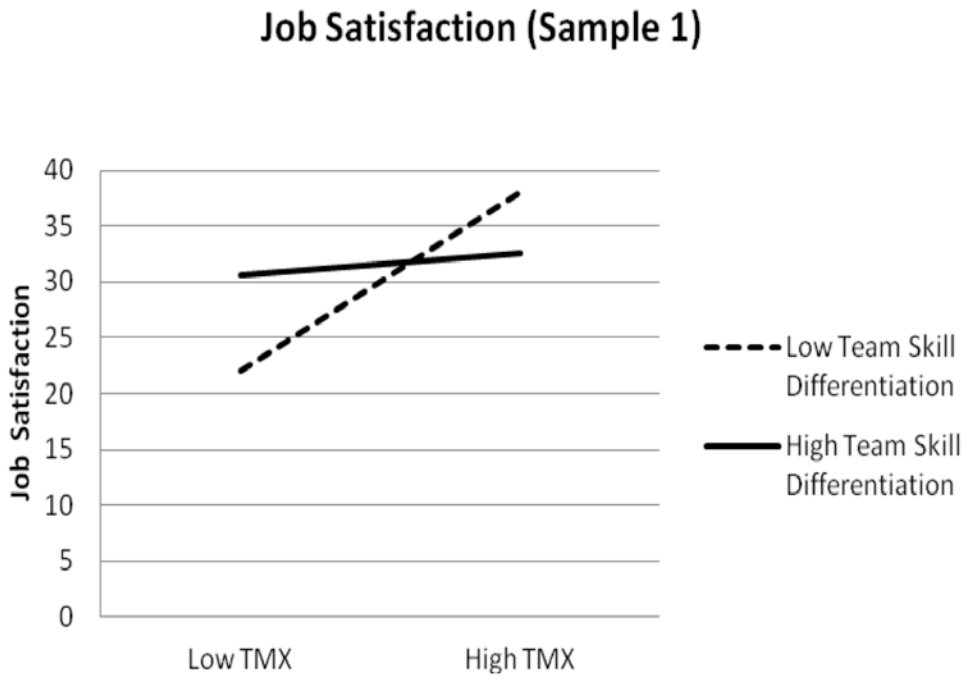


Figure 40 The Interaction Effect of TMX and Team Skill Differentiation on Job Performance (Sample 1)

Figure 41 The Interaction Effect of TMX and Team Skill Differentiation on Retention (Sample 1)

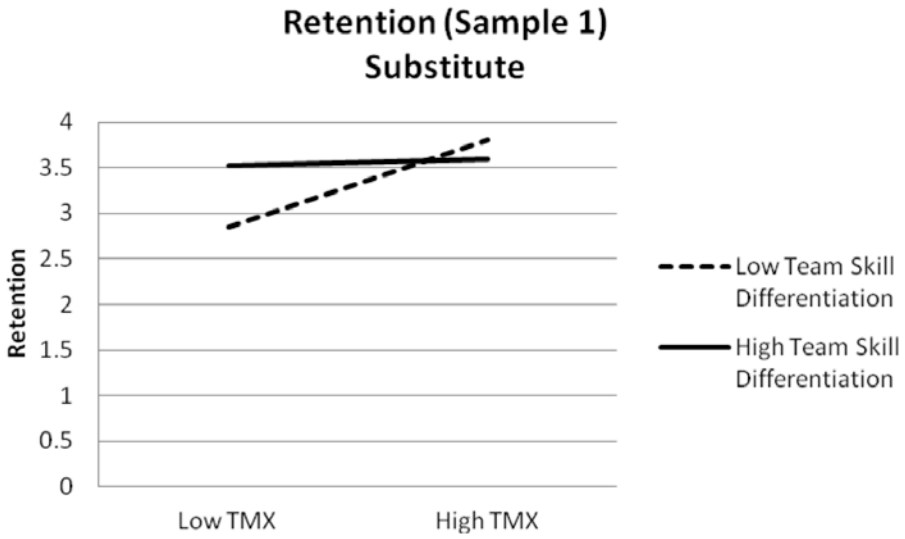


Figure 42 The Interaction Effect of TMX and Team Skill Differentiation on Intrinsic Motivation (Sample 2)

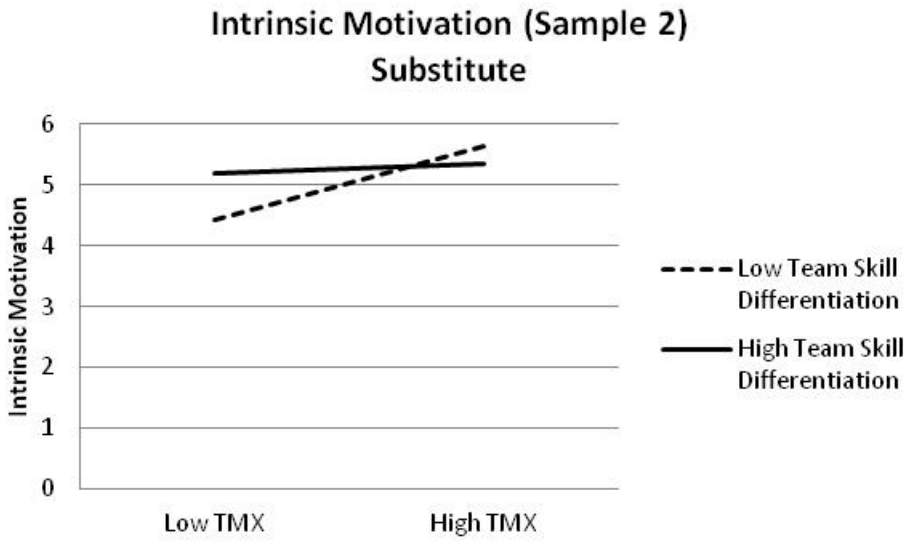


Figure 43 The Interaction Effect of TMX and Team Skill Differentiation on Job Satisfaction (Sample 2)

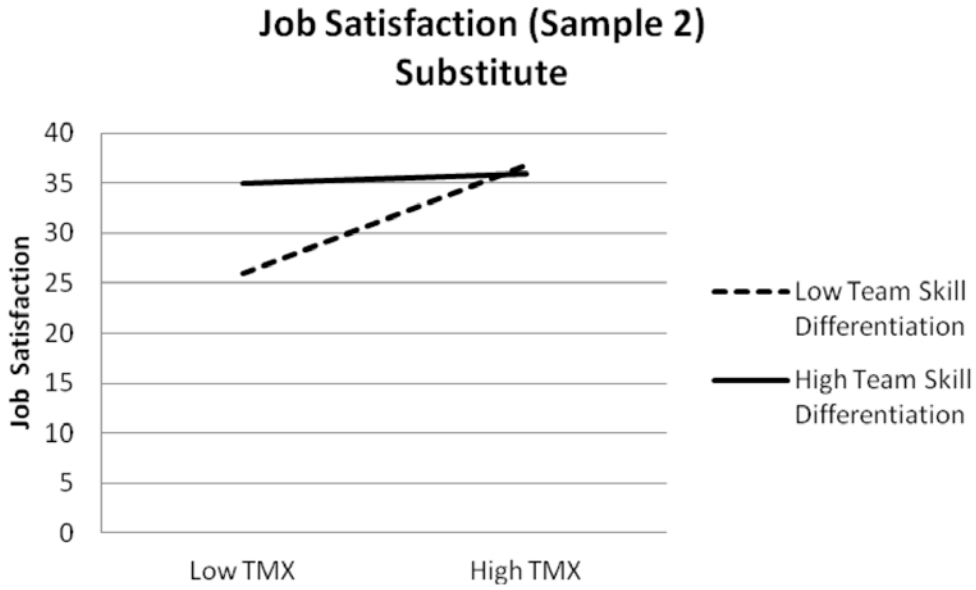


Figure 44 The Interaction Effect of TMX and Team Skill Differentiation on Job Performance (Sample 2)

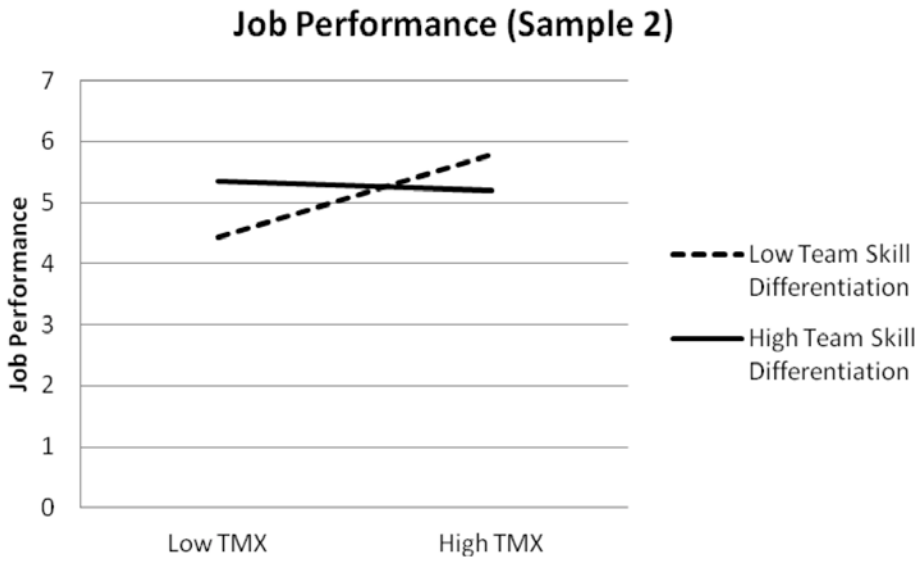


Figure 45 The Interaction Effect of TMX and Team Skill Differentiation on Retention (Sample 2)

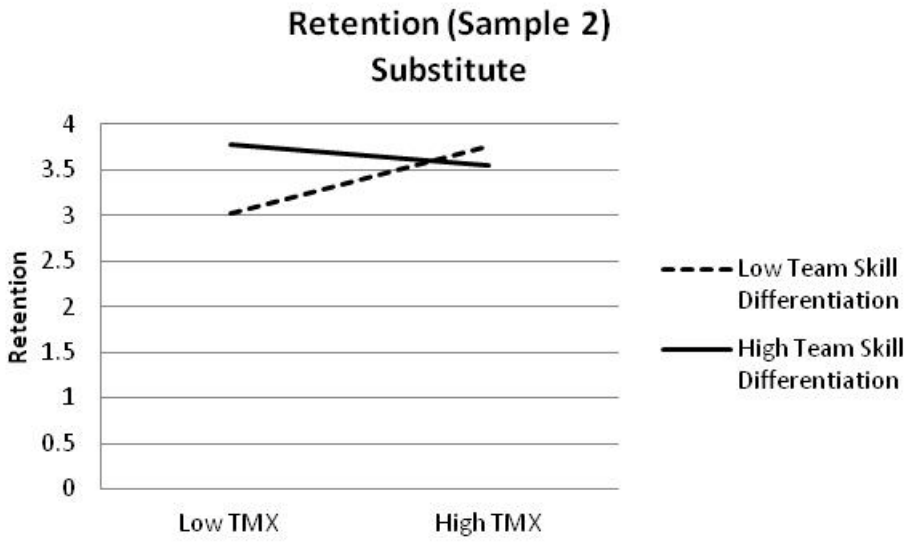


Figure 46 The Interaction Effect of TMX and Team Skill Differentiation on Intrinsic Motivation (Sample 3)

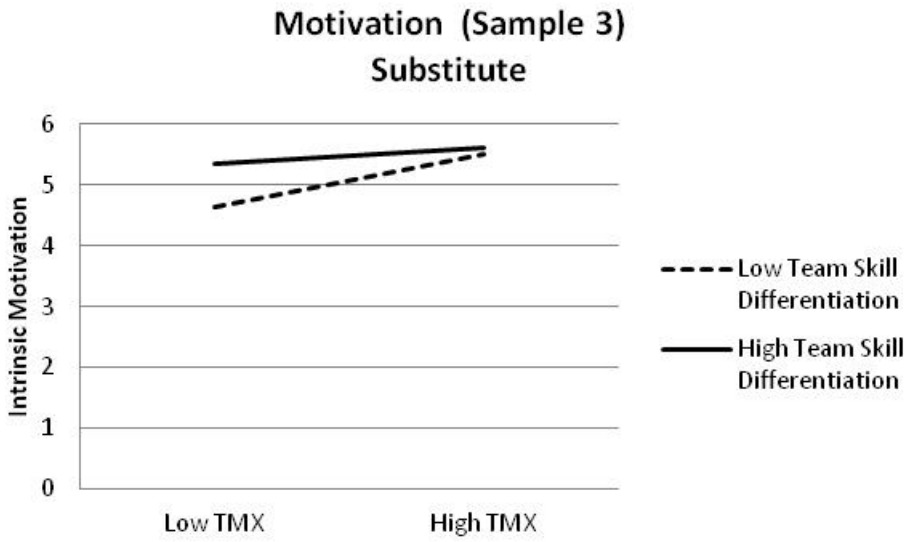


Figure 47 The Interaction Effect of TMX and Team Skill Differentiation on Job Satisfaction (Sample 3)

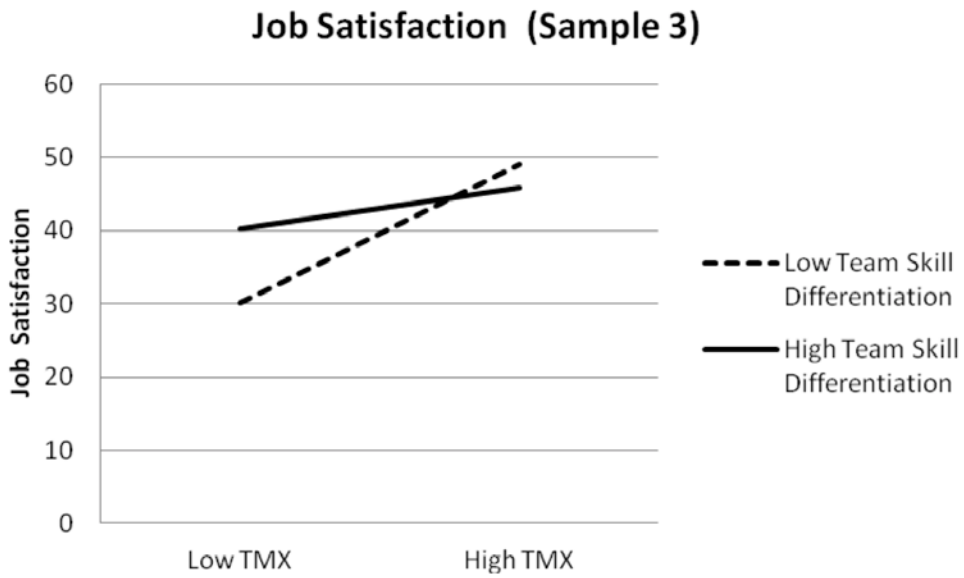


Figure 48 The Interaction Effect of TMX and Team Skill Differentiation on Job Performance (Sample 3)

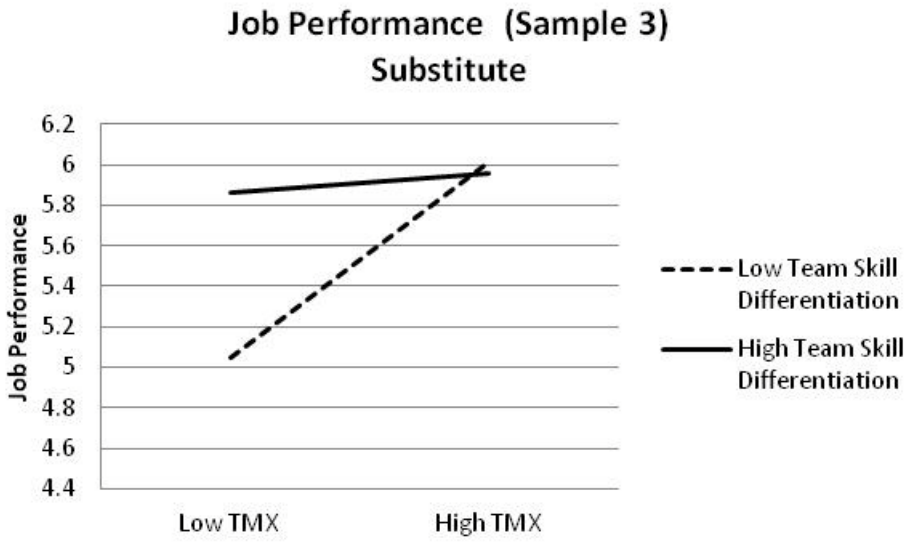
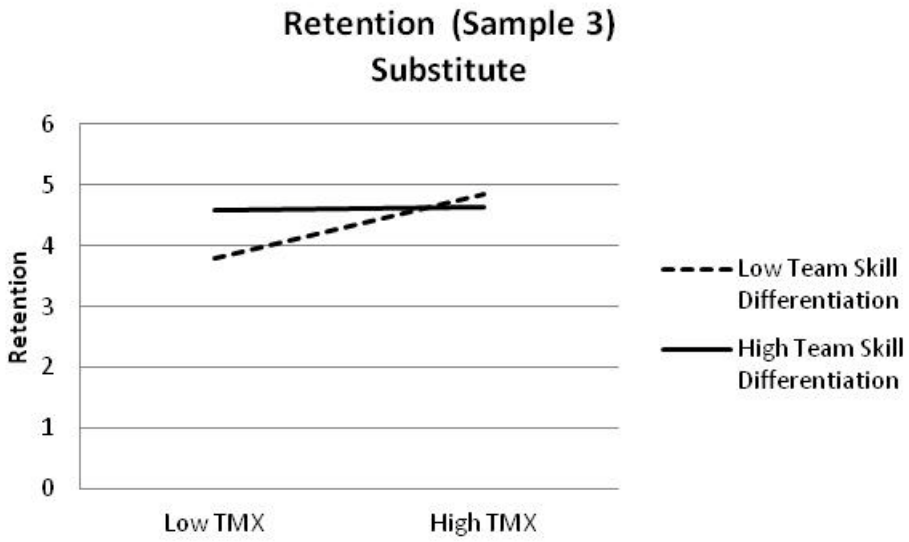


Figure 49 The Interaction Effect of TMX and Team Skill Differentiation on Retention (Sample 3)



APPENDIX B: Measure Items

Leader-member Exchange Relationships (LMX)[2]

Instruction: The following set of questions asks about your relationship to the direct leader of your group. Indicate your response to each question relate to your **direct leader** by **circling** the number of that response.

LMX-7
Do you know where you stand with your leader . . do you usually know how satisfied your leader is with what you do?
1). Rarely
2). Occasionally
3). Sometimes
4). Fairly Often
5). Very Often

How well does your leader understand your job problems and needs?
1). Not a Bit
2). A Little
3). A Fair Amount
4). Quite a Bit
5). A Great Deal

How well does your leader recognize your potential?
1). Not at All
2). A Little
3). Moderately
4). Mostly
5). Fully

Regardless of how much formal authority he/she has built into his/her position, what are the chances that your leader would use his/her power to help you solve problems in your work?
1). None
2). Small
3). Moderate
4). High
5). Very High

Again, regardless of the amount of formal authority your leader has, what are the chances that he/she would "bail you out," at his/her expense?
1). None
2). Small

[2] In the survey, the items are presented in a random order without titles and definitions of the dimensions. The statements are reproduced here for the convenience of the reader.

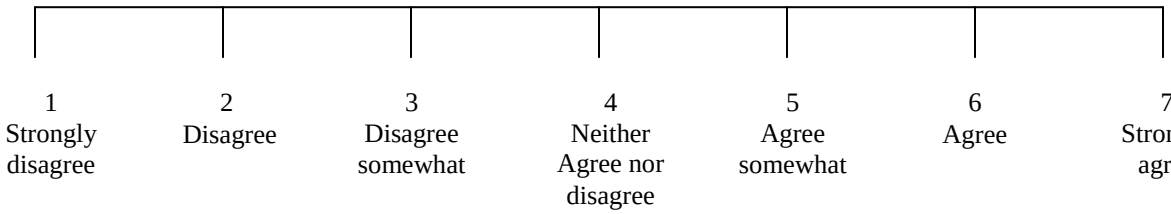
3). Moderate
4). High
5). Very High

I have enough confidence in my leader that I would defend and justify his/her decision if he/she were not present to do so?
1). Strongly Disagree
2). Disagree
3). Neutral
4). Agree
5). Strongly Agree

How would you characterize your working relationship with your leader?
1). Extremely Ineffective
2). Worse Than Average
3). Average
4). Better Than Average
5). Extremely Effective

Team-member Exchange Relationships (TMX)[3]

Instruction: The following set of questions asks about your relationship to your work group members. Think about **the team or unit** you are working with now (i.e., all the people who report directly to your leader, including yourself, are "the team" or "team members"). Indicate your response to each question relate to your **teammates** by **circling** the number that best represents your response using the following scale. How about do you agree with the statement?

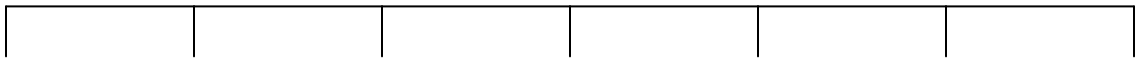


1). I often make suggestions about better work methods to other team members.
2). Other members of my team usually let me know when I do something that makes their jobs easier (or harder).
3). I often let other team members know when they have done something that makes my job easier (or harder)?
4). Other members of my team recognize my potential.
5). Other members of your team understand your problems and needs.
6). I am flexible about switching job responsibilities to make things easier for other team members.
7). In busy situations, other team members often ask me to help out.
8). In busy situations, I often volunteer my efforts to help others on my team.
9). I am willing to help finish work that had been assigned to others.
10). Other members of my team are willing to help finish work that was assigned to me.

[3] [3] In the survey, the items are presented in a random order without titles and definitions of the dimensions. The statements are reproduced here for the convenience of the reader.

Intrinsic Work Motivation[4]

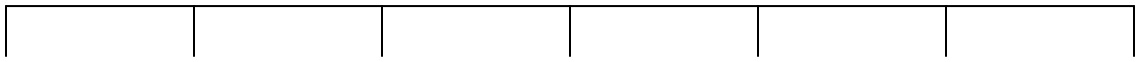
Instruction: Please indicate how you personally feel about your job. The following set of statements s is something that a person might say about his or her job. You are to indicate your own personal feelings about your job by **circling** how much you agree with each of the statements. How about do you agree with the statement?



1	2	3	4	5	6	7
Strongly disagree	Disagree	Disagree somewhat	Neither Agree nor disagree	Agree somewhat	Agree	Strongly agree

1). My opinion of myself goes up when I do this job well.
2). I feel a great sense of personal satisfaction when I do this job well.
3). I feel bad and unhappy when I discover that I have performed poorly on this job.
4). My own feelings are generally not affected much one way or the other by how well I do on this job. (R)

Now please think of the other people in your organization who hold the same job you do. If no one has exactly the same job as you, think of the job which is most similar to yours. Please think about how accurately each of the statement describes the feelings of those people about the job. It is quite all right if your answers here different from when you described your own reactions to the job. Often different people feel quite differently about the same job. How much do you agree with the statement?



1	2	3	4	5	6	7
Strongly disagree	Disagree	Disagree somewhat	Neither Agree nor disagree	Agree somewhat	Agree	Strongly agree

5). Most people on this job feel a great sense of personal satisfactions when they do the job well.
6). Most people on this job feel bad or unhappy when they find that they have performed the work poorly.

Note. R = reverse coded.

[4] [4] In the survey, the items are presented in a random order without titles and definitions of the dimensions. The statements are reproduced here for the convenience of the reader.

Job Satisfaction[5]

Instruction: Please find the following statements about your present job. Please read each statement carefully and put Y beside each item if it describes the feature in question, N if the item does not describe that feature, or ? if they cannot decide.

Work on present job:

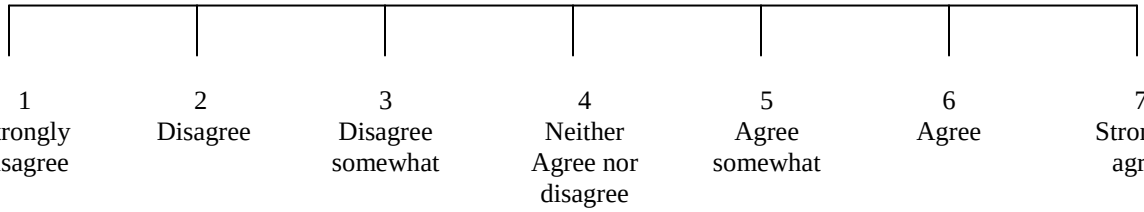
1. Fascinating
2. Routine
3. Satisfying
4. Boring
5. Creative
6. Respected
7. Pleasant
8. Useful
9. Tiresome
10. Challenging
11. Frustrating
12. Simple
13. Gives sense of accomplishment
14. A source of pleasure
15. Dull
16. Interesting
17. Awful
18. Important

[5] [5] In the survey, the items are presented in a random order without titles and definitions of the dimensions. The statements are reproduced here for the convenience of the reader.

Job Performance[6]

Instruction: This section asks you to assess the **individual performance** of each of your direct reports. For each statement below, please **circle the number** that best represents your response.

For the following statements, please indicate the extent to which you agreed that this employee's performance on the core job is higher than that of other employees in a similar job. How about do you agree with the statement?



1). Quality of work is much higher than average.
2). Quality of work is much higher than average.
3). Efficiency is higher than average.
4). Standard of work quality are higher than formal standard for the job.
5). Strive for higher quality of work than required.
6). Uphold highest professional standard.

For the following statements, please circle the number that corresponds to your level of satisfaction with this employee in performing his or her assigned role.

7). Ability to perform core job tasks.
8). Judgment when performing core job tasks.
9). Accuracy when performing core job tasks.
10). Job knowledge with reference to core job tasks.
11). Creatively when performing core tasks.

[6] [6] In the survey, the items are presented in a random order without titles and definitions of the dimensions. The statements are reproduced here for the convenience of the reader.

Retention[7]

Instruction: Please be as honest and accurate as you can in your response to each statement. Please **circle** the number that best represents your response using the following scale:

Which of the following statements most clearly reflects your feelings about your future with this organization in the next year? (R)
1). I definitely will not leave
2). I probably will not leave
3). I am uncertain
4). I probably will leave
5). I definitely will leave

How do you feel about leaving this organization?
1). I am presently looking and planning to leave
2). I am seriously considering leaving in the near future
3). I have no feelings about this one way or the other
4). As far as I can see ahead, I intend to stay with this organization
5). It is very unlikely that I would ever consider leaving this organization

If you were completely free to choose, would you prefer or not prefer to continue working for this organization? (R)
1). Prefer very much to continue working for this organization
2). Prefer to work here
3). Don't care either way
4). Prefer not to work here
5). Prefer very much not to continue working for this organization

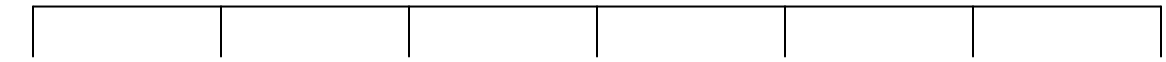
How important is it to you personally that you spend your career I this organization rather than some other organization?
1). It is of no importance at all
2). I have mixed feelings about its importance
3). It is not of some importance
4). It is fairly important
5). It is very important for me to spend my career in this organization

Note. R = reverse coded.

[7] [7] In the survey, the items are presented in a random order without titles and definitions of the dimensions. The statements are reproduced here for the convenience of the reader.

Identity Orientation[8]

Instruction: Below are several statements about, generally, how you see your relationships with others (e.g., your friends, or colleagues) and your memberships in groups (e.g., your team or your organization). Please indicate the extent to which you agree or disagree with each statement using the following scale. How about do you agree with the statement?



1	2	3	4	5	6	7
Strongly disagree	Disagree	Disagree somewhat	Neither Agree nor disagree	Agree somewhat	Agree	Strongly agree

1. Relational identity: Concern for Others

1). I value friends who are caring, empathetic individuals.
2). It is important to me that I uphold my commitments to significant people in my life.
3). If a friend were having a personal problem, I would help him/her even if it meant sacrificing my time or money.
4.) Caring deeply about another person such as a close friend or relative is very important to me.
5.) Knowing that a close other acknowledges and values the role that I play in their life makes me feel like a worthwhile person.

2. Collective identity: Group Achievement Focus

1). Making a lasting contribution to groups that I belong to, such as my school or work organization, is very important to me.
2). When I become involved in a group project, I do my best to ensure its success.
3). I feel great pride when my team or work group does well, even if I'm not the main reason for success.
4). I would be honored if I were chosen by an organization or club that I belong to, to represent them at a conference or meeting.
5). When I'm part of a team, I am concerned about the group as a whole instead of whether individual team members like me, or whether I like them.

[8] [8] In the survey, the items are presented in a random order without titles and definitions of the dimensions. The statements are reproduced here for the convenience of the reader.

Team Dimensions[9]

Instruction: Think about **your perception** on the following statement. Please **circle** the number that best represents your own beliefs on the characteristics of your work group.

Authority Differentiation Dimension

1a. There was no official team leader; and **no one emerged** as an informal *team leader*.
1b. There was no official leader and **many different people emerged** as informal *team leaders*.
1c. There was no official leader but the **same small subgroup usually emerged** as informal *team leaders*.
1d. There was no official leader but the **same person always emerged** as the informal *team leader*.
1e. There was one team member who was **formally recognized** as the official *team leader*.

2a. There was no leader; the team made decisions by **voting or reaching consensus**.
2b. The team leader delegated **some of the large** *decisions* and **almost all of the small** decisions.
2c. The team leader made all the large *team decisions* and **delegated almost all the small** decisions.
2d. The team leader made all of the large *team decisions*, but **delegated some small** decisions**.**
2e. The team leader made all of the *team decisions*, **both large and small** decisions**.**

3a. There was no leader; everyone had an **equal amount** of input into team decisions.
3b. The team leader *sought input* **from all** team members when making decisions.
3c. The leader *sought input* **from most, but not all** team members when making decisions.
3d. The leader *sought input* **from just one or two** other team member when making decisions.
3e. The leader *did not seek input* **from anyone** when making decisions.

4a. There was no leader; decisions were based on *leaderless public group discussions* **among all members**.
4b. The leader *met publically* with **all members** and led a public discussion prior to making decisions.
4c. The leader met privately with **small subgroups** of team members prior to making decisions.
4d. The leader met privately, and **one-on-one** with team members prior to making decisions.
4e. The leader never met with **anyone** prior to making decisions.

[9] [9] In the survey, the items are presented in a random order without titles and definitions of the dimensions. The statements are reproduced here for the convenience of the reader.

5a. There was no leader; **no one stood out** as having any more or less *power* outside the team.
5b. The team leader had **almost no** *power* in dealing with people outside the team.
5c. The team leader had a **little** *power* in dealing with people outside the team.
5d. The team leader had **some** *power* in dealing with people outside the team.
5e. The team leader had a **great deal** of *power* in dealing with people outside the team.

6a. There was no leader; **every member** of the team had *unique expertise* that others needed.
6b. **Most members** of the team had *unique expertise* that the leader needed, but did not possess.
6c. **A few members** had *unique expertise* that the leader needed, but did not possess.
6d. **One member** had *unique expertise* that the leader needed. but did not possess.
6e. **No team member** had *unique expertise* that the team leader needed, but did not possess.

7a. There was no leader**; no one stood out** as being *admired* more than anyone else.
7b. **Few** of the team members *admired* the leader.
7c. **Half** the team members *admired* the leader.
7d. **Most** members of the team *admired* the leader.
7e. **Every** member of the team *admired* the leader.

8a. There was no team leader; **no one stood out** in terms of being able to *add or eliminate* members.
8b. The leader could **rarely** *unilaterally add or eliminate* anyone from the team.
8c. The leader could **sometimes** *unilaterally add or eliminate* someone from the team.
8d. The leader could **usually** *unilaterally add or eliminate* someone from the team.
8e. The leader could **always** *unilaterally add or eliminate* someone from the team.

Skill Differentiation Dimension

1a. **None** of the members had *unique skills* and so it was easy to substitute one team member for another in terms of skills.
1b. **Very few** of the team members had *unique skills* and so it was often possible to substitute one member for another in terms of skills.
1c. **Half** of the team members had *unique skills* and so it was difficult to substitute one member for another in terms of skills.
1d. **Most** of the team members had *unique skills* and so it was very difficult to substitute one member for another in terms of skills.
1e. **All** of the team members had *unique skills* and so it was impossible to substitute one member for another in terms of skills

2a. **None** of the members had *specialized training* and so it was making to substitute one team member for another in terms of training.
2b. **Few** of the team members had *specialized training* and so it was often possible to substitute one member for another in terms of training.

2c. **Half** of the team members had *specialized training* and so it was difficult to substitute one member for another in terms of training.
2d. **Most** of the team members had *specialized training* and so it was very difficult to substitute one member for another in terms of training.
2e. **All** of the team members had *specialized training* and so it was impossible to substitute one member for another in terms of training.

3a. **None** of the members had *unique contacts* with people outside the team and so it was easy to substitute one team member for another when it came to their contacts.
3b. **Few** of the team members had *unique contacts* with people outside the team and so it was often possible to substitute one member for another when it came to their contacts.
3c. **Half** of the team members had *unique contacts* with people outside the team and so it was difficult to substitute one member for another when it came to their contacts.
3d. **Most** of the team members had *unique contacts* with people outside the team and so it was very difficult to substitute one member for another when it came to their contacts.
3e. **All** of the team members had *unique contacts* with people outside the team and so it was impossible to substitute one member for another when it came to their contacts.

4a. **None** of the members had *unique previous experiences* and so it was easy to substitute one member for another when it came to their experience.
4b. **Few** of the team members had *unique previous experiences* and so it was often possible to substitute one member for another when it came to their experience
4c. **Half** of the team members had *unique previous experiences* and so it was difficult to substitute one member for another when it came to their experience.
4d. **Most** of the team members had *unique previous experiences* and so it was very difficult to substitute one member for another when it came to their experience.
4e. **All** of the team member had access to *unique previous experiences* and so it was impossible to substitute one member for another when it came to their experience.

5a. **None** of the members had access to *unique tools and equipment* and so it was easy to substitute one member for an0ther when it came to tools and equipment.
5b. **Few** of the members had access to *unique tools and equipment* and so it was often possible to substitute one member for another in terms of tools and equipment.
5c. **Half** of the members had unique access to *unique tools and equipment* and so it was difficult to substitute one member for another in terms of tools and equipment.
5d. **Most** of the members had unique access to *unique tools and equipment* and so it was very difficult to substitute one member for another in terms of tools and equipment.
5e. **All** of the team member had access to *unique tools and equipment* and so it was impossible to substitute one member for another in terms of tools and equipment.

6a. **None** of the members had a unique *demographic profiles* (age, gender, race, etc.) and so it was easy to substitute one member for another demographically.

6b. **Few** of the team members had a unique *demographic profiles* (age, gender, race, etc.) and so it was often possible to substitute one member for another demographically.
6c. **Half** of the team members had a unique *demographic profiles* (age, gender, race, etc.) and so it was difficult to substitute one member for another demographically.
6d. **Most** of the team members had a unique *demographic profiles* (age, gender, race, etc.) and so it was very difficult to substitute one member for another demographically.
6e. **All** of the team member had a unique *demographic profile* (age, gender, race, etc.) and so it was impossible to substitute one member for another demographically.

7a. **All** of the team members were *cross-trained* on all the task the team performed and so it was easy to substitute on team member for another in terms of training.
7b. **Most** of the team members were *cross-trained* on all of the tasks that the team performed and so it was often possible to substitute one team member for another in terms of training.
7c. **Half** of the team members were *cross-trained* on all of the tasks that the team performed and so it was difficult to substitute one team member for another in terms of training.
7d. **Few** of the team members were *cross-trained* on all of the tasks that the team performed and so it was very difficult to substitute one team member for another in terms of training.
7e. **None** of the team members were *cross-trained* on all of the tasks that the team performed and so it was impossible to substitute one team member for another in terms of training.

8a. **None** of the team members performed *complex tasks*, making it easy to substitute one member for another.
8b. **Few** of the team members performed *complex tasks*, making it somewhat possible to substitute one member for another.
8c. **Half** of the team members performed *complex tasks* and so it was difficult to substitute one team member for another.
8d. **Most** of the team members performed *complex tasks* and so it was very difficult to substitute one member for another.
8e. **All** of the team members performed *complex tasks* and so it was impossible to substitute one member for another.

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