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A Multi-level Analysis of Team Climate and Interpersonal Exchange Relationships at Work

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Abstract

In this study, we seek to advance research on interpersonal exchange relationships between supervisors, subordinates and coworkers at work by integrating social exchange, workplace friendship, and climate research to develop a multi-level model. We tested the model using hierarchical linear modeling (HLM) with data obtained from a sample of 215 manager-employee dyads working in 36 teams. At the individual level, leader-member exchange (LMX) was found to be related to workplace friendship. Further, workplace friendship was positively related to team-member exchange (TMX), and also mediated the LMX-TMX relationship. At the team level, HLM results indicate that the relationship between LMX and workplace friendship was moderated by affective climate. Findings suggest that high-quality LMX relationships are associated with enhanced workplace friendship between employees, especially when affective climate is strong.

**Keywords:** Leader Member Exchange (LMX), Team Member Exchange (TMX), Workplace Friendship, Affective Climate

Considerable research attention has been devoted to understanding the implications of leader-member exchange (LMX) theory over the last thirty years (see Graen & Uhl-Bien, 1995, for a review). LMX theory focuses on differentiated exchange relationships that leaders develop and maintain with subordinates within workgroups (Dansereau, Graen, & Haga, 1975). Evidence demonstrates that LMX substantially influences employees' organizational commitment, job satisfaction, task performance, helping behaviors, and turnover intentions (e.g., see Gerstner & Day, 1997). There are, however, several important questions that are still unanswered in the LMX literature. One of these questions concerns how and whether LMX influences people outside of the leader-member dyadic relationships (Sias & Jablin, 1995).

Sparrowe and Liden (1997, 2005) and Cole, Schaninger, and Harris (2002) suggest that interpersonal relationships between leaders, subordinates, and coworkers constitute an interconnected social system that operates in teams and organizations. Similarly, based on a systems perspective, Graen and Uhl-Bien (1995) have called for more research to understand how LMX relationships affect employees' work attitudes and behaviors in larger collectives of workgroups; they argue that LMX is not only influenced by, but may also influence other exchange relationships within the larger system. Consequently, we posit here that LMX may have implications for team member exchange (TMX), defined by Seers (1989) as the relationship quality between an individual and her or his team members.

According to Dienesch and Liden (1986), leaders often develop high-quality LMX relationships with only a few subordinates because of limited time, abilities, and resources. The differential treatment of employees in teams appears problematic because employees can be sensitive to social comparison information and perceptions of unfairness. The resulting altered self-concept may then affect employees' attitudes towards TMX (Tyler & Blader,

2003; Greenberg, Ashton-James, & Ashkanasy, in press). The reasoning here is that LMX relationships determine how work team supervisors distribute resources, work-related information, and psychological support. In this respect, team members in high-quality LMX relationships are likely to be more advantageously treated relative to other team members. Team members in low-quality LMX relationships therefore are likely to receive less supervisory attention, access to organizational resources and empowerment, potentially leading to job dissatisfaction and lower organizational commitment (e.g. Gerstner & Day, 1997). Hence, these team members may be jealous and resentful of their coworkers in more beneficial high-quality LMX relationships.

Although the implications of LMX for TMX within a larger organization's social system has been implicit in the social exchange literature, it has not been made theoretically explicit, nor has it been empirically tested in a systematic manner (e.g. Cole et al., 2002; Graen & Uhl-Bien, 1995; Sparrowe & Liden, 1997, 2005). The empirical evidence demonstrates that individuals who experience high-quality TMX relationships are more likely to contribute by assisting each other and to share information, ideas, and feedback within work teams (e.g. Seers, 1989; Seers et al., 1995). Hence, interpersonal relationships play a pivotal role in effective team functioning. This is because such relationships facilitate behaviors that maximize the individual potential for team efficiency and effectiveness (see Kostova & Roth, 2003). Based on this, exploring the processes by which dyadic LMX relationships influence employees' perceptions of TMX relationships is an important yet neglected aspect of the social exchange literature (e.g. Graen & Uhl-Bien, 1995; Seers et al., 1995).

In the present study, we attempt to advance the research on interpersonal exchange relationships in several ways. First, we respond to the call by Graen and Uhl-Bien (1995) to examine the impact of dyadic LMX relationships within a larger system of workgroups. To achieve this, we develop and test a multi-level model that specifies the relationship between LMX, workplace friendship, affective climate, and TMX within a team context. Second, we hypothesize that workplace friendship is a process variable that mediates the relationship between LMX and TMX. This addresses Gerstner and Day's (1997) call to identify the underlying process variables linking LMX and important work outcomes, such as TMX; and also the call by Berman and his colleagues (2002) to explore the role of workplace friendship in creating social systems in organizations. Finally, our study contributes to the growing body of research on multi-level models of leader-member exchange (e.g. Cogliser & Schriesheim, 2000); integrating individual and team levels of analysis by investigating cross-level interaction effects. Specifically, we conceptualize affective climate as a team-level construct and examine the impact of this on individual-level constructs such as LMX, workplace friendship, and TMX. Exploring these relationships using multi-level analysis is theoretically and practically imperative because it provides a more comprehensive and realistic picture of the interpersonal exchange relationships between supervisors, subordinates, and coworkers in organizations.

### Theory and Hypotheses Development

Figure 1 depicts a multi-level model, where we posit that workplace friendship is a mediator linking the relationship between LMX and TMX at the individual level, and affective climate serves as a group-level moderator to buffer the relationship between LMX and workplace friendship at the individual level.

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Insert Figure 1 about here

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In the following section, we provide the rationale underlying our model development, and develop theoretical arguments supporting the hypothesized relationships. We begin by discussing the extant research concerning the relationships between LMX and workplace friendship. Following this, we discuss how workplace friendship mediates the LMX-TMX relationship. Finally, we present arguments explaining the theoretical basis of the group-level moderation effect of affective climate on the relationship between LMX and workplace friendship within the model.

#### *LMX and Workplace Friendship*

According to Wright (1984), workplace friendship embodies a relationship involving voluntary or unconstrained interaction, in which the participants respond to one another personally as unique individuals rather than as a mere role occupant in the organization. More recently, Winstead, Derlega, Montgomery, and Pilkington (1995) found that workplace friendship is defined by: 1) the degree of mutual concern and interest that partners show for one another as being unique and irreplaceable, and 2) voluntary interdependence which reflects the intensity that the relationship partners commit free time to interacting with one another in the absence of constraints or pressures that are external to the relationship itself. These characteristics help distinguish workplace friendship from other dyadic relationships (i.e., supervisor-subordinate and team member relationships). A review of research suggests that workplace friendship is positively related to employees' job satisfaction, job performance, job involvement, team cohesion and organizational commitment; and negatively associated

with employees' turnover intentions and negative emotions (e.g. Winstead et al., 1995, Morrison, 2004; Berman, West & Richter, 2002; Riordan & Griffeth, 1995; Nielsen, Jex, & Adams, 2000). Although these findings are important for the advancement of research on workplace friendship in relation to employee outcomes, several researchers (e.g. Sias, 2005; Sias & Cahill, 1998; Nielsen et al., 2000) have noted that there is still little understanding of what factors predict workplace friendship.

Based on the characteristics of workplace friendship we have identified, we suggest that LMX relationships influence how employees approach, interpret, and establish friendships at work. High-quality LMX relationships are characterized by mutual trust and respect, commitment, and influence (Graen, & Uhl-Bien, 1995). We argue therefore that employees who enjoy high-quality LMX relationships are more likely to stress friendship development at work; this is because they have experienced affective bonding in the exchange process and are aware of the associated benefits. Such employees may feel motivated to extend or transform the relationship into friendship regardless of their formal role expected for reciprocity. They may also commit free time and resources to interacting and socializing with supervisors after work (Winstead et al., 1995). Furthermore, a high-quality LMX relationship can create and communicate a shared identity or values through the ongoing interactions. This serves as a platform upon which employees experience strong emotional attachment and have similar values to one another (Ellemers, De Gilder, & Haslam, 2004), enhancing friendship formation at work.

Similarly, Mueller and Lee (2002) have demonstrated that followers in high-quality LMX relationships enjoy greater openness and frequency in communication, voice, feedback opportunities, attention, participation and involvement in decision making and related matters,

cooperative and receptive information sharing, and person-oriented message exchanges which determine their communication satisfaction (Baker & Ganster, 1985; Lee & Jablin, 1995; Kacmar et al., 2003). Thus, the focus of communication between employees in high-quality LMX relationships moves from work-related issues (i.e., low-quality economic exchange) to an increased sharing of feelings, emotions, and opinions about the work environment (high-quality social exchange). Based on this, it seems reasonable to expect that LMX relationships are perceived by employees as valuable sources of emotional and instrumental motivation that increase the likelihood of workplace friendship development. This further implies that LMX relationships may be associated with employees' perceptions of workplace friendship within a team. Thus, we hypothesize:

*Hypothesis 1:* At the individual level, LMX will be positively related to workplace friendship.

#### *Workplace Friendship and TMX*

Team-member exchange (TMX) is a theoretical extension of LMX (Seers, 1989). It concerns the relationship between an individual and her or his team members and thus indicates the effectiveness of the member's ongoing relationships within the team. Specifically, TMX focuses on an individual's willingness to assist other members, to share ideas and feedback and, in turn, to provide information to other members and to receive recognition from other members (Seers, 1989; Seers et al., 1995). Contemporary research on TMX has primarily focused on identifying different types of justice, team temporal scope, communication mediation, and supervisor-subordinate relationships as the antecedents of

TMX (e.g., Alge, Wiethoff, & Klein, 2003; Liden et al., 2000; Sherony & Green, 2002; Hiller & Day, 2003).

We argue here that the social exchanges underlying TMX are likely to be aided by the presence of friendships between team members. This is because friendships create social ties and affective bonding, enabling team members to experience relational meanings about their interpersonal relationships, including TMX (Duck & Pittman, 1995). Our reasoning is that workplace friendships are unique interpersonal relationships that employees develop and maintain by choice, not compulsion; and they are willing to spend time with one another beyond their formal role expected within other relationships in organizations (Sias & Cahill, 1998; Sias, 2005). This voluntary interdependence assists with functions such as decision making and influence-sharing, and provides an instrumental and emotional support system for team members. Hence, friendship is an important source of support and intrinsic reward for team members (Sias & Cahill, 1998).

In line with this reasoning, we argue that workplace friendship nourishes high-quality TMX relationships because team members can trust and value each other, share interests, and view the emotional and instrumental support as valuable means of growth and dependence (Berman et al., 2002). This serves as a motivational force to engage in high-quality TMX relationship development because they see their team members as friends rather than formal colleagues at work. Evidence supporting this claim can be found in an empirical study by Morrison (2004) who found that workplace friendship accounted for substantial variance in team cohesion. Based on this, we suggest that workplace friendship may be a necessary condition for, and is conducive to, the formation of high-quality TMX; thus:

*Hypothesis 2:* At the individual level, workplace friendship will be positively related to TMX.

### *The Mediating Role of Workplace Friendship*

The mediating role of workplace friendship in the relationship between LMX and TMX is premised on the idea that friendships represent a key element of the informal social system of an organization. In this regard, Argyis (1996) has posited that workplace friendship lays a foundation for organizational social systems that links formal, informal, vertical, and lateral interactions with open styles of communication and fluid task structures for accomplishment. According to Morrision (2004), informal social relationships, including workplace friendships, offer significant rewards to individuals. As such, friendships are powerful structural units that can either hinder or facilitate team and organizational effectiveness via the informal social system. This is because the characteristics of workplace friendship emphasize discretionary attitudes and behaviors that are not pre-specified for an expected role within interpersonal relationships (Wright, 1984). We therefore propose that workplace friendship is an intermediate interpersonal mechanism linking supervisor-subordinate and team member exchange relationships.

As noted earlier, high-quality LMX relationships facilitate workplace friendship via affective and social bonding, providing team members with emotional and instrumental support. This is regarded by team members as a strong intrinsic motivation that may elevate their commitment to form high-quality TMX relationships. Conversely, low-quality LMX relationships undermine the quality of workplace friendship by emphasizing the role fulfillment for reciprocity, so that team members perceive it as part of their formal obligation.

This in turn engenders negative implications for team members' attitudes towards the development of TMX relationships.

In addition, and as we have argued already, workplace friendships are likely to reflect high-quality LMX relationships with respect to communication quality. Friendships are enhanced through open and honest communication interactions in which employees and supervisors talk about their emotional feelings regarding the work environment and their personal lives, and also share forthcoming sensitive information (Sias & Cahill, 1998). They also tend to be less cautious and engage in less 'editing' in their communication (Sias & Jablin, 1995). We therefore expect that workplace friendship plays a role in determining the relationship between LMX and TMX. This notion is supported in a field study by Sias (2005) who found that the quality of information employees received from coworkers or supervisors was related to the extent to which they are satisfied with their communication. Based on the foregoing, we suggest that workplace friendship serves as a proximal outcome through which LMX influences the more distal outcome of TMX. Thus:

*Hypothesis 3: At the individual level, workplace friendship will mediate the LMX-TMX relationship.*

#### *The Moderating Role of Affective Climate*

Over the last three decades, a considerable amount of research has examined the implications of climate in organizations (see Schneider, 2000 for a review of this literature). Jones and James (1979) defined psychological climate as organizational members' shared perceptions and interpretations of their work environment, in terms of psychological meaning and significance. A specific focus of climate research has been on the role climate plays in

motivational processes for individual and team outcomes (Kozlowski & Klein, 2000; Ashkanasy, Wilderom, & Peterson, 2000). Specific domains of climate that have been studied include service (Schneider, Parkington & Buxton, 1980), innovation climate (Anderson & West, 1998), safety climate (Hofmann & Stetzer, 1996), transfer to training climate (Tracey, Tannenbaum & Kavanagh, 1995), procedural justice climate (Naumann & Bennett, 2000), and affective climate (De Rivera, 1992). In general, this research has shown that climate accounts for substantial variance in work attitudes and behaviors.

Although climate is defined as a collective property of groups, only few empirical studies have used the group as a level analysis distinct from the wider organization (Anderson & West, 1998; see Ashkanasy & Nicholson, 2003, for an exception). Affective climate is a specific domain of climate, defined by De Rivera (1992) as an objective group phenomenon that can be “palpably sensed” (p. 197). Later, Choi, Price, and Vinokur (2003) provide a definition of affective climate, stating that it is an overall interaction pattern or a shared positive perception among members and the atmosphere that characterize interactions within a team. These represent “ambient group stimuli” (p. 357) reflecting the nature of the team and are important because they can shape an action tendency of individuals within the team.

Although climate perceptions originate within individuals, affective climate perceptions are expected to be shared by members within discrete work groups. Positive or negative affective climates are likely to be different within separate groups. This is because affective climate is conceptualized as a derivative of close social networks that exist within work groups (De Rivera, 1992). Affective climate is thus likely to be found in pockets within organizations rather than throughout whole organizations. In a field study, for instance, Ashkanasy and Nicholson (2003) found that affective climate differed between work groups

as a result of work-group specific differences, rather than organization-wide differences. This affirms that there is an effect on individuals' perceptions at the group level, causing them to share a perception of affect in the workplace that is greater than organization-wide impact (De Rivera, 1992). In addition, increased social interaction processes result in stronger homogeneity of climate perceptions among team members within teams and greater variation across teams (Ashkanasy et al., 2000). Thus, the appropriate unit of analysis of studying the impact of affective climate is the group and not the individual.

Climate perceptions determine how individuals behave collectively by influencing their perceptions and feelings about certain aspects of their surrounding environment. For this reason, we suggest that affective climate should be conceptualized as a group-level moderator of the relationship between LMX and workplace friendship. In particular, employees seek guidelines from their environment to interpret events, to develop appropriate attitudes, and to understand expectations concerning their behaviors and its consequences (Salancik & Pfeffer, 1978). Characteristics of affective climate, including warmth, support, acceptance, sincerity, and enthusiasm, serve as social control mechanisms facilitating and shaping employees' behaviors in a team (O'Reilly & Chatman, 1996). Therefore, if team members share strong perceptions of affective climate, members in the team may feel motivated to develop workplace friendships because of their positive experience in high-quality LMX relationships. On this basis, we argue that affective climate is likely to be a moderator of the LMX-workplace friendship relationship, and that the relationship is going to be a function of the variation in affective climate across work teams; thus our cross-level hypothesis:

*Hypothesis 4:* The relationship between LMX and workplace friendship at the individual level will be moderated by affective climate at the group level, such that the

relationship between LMX and workplace friendship will be stronger when the affective climate is strong.

## Method

### *Participants*

The participants in this study were employees and their immediate managers working in geographically separate branches of a large Australian bank. Some branches were engaged in delivering standard banking customer services, such as dealing with personal and corporate banking accounts, home loans, and general investment advice. Other branches were engaged in several interdependent tasks including handling customer complaints, promoting investment schemes, different types of insurance, and superannuation management. The differing functions of each branch thus created variation for within-branch and between-branch comparisons making this sample ideal for multi-level modeling and analysis.

Participants had a range of job titles, including tellers, investment consultants, insurance planners, and customer service officers. Branch managers had been formally appointed by the organization to manage the staff, and to maintain the effectiveness of daily operation for branches. Their job responsibilities include junior employee mentoring, employee performance evaluation, job allocation, employee rotation, and delivering general banking services to personal and corporate customers. Most of the local branches generally consisted of ten to twelve employees although some had more than twenty. Each employee directly reported their job progress to their branch manager on a daily basis. We excluded branch managers who had been in their positions for less than 6 months, and employees who had been in their branch for less than 3 months. This selection rule was to ensure that

employees were sufficiently acquainted with their coworkers and managers in order to have developed exchange relationships with them.

### *Procedure*

Survey packs were sent to potential respondents through the internal mail system and were prefaced with a cover letter outlining the details of the research, voluntary participation, and an assurance of confidentiality. Each survey pack contained a manager-report questionnaire and numerous self-report employee questionnaires. The number of surveys included was dependent on the size of each branch. The two forms of questionnaires aimed to collect information about the social exchange relationships from manager and employees' perspectives. The self-report questionnaire measured individual employees' perceptions of affective climate, workplace friendship and TMX; while the manager-report questionnaire contained measures of individual managers' perceptions of LMX for each employee within the branch. Hence, all constructs (individual and group level) were measured based on individual perceptions initially. Participants were provided with pre-addressed sealed envelopes to return their completed surveys to the researchers directly. The employee questionnaires were matched to the responses of their managers using a coding system based on information provided by the human resources manager of the bank.

Out of the 59 manager questionnaires and 682 employee questionnaires distributed, 36 manager questionnaires (61% response rate) and 347 employee questionnaires (51% response rate) were returned. After excluding incomplete questionnaires and those failing to match with a manager within each branch, the sample comprised of 215 manager-employee dyads from 36 branches. The average branch size was 6 individuals and the overall response rate was 32%. To minimize concern about possible sampling bias, we compared sample means for the

usable cases and the cases dropped on the basis of unmatched questionnaires for all study variables. ANOVA results indicated that the two groups of data were not significantly different from each other. We therefore concluded that the manager-employee matched sample was valid for subsequent analyses and sampling bias was not a major problem in this study<sup>1</sup>.

Eighty-four percent of the managers in the sample were women. Sixty-two percent were aged 45 years or below. The managers had been employed in the organization between 1 to 28 years (mean = 14 years) and their average experience working in their present position was 3.8 years. About seventy-eight percent of the managers had been working with their employees for 2 years.

Among the employees in the sample, eighty-nine percent were women. Seventy-eight percent were aged 45 years or below. Eighty-seven percent had been working in their current branches for more than 5 years. Eighty-one percent had been working with their managers for 2.5 years. Over half of the employees in the sample interacted with their managers on a daily basis. In respect to their teams, seventy percent had been working with their team members for 2.5 years and fifty-four percent interacted with their team members on a daily basis.

#### *Measures - Individual-level variables*

*Leader-member exchange.* We used the LMX-7 scale (Graen & Uhl-Bien, 1995) to measure individual perceptions of the relationship quality between branch managers and their employees. This scale has been widely used to measure manager-subordinate exchange relationships. It consists of seven items that characterize various aspects of the working relationship between a supervisor and a subordinate. LMX data was collected from managers'

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<sup>1</sup> Please note that the ANOVA results are available upon request.

perspectives, and was measured using a five-point scale, which ranged from 1 (Not at all) to 5 (Extremely). Each branch manager was asked to provide his or her own ratings of the relationship with each of his or her individual subordinates within the branch. This measurement is consistent with the past LMX research, conceptualizing and assessing it as a dyadic individual-level variable for analysis (see Schriesheim, Castro, & Cogliser, 1999). Sample items include: "To what extent do you understand work problems and needs of the employee" and "To what extent do you recognize the potential of the employee." The alpha reliability for this scale was .87.

*Workplace friendship.* We used six items developed by Nielsen et al. (2000) to measure the prevalence of workplace friendship as perceived by individual employees. Responses to the items were on a seven-point scale that ranged from 1 (Strongly disagree) to 7 (Strongly agree). Sample items include: "I have formed strong friendships at work," "I socialize with coworkers outside of the workplace," and "I do not feel that anyone I work with is a true friend." The alpha reliability for this scale was .80.

*Team member exchange.* The ten-item TMX scale developed by Seers et al. (1995) was used to measure individual team members' perceptions of the reciprocal exchange relationship that exists between themselves and their team members. TMX indicates the quality and effectiveness of an individual member's working relationship with other members within his/her team. Responses to the items were on a seven-point scale that ranged from 1 (Strongly disagree) to 7 (Strongly agree). Sample items include: "In busy situations, other team members often volunteer to help me out," and "I am willing to help finish work that has been given to other members in my team." The alpha reliability for this scale was .83.

*Group-level Measure*

According to Chan (1998), specifying the appropriate composition model is essential for multi-level research. Composition models define the relationships among the variables at different levels of analysis that concern fundamentally the same content but are qualitatively different (Rousseau, 1985; Kozlowski & Klein, 2000). As a result, this study employed the referent-shift consensus composition model because we were interested in individual employees' aggregate perception of affective climate. The affective climate measure was specifically designed for the purpose of this referent shift with collective entity as the focal point.

*Affective climate.* This was measured using the 5-item positive group perception scale developed by Choi et al. (2003), slightly modified for the branch context of the sample. This scale captures individual participants' overall perceptions of their group climate, and is also specifically designed to deal with a shared perception of affective climate among employees. Hence, the scale was designed as a workgroup property, using the collective entity as the focal point. Items were assessed on a five-point scale, ranging from 1 (Not at all) to 5 (Extremely). Sample items include: "In general how enthusiastic do you think your branch is?" and "In general, how warm do you think your branch is"? The alpha reliability for this scale was .92.

*Measures - Control variables*

Demographic variables of employees could account for variance in TMX (e.g., Seers, 1989; Seers et al., 1995). We therefore included gender and age of employees and their experience working in their current branch as control variables. In addition, we controlled for employees' length of work experience with team members and their interaction frequency with other team members because these variables may potentially explain team outcomes,

such as TMX (Rentsch & Klimoski, 2002; Pelled, Eisenhardt, & Xin, 1999). Coding for the categorical control variables are shown below Table 2.

## Data Analysis

### *Construct Validity*

Given most of the variables included in this study were collected from the same source, confirmatory analyses (CFA) was conducted to examine whether the variables were empirically distinct from each other, based on the fit indices of RMSEA, TLI and CFI . We compared the fit of our hypothesized four-factor measurement model in which LMX, group climate, workplace friendship, and TMX were expected to load on their respective factors with other plausible alternative models (e.g., LMX and TMX were set to load on a one- factor model or workplace friendship and TMX were set to load on one-factor model).

### *Level of Analysis*

As the purpose of our study was to explore how affective climate influences the relationship between LMX, workplace friendship, and TMX at the individual level, it was necessary for us to justify why affective climate can be aggregated as a group-level construct (Rousseau, 1985). To do this, we determined the degree to which individuals' perceptions of affective climate were shared within each of the 36 workgroups (e.g. Chan, 1998; Hofmann, 1997). We conducted an  $r_{wg}$  test to assess the level of inter-rater agreement for group climate within the teams. This agreement means that reliability of group climate takes into account differences within branches relative to differences between teams. Generally, an  $r_{wg}$  above .70 is desirable; hence, the higher the value of  $r_{wg}$ , the stronger within group agreement of the construct is reflected (James, Demaree, & Wolf, 1984).

We also performed an analysis of variance (ANOVA) to examine between-group variations in affective climate perceptions and computed the intra-class (ICC) correlation values, to reflect the inter-rater reliability (Bliese, 2000). There are two forms of ICC values. ICC (1) represents the proportion of variance due to team variability, whereas ICC (2) reflects the extent to which teams can be used to reliably differentiate in terms of individuals' ratings of affective climate. Bliese (2000) suggests that ICC (1) values different from zero are desirable, with values close to .20 indicating high scores for group-level analysis. Glick (1985) proposed that ICC (2) values above .60 are desirable.

#### *Data Analytical Strategy*

To overcome the shortcomings of the aggregation and disaggregation biases associated with multi-level data, we used hierarchical linear modeling (HLM) in conjunction with the mediation testing procedures outlined by Baron and Kenny (1986) to test our hypotheses. HLM allows the analysis of multiple level data simultaneously to avoid the possible biases, and enables the examination of interactions between variables at different levels of analysis while accounting for their different sources of variance (Griffin, 2001; Hofmann, Griffin, & Gavin, 2000). In addition, HLM is effective for modeling cross-level interaction effects between group-level predictors and individual-level independent variables on outcome variables (Hofmann et al., 2000). The standard process for HLM is to run a series of hierarchical models to test the hypotheses that relate to different levels of analysis. In this study, a hierarchical regression equation was calculated for each individual at Level 1. The intercept and slope score from Level 1 were used as dependent variables at Level 2. A significant parameter estimate for the Level 1 predictor indicates an individual-effect, and a

significant parameter estimate for Level 2 predictor of the Level 1 intercepts and slopes indicates a group-level effect.

## Results

### *Measurement Model*

As discussed earlier, CFA was conducted to determine the validity of our hypothesized factor model as compared to other underlying plausible factor models based on several fit indices. The chi-square and fit indices were  $\chi^2 = 891.60$ ,  $df = 344$ ; RMSEA = .08; CFI = .97 and TLI = .97; showing that the hypothesized four-factor model (i.e., LMX, group climate, workplace friendship and TMX) fitted the data significantly better than all alternative models. The results provide evidence for the distinctiveness of the constructs in this study and also suggest that common method variance was not responsible for the relationships between the constructs (Podsakoff et al., 2003).

### *Justification for Group Climate Aggregation*

To justify the appropriateness of aggregating affective climate as a group-level construct, it was necessary for us first to evaluate both between-group variability and within-group agreement of affective climate (Hofmann, 1997; Klein et al., 1994). The average  $r_{wg}$  of group climate across 36 teams was .90, which meets the within-group agreement requirement discussed earlier. Further, results of ANOVA show that the between-group variance in group climate was significantly different from zero,  $F(35, 179) = 3.33$ ,  $p < .01$ . The ICC (1) derived from ANOVA was .28, and ICC (2) was .75, which provides sufficient evidence for between-group variability. These results indicate that group climate comprised of individual perceptions and was able to be aggregated as a group-level construct.

*Descriptive Statistics*

Table 1 presents the means, standard deviations and correlations. All variables in our model were significantly and positively correlated. Consistent with our hypotheses, LMX was positively related to workplace friendship, and workplace friendship was positively associated with TMX. These results provide initial evidence for Hypotheses 1 and 2, and also support two conditions for the mediation test using the Baron and Kenny (1986) approach. None of the control variables were correlated with TMX, however. In this respect, Becker (2005) suggests that such “impotent” control variables have little use except to use up degrees of freedom, resulting in biased parameter estimates. In the light of our sample size and Becker’s suggestion, we elected therefore not to include control variables in the subsequent HLM analyses.

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Insert Table 1 about here

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*Test of Hypotheses*

In the following section, we present the HLM results, testing Hypotheses 1 to 4. Before testing the hypotheses, we first needed to run null models (no individual or group level predictors) in order to examine whether there was significantly systematic between-group variance in the mediating and outcome variables. Results in Table 2 provide support for significant within-group variation in workplace friendship ( $\tau_{00} = .06$ ,  $\chi^2(35) = 55.03$ ,  $p < .05$ ), and ICC (1) was .10, which show that workplace friendship had 10 percent between-group variance. Similar results were found for TMX,  $\tau_{00} = .09$ ,  $\chi^2(35) = 70.40$ ,  $p < .01$ , and ICC (1)

was .14, which indicate that 14 percent of variance in TMX resides between the workgroups. These results justified the appropriateness for cross-level analyses (Snijders & Bosker, 1999).

#### *Individual-level relationships*

Hypothesis 1 predicted that LMX would be positively related to workplace friendship. Table 2 shows that LMX had a significant positive relationship with workplace friendship. Thus, Hypothesis 1 was supported. Also, as predicted in Hypothesis 2, results reveal that workplace friendship was positively associated with TMX, which provides evidence supporting the significant positive relationship between workplace friendship and TMX. Hence, Hypothesis 2 was also supported.

In view of the above HLM results providing evidence in support of Hypotheses 1 and 2, the first two conditions of the mediation test were supported (Baron & Kenny, 1986). The final step for testing mediation was to regress TMX on LMX and workplace friendship. Here we tested whether workplace friendship would mediate the relationship between LMX and TMX. Table 2 shows that the main effect of LMX on TMX became non-significant, when workplace friendship was entered as a mediator. The overall  $R^2$  of this mediation test was .40. Thus, Hypothesis 3 was supported because workplace friendship was related to TMX and mediated the LMX-TMX relationship.

#### *Group-level relationship*

In testing Hypothesis 4, we aimed to examine whether affective climate would moderate the relationship between LMX and workplace friendship at the individual level. This hypothesis was tested using “slopes-as-outcomes” model where the variance in the slope across workgroups is expected to be significantly related to affective climate. Hofmann and Gavin (1998) assert that it is difficult to detect true cross-level interaction relationships

between predictors at different levels of analysis without separating the cross-level from the between-group interaction variance. To test the cross-level interaction we added the interaction term of group-mean LMX and affective climate as predictors of the intercept, and entered affective climate as predictor of the variance in the slopes relating to LMX and workplace friendship (Hofmann & Gavin, 1998; Hofmann et al., 2003). Results in Table 3 show that the cross-level interaction between affective climate and LMX on workplace friendship was significant. To estimate the level of variance in workplace friendship accounted for by the cross-interaction level effects, we conducted hierarchical regression analyses to estimate the change in  $R^2$ , when the interaction term was included in the model (Hofmann et al., 2003). Results show that the interaction term between LMX and affective climate explained 4% of the variance in workplace friendship,  $\Delta R^2 = .04$ ,  $F = 13.48$ ,  $p < .01$ , after controlling for the main effect of LMX and affective climate. According to Cohen and colleagues (2003), interactions typically explain 1 - 3% of the variance in outcomes of interest. Thus, the magnitude of our  $R^2$  change is within the range of interaction estimation.

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Insert Table 2 and Figure 2 about here

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To understand the nature of cross-level interaction, the procedure outlined by Aiken and West (1991) was employed. The high and low values of the independent variables were substituted into the regression equation and the interaction effect was plotted on the graph shown in Figure 2. We did this by plotting the LMX-workplace friendship graph one standard deviation above and below the affective climate mean (Aiken & West, 1991). In line with Hypothesis 4, Figure 2 illustrates that the relationship between LMX and workplace

friendship was strong and positive in teams when teams have a strong climate, and this relationship is not significant when teams have a weak climate. Here, the finding that the within-group relationship between LMX and workplace friendship changes as a function of between-group differences in affective climate, which supports Hypothesis 4.

The HLM results provide evidence supporting the hypothesized relationships at the individual level, and the moderating effect of affective climate at the group level. Upon request of the editors, however, we also conducted an alternative multi-level analysis using within and between analysis (WABA: see Dansereau, Alutto, & Yammarino, 1984; Yammarino, Dubinsky, Cormer, & Jolson, 1997; Sosik et al., 2004), at the group level for all relationships of interest. Results suggest that the variance and covariance is equivocal that these relationships may possibly be attributable to individual difference effects and not group-level effects (see the Appendix for WABA results).

## Discussion

### *Implications for Theory and Research*

Our HLM findings contribute to the literature on interpersonal exchange relationships in several ways. First, as Sparrowe and Liden (1997, 2005) suggest, although the implications of LMX for subordinates' perception of relationship development with other team members has been explicit in social exchange literature, this has not been empirically tested in a systematic manner (Graen & Uhl-Bien, 1995). This study is the first empirical study to integrate LMX and TMX exchange relationships in organizations by developing and testing a multi-level model using HLM. Our results provide support for the hypothesized relationships in the model. Specifically, LMX was found to be significantly related to workplace friendship. We have shown that workplace friendship relates to TMX and also mediates the LMX-TMX

relationship. In addition, our HLM results indicate that affective climate moderates the individual-level relationship between LMX and workplace friendship. The overall findings have substantial implications for advancing research on LMX, workplace friendship and group climate.

Second, our findings shed new light on the mediating role of workplace friendship in the LMX-TMX relationship. Researchers, such as Berman and his colleagues (2002) suggest that workplace friendship can constitute and facilitate a social system in organizations by linking formal and informal, vertical and lateral interpersonal relationships at work. To date, research on workplace friendship has focused on identifying individual and contextual factors that influence the development of such relationships (Sias & Cahill, 1998; Morrison, 2004). In this study, we took a step forward to address both issues by exploring the role of workplace friendship in the LMX-TMX relationship in order to understand the antecedents and consequences, and the mediating effects of workplace friendship within interpersonal exchange processes. Our results add to the emerging body of research on workplace friendship by revealing that LMX is related to workplace friendship and it serves as a mediator influencing the relationship. We believe that high-quality LMX relationships can be seen by subordinates as a social currency to nourish their perceptions of workplace friendship which in turn facilitate high-quality TMX development in teams. These results suggest that workplace friendship has potential to create a social system which affects work attitudes, behaviors and perceptions in larger collectives of workgroups.

Finally, although affective climate has been studied for some time now in organizational settings (see Ashkanasy et al., 2000; Reichers & Schneider, 1990), little attention has been directed towards the role of affective climate as a group-level construct

with implications for interpersonal exchange processes. We conceptualized affective climate as a group-level construct, and as a buffer of the relationship between LMX and workplace friendship. Consistent with our hypothesis, affective climate moderates the relationship significantly. In a workgroup where there is a strong positive affective climate, individuals experiencing high-quality LMX relationships are more likely to develop friendships at work. When the affective climate is weak in the workgroup, even employees experiencing high-quality LMX relationships, are less likely to form workplace friendships. Although affective climate could only account for 4 percent of the variance in the slope relating to LMX and workplace friendship, we note that it is a significant cross-level interaction effect because Figure 2 illustrates clearly how the shared (group-level) perception of affective climate influences the relationship beyond (individual-level) social exchange relationships. In effect, and consistent with the multi-level literature (e.g., Kozlowski & Klein, 2000), this provides an exemplar of a group-level construct that explains additional variance in the individual-level relationships between the variables. The added value of this study is therefore to explicate affective climate as a mechanism moderating the relationship between LMX and workplace friendship in teams.

#### *Implications for Practice*

These findings have implications for the management of interpersonal exchange processes in the workplace. First, the present study builds upon the notion that LMX quality can have a potential impact on the development of TMX through the workplace friendships aroused in the high-quality supervisor and subordinate interactions. Further, affective climate promotes the relationship between LMX and workplace friendship within teams. An implication of this, as Ashkanasy et al. (2000) have noted, fostering a healthy affective

climate helps employees understand that they are not in isolation from other coworkers in teams, because the shared group climate would affect the expectations of, and how they interpret their experiences of, high-quality LMX relationships. This in turn determines their attitudes and behaviors towards workplace friendship development. Hence, organizations can use affective climate as a mechanism to guide and to educate their employees about how the organization cares for their emotional well-being, and to foster positive emotions among employees at work.

Our findings also reveal that high-quality LMX relationships are a driving force in the formation of workplace friendships which in turn, influence the quality of TMX in teams. Specifically, supervisors need to pay attention to their subordinates' perceptions of the relationship characteristics, and to reciprocate in ways that meet their subordinates' expectations. Effective leaders should attempt to stimulate subordinates' shared perceptions regarding affective climate and to promote workplace friendship within teams.

In addition, the findings suggest that promoting workplace friendship in teams can be effective in improving the quality of LMX and TMX relationships for team efficiency and effectiveness. This is supported by a study by Berman and colleagues (2002), who found that 76.4% of senior managers approved or strongly approved of various types of workplace friendships. The managers further reported that workplace friendship can improve communication and employees perform better. This study shows that positive orientations towards workplace friendship are reflected in organizational efforts to foster closer workplace relations. As Tse and Dasborough (in press) suggest, managers should organize and coordinate social gatherings, such as picnics, happy hours after work, BBQ's, parties and sport activities to help promote friendship formation within teams.

*Limitations, Future Research Directions, and Conclusions*

The present study has four limitations that should be addressed in future research.

First, the dynamic nature of relationship between LMX and TMX was not fully explored in this study because we did not collect longitudinal data. Hence, this limits our understanding of how LMX influences employees' perceptions of their relationship with their team members over time. Although the extant literature seems to support our model of conceptualizing the effect of LMX on TMX via workplace friendship within teams (Graen & Uhl-Bien, 1995; Sparrowe & Liden, 1997, 2005), we cannot eliminate the possibility of a reverse causal model given the cross-sectional design of this study. For example, the relationship quality among individuals in a team may determine their perceptions of relationship quality with their managers, based on the individuals' perception of workplace friendship within the team. To check this, we conducted another set of analyses to confirm the significance of the reverse model. Results however, found no significant mediation effects of workplace friendship in the TMX-LMX relationship. Although the results of the reverse model were not significant, future research should adopt experimental and longitudinal designs to strengthen conclusions about the casual direction between LMX, workplace friendship and TMX.

The second limitation of this study is the sample size. Response rates within groups are particularly important for all multi-level studies (Bliese, 2000; Bassiri, 1988). Our analyses contained 215 manager-employee dyads nested within 36 branches. The branch size is rather small which would lead to some problems with estimation of HLM models in relation to hypothesis testing (Hofmann, 1997; Hofmann et al., 2003). Nonetheless, as suggested by James and Williams (2000), the HLM modeling strategy is somewhat complex

and that “simpler is sometimes better” (p.423), we addressed this issue by analyzing data using the ordinary least squares (OLS) regression before conducting HLM analyses. The results of these OLS analyses were consistent with the HLM results which imply that the smaller sample size does not invalidate the observed relationships in this study. Future research should nonetheless be conducted to attempt to replicate this study using a sample of more teams in different organizational settings in order to improve the confidence in the findings and their generalizability.

The third limitation concerns common method variance (Podsakoff et al., 2003). It might be arguable that common method variance may have inflated the hypothesized relationships in this study because the moderating variable (affective climate), mediating variable (workplace friendship), and the dependent variable (TMX) were measured as individual perceptions with a common method and source. Following the recommendation by Podsakoff et al. (2003), we minimized the problem through use of a different data source for our independent variable (LMX) and used data aggregation. Specifically, we obtained the manager ratings of LMX, which constituted an independent data source for testing the LMX-TMX relationship (it should be noted however, that to fully understand LMX relationships it must be investigated from both supervisors’ and subordinates’ perspective). Furthermore, our data analysis focused on the shared perceptions among members in a branch regarding their affective climate, rather than the affective climate as perceived by an individual member. We aggregated affective climate as a group-level variable which helped reduce the potential for spurious results based on individual-level observed variance. This is consistent with the theoretical basis that affective climate shapes members’ attitudes and behaviors within the entire group (De Rivera, 1992). The CFA results also demonstrated the distinctiveness of the

variables, suggesting that common method variance is not responsible for the significant effect observed.

Finally, we note that the results of an alternative analysis using WABA raise some doubt about the appropriateness of our multi-level results based on HLM. As a consequence, these results should be interpreted with caution, and further investigation of the inconsistency between HLM and WABA results would appear to be warranted (see Dansereau, Cho, & Yammarino, 2006 for a discussion of the two analytical methods).

In conclusion, the present study contributes to the research on interpersonal exchange relationships by developing and testing a multi-level model that includes workplace friendship, mediating the LMX-TMX relationship at the individual level, and affective climate at the group level moderating the LMX-workplace friendship relationship. Overall, the HLM results of this study provide support for all hypothesized relationships. Indeed, the social exchange relationships that exist in organizations are enhanced via a strong affective climate and the presence of friendships at work. We hope that our findings encourage researchers to pay closer attention to the relationship between the constructs of LMX and TMX in future, and to explore other possible mediating and moderating variables within the team context, and the larger social network of organizations.

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Figure 1. A multi-level model of interpersonal exchange relationships at work

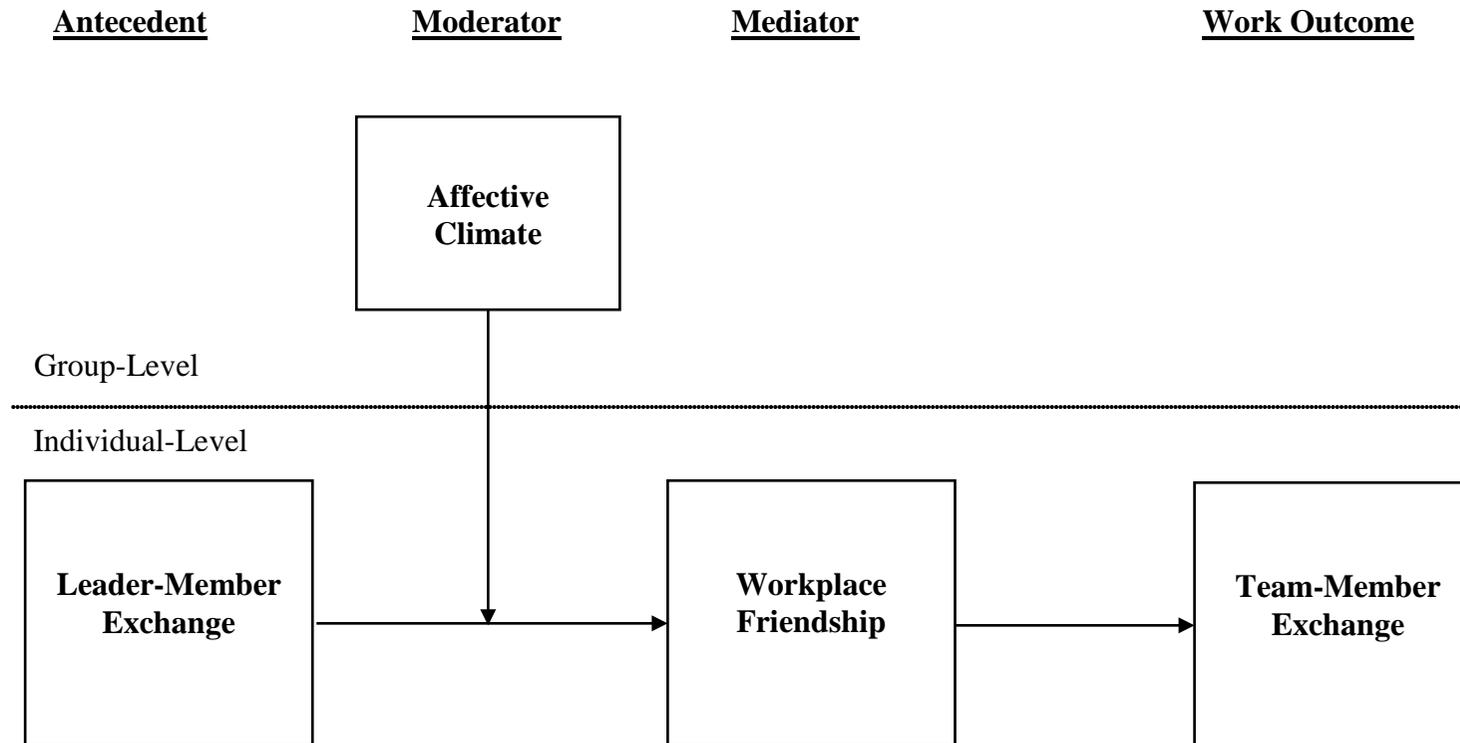


Table 1

*Means, Standard Deviations, Reliabilities, and Correlations among Study Variables<sup>a</sup>*

Variables	M	SD	1	2	3	4	5	6	7	8	9
1. Gender of employees <sup>b</sup>	1.90	.30	--								
2. Age of employees <sup>c</sup>	4.94	.19	.14*	--							
3. Branch tenure <sup>d</sup>	34.80	7.30	-.03	.41**	--						
4. Work experience <sup>e</sup>	27.30	8.30	.03	.33**	.52**	--					
5. Interaction frequency <sup>f</sup>	6.20	1.01	.16*	-.14*	-.20**	-.08	--				
6. LMX	4.20	.56	.02	.11	.14*	.10	.05	(.86)			
7. Affective climate	3.90	.52	.02	.13	.05	.10	.04	.41**	(.92)		
8. Workplace friendship	4.60	.82	.07	.13	.18*	.21**	.02	.24**	.33**	(.80)	
9. TMX	5.20	.76	.08	.12	.12	.04	.13	.32**	.37**	.55**	(.84)

<sup>a</sup>  $N = 215$ . Internal consistency reliabilities appears in parentheses along diagonal. Although the correlations between affective climate and all other variables were computed using  $N = 215$ , affective climate scores for individual groups were assigned down to individuals within those groups. Thus, the effective sample size for affective climate is 36.

<sup>b</sup> Gender of employee was coded: Male = 1, Female = 2.

<sup>c</sup> Age of employees was coded: 1 = < 20 yrs, 2 = 21-25 yrs, 3 = 26-30 yrs, 4 = 31-35 yrs, 5 = 36-40 yrs, 6 = 41-45 yrs, 7 = 46-50 yrs, 8 = 51-55 yrs, 9 = > 55 yrs.

<sup>d</sup> Branch tenure = Length of time in months employees have worked in their current branch.

<sup>e</sup> Work experience = Length of time in months employees have worked with their team members.

<sup>f</sup> Interaction frequency = Interpersonal interaction frequency between individual employees and their team members; was coded: 1 = Every three months, 2 = Once a month, 3 = Once a fortnight, 4 = Once a week, 5 = A few times a week, 6 = Daily and 7 = A few times a day.

\*  $p < .05$ ; \*\*  $p > .01$

Table 2

*Hierarchical Linear Modeling Results for Interpersonal Exchange Relationships at Work<sup>a</sup>*

Variables	Null Models		Workplace Friendship		TMX	
	Variance	$\chi^2$	Coefficient	<i>t</i>	Coefficient	<i>t</i>
<b>Individual-level Analysis</b>						
Workplace friendship $\tau_{00}$	.06*	55.03				
TMX $\tau_{00}$	.09**	70.40				
<b>Main Effects</b>						
<b>Hypotheses 1 &amp; 2</b>						
LMX $\gamma_{10}$			.53**	4.06	.42**	3.33
Workplace friendship $\gamma_{10}$					.47**	7.23
<sup>b</sup> R <sup>2</sup>			.09		.40	
<b>Mediation Effects</b>						
<b>Hypothesis 3</b>						
LMX $\gamma_{10}$					.18	1.85
Workplace friendship $\gamma_{20}$					.44**	6.27
<sup>b</sup> R <sup>2</sup>					.40	
<b>Relationship between LMX and Workplace Friendship</b>						
<b>Group-Level Analysis</b>						
<b>Moderation Effects</b>						
<b>Hypothesis 4</b>						
Affective climate $\gamma_{11}$			.33*	2.20		
<sup>c</sup> R <sup>2</sup>			.13			

<sup>a</sup> Level 1, N = 215 employees; Level 2, N = 36 branches. Entries are estimations of fixed effects with robust standard error.

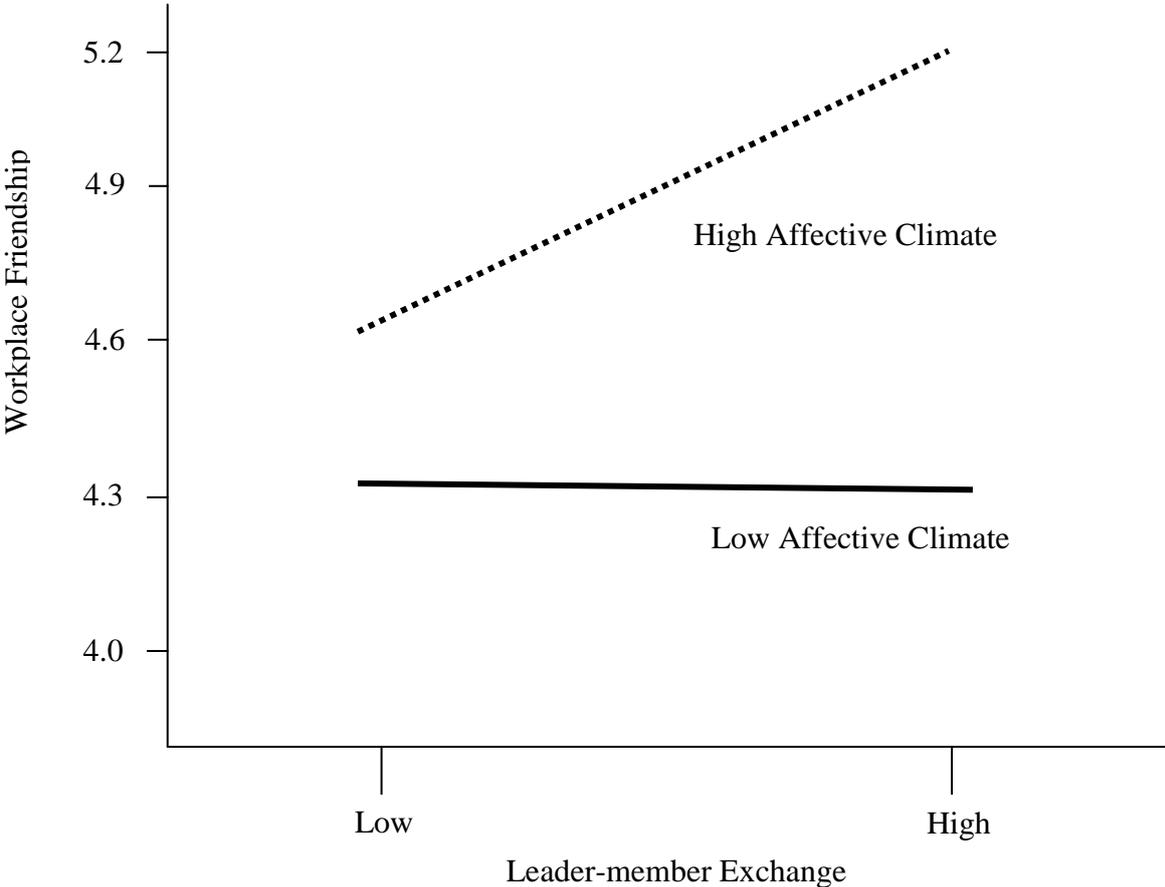
This table shows results concerning individual-level analysis (Hypotheses 1 to 3) and “slope-as-outcomes” analysis (Hypothesis 4).

<sup>b</sup>R<sup>2</sup> = Proportion of within-branch variance explained by level 1 predictor and mediator

<sup>c</sup>R<sup>2</sup> = Proportion of between-branch variance explained by cross-level interaction term.

\*p < .05; \*\* p > .01

Figure 2. Affective climate as a moderator of the relationship between LMX and workplace friendship



Appendix. Results of within- and between-group analysis (WABA)<sup>a</sup>

	<u>Eta</u> <sup>b</sup>		<u>Correlations</u> <sup>c</sup>		<u>Components</u>	
	Between	Within	Between	Within	Between	Within
Group-level analysis						
Affective climate	.63	.78				
LMX	.70	.72	<b>.59*†</b>	<b>.26</b>	.26	.14
Workplace friendship	.48	.88††	<b>.68*†</b>	<b>.44</b>	.21	.30
TMX	.53	.85†	<b>.70*†</b>	<b>.46</b>	.23	.30
LMX						
Workplace friendship			.15	.30	.05	.19
TMX			.42	.27	.16	.16
Workplace friendship						
TMX			.61	.53	.16	.39

<sup>a</sup> Analyses are based on N = 36 managers and N = 215 manager-employee dyads.

<sup>b</sup> Significant *E* test (†) and *F* test (\*) results of the difference between the within and between etas are shown for each variable.

<sup>c</sup> Significant between- and within-group correlations, based on *R* and *t* test results, are bold. Significant *A* test (†) and *Z* test (\*) results of the difference between the within- and between-cell correlations are shown for each relationship.

\**p* < .05, \*\**p* < .01.

†15 degree, ††30 degree.