

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

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Abstract

This paper seeks 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 mediated the LMX-TMX relationship. At the team level, HLM results indicated that the relationship between LMX and workplace friendship was moderated by affective climate. These findings suggest that high-quality LMX relationships are associated with enhanced workplace friendship between employees, especially when the affective climate is strong.

Keywords: Leader-member exchange (LMX); Team-member exchange (TMX); Workplace friendship; Affective climate

1. Introduction

Considerable research attention has been devoted to understanding the implications of leader-member exchange (LMX) theory over the last 30 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). Nevertheless, several important questions remain 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 & Liden (1997, 2005) and Cole, Schaninger, & 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 & 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), which has been defined by Seers (1989) as the relationship quality between an individual and her or his team members.

According to Dienesch & 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 to be problematic because employees can be sensitive to social comparison information and perceptions of unfairness. The resulting altered self-concept may then affect employees' attitudes toward TMX (Greenberg, Ashton-James, & Ashkanasy, 2007; Tyler & Blader, 2003). 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 are, therefore, 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 who enjoy more beneficial high-quality LMX relationships.

Although the implications of LMX for TMX within a larger organization's social system have been implicit in the social exchange literature, they have not been made theoretically explicit, nor have they 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 LMX relationships are more likely to contribute by assisting one another and to share information, ideas, and feedback within work teams (e.g., Seers, 1989; Seers, Petty, & Cashman, 1995). Hence, interpersonal relationships play a pivotal role in effective team functioning because they facilitate behaviors that maximize the individual potential for team efficiency and effectiveness (see Kostova & Roth, 2003). Based on this understanding, 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).

The present article attempts to advance the research on interpersonal exchange relationships in several ways.

First, we respond to the call by Graen & Uhl-Bien (1995) to examine the impact of dyadic LMX relationships within a larger system of workgroups. To do so, 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 line of research addresses Gerstner & Day's (1997) call to identify the underlying process variables linking LMX and important work outcomes, such as, TMX. It also responds to the call by Berman, West, & Richter (2002) to explore the role of workplace friendship in creating social systems in organizations.

Finally, this 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 its effects 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.

2. Theory and hypothesis development

Fig. 1 depicts a multi-level model in which 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.

In this section, we provide the rationale underlying our model development, and we develop theoretical arguments supporting the hypothesized relationships. We begin by discussing the extant research concerning the relationships between LMX and workplace friendship. Next, we discuss how workplace friendship mediates the LMX-TMX

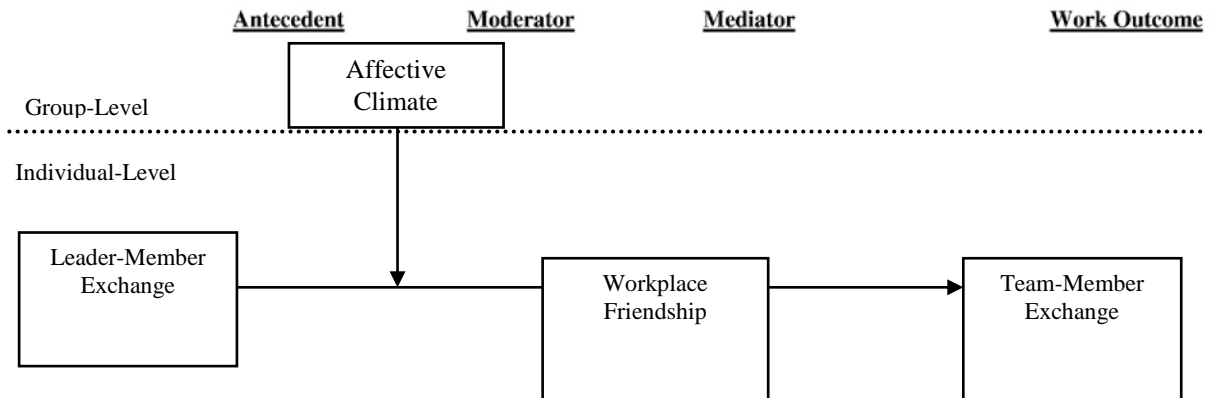


Fig. 1. A multi-level model of interpersonal exchange relationships at work.

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.

2.1. 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 mere role occupants in the organization. More recently, Winstead, Derlega, Montgomery, & Pilkington (1995) found that workplace friendship is defined by two factors: (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 with which 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; it is negatively associated with employees' turnover intentions and negative emotions (e.g., Berman et al., 2002; Morrison, 2004; Nielsen, Jex, & Adams, 2000; Riordan & Griffeth, 1995; Winstead et al., 1995). Although these findings are important for the advancement of research on workplace friendship in relation to employee outcomes, several researchers (e.g., Nielsen et al., 2000; Sias, 2005; Sias & Cahill, 1998) have noted that there is still little understanding of which 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). Employees who enjoy high-quality LMX relationships are, therefore, more likely to stress friendship development at work 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 the sake of reciprocity. These individuals 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), thereby further 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 that determine their communication satisfaction (Baker & Ganster, 1985; Kacmar, Witt, Zivnuska, & Gully, 2003; Lee & Jablin, 1995). 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 trend, 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 idea, in turn, implies that LMX relationships may be associated with employees' perceptions of workplace friendship within a team. These concepts contribute to our first hypothesis:

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

2.2. 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; Hiller & Day, 2003; Liden, Wayne, & Sparrowe, 2000; Sherony & Green, 2002).

The social exchanges underlying TMX are likely to be aided by the presence of friendships between team members. Friendships create social ties and affective bonding, enabling team members to experience relational meanings about their interpersonal relationships, including TMX (Duck & Pittman, 1995). 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, 2005; Sias & Cahill, 1998). This voluntary interdependence assists with functions such as decision making and influence sharing, and it 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 one another, share interests, and view the emotional and instrumental support as valuable means of growth and dependence (Berman et al., 2002). This motivational force encourages employees 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:

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

2.3. 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, Argyris (1996) has posited that workplace friendship lays down 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 Morrison (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 capacity arises 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. Team members regard this possibility 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 perception, in turn, engenders negative implications for team members' attitudes toward the development of TMX relationships.

As mentioned earlier, workplace friendships are also 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 both talk about their emotional feelings regarding the work environment and their personal lives and share forthcoming sensitive information (Sias & Cahill, 1998). Participants in workplace friendships also tend to be less cautious and engage in less "editing" in their communication (Sias & Jablin, 1995). We would therefore expect workplace friendship to play a role in determining the relationship between LMX and TMX. This notion was supported in a field study conducted by Sias (2005), who found that the quality of information employees received from coworkers or supervisors was related to the extent to which they were satisfied with their communication.

Based on the foregoing points, we suggest that workplace friendship serves as a proximal outcome through which LMX influences the more distal outcome of TMX:

Hypothesis 3. At the individual level, workplace friendship will mediate the LMX–TMX relationship.

2.4. 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 & James (1979) defined psychological climate as organizational members' shared perceptions and interpretations of their work environment, in terms of psycho-logical meaning and significance. In particular, researchers have focused on the role that climate plays in motivational processes for individual and team outcomes (Ashkanasy, Wilderon, & Peterson, 2000; Kozlowski & Klein, 2000). Specific domains of climate that have been studied include service climate (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, few empirical studies have used the group as a level for 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 as an objective group phenomenon that can be "palpably sensed" (1992, p. 197). Choi, Price, & Vinokur (2003) provide a later 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 "ambient group stimuli" (p. 357) reflect the nature of the team and can shape the 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 workgroups. Positive or negative affective climates are likely to be different within separate groups. This discrepancy arises because affective climate is conceptualized as a derivative of close social networks that exist within workgroups (De Rivera, 1992). Affective climate is therefore likely to be found in pockets within organizations rather than throughout whole organizations. In a field study, for instance, Ashkanasy & Nicholson (2003) found that affective climate differed between workgroups as a result of workgroup-specific differences, rather than organization-wide differences. This finding affirms that there is an effect on individuals' climate perceptions at the group level, causing them to share a perception of affect in the workplace that is greater than its 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 when 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 that facilitate and shape employees' behaviors in a team (O'Reilly & Chatman, 1996). Therefore, if team members share strong perceptions of affective climate, members of 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 a function of the variation in affective climate across work teams. This leads to 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.

3. Method

3.1. 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 and 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 operations for branches. Their job responsibilities included junior employee mentoring, employee performance evaluation, job allocation, employee rotation, and delivery of general banking services to personal and corporate customers. Most of the local branches generally consisted of 10 to 12 employees, although some had more than 20 employees. Each employee directly reported his or her job progress to the branch manager on a daily basis. The study 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 intended to ensure that employees were sufficiently acquainted with their coworkers and managers so as to have developed exchange relationships with them.

3.2. 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 depended on the size of the branch. The two forms of questionnaires aimed to collect information about the social exchange relationships from managers' and employees' perspectives. The self-report questionnaire measured individual employees' perceptions of affective climate, workplace friendship, and TMX; the manager-report questionnaire measured 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, envelopes in which 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 215 manager–employee dyads from 36 branches. The average branch size was 6 individuals, and the overall response rate was 32%. To minimize concerns 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. Analysis of variance (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.²

In the sample of managers, 84% were women. Some 62% were aged 45 years or younger. The managers had been employed in the organization between 1 and 28 years (mean=14 years), and their average experience working in their present position was 3.8 years. Approximately 78% of the managers had been working with their employees for 2 years.

Among the employees in the sample, 89% were women. In this group, 78% were aged 45 years or younger. Some 87% of employees had been working in their current branches for more than 5 years, and 81% had been working with their managers for 2.5 years. More than half of the employees in the sample interacted with their managers on a daily basis. With respect to their teams, 70% had been working with their team members for 2.5 years and 54% interacted with their team members on a daily basis.

3.3. Measures: individual-level variables

3.3.1. 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 were collected from managers' perspectives and 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, which conceptualizes and assesses LMX as a dyadic individual-level variable for analytical purposes (see Schriesheim, Castro, & Cogliser, 1999). Sample items included "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.

3.3.2. 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 used a seven-point scale that ranged from 1 (strongly disagree) to 7 (strongly agree). Sample items included "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.

3.3.3. 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 existed between themselves and their team members. TMX indicates the quality and effectiveness of an individual member's working relationship with other members within his or her team. Responses to the items used a seven-point scale that ranged from 1 (strongly disagree) to 7 (strongly agree). Sample items included "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.

3.4. Measures: group-level variable

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 (Kozlowski & Klein, 2000; Rousseau, 1985). As a result, this study employed the referent-shift consensus composition model because we were interested in individual

² The ANOVA results are available upon request.

employees' aggregate perception of affective climate. The affective climate measure was specifically designed for the purpose of this referent shift, with the collective entity being the focal point.

3.4.1. *Affective climate*

Affective climate was measured using the five-item positive group perception scale developed by Choi et al. (2003), albeit slightly modified for the branch context of the sample. This scale captures individual participants' overall perceptions of their group climate and is 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 included "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.

3.5. *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 (Pelled, Eisenhardt, & Xin, 1999; Rentsch & Klimoski, 2002). Coding for the categorical control variables is shown below Table 1.

3.6. *Data analysis*

3.6.1. *Construct validity*

Given that most of the variables included in this study were collected from the same source, confirmatory analysis (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 plausible

Table 1
Means, Standard Deviations, Reliabilities, and Correlations among Study Variables^a

Variables	M	SD	1	2	3	4	5	6	7	8	9
1. Gender of employees ^b	.90	.30									
2. Age of employees ^c	.94	.19	.14*								
3. Branch tenure ^d	4.80	.30	.03	.41**							
4. Work experience ^e	7.30	.30	.03	.33**	.52**						
5. Interaction frequency ^f	.20	.01	.16*	.14*	.20**	.08					
6. LMX	.20	.56	.02	.11	.14*	.10	.05	.86)			
7. Affective climate	.90	.52	.02	.13	.05	.10	.04	.41**	.92)		
8. Workplace friendship	.60	.82	.07	.13	.18*	.21**	.02	.24**	.33**	.80)	
9. TMX	.20	.76	.08	.12	.12	.04	.13	.32**	.37**	.55**	.84)

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

^a N=215. Internal consistency reliabilities appear 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.

^b Gender of employee was coded: male=1, female=2.

^c Age of employees was coded: 1 = b20 years, 2 = 21-25 years, 3 = 26-30 years, 4 = 31-35 years, 5 = 36-40 years, 6 = 41~45 years, 7 = 46-50 years, 8 = 51-55 years, 9 = N55 years.

^d Branch tenure=length of time in months employees have worked in their current branch.

^e Work experience=length of time in months employees have worked with their team members.

^f 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, 7 = a few times a day.

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 a one-factor model).

3.6.2. Level of analysis

Because our study sought to explore how affective climate influences the relationship between LMX, workplace friendship, and TMX at the individual level, we needed to justify why affective climate can be aggregated as a group-level construct (Rousseau, 1985). To do so, 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 branches. Generally, an r_{wg} greater than .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 ANOVA test to examine between-group variations in affective climate perceptions and computed the intraclass correlations values (ICC), to reflect the inter-rater reliability (Bliese, 2000). Two forms of ICC values are possible: 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) proposes that ICC (2) values greater than .60 are desirable.

3.6.3. 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 & Kenny (1986) to test our hypotheses. HLM allows for the analysis of multi-level data simultaneously to avoid the possible biases, and it supports 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 develop a series of hierarchical models to test the hypotheses that relate to different levels of analysis. In our study, we calculated a hierarchical regression equation 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-level effect, and a significant parameter estimate for the Level 2 predictor of the Level 1 intercepts and slopes indicates a group-level effect.

4. Results

4.1. 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; 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 suggest that common method variance was not responsible for the relationships between the constructs (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

4.2. Justification for group climate aggregation

To justify the appropriateness of aggregating affective climate as a group-level construct, we had to evaluate both between-group variability and within-group agreement of affective climate (Hofmann, 1997; Klein, Dansereau, & Hall, 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 showed that the between-group variance in group climate was significantly different from zero, $F(35,179) = 3.33$, $pb.01$. The ICC (1) derived from ANOVA was .28, and the ICC (2)

was .75, which provides sufficient evidence for between-group variability. These results indicate that group climate consisted of individual perceptions and was able to be aggregated as a group-level construct.

4.3. Descriptive statistics

Table 1 presents the means, standard deviations, and correlations for our study. 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 supporting Hypotheses 1 and 2, as well as two conditions for the mediation test using the Baron & 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 utility 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 not to include control variables in the subsequent HLM analyses.

4.4. Test of hypotheses

This section presents the HLM results, testing Hypotheses 1 through 4. Before testing the hypotheses, we first needed to run null models (no individual- or group-level predictors) to examine whether significant systematic between-group variance in the mediating and outcome variables was present. 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)=.10-which shows that workplace friendship had 10% between-group variance. Similar results were found for TMX- $\tau_{00}=.09$, $\chi^2(35)=70.40$, $p<.01$, and ICC (1)=.14-which indicates that 14% of variance in TMX resides between the workgroups. These results justified the appropriateness of cross-level analyses (Snijders & Bosker, 1999).

Table 2

Hierarchical linear modeling results for interpersonal exchange relationships at work^a

Variables	Null Models		Workplace Friendship			TMX		
	Coefficient	χ^2	Coefficient		t	Coefficient		t
<i>Individual-level Analysis</i>								
Workplace friendship τ_{00}	.06*	55.03						
TMX τ_{00}	.09**	70.40						
Main effects Hypotheses 1 and 2								
LMX y_{10}			.53**		4.06	.42**		3.33
Workplace friendship y_{10}						.47**		7.23
^b R ²				.09			.40	
Mediation Effects Hypothesis 3								
LMX y_{10}						.18		1.85
Workplace friendship ^{y10}						.44**		6.27
^b R ²							.40	
Relationship Between LMX and Workplace Friendship								
Variables								
Group-level analysis Moderation effects Hypothesis 4								
Affective climate ^{y11}			Coefficient		t			
			.33*		2.20			
^b R ²				.13				

^aLevel 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 1-3) and "slope-as-outcomes" analysis (Hypothesis 4).

^bR²=Proportion of within-branch variance explained by Level 1 predictor and mediator.

^cR²=Proportion of between-branch variance explained by cross-level interaction term. *p<.05; **p>.01.

4.4.1. 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 revealed 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 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 R² of this mediation test was .40. Thus Hypothesis 3 was supported because workplace friendship was related to TMX and mediated the LMX–TMX relationship.

4.4.2. Group-level relationships

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 a “slopes-as-outcomes” model, where the variance in the slope across workgroups is expected to be significantly related to affective climate.

Hofmann & 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 we entered affective climate as a predictor of the variance in the slopes relating to LMX and workplace friendship (Hofmann & Gavin, 1998; Hofmann, Morgeson, & Gerrass, 2003).

Results in Table 2 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 R², when the interaction term was included in the model (Hofmann et al., 2003). Results showed that the interaction term between LMX and affective climate explained 4% of the variance in workplace friendship ($\Delta R^2 = .04$, $F=13.48$, and $p<.01$), after controlling for the main effect of LMX and affective climate. According to Cohen, Cohen, West, & Aiken (2003), interactions typically explain 1%–3% of the variance in outcomes of interest. Thus the magnitude of our R² change is within the range of interaction estimation.

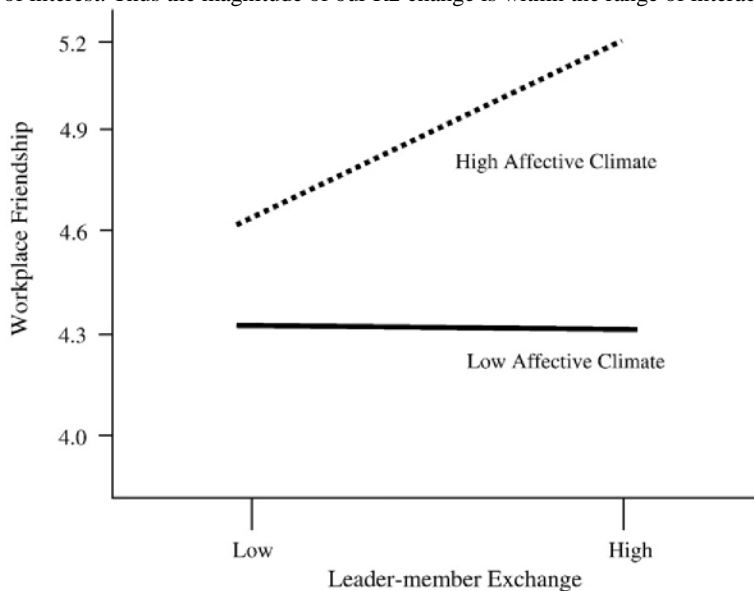


Fig. 2. Affective climate as a moderator of the relationship between LMX and workplace friendship.

To understand the nature of cross-level interaction, we employed the procedure outlined by Aiken & West (1991). That is, we substituted the high and low values of the independent variables into the regression equation and plotted the interaction effect on a graph (see Fig. 2). We plotted the LMX–workplace friendship graph one standard deviation above and below the affective climate mean (Aiken & West, 1991). In line with Hypothesis 4, Fig. 2 illustrates that the relationship between LMX and workplace friendship was strong and positive when teams had a strong climate, but was not significant when teams had a weak climate. Here, the finding is 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; Sosik, Godshalk, & Yammarino, 2004; Yammarino, Dubinsky, Comer, & Jolson, 1997) at the group level for all relationships of interest. Results suggest that the variance and covariance are equivocal and that these relationships may possibly be attributable to individual difference effects and not group-level effects (see Appendix A of this article for WABA results).

5. Discussion

5.1. Implications for theory and research

Our HLM findings contribute to the literature on interpersonal exchange relationships in several ways. First, as Sparrowe & Liden (1997, 2005) suggest, although the implications of LMX for subordinates' perceptions of relationship development with other team members have been explicit in social exchange literature, they have not been empirically tested in a systematic manner (Graen & Uhl-Bien, 1995). This study is the first empirical study to integrate LMX and TMX 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 et al. (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 (Morrison, 2004; Sias & Cahill, 1998). In this study, we took a step forward by addressing both issues through our exploration of the role of workplace friendship in the LMX–TMX relationship in an attempt to understand the antecedents, consequences, and 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 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 facilitates high-quality TMX development in teams. These results suggest that workplace friendship has the potential to create a social system that 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 toward 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 characterized by 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 who experience high-quality LMX relationships, are less likely to form workplace friendships. Although affective climate could account for only 4% of the variance in the slope relating to LMX and workplace friendship, it is a significant cross-level interaction effect—

Fig. 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 study 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.

5.2. 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 potentially influence the development of TMX through the workplace friendships engendered in the high-quality supervisor and subordinate interactions. Further, affective climate promotes the relationship between LMX and workplace friendship within teams. As Ashkanasy et al. (2000) have noted, this finding implies that 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 their expectations and interpretations of their experiences of high-quality LMX relationships. This, in turn, determines their attitudes and behaviors toward 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. A study by Berman et al. (2002), for example, 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 inspire employees to perform better. This study shows that positive orientations toward workplace friendship are reflected in organizational efforts to foster closer workplace relations. As Tse & Dasborough (2008) suggest, managers should organize and coordinate social gatherings, such as picnics, happy hours after work, barbecues, parties, and sports activities to help promote friendship formation within teams.

5.3. Limitations, future research directions, and conclusions

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

First, this study did not fully explore the dynamic nature of the relationship between LMX and TMX because it did not collect longitudinal data. This shortcoming limits our understanding of how LMX influences employees' perceptions of their relationships 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 examine this possibility, we conducted another set of analyses to confirm the significance of the reverse model. The 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 that strengthen conclusions about the casual direction between LMX, workplace friendship, and TMX.

The second limitation of this study relates to the sample size. Response rates within groups are particularly important for all multi-level studies (Bassiri, 1988; Bliese, 2000). 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 & Williams, the HLM modeling strategy is somewhat complex and “simpler is sometimes better” (2000

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 implies that the smaller sample size does not invalidate the observed relationships in this study. Future research should nonetheless attempt to replicate this study using a sample of more teams in different organizational settings so as to improve the confidence in the findings and their generalizability.

The third limitation concerns common method variance (Podsakoff et al., 2003). One might argue that common method variance may have inflated the hypothesized relationships in this study because the moderating variable (affective climate), mediating variable (workplace friendship), and 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 by using a different data source for our independent variable (LMX) and employing the technique of data aggregation. Specifically, we obtained the manager ratings of LMX, which constituted an independent data source for testing the LMX-TMX relationship (to fully understand LMX relationships, however, it must be investigated from both supervisors' and subordinates' perspectives). 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.

The fourth limitation arises because the results of the 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, which mediates the LMX-TMX relationship at the individual level, and discovering that affective climate at the group level moderates the LMX-workplace friendship relationship. Overall, the HLM results of this study provide support for all hypothesized relationships. Indeed, the social exchange relationships in organizations are enhanced by the existence of 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 both the team context and the larger social network of organizations.

Appendix A

Results of within- and between-group analysis (WABA)^a

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

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

†_{15°}, ††_{30°}.

^aAnalyses are based on $N=36$ managers and $N=215$ manager-employee dyads.

^bSignificant E test (†) and F test (*) results of the difference between the within and between etas are shown for each variable.

^cSignificant 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.

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