

IMPACT OF LEADERSHIP AND TEAM MEMBERS' INDIVIDUALISM-  
COLLECTIVISM ON TEAM PROCESSES AND OUTCOMES: A LEADER-  
MEMBER EXCHANGE PERSPECTIVE

by

Jaewon Ko

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As members of the Dissertation Committee, we certify that we have read the dissertation prepared by JAEWON KO

entitled IMPACT OF LEADERSHIP AND TEAM MEMBERS' INDIVIDUALISM-COLLECTIVISM ON TEAM PROCESSES AND OUTCOMES: A LEADER-MEMBER EXCHANGE PERSPECTIVE

and recommend that it be accepted as fulfilling the dissertation requirement for the Degree of DOCTOR OF PHILOSOPHY

\_\_\_\_\_  
Russell Cropanzano Date: 7-27-2005

\_\_\_\_\_  
Barry Goldman Date: 7-27-2005

\_\_\_\_\_  
Jerel E. Slaughter Date: 7-27-2005

\_\_\_\_\_  
Aleksander Ellis Date: 7-27-2005

Final approval and acceptance of this dissertation is contingent upon the candidate's submission of the final copies of the dissertation to the Graduate College.

I hereby certify that I have read this dissertation prepared under my direction and recommend that it be accepted as fulfilling the dissertation requirement.

\_\_\_\_\_  
Dissertation Director: Russell Cropanzano Date: 7-27-2005

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Jaewon Ko

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## ABSTRACT

The present study attempts to extend leader-member exchange theory to the team-level by including team social cohesion and two team-level exchange relationship constructs (i.e., team-level leader-member exchange [LMX] and team-member exchange [TMX]) simultaneously, and by examining antecedents and outcomes associated with these variables. The research model includes transformational leadership and team-members' individualism-collectivism as antecedents of the team relational environment and both team performance and team viability as effectiveness measures. Survey data were collected for a field sample of 89 Airborne Special Operations (ASO) teams in the Korean Army. Each team's effectiveness was rated by three different sources: team members ( $N=823$ , 7~11 people per team;  $M=9.4$ ), regional unit (RU) peers (31~42 peers for each team;  $M=37.2$ ), and RU commanders ( $N=17$ ).

The hypothesized model and several alternative models were tested three times, using team effectiveness measures from each of the three sources in a separate model. Overall, results from path analyses conducted using EQS were consistent with the hypotheses. Specifically, both team-level LMX and TMX were positively affected by transformational leadership and team members' collectivism. TMX showed a stronger positive association with team social cohesion than did team-level LMX. Team performance was positively affected by TMX, team social cohesion, and transformational leadership in the model that employed team members' ratings as team effectiveness measures. However, when the ratings from RU peers were used as team outcome measures, the path from team social cohesion to team performance remained significant,

but the other two paths became non-significant. None of the three variables significantly predicted team performance as rated by RU commanders. When viewed in terms of team viability, team social cohesion showed a significant association with team viability across all three models. Although TMX predicted team viability when team members' ratings were used in the model, it did not predict team viability when the ratings were from either RU peers or RU commanders. Finally, transformational leadership showed a significant positive and negative relationship with the number of collectivists and individualists within a team, respectively, across all three models. The limitations of the present study and recommendations for future research are presented.

## CHAPTER I. INTRODUCTION

Unlike traditional leadership theories, leader-member exchange (*hereafter LMX*) theory (Graen, 1976; Graen & Scandura, 1987; Graen, Novak, & Sommerkamp, 1982) emphasizes the development and effects of separate dyadic relationships between leaders and subordinates. Research using the LMX perspective highlights how leaders develop relationships with subordinates. It considers these relationships to be the fundamental links between leader behavior and follower responses. At the core of the LMX model is the notion that leaders treat their subordinates differently depending on the quality of social exchanges between members and leaders (Graen & Uhl-Bien, 1995). As evidenced by the widespread application of LMX theory, it is a useful tool for understanding the dynamics of team functioning in organizational settings.

One of the basic premises of LMX theory is that the relationship between the leader and members is built from mutually beneficial exchanges. In addition, the LMX literature has documented that leaders tend to differentiate their behaviors within the work unit and thus form two groups (i.e., in- and out-groups). Because the leader is unable to perform all important tasks by him/herself, he/she must delegate certain tasks or responsibilities to trusted personnel (i.e., in-group). However, at the same time, the leader may neglect to support the remainder (i.e., out-group) of the unit and thus create separate classes within the team instead of engendering a sense of unity. That is, some teams may be less effective than others because the leader is incapable or unwilling to support and encourage all members. As a result, some members receive the support they need but

others do not. Thus, LMX theory may provide a basis for gaining insight into what makes some teams more effective than others.

According to LMX, the quality of the relationship that develops between a leader and a follower is predictive of positive organizational outcomes including job satisfaction, performance ratings, tenure, subordinate decision influence, and career progress of managers (see Liden, Sparrow, & Wayne, 1997, for a thorough review). Compared to low quality LMX relationships, high quality LMX relationships are characterized by mutual trust, respect, influence, and obligation (Graen & Uhl-Bien, 1995). Followers in high-quality LMX relationships interact frequently with their leaders and have their leaders' support, confidence, and consideration, and they take on added duties and deliver performance beyond contractual expectations (Liden et al., 1997; Wayne, Shore, & Liden, 1997). Unfortunately, as I shall discuss later, there has been little research on the antecedents to LMX relationship quality. We know more about its consequences and less about its causes. As House and Aditya (1997) criticized: "To our knowledge, there has been less attention devoted to specific leader behaviors that foster high-quality relationships than the effects of such relationships."

In addition, in recent years the LMX concept has been influenced by the growing use of teams in work settings. Scope of LMX, which was originally proposed to explain dyadic level leadership phenomena, has been extended to the team level to explain leadership in team settings. This shift toward the team has taken two forms. First, some LMX researchers (Coglister & Schriesheim, 2000; Graen & Uhl-Bien, 1995) shifted their attention to the effect of LMX on team-level constructs. For example, Graen and Uhl-

Bien (1995) suggested the need for research on team-level rather than dyadic-level effects of LMX and Coglister and Schriesheim (2000) explored the influence of work unit context on team-level LMX differences. Second, other LMX researchers introduced the concept of team-member exchange (*hereafter TMX*; Seers, 1989) which has been defined as an individual member's perception of his/her (work-related) exchange relationship with the peer group as a whole. In other words, in TMX the relevant "dyad" is no longer worker-supervisor. Now it is worker-team. Unfortunately, the relationship between LMX and TMX in the team environment has been understudied. The present study will attempt to address these concerns by exploring antecedents of team-level LMX and TMX and by comparing predictive power of those constructs on team-level outcomes such as team performance and team viability.

Obviously, there are many benefits to studying the application of LMX theory in organizational settings. As just mentioned, leader-member relations can have far-reaching and profound effects for the leader and employees involved with and influenced by these relationships. Accordingly, the present study was conducted in a field setting. Data are collected by having team members, team leaders, and regional unit commanders who are one level higher than the team leaders of Korean Army complete surveys. Surveys have been effectively used in past LMX field research and, more importantly, all relevant variables in the present study can be accurately assessed using survey materials. The measures that are included in these surveys are measures that have been validated and used in prior studies. These measures will be fully detailed in Chapter 3.

Leadership is an outcome of interactions among three domains (i.e., leader trait/behavior, follower, and relationship, Graen & Uhl-Bien, 1995). Since leadership involves all three of these domains, attention should be focused beyond the leader when studying leadership. Although studies of leadership could address each domain singularly (e.g., models that focus on leader such as trait or behavior; models that focus on the follower such as empowered approaches; or models that focus on the relationship such as LMX), in order to obtain the most comprehensive representation of the leadership process, researchers need to employ a multiple domain perspective (Graen & Uhl-Bien, 1995, p.221). Therefore, careful sampling of variables from multiple domains within a single study should account for more of the potential leadership contribution, and thus increase the predictive validity and practical usefulness of the study.

Therefore, I will integrate the leadership literature with the team literature in the present study. Specifically, I will propose and test a new model of LMX based on previous models of team functioning (Gladstein, 1984; Hackman, 1989). These emphasize three phases in teams. In Phase 1, a variety of inputs combine to influence intra-team processes in Phase 2. Finally, in Phase 3, these process variables affect team outcomes (Figure 1). In this study, the input-process-output framework served as the basis for examining actual work teams in organizational setting. The team process phase is especially important. Hence, I will use the term of 'team relational environment' rather than team processes to further divide team processes into three discrete components including team-level LMX, team-member exchange, and team social cohesion.



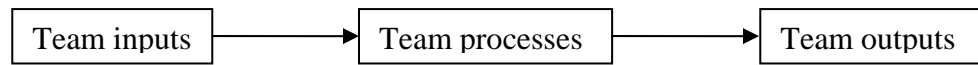


Figure 1. Process Model of Team Functioning

This research is based on the premise that leaders must develop an overall high quality of exchange with their subordinates by reducing status differentiation within the team, in order to achieve ultimate team effectiveness. Specifically, I explored the relationships among leadership characteristics, subordinates' characteristics, team relational environment (i.e., team-level LMX, TMX, and team cohesion), and team-level outcomes in the study.

Structure of the dissertation is as follows. Chapter Two provides an explanation of the theoretical bases for the full model on the antecedents and outcomes of team relational environment proposed in Figure 2. Chapter Two also addresses the specific hypotheses to be tested in the proposed research. Chapter Three discusses the research methodology used in the study. Chapter Four provides a detailed account of the results of the study. Chapter Five discusses the findings of the research and their implications for future research and organizational practices.

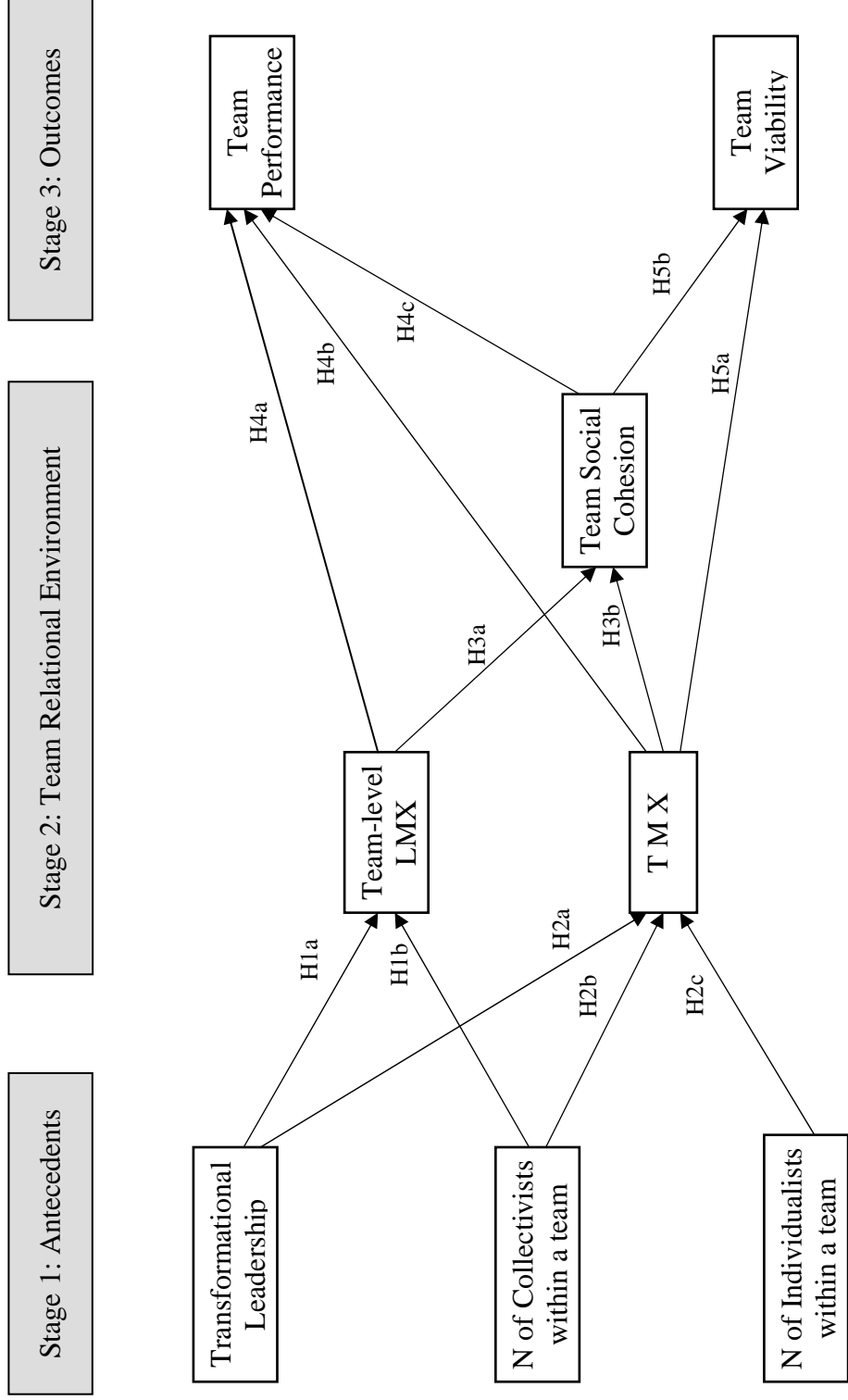


Figure 2. Antecedents and Outcomes of Team Relational Environment

## CHAPTER II. LITERATURE REVIEW

A full model of antecedents and outcomes of team relational environment is presented in Figure 2. The full model provides the reader with a more complete context for understanding the focus of this study. In brief, the full model views transformational leadership and team composition characteristics (i.e., numbers of collectivists/individualists within a team) affect team outcomes through the team relational environment (i.e., team-level LMX, TMX, and team social cohesion).

Chapter Two is organized in the following manner. In Section One, prior research on LMX will be reviewed and limitations in prior studies will be raised. Although the concept of LMX has received considerable research attention, and many of its original propositions have been supported by experimental and empirical findings, it also has been target of criticism. These criticisms relate to both methodological and theoretical aspects of those studies: (1) giving less research attention to team-level effects of LMX and (2) being descriptive rather than prescriptive. In the other three sections, I will detail each of these limitations and propose a new research model with specific research hypotheses. Based on a three stage model of team functioning, in Section Two, research needs for antecedents of team-level LMX and TMX will be raised. In addition, as antecedents of the team relational environment, concepts of transformational leadership and individualism-collectivism are reviewed (Stage 1). In Section Three, variables forming the team relational environment will be defined and the research hypotheses being tested in this study will be proposed (Stage 2). In Section Four, the relationship between the team relational environment (i.e., team-level LMX, TMX, and team social

cohesion) and team outcomes (team performance and team viability) will be proposed (Stage 3).

### LMX Research in the Era of Team-based Organizations

An increasing number of organizations structure work through the use of teams. By moving decision-making down to the work team level, organizations create an environment with more participation, responsibility, and cooperation from employees. Previous models on team functioning emphasized three phases in teams: input-process-output (Gladstein, 1984; Hackman, 1987). Specifically, a variety of inputs combine to influence intragroup processes, which in turn affect team outputs. Several authors have emphasized team processes as integral ingredients to team effectiveness. For example, Hackman (1987) asserts that intra-group interactions may serve as an indicator of how well the team is performing its task.

Some researchers have estimated that in the next several years, as much as 40% to 50% of the United States' workforce will be working in some form of self-managed or empowered team (Stewart, Manz, & Sims, 1999). Reflecting the rapid growth of self-managing teams in organizations, large proportions of previous team-related studies have focused on self-managing teams. Since there is no designated leader in self-managing team, prior research has considered team cohesion, team communication, and work coordination among team members as important team process variables while setting aside the leader's role in achieving ultimate team effectiveness. As a result, intra-team dynamics within teams led by a leader remain unexplored (Guzzo & Salas, 1995; Jordan, Field, & Armenakis, 2002). However, given the fact that a larger proportion of workforce

is still working under manager-led work teams or traditional work groups, research attention on these types of work systems (i.e., manager- or leader-led work teams) is still important.

### Concept of Leader-Member Exchange

The concept of leader-member exchange (LMX) appears to have grown out of dissatisfaction with earlier leadership theories which assume the leader interacts in a consistent, equilateral fashion with all group members. Dansereau, Graen, and Haga (1975) have challenged this assumption with the LMX theory (the *Vertical Dyadic Linkage* approach to leadership, in their original term). The LMX model removes the assumptions concerning homogeneous behavior and reactions on the part of leader and member.

LMX theory derives its definition out of a distinction between “supervision” and “leadership”, noted by Jacobs (1970). A leader keeping a “supervisory” (named later as *out-group, or low quality exchange*) relationship with a member adheres closely to the employment contract between the member and the organization. This contract implies that, in exchange for job performance, the organization will provide continued employment and a particular level of compensation and benefits. In the supervisory relationship, the leader/member exchange is limited to the contract and there is little need for social interaction between the leader and member. Under this condition, the leader is treating the member as “a hired hand” (Dienesch & Liden, 1986).

The alternative approach, where the leader goes beyond the work contract, defines the “leadership” (named later as *in-group, or high quality exchange*) relationship. In this

relationship, the leader offers more job latitude, influence in decision making, and open and honest communication in exchange for enhanced performance and organizational citizenship behaviors. Members enjoying a leadership relationship with their supervisor make contributions beyond their formal job duties while the leader reciprocates with greater attention and support. Thus, in the leadership relationship, the leader and member have a more interdependent relationship which requires a higher level of social interaction. Therefore, the stronger the LMX, the more the leader negotiates with members concerning their role in the relationship and the conditions of employment.

In their original proposition of LMX (*Vertical-Dyadic Linkage*, in their term), Dansereau et al. (1975) focused on the fact that leaders often tend to differentiate their behavior towards subordinates. This means that the enhanced relationship typically does not occur with all of the members under a leader's control. One important way to think about LMX is in terms of the differentiated willingness to negotiate, or 'negotiating latitude' (i.e., either in- or out-group status). Previous research show that the negotiating latitude that develops between a leader and a follower is predictive of organizational outcomes including job satisfaction and performance ratings (Gerstner & Day, 1997; Graen, Novak, & Sommerkamp, 1982), communications (Fairhurst, 1993), subordinate decision influence (Scandura, Graen, & Novak, 1986), social support (Kramer, 1995), and career progress of managers (Wakabayashi & Graen, 1984).

#### Limitation in Prior LMX Research: Focus on Dyadic-level LMX

In terms of level of analysis, most of the previous works on LMX has focused on LMX relationship as a dyadic-level phenomenon which develops between a leader and a

subordinate. This tradition is based on the origin of LMX theory. Regarding the level of measurement, Graen and Scandura (1987) suggest that “By its very nature, the LMX relationship (*‘the double interact’*, in their term) is a dyadic phenomenon. ... Hence, the process of organizing via LMX relationship quality must be studied at the level of dyad (p. 178).” Put differently, LMX theory is based on a view of organizations as a collection of independent dyads and neglects the fact that the nature of one dyad can impact another. However, for most people who work in organizations, this is not representative of leadership situations because a leader interacts with multiple members working together as a collective. Therefore, the differentiation in the quality of leader-member exchange relationships among team members may adversely affect the dynamics of the team. By creating status differences among members, the leader may actually increase the amount of conflict within the team. Accordingly, team members may be less likely to engage in positive communication and cooperation. As a result, team effectiveness will be negatively influenced by the differential relationships. Given the fact that the differential relationships were caused (or intended) by the leader’s need for efficiency and performance (Dienesch & Liden, 1986), lowered team effectiveness would be an ironic result. In recognition of these problems, recent researchers (Forret & Turban, 1994; Graen & Uhl-Bien, 1995) proposed that LMX should be viewed as systems of interdependent dyadic relationships rather than independent dyads.

Specifically, Graen and Uhl-Bien (1995) proposed that the ultimate theoretical advancement of LMX theory (i.e., Stage 4) should be focused on a system-level perspective and pursue the question of how differentiated dyadic relationships combine

together to form larger systems of network assemblies. Graen and Uhl-Bien (1995) suggested that the 'Stage 4' of LMX research involves investigating patterns of relationship quality within the leadership structure, taking into consideration the criticality of relationships for task performance, as well as the effects of differentiated relationships on the entire structure. At the work-group level, the predominant issues should involve the question of how higher- and lower-quality exchanges are aggregated within a single work unit and what their combined effect is on group-level work processes and outcomes across teams.

Considering the heightened level of interaction and interdependence among team members in team-based organizations compared to traditional hierarchical organizations, empirical testing on the relationship between team-level LMX and team processes and performance in teams are of importance for further development of LMX theory.

#### Limitation in Prior LMX Research: Less Research Attention on the Antecedents of LMX

Since its origination, researchers have explored outcomes of high/low quality LMX relationships, especially comparisons of individual level outcomes. Less attention has been dedicated to antecedents of LMX relationship quality. In their meta-analysis on LMX and its correlates, Gerstner and Day (1997) suggest that there is very little cumulative knowledge currently available regarding the antecedents of LMX (p. 837). They also concluded that although some studies have examined demographic variables as antecedents of LMX, there appears to be little theoretical or empirical justification for the development of LMX based on simple demographics.



Therefore, personal and interpersonal attributes related to exchange quality are still under-explored and the identification of these personal characteristics is important for both the theoretical development of the LMX model and its practical application.

### STAGE 1: Team Inputs for Team Relational Environment

Because of its theoretical focus on within group variation of LMX quality (i.e., high/low LMX subordinates in a work group), while considerable research demonstrates the importance of follower's characteristics in the relationship development, studies investigating the effect of leader's characteristics as antecedents of LMX are rare (see Liden et al., 1997, for a thorough review). However, LMX relationships are as much a function of the characteristics and behavior of supervisors as the behavior of subordinates. Theories of LMX development suggest that the leader rather than the member has more control over the LMX quality (Liden, Sparrow, & Wayne, 1997, p. 56). Specifically, the leader's perceptions and evaluations of the member are critical in determining the leaders' behavior toward the member, including the amount of delegation given to the member (Bauer & Green, 1996). Liden et al. (1997) also contended that leader characteristics may be important in determining whether an employee desires and accepts a high-quality exchange offered by the leader.

#### Leadership Characteristics

Although some previous researchers have considered leader's characteristics along with followers', they focused on either relational demography (Bauer & Green, 1996; Duchon, Green, & Taber, 1986; Green, Anderson, & Shivers, 1996; Liden, Wayne, & Stilwell, 1993; McClane, 1991) or similarity/congruence (*perceived affective similarity*, Bauer & Green, 1996; *value congruence*, McClane, 1991; Phillips & Bedeian, 1994) between leader and followers as antecedents of LMX relationship quality. However, since either similarity or congruence are contingent upon subordinates' characteristics,

however, this category of LMX antecedents does not provide meaningful information as to the ultimate characteristics of leader who may form high quality LMX relationships with the larger proportion of his/her followers.

Limited resource perspective on differential LMX development.

An underlying assumption of LMX researchers regarding the existence of differential LMX relationships within a work group is that a leader's time, energy, and mental resource is not sufficient to develop high quality relationships with all of his/her followers. As a result, leaders will develop high quality relationship (i.e., leadership relationship) with some of his/her followers and low quality relationship (i.e., supervisory relationship) with the other followers.

The assumption of the limited resource perspective has been empirically tested by examining the relationship between work unit size and the group-level mean LMX. However, the negative relationship between work unit size and work group-level mean LMX was not found in previous studies (Coglister & Schriesheim, 2000; Phillips & Bedeian, 1994). This null finding calls into question the limited resource explanation on the differential LMX relationship development. This result suggests that there may be certain leader characteristics which are important in deciding number of in-group and out-group subordinates within a work unit regardless number of direct reports.

In this research, I would suggest transformational leadership as a leadership characteristic related to high quality LMX relationships with a higher proportion of subordinates within one's work team and to high quality team-member exchange relationships among subordinates.

### Transformational leadership

Recent leadership research suggests two broad families of leader behavior – transformational leadership and transactional leadership (Bass, 1985; 1995; 1997; Bass & Avolio, 1993). Transactional leaders clarify followers' responsibilities, the expectations of the leader, the tasks that must be accomplished, and the benefits to the self-interests of the followers for compliance. By itself, transactional leadership does not engender strong emotional bonds with followers nor does it inspire them to do more than they thought possible. Conversely, transformational leaders motivate their followers to perform beyond expectations by activating followers' higher order needs, fostering a climate of trust, and inducing followers to transcend self-interest for the sake of the organization.

Several studies have documented significant correlations between transformational leadership and various effectiveness criteria (Hater & Bass, 1988). Higher levels of transformational leadership are also associated positively with subordinates' job performance (Bass, 1985; Howell & Avolio, 1993). The five primary components of transformational leadership as conceptualized by Bass and Avolio (1993) include charisma or idealized influence (followers trust in and emotionally identify with the leader), inspirational motivation (followers are provided with symbols and emotional appeals directed at goal achievement), intellectual stimulation (followers are encouraged to question their own way of doing things or to break with the past), and individualized consideration (assignments are delegated to followers to provide learning opportunities). Conceptually, it is useful for scholars to consider all of these dimensions since there are

theoretical differences among them (Bass, 1985; 1995). From an applied point of view, these dimensions provide a thorough guide for developing employees (Avolio, 1999).

Despite these considerations, it is also important to recognize that the empirically obtained factor structure typically shows fewer than five factors (Bass & Avolio, 1993; Howell & Avolio, 1993). That is, the available measures of transformational leadership tend to show more support for a unidimensional model of transformational leadership as opposed to a five-factor model, and when sub-dimensions are treated separately, the factors are highly correlated with one another (see for example, work by Bycio, Hackett, & Allen, 1995; Goodwin, Wofford, & Whittington, 2001; Pillai, Schriesheim, & Williams, 1999; Podsakoff, MacKenzie, Morrison, & Fetter, 1990). For this reason, scholars have tended to use a composite transformational leadership score that aggregates across the five subfacets (Deluga, 1992; Howell & Hall-Merenda, 1999; Hughes, 1997; Pillai et al, 1999). The current study takes this approach as well.

#### Team Members' Individualism and Collectivism

The use of work teams has been described as pivotal to organizational transformation (Sundstrom, De Meuse, and Futrell, 1990). However, even with an increasing number of organizations structuring work through the use of teams, we know relatively little about how the individuals composing a team affect intragroup processes and outcomes (Barrick, Stewart, Neubert, & Mount, 1997, p. 377). I propose team members' individualism and collectivism in the present study as important team composition characteristics affecting team processes,

Researchers have consistently defined values as key determinants of behavior (Rokeach, 1973) on the basis that values anchor intentions and behavior. Schwartz and Bilsky (1987) defined values as concepts of or beliefs about desirable behavior that transcend situations and guide both the selection and the evaluation of behavior and events. Among a long list of values, individualism and collectivism are perhaps the most useful and powerful dimensions in explaining a diverse array of social behavior (Triandis, 1995). Individualism and collectivism may be particularly important to LMX because self-concept derived motives are central to the nature of the exchange that individuals try to establish with their leader and peers.

#### Concept of individualism and collectivism

Given the importance of individualism-collectivism in defining self, Singelis (1994) referred to individualism and collectivism as independent and interdependent self-construals, respectively. Individualism refers to the tendency to view one's self as independent of others and to be more concerned about consequences of behavior for one's personal goals. Individualist values include autonomy, freedom, self-fulfillment, assertiveness, and a sense of personal uniqueness. Collectivism refers to the tendency to view the self as interdependent with selected others, be concerned about consequences of behavior for the goals of in-group, and be more willing to sacrifice personal interests for group's or partner's welfare. Collectivist values include nurturance, compliance, inhibited hedonism, and interdependency (Kim, Triandis, Kagitcibasi, Choi, & Yoon, 1994).

### Individual- and societal-level individualism-collectivism

The concept of individualism-collectivism initially applied to entire societies and defined polar opposite along a single continuum (Hofstede, 1994, p. xi). In this regard, collectivism was deemed to more typical of non-Western societies and centers on interpersonal relationships that promote group harmony through the appropriate functioning of roles, duties, and obligations. However, this does not imply that all members in collectivistic/individualistic societies are in accordance with the societal-level values. Put differently, within any given society, regardless of whether it is broadly construed as individualistic or collectivistic, people differ in their personal level of individualism-collectivism and related constructs (Chen, Brockner, & Chen, 2002).

While national culture influences the value profile of individuals raised within it, individual sources of variation, such as idiosyncratic experiences and personality will also affect individuals' value orientations, creating variation within socio-cultural groups. Triandis and his colleagues distinguished formally between the personal and cultural levels of analysis by referring to the individualism and collectivism of persons as idiocentrism and allocentrism, respectively<sup>1</sup> (Triandis, 1994; Singelis, Triandis, Bhawuk, & Gelfand, 1995). Furthermore, regarding the relationship between societal and individual level of individualism-collectivism, Triandis (2001) summarized that “there are just more allocentrics than idiocentrics in collectivist and more idiocentrics than allocentrics in individualist cultures (p. 910).”

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<sup>1</sup> However, this terminology has not been widely adopted; thus, consistent with common practice, in this study, I use both of the terms interchangeably (i.e., idiocentrism or individualism; allocentrism or collectivism) to refer individualism-collectivism at individual level.

### Multi-dimensionality of individualism-collectivism

Another issue needs to be considered is the multi-dimensionality of individualism-collectivism. Although it has been considered initially as both extreme ends of a single continuum, late research indicates that the uni-dimensional model of individualism-collectivism would not hold true for personal functioning as individuals might score high or low on both values. Empirical studies have also provided supports for the multi-dimensional perspective on individualism-collectivism.

To be considered as a uni-dimensional construct, measures of individualism and collectivism need to be negatively correlated to each other. However, Yamaguchi, Kuhlman, and Sugimori (1995) found that individualism and collectivism scales are not correlated with the U.S. sample ( $r=.04$ ) showing that low collectivism is not equivalent to individualism. Furthermore, other researchers found positive correlations between the two scales ( $r=.48$  with Americans, Watson, Sherbak, & Morris, 1998;  $r=.43$  with both Iranian and American samples, Ghorbani, Bing, Watson, Davison, & LeBreton, 2003). Based on their results, Ghorbani et al. (2003) concluded that empirical research efforts to clarify the individual-level association between these two value systems (or self-construals) have conformed with previous demonstrations of the multidimensional complexity of individualism and collectivism (p. 432). Therefore, individualism and collectivism will be considered as two orthogonal dimensions which are independent from each other in this study.



## STAGE 2: Team Relational Environment

As mentioned earlier, I consider the intra-team relational dynamics as the “team relational environment” in this study and both team-level LMX and TMX are parts of it. I use the term “team relational environment” to refer broadly to all components of intra-team relational dynamics. These include social and work relationships among a leader and team members. Therefore, it is not a single measure. Three components of the team relational environment in this study include team-level LMX, TMX, and team social cohesion. Specifically, I would use team-level LMX to refer to ‘team members’ work relationships with the leader’, TMX to represent ‘work relationships among team members’, and team cohesion to refer to ‘social relationship among team members’. Each construct will be detailed more fully in the following sections.

### Team-level LMX

Regarding team-level LMX, the conventional operationalization in literature (e.g., Gerstner, 1998; Seers, Petty, & Cashman, 1995) is to calculate a mean score across all the team members. This approach assumes that the amount of a characteristic possessed by each individual member increases the collective pool of that characteristic within a team (Barrick et al., 1998). Although variability (e.g., Tsui, Egan, & O’Reilly, 1992; Barrick et al., 1998) and highest/lowest individual scores within each team (e.g., Steiner, 1972; Barrick et al., 1998) for a particular trait have been occasionally used as measures of team characteristics in literature, Barrick et al. (1998) suggest that for additive tasks the mean level of a variable may be most appropriate for understanding the effect of group-level characteristics on compensatory tasks. In addition, given the fact that individual

members' LMX within a team are formed through their interactions with exactly the same referent (i.e., a leader), aggregation of individual LMXs to form team-level LMX is an appropriate operationalization of the construct. Therefore, I would use mean of individual LMXs within a team as a measure of team-level LMX in this study. The hypothesized model of this study (refer to Figure 2) proposes that both transformational leadership and number of collectivists within a team as predictors of team-level LMX. I'll specify the influence of each predictor on team-level LMX in the following sections.

#### Impact of transformational leadership

LMX and transformational-transactional leadership tend to be correlated (Deluga, 1992; Howell & Hall-Merenda, 1999), but the proposed relationship between them has not been consistently established by previous research. Some researchers (Basu & Green, 1997; Yukl, 1989) treat LMX synonymously with transactional leadership, while others (Bass, 1996; Graen & Uhl-Bien, 1995) treat LMX as a part of transformational leadership, and still others (Deluga, 1992; Howell & Hall-Merenda, 1999; Ko, Cropanzano, Nam, & Rupp, 2004; Wang, Law, Hackett, Wang, & Chen, 2005) suggest that LMX is a construct independent from transformational and/or transactional leadership.

Some prior researchers (Deluga, 1992; Howell & Hall-Merenda, 1999; Ko et al., 2004; Wang et al., 2005) tried to verify the relationship empirically. For example, Deluga (1992) showed that transformational leadership is significantly associated with high-quality exchanges with a sample of naval officers. Likewise, Howell and Hall-Merenda (1999) demonstrated that transformational leadership is positively related with high levels of LMX relationships.

With Korean military sample, Ko, Cropanzano, Nam, and Rupp (2004) also confirmed the previous finding that transformational-transactional leadership and LMX are highly correlated. Their confirmatory factor analysis results, however, show that *a priori* factor models which consider LMX as an independent construct from transformational-transactional leadership always show better fits than models combining LMX with either transformational or transactional leadership components. Therefore, the results indirectly support the idea that LMX is a construct different from transformational-transactional leadership, although they tend to be significantly correlated. This makes sense conceptually because LMX is a measure of relationship and transformational leadership a measure of behaviors.

In their procedural model of LMX development, Dienesch and Graen (1986, p. 629) suggested that behavioral factors typically will be the major determinants of the LMX development process and that initial contact and the delegation by the leader to the member of a initial set of duties should be proceeded. There are a variety of ways in which transformational leadership influence LMX relationship quality. Visioning behaviors of idealized influence/inspirational motivation may involve rapport building and empathetic language (Dionne, Yammarino, Atwater, & Spangler, 2004). In turn, this component of transformational leadership will help subordinates form strong emotional bonds with the leader and make everyone feel like part of the team. Intellectual motivation will encourage subordinates to question assumptions and to invent new uses for old processes (Bass, 1990) and, in turn, this will enhance subordinates' self-competency, which is an important component in developing high quality work

relationship with the leader. Individualized consideration is other directed component to the extent that ‘continually adjust their behavior to the level to which the follower has been developed’ (Avolio & Bass, 1995). Therefore, the individually considerate leader is responsible for constructing a one-to-one relationship with each team member, listening to concerns and addressing individual needs (Yammarino, Dubinsky, & Spangler, 1998).

With those aspects, transformational behaviors of leadership are analogous to leader behaviors offering high quality exchange relationships to subordinates. As shown in LMX-based leadership training studies (Scandura & Graen, 1984), the more a leader offers for higher exchange relationships, the more members eventually form high quality relationships. Therefore, transformational leaders will maintain more high quality relationships within his/her work team and, in turn, result in higher team-level LMX.

*H1a: Transformational leadership will be positively associated with team-level LMX.*

#### Impact of team members’ collectivism

Individual level variation in value profiles should be most closely tied to the formation of the individual exchange relationship. Cross-cultural psychologists have compared unique characteristics of individualists and collectivists. Among those, an important characteristic of collectivists in developing high quality LMX relationship is their emphasis on duties and obligations in relationships. For example, Triandis (1995) suggests that among collectivists, social behavior is best predicted from norms and perceived duties and moral obligations. Watson et al. (1998) also found that collectivism was positively correlated with social responsibility and negatively with normlessness;

individualism was positively correlated with both self-esteem and normlessness. Because of their attention on duties and moral obligations, collectivists may be willing to contribute to their leaders beyond the employment contract. Generally, collectivists value the relationship than individualists do. Since relationships are of the greatest importance among collectivists, even if the costs of the relationships exceed the benefits, individuals tend to stay with the relationship. Among individualists, when the costs exceed the benefits, the relationship is often dropped (Kim, Triandis, Kagitcibasi, Choi, & Yoon, 1994). These characteristics of collectivists (i.e., dedication to the leader beyond contract and tendency to stay with the relationship) will be perceived as loyalty and commitment to the leader and which, in turn, may elicit socio-emotional obligations for the relationship partners (i.e., collectivistic subordinates) from the leader. Therefore, collectivistic team members will be able to form high LMX relationships with the team leader which, in turn, result in high team-level LMX.

*H1b: Number of collectivistic members within a team will be positively associated with team-level mean LMX.*

#### Team-Member Exchange

Reflecting the popularity of team structures in organizations, LMX researchers use the concept of team-member exchange (Seers, 1989) to predict team effectiveness. TMX has been defined as individual member's perception of his/her (work-related) exchange relationship with the peer group as a whole and defined in the context of ongoing work group as the member interacts with interdependent members of the role set. Put differently, Seers (1989) introduced TMX as a way to measure a member's

willingness to assist team members, share feedback, and contribute ideas, and perceptions of help, information, and recognition provided by team peers in return for his/her contribution. Thus, TMX reflects the quality of team members' working relationship with their peer group (p. 119).

Seers (1989) showed that TMX would be related to, but distinct from, both other peer-related variables such as perceptions of cohesiveness, satisfaction with coworkers, and LMX. Cohesiveness involves the broad affective perceptions of the group as a whole while TMX quality involves the perception of one's role within the group. The most glaring difference between LMX and TMX is that TMX is not dyadic. TMX is developed from cues provided by an entire group. Evidence about the distinctiveness between LMX and TMX was also established from empirical results. A recent longitudinal study provides evidence of the difference between these constructs (Major, Kozlowski, Chao, & Gardner, 1995). Specifically, LMX and TMX were only moderately correlated ( $r=.18$ ) and LMX was significantly associated with intentions to leave the organization while TMX was not.

In prior research on the antecedents of TMX, most research has viewed organizational structure (e.g., team autonomy) as the primary antecedent (Seers, 1989; Seers et al., 1995) and has not been investigated others such as team composition characteristic. Using one item measure of TMX, Baugh and Graen (1997) hypothesized that sex and racial diversity in cross-functional teams would lead to lower perceptions of TMX quality; however, this relationship was not supported. The research model of this

study proposes that both transformational leadership and the number of collectivistic/individualistic members within a team are predictors of TMX.

#### Impact of transformational leadership

Because of its definitional characteristic, prior TMX research has been emphasized roles of other team members in developing TMX relationships (Seers, 1989; Dunegan, Tierney, & Duchon, 1992) and the direct influence of leadership on TMX relationship quality has not been tested in prior studies.

However, even in team settings, a leader's power and salience in influencing team work coordination is larger than any individual (or aggregation of) team members and, given the special characteristics of transformational leadership, the positive influence of transformational leadership on the perception of TMX will be substantial. Specifically, by using the strategies of visioning, setting high performance expectations for the team, and allowing participation in team goal setting, transformational leaders may be successful in motivating team members to support each other in achieving team goals and to respond actively to other team members' work-related request. By intellectually motivating behaviors, transformational leaders may also stimulate team members to propose better work methods to peers. With such behaviors, transformational leaders may draw the team members closer together and align team members towards the attainment of team work goals.

*H2a: Transformational leadership will be positively associated with TMX.*

### Impact of team members' individualism and collectivism

Triandis (1995) suggests that collectivists tend to have personal goals that overlap with the goals of their in-groups, and if there is a discrepancy between the two sets of goals, they consider it obvious that the group goals should have priority over their personal goals. Individualists have personal goals that may or may not overlap with the goals of their in-groups, and if there is a discrepancy between the two sets of goals, they consider it obvious that their personal goals should have priority over the group goals (Schwartz, 1990). Collectivists often have internalized the norms of their in-groups, so they enjoy doing what their in-groups expect them to do (Bontempo, Lobel, & Triandis, 1990) and have very positive attitudes about their in-groups (Lee & Ward, 1998). The motive structure of collectivists reflects receptivity to others, adjustment to the needs of others, and restraint of their own needs and desires. The basic motive structure of individualists reflects their internal needs, rights, and capacities, including their ability to withstand social pressures (Markus & Kitayama, 1991). These characteristics of collectivists will enhance others' TMX perception by increasing acceptance to other's requests for task completion and the interpersonal attraction of group members for each other. Therefore, Triandis and Gelfand (1998) suggest that "the collectivism pattern is likely to lead to much social support and sociability and can allow the in-group to produce more than the sum of its parts" (p.126).

On the contrary, team-members' individualism, which is personal tendency to be unique, distinct from groups, and being self-reliant, will have negative relationships with TMX because it may result in social isolation, in which individuals do their own thing but



no one approves of what they do. Given the research evidence on the difference between individualists and collectivists, the following hypotheses are proposed:

*H2b: The more collectivistic members within a team, the higher TMX will be resulted in.*

*H2c: The more individualistic members within a team, the lower TMX will be resulted in.*

### Team Social Cohesion

Social cohesion has motivated research in many disciplines, including social psychology, group dynamics, and organizational behavior. There are many definitions of cohesion, as it has been operationalized in numerous ways over the years (Muller & Copper, 1994). Festinger (1950, p.274) described group cohesiveness as “the resultant forces which are acting on the members to stay in a group”. This definition has been widely accepted by researchers on group cohesion. Other researchers describe cohesiveness as the degree to which group members are attracted to and motivated to stay with a group (Zaccaro, Peterson, & Zazanis, 1995), as ‘the propensity for members to stick together’ (Cummings, 1981), or as ‘a group property with individual manifestations of feelings of belongingness or attraction to the group’ (Lieberman, Yalom, & Miles, 1973). Regardless of the specific definition adopted in a certain study, group cohesion has traditionally been considered as an important element of group dynamics. Similarly, teams may become cohesive because the members enjoy interacting with one another and of feel a certain amount of prestige in their team membership. Therefore, work unit cohesiveness is generally considered a group level variable, and groups are theoretically

expected to vary with respect to cohesiveness as a result of their internal history and environmental demands and constraints (Seers, 1989).

Since perception of social relationships will come from exchanges with the leader and exchanges among members of the work team itself (James & James, 1989), I propose that both team-level LMX and TMX are predictors of team social cohesion (refer Figure 2). Although there have been a few studies that considered LMX and TMX simultaneously, most have focused on individual-level LMX and TMX and their effects on individual-level outcomes.

#### Impact of team-level LMX

The predictive power of LMX may expand to outcomes beyond the individual or dyad level, such as social relationships among team members and team outcomes. Leaders may positively or negatively influence team dynamics through their relationship or interaction patterns with the team members. For example, Kozlowski and Doherty (1989) found a positive relationship between LMX and perceptions of climate including teamwork and intergroup cooperation dimensions. Dunegan et al. (1992) also showed that a leader is an important source of innovative climate<sup>2</sup> perception of employees through LMX relationship quality with each employee. Research also show that individuals with high LMX may be more unified because of similar value structures (e.g., Ashkanasy & O'Conner, 1997), demographics and attitudes (Duchon et al., 1986; Liden et al., 1993), and they may feel as a result that their work group is more cohesive.

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<sup>2</sup> In Dunegan et al. (1992), innovative climate is a composite score of multiple constructs such as freedom, disinterest, recognition, encouragement, constraints, and coordination. Among those, I think some of them (i.e., recognition, encouragement, and coordination) are broadly linked to the team social cohesion construct in this study.

Leaders would be expected to interact with the members as a source of support, information, and expertise. Ideally, the leader would serve as a resource for all team members and would interact with each team member equally. As discussed earlier, however, leader differentiates team members and only subordinates who have high quality LMX relationship with the leader get sufficient support

By keeping high LMX relationships with more subordinates in his/her team, the leader may create a harmonious environment within the team. That is, each team member would receive the resources that he or she needed to function successfully within the team. With this type of supportive interaction, the leader would be enhancing or promoting the communication, cooperation, and cohesion of the team. With positive internal dynamics in place, team members' feelings of belongingness or attraction to the group (i.e., team social cohesion) will be enhanced.

On the other hand, team members who did not receive sufficient support and flexibility from their leader (i.e., low LMX relationship) should feel relatively dissatisfied and uncommitted to their team and, in turn, create competition and conflict within the team. The competitive environment induced from these separate classes within the team may be problematic for intra-team relational processes and thus lead to a decreased level of team social cohesion. Pearce and Ravlin (1987) contend that by minimizing within group status differences, managers can facilitate open communication, autonomy in the group, member commitment, and increased feelings of responsibility. Thus, team members who work in a team which has high team-level LMX are likely to develop stronger relational bonds with each other than team members in low team-level LMX.

*H3a: Team-level mean LMX will be positively associated with team social cohesion.*

Impact of team-member exchange

Since perception of social cohesiveness in teams has a strong subjectively-based component (Schneider, 1975), much of what a team member comes to perceive will be the result of interactions with the leader and, more importantly, peer team members through work-related exchanges. Individuals experiencing a high level of team-member exchange quality will put more cooperative and collaborative efforts to other team members and, in return, receive more social rewards in the bargain, whereas members low on team-member exchange may direct fewer efforts toward the group and receive lesser social rewards (Seers et al., 1995). Therefore, the more team members who perceive high TMX relationship quality, the higher team social cohesion will result.

*H3b: Aggregated perception of TMX among team members will be positively associated with team social cohesion.*

### STAGE 3: Team Outcomes of Team Relational Environment

One team effectiveness definition that has been widely accepted was one proposed by Hackman (1987) that delineates three criteria of team effectiveness (i.e., team performance, team viability, and team satisfaction). Hackman (1987) noted that researchers investigating team effectiveness in an artificial environment have tended to develop success criteria whereby it was easy to determine success or failure. But, criteria of team effectiveness for most teams in organizations are more complex than teams in laboratory or simulated research settings. For this reason, Hackman (1987) emphasized the need for multiple team effectiveness criteria in the research of teams in field setting. Among those three effectiveness criteria, I will measure team performance (as current level of team effectiveness) and viability of the team to continue in the future (as future-oriented criteria of team effectiveness). One of the purposes of this study is to make comparisons of the hypothesized model across different data sources of team effectiveness. Since team satisfaction cannot be meaningfully rated by persons outside of a focal team (such as members in neighboring teams and commanders who are one level above the leader), however, team satisfaction was not measured in this study.

#### Team Performance

The research model proposes team-level LMX, TMX, and team social cohesion as predictors of team-level performance. I would detail influence of each team relational environment variable on team performance in the following sections.

### Impact of team-level LMX

Work teams with members who receive high levels of support from their leader may be more willing to perform beyond the call of duty and be more committed to the job than teams with members who do not receive support from their leaders (McClane, 1991; George, 1996). In work groups where LMX quality is high on average, the group may tend to work together on completion of complex, delegated tasks (Coglister & Schriesheim, 2000).

The LMX literature has documented the member's perceptions associated with leader differentiating behaviors. For example, members who perceive that they do not receive support or interesting tasks from their leader (i.e., out-group subordinates), feel dissatisfied with the leader and the work, meet only minimum role demands, and spend little time on the job (Dansereau et al., 1975). In work groups where LMX quality is high on average, the group may tend to work together on completion of delegated tasks. Griffin (1979) found that LMX quality was related to growth potential of subordinates, and these types of individuals may be likely to work together to assure successful task completion and accept extra-role challenges (Graen & Scandura, 1987; Liden & Graen, 1980).

Prior studies show positive association between team-level LMX and team performance. For example, in Gerstner's (1998) study, the correlation coefficients between team-level LMX and various measures of team performance ranged from .18 to .20 showing higher association than individual-level meta-analytic correlation ( $r=.10$ , Gerstner & Day, 1997). Based on these results, Gerstner (1998) concluded that the effects

of LMX are consistent, and perhaps even stronger in the case of performance, when the construct is taken to the group level.

*H4a: Team-level mean LMX will be positively associated with team-level performance.*

#### Impact of team-member exchange

Prior researchers considered the within-group work dynamics of the team as a central precedent of team effectiveness and suggested that actual group performance may be less than optimal if the group could not successfully manage their intra-group work processes (Sundstrom et al., 1990; Steiner, 1972). After the introduction of the concept of TMX (Seers, 1989) as an important component of intra-team dynamics, research attention on the role of TMX in achieving team effectiveness has recently been increased. For example, Seers et al.(1995) suggest that an aggregated perception like TMX may in fact be necessary to establish the identity of a group as a meaningful team in the eyes of its members as well as to give meaning to the members' roles within that group, and showed that TMX was the variable most closely associated with gains in productivity following a self-managing team intervention.

Although the relationship between TMX and job performance has been supported in prior studies, those studies focused the effect of TMX either on individual-level job performance (Seers, 1989; Liden, Wayne, & Sparrowe, 2000) or team-level performance in self-managing teams (Jordan et al., 2002; Seers et al., 1995). Therefore, testing unique variance of TMX along with other measures of intra-team dynamics (i.e., team-level

LMX and team social cohesion) in predicting team performance of leader-led teams is a meaningful exploration.

While the relational influence of the supervisor in performing jobs may be backed by positional authorities and formal sanctions beyond the reach of a focal member's peers, most employees spend more time interacting with peers and also have multiple group members with whom to interact. As a consequence, one's peer group members will have considerable influence on the focal person's appraisals of team performance.

*H4b: Aggregated perception of TMX among team members will be positively associated with team-level performance.*

#### Impact of team social cohesion

Team cohesion has been noted as a critical motivational factor influencing team performance in prior empirical research (Barrick et al., 1998; Dionne et al., 2004; Weaver, Bowers, Salas, & Cannon-Bowers, 1997). Kidwell, Mossholder, and Bennett (1997) suggested that social exchanges between group members should be more positive and frequent in highly cohesive groups. Therefore, Barrick et al. (1998) viewed social cohesion as "a general indicator of synergistic group interaction or process" (p. 382).

Although significant cohesion-performance effects were found in previous meta-analyses (Evans & Dion, 1991; Mullen & Copper, 1994), it is also important to note that the relationship between social cohesion and performance was not supported in many studies. For example, cohesive groups may be more enjoyable for members but not always more productive (Forsythe, 1990). Other researcher show that cohesiveness is



critical but does not always account for effectiveness and high performance in teams (Goleman, 1998).

Characteristics of highly cohesive teams are that the team is important to its members, it elicits strong loyalty and support, and it contains members who work toward team goals (Jewell & Reitz, 1981). In addition, in comparison with low cohesion, highly cohesive teams have been found to communicate more about task relevant or irrelevant matters (Jewell & Reitz, 1981). George and Bettenhausen (1990) found that group cohesiveness correlated significantly with prosocial behavior. Highly cohesive groups may initiate their own direction towards tasks and be more interdependent, thus requiring less direction from formal leaders (Schriesheim, 1980). Perceived friendliness and interpersonal warmth of peers which have been provided by team cohesion will enhance work discussions to resolve team tasks at hand and enhance work coordination among team members. Members in cohesive work teams would also be able to suggest better work methods to each other without fear of criticism, to switch jobs flexibly with each other, and be willing to volunteer extra help.

*H4c: Team social cohesion will be positively associated with team performance.*

#### Team Viability

Hackman (1987) proposed team viability as a future-oriented index of team effectiveness (i.e., capability to continue working together as a unit) compared to present-focused team performance. Teams without long-term viability experience burnout because of unresolved conflict, as well as increased divisiveness and a decreased

willingness to work cooperatively (Hackman, 1987). Therefore, the hypothesized model of this study proposes TMX and team social cohesion as predictors of team viability.

#### Impact of team-member exchange

Research has found that employees who are committed to an organization (or a team) are less likely to leave than those who are not (Allen & Meyer, 1990; Bishop, Scott, & Burroughs, 2000). Well organized work coordination among team members may reduce interpersonal conflict within a team. Hackman and Oldham (1980) suggest that a team can burn itself up while performing their task if the internal processes within the group become divisive. Thus, failed internal work coordination (i.e., low TMX) may leave the group unwilling to work together in the future.

*H5a: Aggregated perception of TMX among team members will be positively associated with team viability.*

#### Impact of team social cohesion

Almost by definition, team social cohesion may have strong association with team viability. As defined earlier in this chapter, team social cohesion is ‘the resultant of all the forces acting on members to remain in the group’ (Festinger, 1950), and team viability is ‘the degree to which the team was likely to continue to function together as a team in the future’ (Barrick et al., 1998). This significant association between team social cohesion and team viability has been shown in previous empirical studies (Barrick et al., 1998; Spink, 1998; Van Vianen & De Dreu, 2001).

Because social cohesiveness is an indicator of positive interpersonal dynamics within the team, I expected that team social cohesion will be positively associated with team viability. In Festinger's (1950) seminal formulation, cohesiveness was formed by the attractiveness or unattractiveness of either the prestige of the group, members in the group, or the activities in which the group engages (p. 274).

Therefore, individuals may be willing to remain in the team or interact with other team members as a team in the future because they like the other members, because being a member of the group may be attractive in itself, or because the group may mediate goals which are important for the individual.

*H5b: Team social cohesion will be positively associated with team viability.*

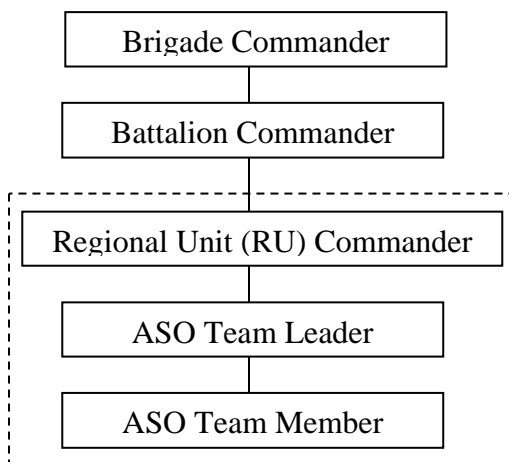
### CHAPTER III. RESEARCH METHODOLOGY

The present study is a longitudinal field study which examines the effects of leadership and team-members' individualism and collectivism on the team relational environment (e.g., team-level LMX, TMX, and team cohesion) and team outcomes. The data were collected through survey questionnaires.

#### Research Design

##### Setting and Subjects

Data for this study were collected from two airborne special operations (ASO) brigades in the Korean Army. Each ASO team led by an officer consists of 11~13 team-members who are mostly non-coms except for a lieutenant or 2<sup>nd</sup> lieutenant (e.g., assistant-to-the-leader)<sup>3</sup>. A few ASO teams make a regional unit. A few regional units (*RU, hereafter*) make an ASO battalion. (refer Figure 3).



Note: The dotted box denotes the levels of hierarchy surveyed for this study.

Figure 3. Organizational Hierarchy in an ASO Brigade

<sup>3</sup> Because of military confidentiality issue, specific numbers of units and military rank of leader or commander in each level were not detailed.

There were three different types of surveys. First, all team-members were asked to complete a questionnaire regarding their immediate leader, intra-team peers, and all the teams within the same RU (team-member survey). Second, all team leaders were asked to complete a similar questionnaire about themselves, their direct reports, and all the teams within the same RU (leader survey). Third, RU commanders were asked to rate current performance levels and the viability of all the teams under his command (RU commander survey). As RU commander surveys were distributed one month later than team-member and team-leader surveys, this study has a (partially) longitudinal design.

The team member survey includes items measuring individualism-collectivism, team social cohesion, TMX relationship with the team members, LMX relationship quality with the immediate leader, leadership style of the leader, and team outcome variables such as team performance and team viability. The team leader survey includes items measuring their own leadership style, LMX relationship quality with each direct report, and team performance and viability. Since each team has 11 to 13 team members, to reduce the leaders' rating load and to form split-halved groups in each team for data analytic purposes, team leaders were asked to rate only 6 of his direct reports in rating of dyadic LMX. As all the ASO teams have the same structure with exactly the same position titles, I pre-selected six job positions and the ratee's job title was printed on the leader survey to reduce any effect of differential selection of ratees across teams. If a team has any missing positions which were printed on the survey at the time of data collection, team leaders were instructed to pick another job position to rate, with the order

of selection described in the team leader survey to make all the conditions equal across teams.

The total number of teams sampled for this study is 89. Specifically, research surveys were delivered to 18 regional unit commanders, 89 team leaders, and 990 team members. All subjects participated voluntarily and were ensured complete confidentiality. To accomplish confidentiality, the surveys were delivered to the respondents with a postage pre-paid return envelope. They sealed the envelope after completing the survey and mailed it by themselves directly to the author's work address in Korea. Completed surveys were returned from 17 regional unit commander, and 88 team leaders, and 823 team members with response rates of 94%, 98%, and 83%, respectively. The number of team member's responses from each regional unit was ranged from 39 to 51 (mean=45.7 team members per RU). Seven to eleven team members responded from each ASO team (mean=9.4 team members per team).

Respondents are all male soldiers with mean age of 22.8 years old. Modal education level was 2-years in college and 95% of them were non-com officers and 5% of them were lower-level officers (i.e., either 2<sup>nd</sup> lieutenants or lieutenants). They served in the military for 3.2 years on average at the time of data collection and mean work tenure with the team leaders was seven and half months.

### Measures

Transformational-transactional leadership. Transformational and transactional leadership was measured with the Multi-Factor Leadership Questionnaire (MLQ) Form 5x-short (Bass & Avolio, 1995). The MLQ is the most widely used measure of

transformational and transactional leadership. Bass and Avolio (1995) reported that a number of studies using this scale have been conducted in a wide variety of settings across different national cultures support the basic propositions of the model. Team members assessed their team leaders' leadership behavior on the 36-item MLQ Form 5x-short (Bass & Avolio, 1995). Team leaders also assessed their own leadership behavior on the same scale. This version of MLQ measures five forms of transformational behavior: attributed charisma, idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration and four transactional leadership behaviors: contingent reward, active/passive management-by-exception, and laissez-faire. MLQ items have a 5-point Likert-type response scale ranging from 1 (*not at all*) to 5 (*frequently if not always*).

Individualism and collectivism. Markus and Kitayama (1991) further divided individualism-collectivism into four dimensions by introducing horizontality (i.e., strength of emphasis on similarity across people) and verticality (i.e., strength of acceptance of inequality) dimensions to individualism-collectivism. However, later work suggests using only two dimensions rather than four. For example, Triandis (1995) shows that vertical-collectivism and horizontal-individualism appear to be the dominant value profiles around the world. That is, verticality serves to reinforce collectivism and horizontality reinforces individualism (Thomas, Au, & Ravlin, 2003, p. 455). In addition to that, as the horizontal-vertical collectivism constructs are statistically related to each other, Singelis et al. (1995) recommended collapsing these two constructs. Following the

later works, I considered only horizontal-individualism as individualism, but both horizontal- and vertical-collectivisms were combined as collectivism in this study.

A shortened version of Singelis et al.'s (1995) 32-item scale was used to measure individualism and collectivism in this study. Specifically, to reduce subjects' rating load, twelve items for collectivism (6 items from both H-C and V-C) and six items for individualism were selected by dropping two items from each scale which had shown the lowest factor loadings in Singelis et al.'s (1995) study. Sample items include "I often do my own thing (H-I)"; "The well-being of my coworkers is important to me (H-C)"; "It is important to me that I respect the decisions made by my groups (V-C)." Team members were asked to rate their own characteristics by using a 7-point Likert-type response scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Means of six individualism items and of twelve collectivism items are individual-level measures of individualism and collectivism, respectively.

Team-level LMX. First, dyadic-level LMX was assessed using the LMX-7 (Graen et al., 1982; Scandura & Graen, 1984). Graen and Uhl-Bien (1995) argued that the LMX-7 is the most appropriate measure of dyadic relationship quality. Gerstner and Day (1997) also recommended this scale based on their findings of higher internal consistencies (average  $\alpha=.85$ , measured from the member's perspective) and predictive validities associated with the LMX-7 measure as compared to other measures. The scale consists of seven items that characterize various aspects of the working relationships between the leader and the subordinate, including effectiveness of the working relationship, understanding of job problems and needs, recognition of potential,



and willingness to support others. Sample items include “Do you know where you stand with your supervisor?” and “How well does your leader understand your job problems and needs?” Response options ranged from 1 (*not at all*) to 7 (*quite well*).

Leader’s appraisal on the LMX relationship quality with each of his/her team member was assessed with a similar 7-item scale but the wordings were changed slightly to accommodate the leader’s perspective. As mentioned earlier, since each leader has 11 to 13 subordinates, to reduce the leaders’ rating load, they were asked to rate only six team members in rating of dyadic LMX.

Team-level LMX was calculated by averaging individual LMX ratings within a team. Since both leaders and members completed the LMX-7 scale, ‘team-level LMX appraised by team members’ is the mean of individual LMX ratings across all the team members and ‘team-level LMX appraised by leader’ is the mean of each leader’s LMX ratings across 6 subordinates.

Considering that potential biases involved in self-reported LMX measures, especially inflation of leader-appraised LMX, I also used a ranking method as a supplemental measure of LMX. Some prior researchers (Dockery & Steiner, 1990; Duchon et al., 1986; Phillips & Bedeian, 1994) have used leader appraised LMX ranking scores because of inflated ratings in leader-appraised LMX compared to subordinate-appraised LMX. Both the team leader and members were asked to rate either LMX ranking of each rated subordinate (in leader survey) or their own LMX ranking within a team with the leader (in team member survey) on a single item, “Please think about the rankings of all team members within your team in terms of intimacy with you (*or your*

current leader, in team member survey) and fill in the blanks with appropriate numbers. Intimacy means general closeness of personal and work-related relationships with you (*or* the leader, in team member survey). If a team member who keeps currently the highest intimacy with you (*or* your team leader) needs to be ranked as ‘the number 1’, this subordinate (*or* you) is ranked at the number (*blank*) among (*blank*) subordinates (*or* members).” Individual’s LMX rank was calculated by the following equation:

$$\text{Individual's LMX rank} = (\text{Individual ranking} / \text{Total number of team members}) * 10$$

Team-member exchange (TMX). The team-member exchange was measured with the TMX scale (Seers, 1989) which was developed by adapting the LMX scale used by Seers and Graen (1984). It references the team member’s view of the quality of working relationships with other team members rather than with the team leader. Among the 10 items in the original scale, two items which seem inappropriate to the work situation of the subjects’ in this study were dropped from this study. Examples of the remaining 8 items include “Others are willing to finish work assigned to me” and “I often suggest better work methods to others.” Response options ranged from 1 (*not at all*) to 7 (*quite well*).

Team social cohesion. Team social cohesion was assessed by using eight items from Stoke’s (1983) Social Cohesion Scale. The scale has been used in previous studies (e.g., Barrick et al., 1998; O’Reilly, Caldwell, & Barnett, 1989; Seers, 1989; Stokes, 1983). Participants responded to eight items using a 7-point Likert-type scale, with high scores associated with favorable (highly cohesive) responses. Examples of items include

“The team is honest and straight-forward with me,” and “There are not many people like as individuals in this team.”

Team work performance. Two different measures were used to rate team performance. The first measure involves team performance rating for all the teams within the RU, which were rated by team members, team leaders, and the RU commander. Respondents were asked to rank all the five teams within their RU on a single item based on current level of team performance from highest to lowest. For this ranking scale, I used a variant of Leana (1987), so called 8-point ‘ordered-rating scale’ (refer to APPENDIX B, C, or D of this study) with response options from 1 (*very unlikely team*) to 8 (*very likely team*). This type of scale has been used successfully in prior studies (e.g., Yukl & Fu, 1999).

RU-wide peer rating of team performance was calculated from this item. To obtain a RU-wide peer rating score, the mean score of each team obtained from 31-42 team members within the same RU was calculated (team members’ rating on their own team were excluded in this calculation). For example, if a certain RU has five teams (e.g., team 1, 2, 3, 4, and 5), the ratings from members of team 1 were not included in calculation of team 1’s RU-wide peer performance rating.

The second measure involves rating of team performance. Team members rated their own team on 7-item performance criteria. Four items from Wayne et al. (1997) were included as a general term performance measure. In addition, to identify practically important performance criteria, telephone interviews were conducted with a regional unit commander, a team leader, and a staff officer in the Headquarters of ASO Command.

Through these interviews, three common themes were emerged: (a) combat readiness level, (b) reliability of work outcomes, and (c) current status of team leader's commanding authorities (or loyalty to the team leader). Each dimension was defined by a one-sentence description and included as a part of the 7-item team performance measure. These 7 items were rated on a 7-point scale (1=*strongly disagree*, 7=*strongly agree*).

Team viability. Team viability was also rated with two measures similar to team performance measures. Team viability ranking were measured with one item, i.e., 8-point ordered-rating scale (Leana, 1987, refer to APPENDIX B, C, or D) with response options from 1 (*very unlikely team*) to 8 (*very likely team*). This rating was measured from team members, team leaders, and RU commanders and reverse coded after data collection to represent highly viable teams with high scores.

RU-wide peer rating of team viability was calculated from this measure, which followed exactly the same procedure as explained in the team performance measure.

The second measure is the team members' rating of their own team on a 3-item team viability scale: "As a team, this team shows signs of falling apart," "This team should not continue to function as a team," and "This team is not capable of working together as a team." These items were selected from the scale used in Barrick et al. (1998) and were rated on a 7-point scale (1=*strongly disagree*, 7=*strongly agree*). Individual responses are reverse coded after data collection to represent high scores associated with favorable (highly viable team) responses.

Translation of the materials Since all the scales were originally developed and tested in English, the materials were translated to Korean by me and then independently

back-translated to English by another person who is fluent in both Korean and English to assure equivalence in meaning. Each measure used in the present study is summarized in Table 1 along with its data source, and the specific items in each scale are provided in APPENDIX B, C, and D.

Table 1  
Summary of Data Collected by Source

Variables	Scales used	Number of items	Completed by ...		
			Team Member	Team Leader	RU Commander
Leadership characteristics <sup>a</sup>					
<i>Transformational leadership</i>	MLQ-Form 5X-short	20	0	0	0
<i>Contingent reward</i>	MLQ-Form 5X	4	0	0	0
<i>Active management-by-exception</i>	MLQ-Form 5X-short	4	0	0	0
<i>Passive management-by-exception</i>	MLQ-Form 5X-short	4	0	0	0
<i>Laissez-faire</i>	MLQ-Form 5X-short	4	0	0	0
Individualism-Collectivism					
<i>Individualism</i>	Singelis et al. (1995)	6	0	0	0
<i>Collectivism</i>	Singelis et al. (1995)	12	0	0	0
LMX					
	LMX-7 (Graen et al.,1982)	7	0	0	0
	Developed	1 <sup>b</sup>	0	0	0
TMX	Seers (1989)	8	0	0	0
Team social cohesion	Stoke (1983)	8	0	0	0
Team performance					
	Developed	1 <sup>c</sup>	0	0	0
	Wayne et al.(1997, 4 items) + Developed (3 items)	7	0	0	0
Team viability					
	Developed	1 <sup>c</sup>	0	0	0
	Barrick et al. (1998)	3	0	0	0

<sup>a</sup> All the leadership measures but transformational leadership were included for the purpose of exploring the factor structure rather than hypotheses testing.

<sup>b</sup> Rank scale

<sup>c</sup> Ordered-rank scale

### Analytic Issues Cleared Before Hypothesized Model Testing

Since characteristics of research design in this study necessitate checks on a couple of methodological issues before the main hypotheses testing: levels of analysis and defensive response issues. In the following sections, each of methodological issue is discussed.

#### Levels of Analysis Issues

The variables in this study were measured at individual level and aggregated to make team-level variables. Therefore, all the variables used in hypotheses testing are variable means across teams and the only exception of this manipulation is the individualism-collectivism measure.

As mentioned earlier in this chapter, I operationalized team-level individualism and collectivism as the number of team members who show strong individualism and collectivism, respectively. The reason to select this type of operationalization for team-level individualism and collectivism is that aggregation of individual characteristics which are not products of team activities needs different types of operationalization which preserves measured variance of the variables while keeping the variable as a meaningful measure. By referring to Barry and Stewart's (1997) practice, I operationalized the number of team members scoring high on individualism and collectivism as the number of people who scored 1 standard deviation above the mean in the individualism and collectivism scales, respectively<sup>4</sup>. Therefore, I calculated standard

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<sup>4</sup> I also tested the research models with mean scores of team-level individualism and collectivism, but there is no difference in the results of hypotheses testing.

deviation scores of both individualism and collectivism at individual-level (N=823) and then counted the number of team members who rated themselves above 1 standard deviation score on either individualism or collectivism. Because the number of team members who replied to the survey varies somewhat across teams (7~12 persons), the numbers of individualists/collectivists within a team were divided by the number of the team members who responded to the survey, to turn the numbers into proportion values.

The rest of the items were worded so that either the team or the leader was the referent. In other words, individuals completed the items either as a member of the team or as a subordinate of the leader. In this way, the measures were operationalized at the proper level of analysis (Campion, Medsker, & Higgs, 1993; Van de Ven & Ferry, 1980).

In a prior study (Gerstner, 1998), the appropriateness of team level aggregation of individual-level measures was empirically tested with both inter-rater agreement indices (e.g.,  $r_{WG(J)}$ ; James, Demaree, & Wolf, 1984)<sup>5</sup> and one-way ANOVA using the team as the independent variable to examine the ratio of within- to between-group variance. As presented in Table 2, the mean  $r_{WG(J)}$ s were all sufficiently large to assume team-level phenomena (e.g., above than .70 cutoff suggested by James et al.). Specifically, between 71% and 96% of the  $r_{WG(J)}$  value calculated for each scale within each of the 88 ASO teams were above than .70. and the mean  $r_{WG(J)}$  value for ratings of the ASO team leader's transformational leadership was .86; for team-level LMX, .77; for TMX, .82; for team social cohesion, .84; for team performance, .85; and for team viability, .79. In addition, the between-group variance was higher than the within-group variance for all

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<sup>5</sup> James et al. (1984) suggested  $r_{WG}$  and  $r_{WG(J)}$  as indices of agreement for ratings of a single target on a single item and multiple items, respectively.



variables in this study, as indicated by significant  $F$ -ratios (Campion et al., 1993). This signifies that there was more variance between groups than within groups, which provides further support for the group-level aggregation of these measures (see Table 2).

Also notable in Table 2, when compared to member-appraised LMX, leader-appraised LMX show similar between-group variance but extremely low within group variance ( $F=9.753$ ,  $p<.001$  for leader-appraised LMX;  $F=2.688$ ,  $p<.001$  for member-appraised LMX).

Table 2  
Agreement Indices & One-Way ANOVAs for Aggregated Variables

Variables	Mean $r_{WG(J)}$	Mean Square		$F$
		Between Group	Within Group	
Transformational Leadership	.86	.851	.294	2.898***
LMX (members' rating)	.77	2.714	1.004	2.688***
LMX (leader's ratings)	-	2.168	.221	9.753***
Team-Member Exchange	.82	1.491	.824	1.808***
Team Social Cohesion	.84	1.803	.861	2.094***
Team Performance	.85	2.241	.843	2.657***
Team Viability	.79	2.973	1.251	2.377***

\*  $p<.05$  \*\*  $p<.01$  \*\*\*  $p<.001$

### Defensive Responses Issues

It is well known that self-reports may be biased by tendencies to report socially-desirable behaviors (Azjen, 1988). Furthermore, in many research areas of psychology, people show a tendency to respond defensively if a certain measure is related to an appraisal of their personal characteristics. The leadership literature also shows that

leaders tend to respond defensively on their own leadership appraisals (e.g., Graen & Scandura, 1987; Harris & Schaubroeck, 1988; Kolb, 1995; Mount, 1984). For example, Graen and Scandura (1987) have noted that the ‘main difficulty with this (LMX) and other measures of the dyad taken from superior’s point of view is the tendency of superiors to respond somewhat defensively and give ‘socially desirable’ answers” (p. 191). In prior studies (Graen & Scandura, 1987; Liden et al., 1993), the LMX measures were larger and the variances smaller for leader reports than for member reports supporting the argument.

Therefore, I checked if there are any defensive response tendencies in leaders’ ratings using paired sample t-tests. As shown in Table 3, leader’s own appraisals of leadership related variables show positivity bias. Leaders rated their own transformational leadership significantly higher than team members’ mean rating (leader’s rating=3.95; team members’ mean rating=3.62; mean difference=.33,  $t=6.82$ ,  $p<.001$ ). After combining this result with the small within group variance in team members rating of leader’s transformational leadership in Table 2, I concluded that the team members who worked with the leaders and were in direct contact with them would be in the better position in assess team leaders’ leadership behaviors (Podsakoff, MacKenzie, & Bommer, 1996) than the team leader himself/herself.

Table 3 also presents that leader-rated LMX was significantly higher than member-rated mean LMX (leader’s mean LMX-7 rating across six subordinates=5.84; mean LMX-7 rating for six subordinates=5.36; mean difference=.48,  $t=8.31$ ,  $p<.001$ ), which is consistent with Graen and Scandura (1987). Leaders’ positivity bias in rating

(i.e., LMX-7 scale) was also verified by the other LMX measure in which leaders were asked to rank each of six subordinates (out of 11-13 subordinates) on a single item. Rank scale has an advantage over rating scale by forcing leaders to distribute rates on the scale with larger range. As shown in Table 3, correlation between team leader's and team member's rating on LMX-7 scale was .13 ( $p < .001$ ) which is lower than average correlation ( $r = .29$ ) calculated in a prior meta-analysis (Gerstner & Day, 1997). However, when the correlation was calculated with the one-item LMX rank scale, leader-appraised LMX rank of a certain team member and member-appraised LMX rank of himself/herself within the team shows a higher correlation coefficient ( $r = .39$ ,  $p < .001$ ) which is higher than the average correlation in literature.

Table 3  
Correlations and T-test Results Between Leader's and Team Members' Appraisal on Leadership-related Variables<sup>a</sup>

Variable/Scale	Correlation between two appraisals	Leader's appraisal	Members' appraisal	Mean difference	t-value
Transformational leadership	.24*	3.95	3.62	.33	6.82***
Leader-member exchange (LMX-7 scale)	.13**	5.84	5.36	.48	8.31***
Leader-member exchange (1 item rank scale) <sup>b</sup>	.39**	.40	.42	-.02	-1.55

\*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$

<sup>a</sup>  $N = 89$  for transformational leadership;  $N = 479$  for LMX-7;  $N = 327$  for 1 item LMX scale

<sup>b</sup> LMX rank was divided by the number of total team members within a team.

Because of this defensive tendency in leaders' response in their meta-analysis, Gerstner and Day concluded that LMX is more reliably assessed from a member's

perspective than from a leader's perspective. Therefore, the data from leader survey will not be used in the following hypotheses tests.

#### Analytic Strategies for Hypothesized Model Testing

Structural equation modeling allows causal inferences even with cross-sectional data by using latent variable models with multiple indicators (e.g., Bentler, 1980; Schmitt & Bedeian, 1982). Although the use of latent variable models with multiple indicators represents an advancement in social science methodology, this technique is not without its limitations. For example, Jöreskog and Sörbom (1986) noted that models that include more than 30 indicators are exceedingly difficult to fit even with strong theoretical support. In addition, Schmitt and Bedeian (1982) point out that the distorted estimates of structural parameters that can result from the simultaneous solution of the measurement and structural models, a problem similar to interpretational confounding as discussed by Bagozzi (1980). As another limitation of structural equation modeling, Schmitt and Bedeian (1982) mention that the mathematics of latent variable analysis with multiple indicators are complex, and obtaining enough indicators for identification may not always be feasible. In other words, there may not be enough information in the covariances/correlations to allow for unique parameter estimates by having fewer cases than required optimal. Regarding sample size issue, the most commonly accepted "rule of thumb" is that, in order to meet distributional requirements, the sample size (i.e., the number of cases used as input to the program) should be at least five times larger than the number of parameters to be estimated (e.g., Bentler & Chou, 1988; Bollen, 1989). However, in studies on teams, it is hard to obtain a sufficient number of teams (Barrick,

et al., 1998; McIntyre & Salas, 1995) to meet the minimum requirement for full latent structural modeling.

Therefore, prior researchers has sought alternative ways to use structural equation modeling for the situation in which multiple indicators are not available or in which the decision is made not to use them. In practice, there may be cases where well-established scales are available to measure a construct, and the decision is made not to break the scale into several indicators. For that situation, a technique has been developed to allow for the evaluation of latent variable models, the so called 'single indicator approach'(Jöreskog & Sörbom, 1993; Williams & Hazer, 1986) in latent variable model testing.

The difference between normal structural equation modeling and the single indicator approach is the handling of the measurement error of the model. In a typical structural equation modeling, measurement and structural components of the model are estimated simultaneously, but the single indicator approach handles them sequentially. Specifically, to include an adjustment for measurement error in the scale scores, Jöreskog and Sörbom (1993) suggested setting the path from the latent variables to the indicator equal to the product of the square root of the scale reliability and the scale standard deviation and to set the error variance equal to the variance of the scale score multiplied by 1 minus the reliability. This technique has been shown to be a reasonable approximation for the error variance by Netemeyer, Johnson, and Burton (1990) and used by a variety of studies, generally with good results (e.g., Moorman, 1991; Pillai et al., 1999).

However, neither of the two techniques (i.e., full latent model testing and the single indicator approach) was applicable in this study for two reasons.

First, the latent constructs in the study (known as factors in EQS terminology, Bentler, 1985) had the following number of indicators: transformational leadership – 20; team-level LMX – 7; team-member exchange – 8; team social cohesion – 8; team performance – 7; and team viability – 3. In addition, there are two measured variables (i.e., numbers of both individualists and collectivists within a team) and a covariance between two team outcome measures. Consequently, there were 129 elements to be estimated. Thus, given the conventional minimum ratio of 1:5 between number of indicators and number of cases, required sample size to do full latent variable model testing was 645 teams or above. Even after limiting the number of indicators (i.e., items in each scale) to three in each factor by eliminating a few items in each scale, which was the (recommended) minimum number of indicators to make latent variables (Bentler, 1985), the sample size needs to exceed 315 teams. In a study on teams with aggregation of individual responses to make team-level constructs, it is almost impossible to collect that number of responses. Therefore, full latent model testing is a feasible technique only in a study with individual-level data analysis.

A second problem is related to scale reliability estimation. To apply the single indicator approach, the internal consistency coefficient of each latent variable should be available. However, as team-level constructs in this study except for individualism-collectivism are defined as aggregated variable means across different team members, it is impossible to calculate internal consistency of a certain scale at the team-level. For

example, the LMX-7 scale has 7 items. If 'Team A' has 10 members, then there are 70 measures to represent Team A's team-level LMX. To calculate the internal consistency coefficient of LMX measure, I have to aggregate ten persons' response on each item. Therefore, calculation of an internal consistency coefficient with items which were already aggregated from 10 persons' response is a meaningless process.

Given these limitations in the full latent modeling technique itself and practical limitations in the present study, I decided to use path analysis with structural equation modeling technique rather than full latent modeling. By definition, path analysis is a special case of general structural equation modeling that excludes considerations on the measurement error. There is an advantage of doing path analysis by using structural equation modeling technique. Traditional path analysis with multiple regression analyses tests path coefficients between variables under the assumption that the entire model is correct. However, path analysis with structural equation modeling technique provides tests for overall model fits in addition to the specific path coefficient estimates. Therefore, I was able to avoid at least one of the two common criticisms related to path analysis (i.e., model specification error and measurement error).

The model in Figure 2 was tested using the EQS for Windows 6.1 for structural equation modeling package (Bentler & Wu, 1995). It should be noted that neither structural equation modeling nor standard approaches (such as multiple regression and ANOVA) offer statistical tests of causality. Directionality of the relationships are appropriately established through logic, strong theory, or methodological strategies (Bentler, 1995).

To test this model, the covariance matrix was analyzed using the maximum likelihood estimation procedure which has been found to be a robust estimation technique even in data that violates many of the assumption of structural equation modeling (e.g., nonnormally distributed data; Chou & Bentler, 1995).

After assessing the overall model fits, individual hypotheses were tested by examining individual path coefficients. This represents the internal structure of the model and each of the hypothesized relationships is represented by a particular path in the overall model.

I should note that, based on prior research (Barrick et al., 1998; Hackman, 1987), I expected that team performance and team viability to be related. Since it's not a focus of this study, however, both team performance and team viability were allowed to covary.

The third and final analytic step involved using the data to find the best fitting model. After the hypothesized model had been tested, several alternative models were examined which are based either on theoretical arguments that somewhat differ from the hypothesized model or on data-driven statistical methods (such as Lagrange Multiplier and Wald tests) by running checks for missing and irrelevant paths in the hypothesized model.

#### Fit Indices.

The causal modeling process requires the examination of the fit of the structural model before testing the significance of any of the individual paths in the model. Because no single measure has demonstrated clear superiority over any other measure, as recommended by Bollen (1989), I assessed the fit of the individual models by using



several indices: the comparative fit index (CFI), the incremental fit index (IFI), the goodness-of-fit index (GFI), and the root-mean-square residual (RMSR). It is worth considering all of these tests because each provides somewhat different information. The Comparative Fit Index (CFI) assesses fit relative to other models, such as the independence model (the model that corresponds to completely unrelated variables). The CFI employs the noncentral chi-square distribution within noncentrality parameters. Therefore, the CFI has advantage in reflecting fit relatively well at all sample sizes, especially in avoiding the underestimation of fit. The Incremental Fit Index (IFI) is a modification of the normed fit index (NFI) which has problems in assessing fit with small sample. The IFI has the major advantage of reflecting model fit very well at all sample sizes, but has a smaller sampling variance than the non-normed fit index (NNFI) which is another modification of NFI (Bollen, 1989). The GFI reflects the relative amount of the variance and covariance in the sample matrix to the variance and covariance predicted by the model matrix. For all of these indices, the closer to 1, the better fit. A value of .90 is usually used as an arbitrary indicator of good fit. The RMSR is an absolute fit index as it is absolute in the sense that it does not depend on a comparison with another model. This index examines residual values. Values around .05 or less are generally desired to consider a model acceptable (MacCallum, Browne, & Sugawara, 1996).

Although the most commonly reported fit index is the chi square test, this index has been faulted for being too dependent on sample size and reliance on perfect fit as the standard for comparison (Bollen, 1989). Therefore, I should note that the significance of the hypothesized model's chi-square statistic was not used to assess its fit even though it

is reported along with the other fit indexes. Instead, based on the recommendations by Bollen (1989) and others (Jöreskog & Sörbom, 1993; Medsker et al., 1994), I used chi-square difference test, which compares the relative fit of nested models, in alternative model testing along with differences in the fit indexes. Because it appraises the model fit with consideration of the model's degrees of freedom (i.e. relative chi-square), researchers generally prefer the chi-square difference test to the absolute chi-square value in nested model comparisons.

#### Testing Individual Hypotheses

After the overall fit of the hypothesized model had been assessed, individual hypotheses were tested by examining path coefficients. This represents the internal structure of the model, and each of the hypothesized relationships is represented by a particular path in the overall model. In addition to checking the significance of these paths, Lagrange Multiplier and Wald tests were run to check for missing and irrelevant paths.

#### Test of Alternative Models

After the hypothesized model was tested, a few alternative models were tested. These alternative models each are supported by theoretical arguments that somewhat differ from the hypothesized model.

For this study, alternative models were compared by an examination of the difference in chi-square tests since the hypothesized models are hierarchically-related (or nested) to all the alternative models.

## CHAPTER IV. RESULTS

The results section is divided into four sections. In the first section, exploratory and confirmatory factor analyses on transformational-transactional leadership measures along with LMX scales are presented. In the second section, descriptive statistics and internal consistency reliabilities are provided for all variables in the study. In the third section, results from structural equation modeling on the hypothesized model are presented along with results for each of the four major clusters of hypotheses. In the fourth section, several alternative models are tested to compare their global fit with that of original hypothesized model proposed in Figure 2.

### Individual-level Exploratory and Confirmatory Factor Analyses on MLQ Items and LMX-7 Scale

As mentioned in Chapter Three, construct validity of all the scales used in the survey has been established in the literature. However, because the distinction between transformational-transactional leadership and LMX has been debated, I examined with exploratory and confirmatory factor analyses.

Ko et al. (2004) used exploratory and confirmatory factor analyses as methods to resolve the debate and showed that LMX is an independent construct distinct from both transformational and transactional leadership. As a replication of prior study, I did exploratory and confirmatory factor analyses before doing the main hypotheses tests. All the MLQ items and LMX-7 items were entered into a principal component factor analysis with varimax rotation. Based on prior research (Ko et al., 2004), a five-factor solution was explored.

The results show clear five-factor solution with minimal cross-loadings. Exploratory factor analysis results for the five-factor solution were provided in Table 4. These factors could be interpreted as transformational leadership (factor 1), LMX (factor 2), contingent reward (factor 3), passive management-by-exception including laissez-faire leadership (factor 4), and active management-by-exception (factor 5). The five factors solution explained 56.13% of the total variance. The five factor solution is consistent with Ko et al.'s (2004) results supporting that LMX is independent from both transformational and transactional leadership components. Except for one item, all the items showed the highest factor loadings on the intended factor. The only item shows the highest loading on unintended factor was one of transformational leadership items (i.e., idealized influence through attribute) which loaded on active management-by-exception.

Confirmatory factor analysis using EQS with the five-factor model from exploratory factor analysis shows acceptable fits for the five-factor solution ( $\chi^2(340)=1229.47^{***}$ ; CFI=.922; IFI=.923; GFI=.894; RMSR=.056).

Table 4  
Individual-Level Exploratory Factor Analysis (Leadership and LMX)

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Q2.14 (TRL; IIB)	.673	.180	-.219	.065	-.019
Q2.13 (TRL; IM)	.672	.190	-.218	-.012	.052
Q2.06 (TRL; IIB)	.620	.140	-.122	.011	.044
Q2.38 (TRL; IIB)	.590	.193	-.153	.293	-.045
Q2.08 (TRL; IS)	.584	.223	-.314	.094	-.020
Q2.34 (TRL; IS)	.574	.218	.054	.263	-.072
Q2.36 (TRL; IS)	.569	.335	-.181	.333	-.042
Q2.10 (TRL; IIA)	.558	.335	-.234	.174	-.001
Q2.33 (TRL; IC)	.548	.186	-.080	.201	-.174
Q2.28 (TRL; IM)	.535	.226	-.259	.363	.057
Q2.35 (TRL; IC)	.531	.386	-.186	.348	-.123
Q2.25 (TRL; IIB)	.526	.196	-.184	.288	-.009
Q2.40 (TRL; IM)	.506	.256	-.193	.289	-.008
Q2.23 (TRL; IIA)	.503	.387	-.184	.336	-.022
Q2.15 (TRL; IC)	.467	.209	-.149	.221	.181
Q2.19 (TRL; IC)	.462	.335	-.277	.234	-.198
Q2.02 (TRL; IS)	.435	.358	-.294	.157	.033
Q2.18 (TRL; IIA)	.431	.423	-.201	.237	.052
Q2.09 (TRL; IM)	.405	.019	.061	-.044	-.048
Q3.05 (LMX-7)	.226	.815	-.107	.117	-.084
Q3.03 (LMX-7)	.242	.806	-.139	.178	-.046
Q3.02 (LMX-7)	.271	.780	-.176	.118	-.109
Q3.04 (LMX-7)	.202	.775	-.165	.180	-.015
Q3.07 (LMX-7)	.212	.744	-.174	.094	-.110
Q3.06 (LMX-7)	.255	.739	-.067	.143	.001
Q3.01 (LMX-7)	.282	.710	-.240	.088	-.149
Q2.12 (MBEP)	-.228	-.209	.698	-.033	.086
Q2.03 (MBEP)	-.174	-.166	.675	-.091	.059
Q2.07 (LF)	-.195	-.166	.663	-.135	.132
Q2.05 (LF)	-.206	-.199	.649	-.060	.184
Q2.37 (LF)	-.299	-.107	.625	-.039	.168
Q2.21 (MBEP)	-.035	-.073	.559	-.015	.331
Q2.31 (LF)	-.220	-.090	.553	-.002	.234
Q2.17 (MBEP)	.206	-.036	.295	.106	-.128
Q2.30 (CR)	.150	.179	.012	.751	.059
Q2.41 (CR)	.128	.130	.050	.736	.096
Q2.20 (CR)	.295	.127	-.112	.608	.076
Q2.16 (CR)	.311	.294	-.092	.551	-.129
Q2.26 (MBEA)	.021	-.042	.066	.024	.768
Q2.24 (MBEA)	.017	-.097	.264	-.026	.705
Q2.04 (MBEA)	.045	-.079	.070	-.073	.698
Q2.29 (MBEA)	-.180	-.053	.292	.006	.543
Q2.07 (IIA)	-.005	-.019	.063	.180	.452

Principal Component Analysis with Varimax Rotation.

Note: TRL=transformational leadership; IIA=idealized influence (attribute); IIB=idealized influence (behavior); IC=individualized consideration; IM=inspirational motivation; IS=intellectual stimulation; CR=contingent reward; MBEA/MBEP=management-by-exception (active/passive); LF=laissez-faire.

### Descriptives and Internal Consistency Coefficients

Descriptive statistics and internal consistency estimates for all variables measured in the surveys can be found in Table 5 (team member survey), Table 6 (team leader survey), and Table 7 (RU commander survey)<sup>6</sup>. As presented in Table 5, all the scales used in this study show acceptable internal consistency coefficients (above .70) as suggested by Nunnally and Bernstein (1994). The only exception to this involved the individualism scale. Individualism scale showed an alpha of only .67. This is similar to original coefficient reported by Singelis et al. (1995).

The reason for low reliability coefficients of individualism-collectivism was discussed by Singelis and his colleagues (1995) in terms of the “bandwidth versus fidelity dilemma” (Cronbach, 1990, pp. 208-210). Bandwidth refers to the amount of information and is a linear function of the number of different questions asked. Fidelity refers to the accuracy of the information, that is, the consistency of the answers obtained. Bandwidth is inversely related to fidelity. In short, several scores with relatively low alphas will give more valid information (covering the whole bandwidth) than fewer scores with high alphas. The difficulty with individualism-collectivism is that they are broad constructs (e.g., large bandwidth). When the construct (i.e., individualism-collectivism) is broad and the numbers of items corresponding to each aspect are small, the alphas rarely exceeded .70 (e.g., low fidelity).

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<sup>6</sup> Although descriptive statistics from the team leader survey are presented in Table 6, those data were not used in the following analyses because of the biased response issues explained in Chapter Three.

Table 5  
Descriptive Statistics and Alpha Coefficients of the Scales in Member Survey

Variable/Scale	Response range	Mean	<i>s.d.</i>	Alpha	Number of Items
1. Individualism	1-7	4.71	.87	.67	6
2. Collectivism	1-7	5.73	.72	.80	12
3. Transformational leadership	1-5	3.62	.60	.92	20
4. Leader-member exchange	1-7	5.36	1.09	.93	7
5. Team-member exchange	1-7	5.34	.93	.89	8
6. Team social cohesion	1-7	5.79	.98	.88	8
7. Team performance I <sup>a</sup>	1-8	5.41	.61	-	1
8. Team viability I <sup>a</sup>	1-8	5.30	.57	-	1
9. Team performance II <sup>b</sup>	1-7	5.82	.99	.90	7
10. Team viability II <sup>b</sup>	1-7	6.23	1.20	.85	3

<sup>a</sup> Subjects were asked to rate all five teams within the same RU on single item.

<sup>b</sup> Subjects were asked to rate only their own team.

Table 6  
Descriptive Statistics and Alpha Coefficients of the Scales in Leader Survey

Variable/Scale	Response range	Mean	<i>s.d.</i>	Alpha	Number of Items
1. Transformational leadership	1-5	3.95	.43	.91	20
2. Leader-member exchange	1-7	5.84	.75	.90	7
3. Team performance I <sup>a</sup>	1-8	5.39	1.07	-	1
4. Team viability I <sup>a</sup>	1-8	5.34	1.09	-	1

<sup>a</sup> Subjects were asked to rate all five teams within the same RU on single item.

Table 7  
Descriptive Statistics of the Scales in RU Commander Survey

Variable/Scale	Response range	Mean	<i>s.d.</i>	Alpha	Number of Items
1. Team performance I <sup>a</sup>	1-8	5.56	1.91	-	1
2. Team viability I <sup>a</sup>	1-8	5.03	2.25	-	1

<sup>a</sup> Subjects were asked to rate all five teams under his own control on single item.

Both individual- and team-level correlation coefficients among the variables in the present study are presented in Table 8. In this table, individual-level correlation coefficients appear above the diagonal and team-level correlation coefficients are presented below. Means and standard deviation scores presented in Table 8 are calculated from team-level data.

At the individual level, all the variables in the study show significant positive inter-correlations. The exception to this is the individualism measure which does not significantly correlate with any of the variables. This suggests that while collectivism might benefit team relational environment, individualism does not appear to harm it. Also notable from Table 8 is that individualism and collectivism are positively correlated ( $r=.17, p<.01$ ) at the individual level, supporting the multi-dimensional nature of the individualism-collectivism (Chen et al., 2002; Ghorbani et al., 2003; Markus & Kitayama, 1991; Watson et al., 1998).

At the team level, the correlation between individualism and collectivism was non-significant ( $r=.04, p>.10$ ). As hypothesized, team-level collectivism (i.e., number of collectivists within a team) was significantly correlated with both LMX (H1b;  $r=.42, p<.01$ ) and TMX (H2b;  $r=.33, p<.01$ ) and team-level individualism was negatively correlated with TMX, but the association was non-significant ( $r=-.15, p>.10$ ).

Also as hypothesized, transformational leadership significantly correlated with both LMX (H1a;  $r=.59, p<.01$ ) and TMX (H2a;  $r=.37, p<.01$ ), and team social cohesion was positively correlated with both team-level LMX (H3a;  $r=.46, p<.01$ ) and TMX (H3b;  $r=.78, p<.01$ ).



As expected, within-source ratings on both team performance and team viability show highly significant correlations across all three sources. Within-source correlations between team performance and team viability were .65, .73, and .60,  $p < .01$ , from non-rated team members, RU-wide peers, and RU commanders, respectively.

It is also important to notice that there are several significant between-source correlations in team performance and team viability ratings, showing inter-rater agreements. Specifically, ratings from both team members and RU-wide peers of team performance and team viability were significantly correlated ( $r = .38$ ,  $p < .01$ , on team performance rating;  $r = .26$ ,  $p < .05$ , on team viability rating). Ratings from both RU-wide peer groups and RU-commanders were also significantly correlated ( $r = .26$ ,  $p < .05$ , on both team performance and team viability ratings). However, ratings from team members and RU commanders were positively correlated but non-significantly ( $r = .11$ ,  $p > .10$ , on team performance rating;  $r = .13$ ,  $p > .10$ , on team viability rating). Interestingly, team members' rating on team performance was significantly correlated with RU-commanders' rating on team viability ( $r = .28$ ,  $p < .01$ ).

In summary, the correlations appearing in Table 8 generally support the research hypotheses in this study and the ratings on team outcomes across three rating sources show significant correlations in general with a few exceptions.

Table 8  
Team- and Individual-level Correlations among Variables

	<i>M</i>	<i>s.d.</i>	1	2	3	4	5	6	7	8	9	10	11
1. Collectivism <sup>a</sup>	1.59	1.35	-	.17**	.35**	.35**	.43**	.41**	.41**	.24**			
2. Individualism <sup>a</sup>	1.53	1.22	.04	-	.01	.01	.06	.01	.03	-.03			
3. Transformational Leadership <sup>b</sup>	3.60	.36	.33**	-.20*	-	.67**	.46**	.39**	.49**	.28**			
4. LMX <sup>c</sup>	5.45	.54	.42**	-.18+	.59**	-	.55**	.46**	.63**	.33**			
5. Team-member exchange <sup>c</sup>	5.24	.46	.33**	-.15	.37**	.48**	-	.69**	.63**	.42**			
6. Team social cohesion <sup>c</sup>	5.79	.55	.20*	-.19+	.37*	.46**	.78**	-	.68**	.52**			
7. Team performance (Team members) <sup>b</sup>	5.86	.63	.23*	-.19+	.54**	.47**	.69**	.71**	-	.52**			
8. Team viability (Team members) <sup>b</sup>	6.23	.72	.11	-.24*	.32**	.28**	.58**	.60**	.65**	-			
9. Team performance (RU-wide peers) <sup>d, e</sup>	4.97	.70	.14	-.01	.17	.20*	.25*	.35**	.38**	.25*	-		
10. Team viability (RU-wide peers) <sup>d, e</sup>	4.89	.62	.02	.00	.09	.11	.21*	.31**	.30**	.26*	.73**	-	
11. Team performance (RU commanders) <sup>e</sup>	5.56	1.91	-.05	-.16	.09	.02	.10	.12	.11	.11	.26*	.09	-
12. Team viability (RU commanders) <sup>e</sup>	5.03	2.25	.13	-.09	.17	.21+	.20+	.31**	.28**	.13	.41**	.26*	.60**

+  $p < .10$  \*  $p < .05$  \*\*  $p < .01$

Note: Team-level correlations among the variables appeared below the diagonal ( $N=75-90$ ); individual-level correlations among the variables appeared above the diagonal ( $N=814-820$ ); mean and *s.d.* are calculated from the team-level variables.

<sup>a</sup> At team-level, the variable is defined as 'the number of team members who show high (i.e., above 1 *s.d.*) either individualism or collectivism'.

<sup>b</sup> At team-level, the variable is mean of ratings by team members who were not rated by the leader (3-6 persons per team).

<sup>c</sup> At team-level, the variable is mean of ratings by team members who were rated by the leader (3-6 persons per team).

<sup>d</sup> At team-level, the variable is mean of ratings by RU-wide peers (31-42 persons per RU).

<sup>e</sup> 1 item (ordered-rating) scale.

### Structural Model Analysis

The structural model which is represented graphically in Figure 2 was tested using EQS Windows 6.1. The model consists of eight variables and error variances on five of them. In addition, as noted previously, the covariance between two team outcome measures was allowed to be freely estimated.

#### Specifications of Data Source of the Variables in Each Hypothesized Model

A problem that has often plagued field research involves the measures taken from a single source that uses self-report measures: the common source problem. In the present study, I employed data from different sources in each stage of the hypothesized model to avoid the same source effect.

Since about 10 people from each team (mean=9.4 people per team) responded to the team member survey, I divided the team members who responded to the survey into split-halves. Since team leaders were asked to rate only 6 out of 11-13 team members in his team, I used that classification as a criterion in split-halving the responding team members and halving subordinates within a team to avoid same source bias has been successfully used in prior research with military units (e.g., Bass, Avolio, Jung, & Berson, 2003).

By doing this, I was able to make up three different datasets from team member surveys for each variable in both Stage 1 (i.e., transformational leadership) and Stage 2 (i.e., team relational environment variables) in the hypothesized model. The only exception to this involved the team members' individualism and collectivism which were

operationally defined as the number of highly individualistic or collectivistic members within a team.

To fully utilize all three data sources (i.e., team members<sup>7</sup>, RU-wide peers, and RU commanders) for the variables in Stage 3 (i.e., team performance and team viability), I tested model fits with three different structural models by employing different data sources into the team outcome variables.

The Hypothesized Model-TM (*Hypo-TM, hereafter*), in which ratings by (non-rated) team members are used as measures of team outcomes, is the base of hypothesized models in this study. The other two hypothesized models are basically the same as Hypo-TM, but ratings by either RU-wide peers (i.e., *Hypo-PR, hereafter*) or RU commanders (i.e., *Hypo-RC, hereafter*) are used as measures of team outcomes. Therefore, it is important to note that, in all of three models, there is at least some data from different sources<sup>8</sup>. Specific data sources of variables in each model are specified in the following sections and graphically presented in Figure 4.

#### Hypothesized Model-TM

As the first (H1a and H1b) and second (H2a, H2b, and H2c) sets of hypotheses are focusing on the relationship between team inputs (i.e., Stage 1) and the team relational environment (i.e., Stage 2), I selected different data sources for each of them. Specifically, I used data from ‘non-rated team members’ for the transformational

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<sup>7</sup> As explained above, team members’ data can be further divided into three different measures. Then, for the variables in Stage 3 (i.e., team performance and team viability), there are five different data sources: (1) rated team members, (2) non-rated team members, (3) all team members, (4) RU-wide peer group, and (5) RU commander

<sup>8</sup> Across all three models, mean scores were used for all variables except team-level individualism and collectivism measures.

leadership variable and data from ‘rated-team members’ for the team relational environment variables (i.e., team-level LMX, TMX, and team social cohesion).

For the stage 2 hypotheses (H3a and H3b), I used same source data (i.e., data from rated team members). However, as those hypotheses are focusing on the relative strength of team-level LMX and TMX in predicting team social cohesion, the use of same source data for the tests of Stage 2 hypotheses is valid.

As the fourth (H4a, H4b, and H4c) and fifth (H5a and H5b) sets of hypotheses focus on the relationship between the team relational environment (i.e., Stage 2) and team outcomes (i.e., Stage 3), I also selected different data sources for team outcome variables. Since measures from ‘rated team members’ were used for the Stage 2 variables, I used data from ‘non-rated team members’ as team members’ rating of team outcome variables for the variables in Stage 3. Thus data for the variables of Stage 1 and Stage 2 as well as Stage 2 and Stage 3 are from different sources in the Model Hypo-TM, although all the variables in the model are measured from team members’ perspectives.

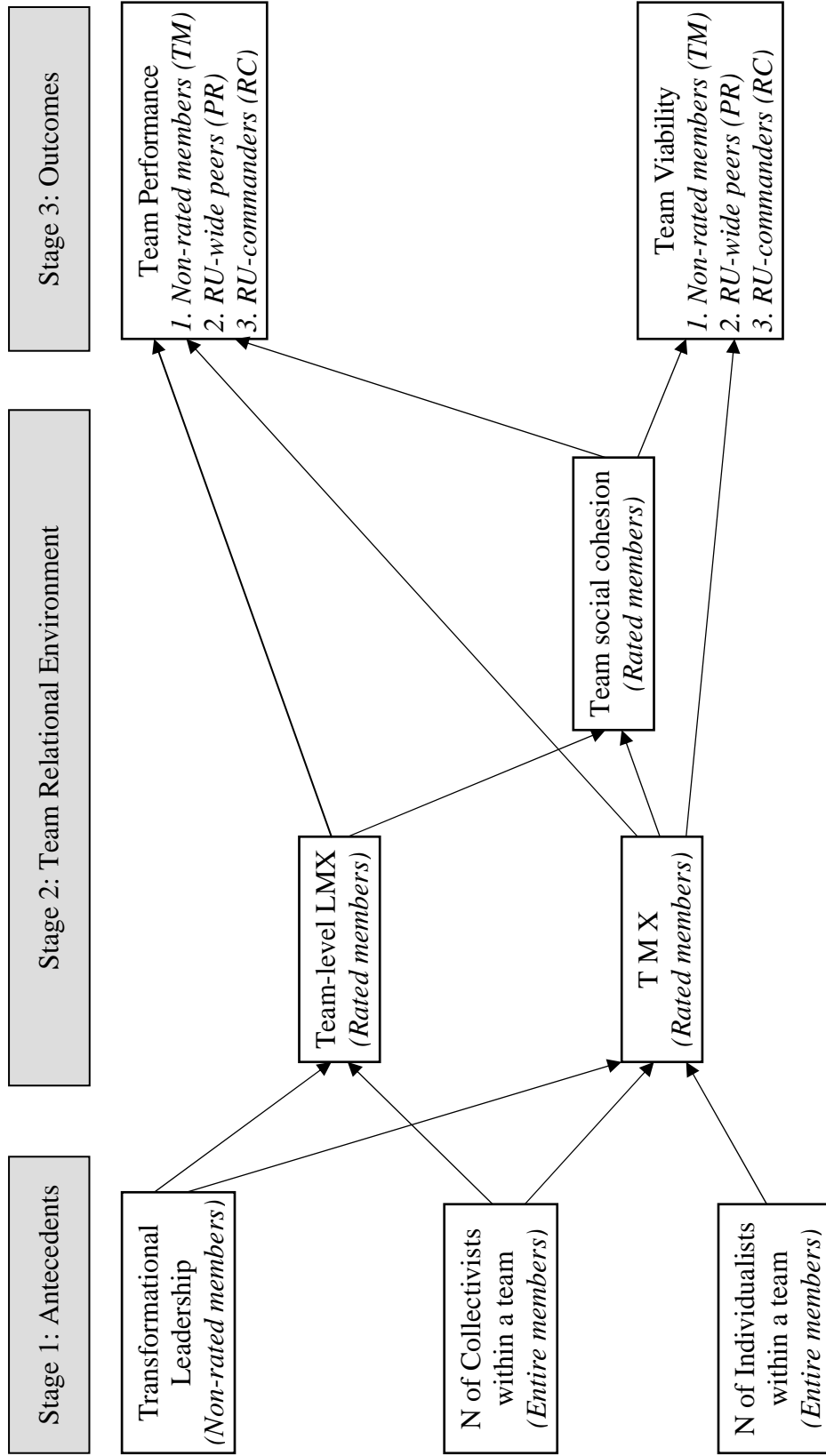
#### Hypothesized Model-PR

In the Hypo-PR, the data sources for variables in both Stage 1 and Stage 2 are the same as explained in the Hypo-TM. The only exception involves the measures of team outcome variables. In the Hypo-PR, ratings by RU-wide peers are used as team outcome measures. As explained in Chapter Three, RU-wide peer ratings of team performance and team viability are the mean scores of each team obtained from 31-42 team members within the same RU and, in calculation of these measures, team members’ rating on their

own team were excluded. Therefore, in the Model Hypo-PR, data for the variables of Stage 2 and Stage 3 are from different sources.

#### Hypothesized Model-RC

In the Hypo-RC, the data sources for variables in both Stage 1 and Stage 2 are the same as explained in the Hypo-TM, which used ratings by either rated team members or non-rated team members. The only exception is that, in the Hypo-RC, RU commanders' ratings are used as team outcome measures. Therefore, in the Model Hypo-RC, data for the variables in Stage 2 and Stage 3 are from different sources.



Note: Data sources are specified in the parenthesis. Mean scores were used for all variables except individualism and collectivism measures.

Figure 4. Specification of Data Source Used in Hypothesized Model Testing

### Structural Model Test Results

The structural model fit the data well across all the models with different data sources of team outcome measures. For example, fit indexes of Model Hypo-TM, which was tested with team outcome measures from non-rated team members, were  $\chi^2(15, N = 89) = 43.38, p < .01$ ; CFI = .904; IFI = .908; GFI = .900; RMR = .063 and the results of the other two models (i.e., Hypo-PR and Hypo-RC) are very similar to the results of Hypo-TM. The fit indexes of each model were summarized in Table 9 and presented graphically in Figure 5-1, 5-2, and 5-3.

Table 9  
Summary of Fit Indices in Each Model

Models	$\chi^2$	CFI	IFI	GFI	RMR
Hypo-TM	43.38**	.904	.908	.900	.063
Hypo-PR	30.16**	.935	.938	.927	.052
Hypo-RC	26.99*	.927	.932	.920	.101

Note: Hypo-TM, -PR, or -RC = Ratings by non-rated team members (3-6 persons per team), by RU-wide peers (31-42 persons per RU), or by RU commanders, respectively, were used as team outcome measures in the model.









Table 10  
Standardized Path Coefficients in Hypothesized Models

Path	Hypothesis	Models	Standardized Beta
Transformational leadership → Team-level LMX	H1a	Hypo-TM	.53**
		Hypo-PR	.53**
		Hypo-RC	.50**
N of collectivists → Team-level LMX	H1b	Hypo-TM	.27**
		Hypo-PR	.27**
		Hypo-RC	.26**
Transformational leadership → TMX	H2a	Hypo-TM	.27**
		Hypo-PR	.27**
		Hypo-RC	.24*
N of collectivists → TMX	H2b	Hypo-TM	.26**
		Hypo-PR	.26**
		Hypo-RC	.26*
N of individualists → TMX	H2c	Hypo-TM	-.11
		Hypo-PR	-.11
		Hypo-RC	-.11
Team-level LMX → Team social cohesion	H3a	Hypo-TM	.11+
		Hypo-PR	.11+
		Hypo-RC	.19*
TMX → Team social cohesion	H3b	Hypo-TM	.74**
		Hypo-PR	.74**
		Hypo-RC	.73**
Team-level LMX → Team performance	H4a	Hypo-TM	.15*
		Hypo-PR	.08
		Hypo-RC	.03
TMX → Team performance	H4b	Hypo-TM	.35**
		Hypo-PR	-.08
		Hypo-RC	.03
Team social cohesion → Team performance	H4c	Hypo-TM	.40**
		Hypo-PR	.36*
		Hypo-RC	.12
TMX → Team viability	H5a	Hypo-TM	.28**
		Hypo-PR	-.09
		Hypo-RC	-.11
Team social cohesion → Team viability	H5b	Hypo-TM	.37**
		Hypo-PR	.36*
		Hypo-RC	.38*

+  $p < .10$  \*  $p < .05$  \*\*  $p < .01$

Note: Hypo-TM, -PR, or -RC = Ratings by non-rated team members (3-6 persons per team), by RU-wide peers (31-42 persons per RU), or by RU commanders, respectively, were used as team outcome measures in the model.

Once the overall structure of a model has been determined to be acceptable, tests of hypotheses can be undertaken (Bagozzi & Yi, 1988). Table 10 summarizes the standardized path estimates for the hypothesized models.

### Antecedents of Team Relationship Environments

The first and second sets of hypotheses examined leader's characteristic (i.e., transformational leadership) and team members' characteristics (i.e., proportions of individualists/collectivists within a team) as antecedents of team relational environment.

#### Team-level LMX – Hypotheses 1a and 1b

The first set of hypotheses examined transformational leadership (H1a) and the proportion of collectivists among team members (H1b) as antecedents to team-level LMX.

Results from the Model Hypo-TM. As presented in Figure 5-1 and Table 10, both leader's transformational leadership (H1a) and the proportion of collectivists among team members (H1b) were significantly and positively related to team-level LMX (transformational leadership,  $\beta = .53, p < .01$ ; proportion of collectivists among team members,  $\beta = .27, p < .01$ ). Thus, both Hypothesis 1a and 1b were supported in the model which employed team members' ratings as team outcome measures.

Results from the Model Hypo-PR. As presented in Figure 5-2, both leader's transformational leadership (H1a) and the proportion of collectivists among team members (H1b) were significantly and positively related to team-level LMX (transformational leadership,  $\beta = .53, p < .01$ ; proportion of collectivists among team

members,  $\beta = .27, p < .01$ ). Therefore, both hypotheses were supported again in the model which employed RU-wide peers' ratings as team outcome measures.

Results from the Model Hypo-RC. Both leader's transformational leadership (H1a) and the proportion of collectivists among team members (H1b) were significantly and positively related to team-level LMX (transformational leadership,  $\beta = .50, p < .01$ ; proportion of collectivists among team members,  $\beta = .26, p < .01$ ). Therefore, both hypotheses were supported in the model which employed RU commanders' ratings as team outcome measures (refer to Figure 5-3 and Table 10).

Summary and Explained Variances. Across all three hypothesized models, both Hypothesis 1a and 1b were supported. Therefore, team members' average perceptions of their dyadic-LMX relationship quality with the leader were significantly and positively affected by the leader's transformational leadership, and the higher proportion of collectivists among team members, the higher the team-level LMX.

In structural equation modeling, the explained variance of a particular endogenous variable in the model is estimated by squaring the coefficient associated with the disturbance term for the particular variable and subtracting it from one. Comparison of the explained variance of team-level LMX across all three hypothesized models (refer to Figure 5-1, 5-2, and 5-3) show that the explained variance was .34 (disturbance=.81), .34 (disturbance=.81), and .31 (disturbance=.83), in the Model Hypo-TM, -PR, and -RC, respectively. Thus, the models explain 31~34 percent of the variance of team-level LMX.

### Team-member exchange – Hypotheses 2a, 2b, and 2c

The second set of hypotheses examined transformational leadership (H2a), the proportion of collectivists among team members (H2b), and the proportion of individualists among team members (H2c) as antecedents to team-member exchange.

Results from the Model Hypo-TM. As hypothesized, results from the Model Hypo-TM show that both leader's transformational leadership (H2a) and the proportion of collectivists among team members (H2b) were significantly and positively related to team-member exchange (transformational leadership,  $\beta = .27, p < .01$ ; proportion of collectivists among team members,  $\beta = .26, p < .01$ ). However, as predicted, the proportion of individualists among team members showed a negative association with team-member exchange (H2c), but the relationship was non-significant ( $\beta = -.11, p > .10$ ). Therefore, Hypothesis 2a and 2b were supported, but Hypothesis 2c was not supported in the model, in which team members' ratings were used as team outcome measures (refer to Figure 5-1 and Table 10).

Results from the Model Hypo-PR. In the hypothesized model which employed RU-wide peers' ratings as team outcome measures (refer to Figure 5-2 and Table 10), both leader's transformational leadership (H2a) and the proportion of collectivists among team members (H2b) were significantly and positively related to team-member exchange (transformational leadership,  $\beta = .27, p < .01$ ; proportion of collectivists among team members,  $\beta = .26, p < .01$ ). Although the proportion of individualists among team members showed a negative association with team-member exchange (H2c), the relationship was

non-significant ( $\beta = -.11, p > .10$ ). Therefore, Hypothesis 2a and 2b were supported, but Hypothesis 2c was not supported in the Model Hypo-PR.

Results from the Model Hypo-RC. Results from the Model Hypo-RC are similar to those from both Hypo-TM and Hypo-PR. Specifically, as hypothesized, both leader's transformational leadership (H2a) and the proportion of collectivists among team members (H2b) were significantly and positively related to team-member exchange (transformational leadership,  $\beta = .24, p < .05$ ; proportion of collectivists among team members,  $\beta = .26, p < .05$ ). However, the proportion of individualists among team members was not significantly associated with team-member exchange (H2c,  $\beta = -.11, p > .10$ ). Therefore, Hypothesis 2a and 2b were supported, but Hypothesis 2c was not supported in the model which employed RU commanders' ratings as team outcome measures (refer to Figure 5-3 and Table 10).

Summary and Explained Variances. Both Hypothesis 2a and 2b were supported across all three hypothesized models, but Hypothesis 2c was not supported. Therefore, team members' average perceptions of their exchange relationship quality with peers were significantly and positively affected by the leader's transformational leadership, and the higher proportion of collectivists among team members, the higher the team-level TMX. However, team-member exchange was not significantly affected by the proportion of individualists among team members. This null result on Hypothesis 2c could be due to the low reliability of the individualism scale.

Comparison of the explained variance of team-member exchange across all three hypothesized models shows that the explained variance was .15 (disturbance=.92), .15



(disturbance=.92), and .14 (disturbance=.93), in the Model Hypo-TM, -PR, and -RC, respectively. Thus, the models explain 14~15 percent of the variance of team-member exchange.

#### Relationship among Team Relationship Environment Variables

The third set of hypotheses examined relationship among variables composing team relational environment by proposing team social cohesion as an outcome of both team-level LMX and TMX.

#### Team social cohesion – Hypotheses 3a and 3b

Results from the Model Hypo-TM. As predicted, TMX (H3b) was a significant predictor of team social cohesion ( $\beta = .74, p < .01$ ). However, the relationship between team-level LMX (H3a) and team social cohesion was only marginally significant ( $\beta = .11, p < .10$ ). Thus, Hypothesis 3b was supported, but Hypothesis 3a was not supported in the model which employed team members' ratings as team outcome measures (refer to Figure 5-1 and Table 10).

Results from the Model Hypo-PR. The Model Hypo-PR also shows results similar to those from the Model Hypo-TM (refer to Figure 5-2). Specifically, as hypothesized, TMX (H3b) was a significant predictor of team social cohesion ( $\beta = .74, p < .01$ ), but the relationship between team-level LMX (H3a) and team social cohesion was only marginally significant ( $\beta = .11, p < .10$ ). Therefore, Hypothesis 3b was supported, but Hypothesis 3a was not supported in the model, in which RU-wide peers' ratings were used as team outcomes.

Results from the Model Hypo-RC. As presented in Figure 5-3, team social cohesion was positively and significantly associated with both team-level LMX (H3a,  $\beta = .73, p < .01$ ) and TMX (H3b,  $\beta = .16, p < .05$ ) in the Model Hypo-RC. Therefore, both Hypothesis 3a and 3b were supported in the model which employed RU commanders' ratings as team outcome measures.

Summary and Explained Variances. Hypothesis 3b was fully supported across all three models, but Hypothesis 3a was only partially supported (i.e., only in the Model Hypo-RC). Therefore, team members' average perceptions of social cohesion within the team was significantly and positively affected by TMX and team-level LMX. However, the positive relationship between team-level LMX and team social cohesion needs to be considered with caution as the relationship was significant only in one of the three models. In addition, given that same source data (i.e., data from rated team members) were used for the all three variables in Stage 2, the results also suggest the relative importance of TMX over team-level LMX in predicting team social cohesion.

Exploration of the explained variance of team member exchange across all three hypothesized models shows that the explained variance was .59 (disturbance=.64), .59 (disturbance=.64), and .62 (disturbance=.62), in the Model Hypo-TM, -PR, and -RC, respectively. Thus, the models explain 59~62 percent of the variance of team social cohesion.

### Outcomes of Team Relational Environment

The fourth and fifth sets of hypotheses examined team-level performance and viability as consequences of team-relational environment variables (i.e., team-level LMX, TMX, and team social cohesion).

#### Team performance – Hypotheses 4a, 4b, and 4c

The effects of team-level LMX (H4a), TMX (H4b), and team social cohesion (H4c) on team-level performance were examined as the fourth set of hypotheses.

Results from the Model Hypo-TM. All three team relational environment variables were significantly and positively associated with team performance in the model which employed team members' ratings as team outcome measures (refer to Figure 5-1), showing support for Hypothesis 4a, 4b, and 4c. Among those variables, both TMX (H4b,  $\beta = .35, p < .01$ ) and team social cohesion (H4c,  $\beta = .40, p < .01$ ) show stronger associations with team performance than team-level LMX (H4a,  $\beta = .15, p < .05$ ).

Results from the Model Hypo-PR. In the model which employed mean rating by RU-wide peers as team performance measure, team social cohesion (H4c,  $\beta = .36, p < .05$ ) shows a significant association with team performance. However, neither team-level LMX (H4a,  $\beta = .08, p > .10$ ) nor TMX (H4b,  $\beta = -.08, p > .10$ ) was significantly associated with team performance (refer to Figure 5-2). Therefore, Hypothesis 4c was supported, but both Hypothesis 4a and 4b were not supported in the Model Hypo-PR.

Results from the Model Hypo-RC. In the Model Hypo-RC which includes RU commanders' rating as team performance measure, none of the three team relational environment variables was significantly associated with team performance (team-level

LMX,  $\beta = .03, p > .10$ ; TMX,  $\beta = .03, p > .10$ ; team social cohesion,  $\beta = .12, p > .10$ ). Therefore, none of the three hypotheses (i.e., H4a, H4b, and H4c) was supported in the Model Hypo-RC (refer to Figure 5-3).

Summary and Explained Variances. Both Hypothesis 4a and 4b were supported only in the model which employed team members' rating on team performance, but not supported in the other two models. Hypothesis 4c was supported in the two models which used either team members' or peers' ratings as team performance measure, but not supported in the model which employed RU commanders' rating. Therefore, the relationship between team relational environment variables and team performance was considerable when team performance ratings were obtained from team members, although team social cohesion shows a significant positive relationship with team performance rated by RU-wide peers. It is also important to note that, even though both the team environment measures and team performance were measured from team members in the Model Hypo-TM, they were measured from different sources (i.e., team relational environment measures from rated team members; team performance measures from non-rated team members). However, none of the variable significantly predicts RU commanders' rating of team performance.

Exploration of the explained variance of team performance across all three hypothesized models show that the explained variance was .54 (disturbance=.68), .12 (disturbance=.94), and .04 (disturbance=.98), in the Model Hypo-TM, -PR, and -RC, respectively. Therefore, the model explains 54 and 12 percent of the variance in team performance which was rated either by team members or by RU-wide peers, respectively,

but the model explains only 4 percent of variance of team performance rated by RU commanders.

#### Team viability – Hypotheses 5a and 5b

The fifth set of hypotheses examined the effects of TMX (H5a) and team social cohesion (H5b) on team viability perceptions.

Results from the Model Hypo-TM. As presented in Figure 5-1 and Table 10, both TMX (H5a) and team social cohesion (H5b) were positively and significantly related with team viability perceptions of team members (TMX,  $\beta = .28, p < .05$ ; team social cohesion,  $\beta = .37, p < .01$ ). Therefore, both Hypothesis 5a and 5b were supported in the model which employed team members' rating of team viability.

Results from the Model Hypo-PR. In the Model Hypo-PR, in which team viability was rated by RU-wide peers, team social cohesion (H5b) was significantly associated with team viability ( $\beta = .36, p < .05$ ), but the relationship between TMX and team viability was non-significant (H5a,  $\beta = -.09, p > .10$ ). Therefore, Hypothesis 5b was supported, but Hypothesis 5a was not supported in this model.

Results from the Model Hypo-RC. The Model Hypo-RC, in which team viability was rated by RU commanders, shows results similar to those from the Model Hypo-PR. Specifically, team social cohesion (H5b) was significantly associated with team viability ( $\beta = .38, p < .05$ ), but the relationship between TMX and team viability was non-significant (H5a,  $\beta = -.11, p > .10$ ). Therefore, Hypothesis 5b was supported, but Hypothesis 5a was not supported.

Summary and Explained Variances. Hypothesis 5b was fully supported across all three models, but Hypothesis 5a was only partially supported. Therefore, regardless of data source, team viability was significantly and positively affected by team social cohesion, but the positive relationship between TMX and team viability was significant only in the model which employed team viability measure from team members. However, it is notable that although TMX did not predict team viability directly, exploration of indirect effect of TMX on team viability through team social cohesion shows significant beta coefficients across all three models ( $\beta = .55, p < .01$ ;  $\beta = .27, p < .05$ ;  $\beta = .28, p < .05$ , for Hypo-TM, -PR, and -RC, respectively). Again, it should be noted that, in the Model Hypo-TM, both TMX and team viability were measured from different sources (i.e., rated team members and non-rated team members, respectively).

The explained variance of team viability was .38 (disturbance=.79), .10 (disturbance=.95), and .10 (disturbance=.95), in the Model Hypo-TM, -PR, and -RC, respectively. Therefore, the hypothesized model explains 38 percent of the variance of team viability rated by team members, and the model explains 10 percent of variance in team viability rated by either peers or RU commanders.

### Respecification of Models

Although the hypothesized model fit the data well, this does not preclude the possibility of alternative models that may also fit the data as well or even better (Bagozzi & Yi, 1988). All that can be test of a well-fitting model is that it has not been disconfirmed. Therefore, it is prudent to test theoretically-supported alternative models to explain the observed effects.

In this section, several alternative models are investigated. These models are of two types: those which are *a priori* theory-driven and those which are essentially exploratory. The theory-driven models represent those for which I had substantial theoretical reasons prior to testing the hypothetical model that, in one or more respects, competed with the hypothesized model. The exploratory models represent those models for which modification indices or other *post hoc* factors suggested model improvements (Bollen, 1989). Nested models were compared using chi-square difference tests.

Since the hypothesized model was tested with three different data sources for team-level outcome measures (i.e., Model Hypo-TM, -PR, and -RC), alternative models were also tested across all three data sources in the following analyses.

#### Theory and Substantive-Based Revisions

##### Alternative Model 1: Direct relationship from transformational leadership to team performance

Alternative Model 1 investigates whether transformational leadership has a direct effect on team performance. This path was based on the findings in literature. Bass (1985) asserted that transformational leadership would result in followers performing

beyond expected levels of performance as a consequence of the leader's influence. He also suggested that performance beyond expectation will be induced by developing followers, through intellectual stimulation and inspiration, to transcend their own interests for a higher collective purpose or vision. Bass's assertion was echoed by Howell and Avolio (1993), 'Leaders described as transformational concentrate their efforts on longer term goals; place value and emphasis on developing vision and inspiring followers to pursue the vision; change or align systems to accommodate their vision rather than work within existing systems; and coach followers to take on greater responsibility for their own development, as well as the development of others' (p. 891).

Positive association between transformational leadership and unit performance was found in several studies (Avolio, Waldman, & Einstein, 1988; Bass, 1997; Hater & Bass, 1988; Howell & Avolio, 1993; Pillai & Williams, 2004) in many different types of organizations. For example, with self-report data, Pillai and Williams (2004) showed that transformational leadership was indirectly related to perceptions of unit performance and commitment through team cohesion. They also show that transformational leadership influenced perceptions of unit performance directly consistent with the earlier research. Further, meta-analysis results have indicated that this relationship is stable across different levels of leadership (Lowe, Kroek, & Sivasubramaniam, 1996).

The fit indices of all three Model Alt 1s are summarized in Table 11 and are graphically presented in Figure 6-1, 6-2, and 6-3, Model Alt 1-TM, -PR, and -RC, respectively.



Table 11  
Summary of Hypothesized and Alternative Models

Models	$\chi^2$	<i>d.f.</i>	$\chi^2 / d.f.$	CFI	IFI	GFI	RMR
<i>With team outcome measures from Non-Rated Team Members</i>							
Hypo-TM	43.38**	15	-	.904	.908	.900	.063
Alt 1-TM	32.84**	14	10.54**	.936	.939	.922	.064
Alt 2-TM	35.57**	14	7.81**	.927	.930	.919	.062
Alt 3-TM	17.79	12	7.53**	.980	.981	.954	.038
<i>With team outcome measures from RU-wide Peers</i>							
Hypo-PR	30.16**	15	-	.935	.938	.927	.052
Alt 1-PR	29.98**	14	.18	.931	.935	.928	.052
Alt 2-PR	22.36+	14	7.80**	.964	.966	.945	.050
Alt 3-PR	14.93	12	7.53**	.987	.988	.960	.026
<i>With team outcome measures from RU Commanders</i>							
Hypo-RC	26.99*	15	-	.927	.932	.920	.101
Alt 1-RC	26.33*	14	.66	.925	.931	.921	.102
Alt 2-RC	21.58+	14	5.41**	.954	.958	.935	.103
Alt 3-RC	13.46	12	4.51**	.991	.992	.957	.061

+  $p < .10$  \*  $p < .05$  \*\*  $p < .01$

Note: Hypo-TM, -PR, or -RC = Ratings by non-rated team members (3-6 persons per team), by RU-wide peers (31-42 persons per RU), or by RU commanders, respectively, were used as team outcome measures in the model.

Results from the Model Alt 1-TM. As presented in Table 11, the Model Alt 1-TM, in which team outcome variables were measured from (non-rated) team members, showed an acceptable fit to the data  $\chi^2(14, N = 89) = 32.84, p < .01$ ; CFI = .936; IFI = .939; GFI = .922; RMR = .064.

The Model Hypo-TM is nested within the Model Alt 1-TM and, therefore, a direct comparison of the two models is possible. The overall fit of the alternative model (i.e., Alt 1-TM) was significantly better than the overall fit for the hypothesized model (i.e., Hypo-TM;  $\chi^2/df = 10.54, p < .01$ ) and, as graphically presented in Figure 6-1 (also refer to Table 12), the new path added to the alternative model (i.e., transformational leadership  $\rightarrow$  team performance) was significant ( $\beta = .27, p < .01$ ).

Results from the Model Alt 1-PR. The Model Alt 1-PR which employed peers' ratings as team outcome measures showed an acceptable fit to the data  $\chi^2(14, N = 89) = 29.98, p < .01$ ; CFI = .931; IFI = .935; GFI = .928; RMR = .052 (refer to Table 11). However, chi-square change statistics shows that the alternative model (i.e., Alt 1-PR) was not significantly better than the hypothesized model (i.e., Hypo-PR;  $\chi^2/df = .18, p > .10$ ) and the new path was non-significant in the alternative model ( $\beta = .04, p > .10$ , refer to Figure 6-2).

Results from the Model Alt 1-RC. The Model Alt 1-RC, in which RU commanders' ratings were used as team outcome, showed an acceptable fit to the data  $\chi^2(14, N = 89) = 26.33, p < .05$ ; CFI = .925; IFI = .931; GFI = .921; RMR = .102 (refer to Table 11). However, chi-square change statistics shows that the alternative model (i.e., Alt 1-RC) was not significantly better than the hypothesized model (i.e., Hypo-RC;

<sup>2/</sup>  $df = .18, p > .10$ ) and the new path was non-significant in the alternative model ( $= .09, p > .10$ , refer to Figure 6-3).







Checking for same source effect on Alternative Model 1-TM

Interestingly, by adding the path to the hypothesized model which employed non-rated team members' ratings as team outcomes (i.e., Hypo-TM, refer to Figure 5-1), one of the significant paths (i.e., team-level LMX  $\rightarrow$  team performance;  $\beta = .15, p < .05$ ) became non-significant (i.e., in Alt 1-TM; team-level LMX  $\rightarrow$  team performance,  $\beta = .01, p > .10$ ). Those changes in path coefficients before/after adding a direct path from transformational leadership to team performance are summarized in Table 12 and graphically presented in Figure 6-1.

Table 12  
Changes in Path Coefficients Before/After Adding a Direct Path from Transformational Leadership to Team Performance (with Non-rated Members' Rating)

Paths	Beta Coefficients	
	in Hypo-TM	in Alt 1-TM
Transformational leadership $\rightarrow$ Team performance (Non-rated team members) (Non-rated team members)	-	.27**
Team-level LMX $\rightarrow$ Team performance (Rated team members) (Non-rated team members)	.15*	.01

+  $p < .10$  \*  $p < .05$  \*\*  $p < .01$

Note: Data source for each variable is specified in the parenthesis.

However, in the alternative model which employed team outcome measures from non-rated team members (i.e., Alt 1-TM), both transformational leadership and team performance were rated by the same source (i.e., non-rated team members) but team-level LMX is from a different data source (i.e., rated team members). Therefore, I checked the possibility of same source bias of the result. To test this, I replaced the team outcome variables for both Hypo-TM and Alt 1-TM with data from all the team members (i.e.,

non-rated team members + rated team members) and tested if the relationship was sustained<sup>9</sup>. In these models (i.e., Hypo-TM-a and Alt 1-TM-a), three data sources are related but relatively independent from each other (i.e., transformational leadership measure from ‘non-rated team members’; team-level LMX measure from ‘rated team members’; and team-level outcome measures from ‘the entire team members’).

Table 13  
Summary of Fit Indices in the Hypothesized Model and Alternative Model 1 with Team Outcome Measures from All Team Members

Models	$\chi^2$	<i>d.f.</i>	$\chi^2 / d.f.$	CFI	IFI	GFI	RMR
Hypo-TM-a	46.16**	15	-	.896	.900	.898	.063
Alt 1-TM-a	39.13**	14	7.03**	.916	.920	.910	.064

+  $p < .10$  \*  $p < .05$  \*\*  $p < .01$

Note: In both models, ratings by all team members (7-11 persons per team) were used as team outcome measures.

Structural model test results for the alternative model, in which all team members’ ratings are used as team outcome measures (i.e., Alt 1-TM-a), are presented graphically in Figure 7. As presented in Table 13, the model also shows acceptable fit for the data,  $\chi^2(14, N = 89) = 39.13, p < .01$ ; CFI = .916; IFI = .920; GFI = .910; RMR = .064. Furthermore, the alternative model which employed all team members’ ratings as team outcome measures (i.e., Alt 1-TM-a) showed significant improvement in model fit in comparison with the hypothesized model (i.e., Hypo 1-TM-a;  $\chi^2 / df = 7.03, p < .01$ ).

<sup>9</sup> Since the added path from transformational leadership to team performance was significant only in the hypothesized model which employed (non-rated) team members’ ratings as team outcome measures (i.e., Alt 1-TM), and there is no possibility of same source effect in the other two models (i.e., Alt 1-PR and -RC), I tested same source effect only in the Alt 1-TM.



Changes of both path coefficients before/after adding a direct path from transformational leadership to team performance are presented in Table 14 (with entire team members rating, i.e., Hypo-TM-a and Alt 1-TM-a).

As summarized in Table 14 (compare this with Table 12), even after employing team outcome measures from all team members, the direct path from transformational leadership to team-level performance was significant (i.e., in Alt 1-TM-a;  $\beta = .23, p < .01$ ). By adding the direct path from transformational leadership to team-level performance, beta coefficient of the path from team-level LMX to team performance became marginally significant (i.e., in Alt 1-TM-a;  $\beta = .13, p < .10$ ), which was significant in the hypothesized model (i.e., in Hypo-TM-a;  $\beta = .24, p < .01$ ). In sum, these results are consistent with the results presented earlier in Table 12, showing that the significant relationship between transformational leadership and team performance is not caused solely by common source effect. Put differently, when equally competing conditions are allowed for both variables, transformational leadership explained more variance than team-level LMX in predicting of team performance.

Table 14  
Changes in Path Coefficients Before/After Adding a Direct Path from Transformational Leadership to Team Performance (with All Team Members' Rating)

Paths	Beta Coefficients	
	in Hypo-TM-a	in Alt 1-TM-a
Transformational leadership → Team performance (Non-rated team members) (All team members)	-	.23**
Team-level LMX → Team performance (Rated team members) (All team members)	.24**	.13+

+  $p < .10$  \*  $p < .05$  \*\*  $p < .01$

Note: Data source for each variable is specified in the parenthesis.

In summary, the alternative model with a direct path from transformational leadership to team-level performance (i.e., Model Alt 1s) showed a better fit than the hypothesized model (i.e., Model Hypos) only when team performance ratings were obtained from team members (i.e., Alt 1-TM). However, the results from the Alt 1-TM are consistent with the literature and, furthermore, checks of same source effect on the model show that the results are sustained even after allowing equal competition between transformational leadership and team-level LMX in predicting team performance by employing all team members' team outcome ratings. Therefore, although the alternative model did not improve the model fit significantly over the hypothesized model when team performance ratings by either peers or RU commanders are employed, the hypothesized models (i.e., Model Hypos) are rejected in favor of the alternative models with the direct path from transformational leadership to team performance (i.e., Alt 1s).



### Alternative Model 2: Direct relationship between team-level LMX and TMX

In the research model (refer to Figure 2), I proposed that transformational leadership will influence TMX directly rather than indirectly. The proposed direct relationship between transformational leadership and TMX was based on the theoretical implications of transformational leadership. As mentioned earlier in Chapter Two, however, the relationship between transformational leadership and TMX has not been explored in literature. The reason is that both research topics have been studied with different types of organizations. A large proportion of previous transformational leadership research were conducted in traditional hierarchical organizations in which leader's influence is dominant on intra-group work coordination and, therefore, the role of peer workers is relatively weaker than the leader. However, prior TMX research has mostly been conducted with self-managed teams which do not have a designated leader. Therefore, research attention has rarely given to the role of leadership.

Dunegan et al. (1992) proposed a different perspective than I hypothesized in this study. Specifically, they suggested a restricted role for leadership on intra-team work dynamics, "While manager is not powerless to affect work group dynamics, most of what he/she can do is limited to indirect strategies. Bottom line, a manager can only provide the opportunity for positive exchanges among work group members to develop." As another avenue of leader influence on TMX, Dunegan et al. (1992) proposed that the quality of exchange which develops between a leader and subordinate (i.e., LMX) will be the one most sensitive to managerial intercessions. In other words, a leader would be in a better position to affect TMX perception through LMX rather than direct influence, and

significant association between LMX and TMX perception at individual level was found in prior empirical studies (Dose, 1999; Seers, 1989). For example, Dose (1999) showed that at individual-level LMX and TMX perception is significantly correlated ( $r=.16$ ,  $p<.05$ ).

Even though Dunegan et al. (1992)'s notion implicated only the indirect path from leadership to TMX through LMX, I included both direct path and indirect path through team-level LMX in the Alternative Model 2 to further explore role of leadership in predicting TMX.

Results from the Model Alt 2-TM. As presented in Table 11, Model Alt 2-TM, in which team outcome variables were measured from (non-rated) team members, showed an acceptable fit to the data  $\chi^2(14, N = 89)=35.57, p<.01$ ; CFI = .927; IFI = .930; GFI = .919; RMR = .062.

The hypothesized model (i.e., Hypo-TM) is nested within the alternative model (i.e., Alt 2-TM) and, therefore, a direct comparison of the two models is possible. The overall fit of the alternative model (i.e., Alt 2-TM) was significantly better than the overall fit for the hypothesized model (i.e., Hypo-TM;  $\chi^2/df = .7.81, p<.01$ ) and, as presented in Figure 8-1 (also refer to Table 16), the new path added to the alternative model (i.e., team-level LMX  $\rightarrow$  TMX) was significant ( $\beta = .34, p<.01$ ).

Results from the Model Alt 2-PR. The alternative model which employed RU-wide peers' ratings as team outcome measures (i.e., Alt 2-PR) also showed an acceptable fit to the data  $\chi^2(14, N = 89)=22.36, p<.10$ ; CFI = .964; IFI = .966; GFI = .945; RMR = .050 (refer to Table 11). In addition, the overall fit of the alternative model (i.e., Alt 2-

PR) was significantly better than the overall fit for the hypothesized model (i.e., Hypo-PR;  $\chi^2/df = .7.80, p < .01$ ) and, as presented in Figure 8-2, the new path added to the alternative model (i.e., Alt 2-PR) was also significant ( $\beta = .34, p < .01$ ).

Results from the Model Alt 2-RC. The alternative model, in which RU commanders' ratings were employed as team outcome measures (i.e., Alt 2-RC), also showed an acceptable fit to the data  $\chi^2(14, N = 89) = 21.58, p < .10$ ; CFI = .954; IFI = .958; GFI = .935; RMR = .103. The chi-square change statistics show that the overall fit of the alternative model (i.e., Alt 2-RC) was significantly better than the overall fit for the hypothesized model (i.e., Hypo-RC;  $\chi^2/df = 5.41, p < .01$ ) and, as presented in Figure 8-3, the new path added to the alternative model (i.e., Alt 2-RC) was also significant ( $\beta = .34, p < .01$ ).









Checking for same source effect on Alternative Model 2s.

Again, by adding the path from team-level LMX to TMX (i.e., Alt 2-TM), all the other paths directed to TMX in the hypothesized model (i.e., Hypo-TM) became non-significant. This is a situation similar to that happened to the alternative model 1. Those changes in path coefficients before/after adding a direct path from team-level LMX to TMX are summarized in Table 15.<sup>10</sup>

Table 15  
Changes in Path Coefficients Before/After Adding a Direct Path from Team-level LMX to TMX (with Rated Team Members' Rating)

Paths		Beta Coefficients	
		in Hypo-TM	in Alt 2-TM
Team-level LMX (Rated team members)	→ TMX (Rated team members)	-	.34**
Transformational leadership (Non-rated team members)	→ TMX (Rated team members)	.27**	.10
Number individualists	→ TMX (Rated team members)	-.11	-.07
Number collectivists	→ TMX (Rated team members)	.26**	.16+

+  $p < .10$  \*  $p < .05$  \*\*  $p < .01$

Note: Data source for each variable is specified in the parenthesis.

However, in the alternative model (i.e., Alt 2s), both team-level LMX and TMX were obtained from the same source (i.e., rated team members) but transformational

<sup>10</sup> In each of these alternative models (i.e., Alt 2s), same source effect was possible since data from 'rated team members' were used in both team-level LMX and TMX across all three models (i.e., Alt 2-TM, -PR, and -RC). However, as the results are very similar across the three models, I demonstrated the changes in path coefficients only with the model, in which (non-rated) team members' ratings are employed as team outcomes (i.e., Alt 2-TM). In addition, the same source bias check on these alternative models (i.e., Alt 2s) which is described in the following paragraphs was also demonstrated only with the alternative model which employed (non-rated) team members' ratings as team outcome measures (i.e. Alt 2-TM).

leadership was rated by different source (i.e., non-rated team members). Therefore, I checked the presence of same source bias on the results again. To test this on the alternative model (i.e., Alt 2-TM), I replaced the TMX measure in the hypothesized model (i.e., Hypo-TM) with data from all team members (i.e., non-rated team members + rated team members). This replacement of data source results in three data sources for both the hypothesized and the alternative model (i.e., Hypo TM-b and Alt 2-TM-b, respectively; refer to Table 16). Specifically, in these models (i.e., Hypo TM-b and Alt 2-TM-b), ratings sources for the three focal variables are relatively independent from each other (i.e., transformational leadership measure from ‘non-rated team members’; team-level LMX measure from ‘rated team members’; and TMX measure from ‘the entire team members’) than the previous models (i.e., Hypo-TM and Alt 2-TM). Therefore, in these models, same source advantage of team-level LMX over transformational leadership measure was eliminated.

Table 16  
Summary of Fit Indices in the Hypothesized Model and Alternative Model 2 with TMX Measures from All Team Members

Models	$\chi^2$	<i>d.f.</i>	$\chi^2 / d.f.$	CFI	IFI	GFI	RMR
Hypo-TM-b	33.32**	15	-	.931	.934	.921	.062
Alt 2-TM-b	29.88**	14	3.44**	.940	.943	.930	.062

+  $p < .10$  \*  $p < .05$  \*\*  $p < .01$

Note: In both models, ratings by all team members (7-11 persons per team) were used as TMX measures.

As appeared in Table 16, the alternative model (i.e., Alt 2-TM-b) was also acceptable,  $\chi^2(14, N = 89) = 29.88, p < .01$ ; CFI = .940; IFI = .943; GFI = .930; RMR = .062, and the model showed significant improvement in model fits over the hypothesized model (i.e., Hypo 2-TM-b;  $\chi^2 / df = 3.44, p < .01$ ).

Changes of both path coefficients before/after adding a direct path from team-level LMX to TMX are presented in Table 17. The table shows that when TMX measure was replaced with the entire members' rating the direct path from team-level LMX to TMX is only marginally significant (in Alt 2-TM-b;  $\beta = .22, p < .10$ ). However, although the size of beta coefficient was reduced slightly (i.e., from .38 to .27), the direct path from transformational leadership to TMX is still significant ( $\beta = .27, p < .05$ ) even after adding the direct path from team-level LMX to TMX (i.e., Alt 2-TM-b).

Table 17  
Changes in Path Coefficients Before/After Adding a Direct Path from Team-level LMX to TMX (with All Team Members' Rating)

Paths		Beta Coefficients	
		in Hypo TM-b	in Alt 2-TM-b
Team-level LMX (Rated team members)	→ TMX (All team members)	-	.22+
Transformational leadership (Non-rated team members)	→ TMX (All team members)	.38**	.27*
Number individualists	→ TMX (All team members)	-.11	-.08
Number collectivists	→ TMX (All team members)	.27**	.21*

+  $p < .10$  \*  $p < .05$  \*\*  $p < .01$

Note: Data source for each variable is specified in the parenthesis.

In sum, these results are different from those presented in Table 15. When the results were compared to those in Table 15, it is clear that the significant relationship between team-level LMX and TMX appeared in the alternative model (i.e., Alt 2-TM), which nullified all the other predictors' effects on TMX, was caused by the same source effect. Put differently, when equally competing conditions were allowed for those variables, both transformational leadership and team-level collectivism explain more variance than team-level LMX in predicting TMX.

The alternative model 1 was eventually selected over the alternative model 2 for two reasons. First, as tested earlier, results of the alternative model 1 (specifically, Alt 1-TM) was sustained even after replacing team outcome measures with the data from all team members but results of the alternative model 2 were significantly affected by the same source effect across three models. Second, the added path in the alternative model 1 (i.e., transformational leadership → team performance, in Alt 1-TM) was significant even when a difference data source was used. However, the newly added path in the alternative model 2s (i.e., team-level LMX → TMX) was only marginally-significant when TMX measure was replaced with the data from all team members.

Therefore, exploratory revision of the model (i.e., the alternative model 3) in the following section, which is purely based on statistical index of EQS, was conducted with the alternative model 1.

### Exploratory Revision

#### Alternative Model 3: Covariances between transformational leadership and team members' individualism and collectivism

The alternative model 3 allows covariances between transformational leadership and the numbers of individualists and collectivists within a team. This modification was suggested by the LM test. The LM test was run for the alternative model 1s. Under the search strategy employed here, the LM test was examined to find the estimated path between variables that, if allowed to be freely estimated, led to the largest reduction in the chi-square estimate. Across all three alternative model 1s (i.e., Alt 1-TM, -PR, and -RC), these were the covariances between transformational leadership and the number of collectivists/individualists within a team. Because the LM test examines the changes in chi-square estimates, not the size of changes in parameter estimates, there is no guarantee that the path estimate will be significant using this technique.

Results from the Model Alt 3-TM<sup>11</sup>. As presented in Table 11, Model Alt 3-TM, in which team outcome variables were measured from (non-rated) team members, fit the data well:  $\chi^2(12, N=89)=17.79, p>.10$ ; CFI = .980; IFI = .981; GFI = .954; RMR = .038. In addition, the new covariances added to the alternative model (i.e., Alt 3-TM) were significant. Specifically, the covariances between transformational leadership and team-level collectivism and individualism were .34 and -.22, respectively ( $p<.01$ , for both).

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<sup>11</sup> As results are quite similar across all three alternative model 3s, I described results only from one of the alternative model 3s, which employed team members' ratings as team outcome measures (i.e., Alt 3-TM). For the specific results for the other two models (i.e., Alt 3-PR and -RC), refer to Table 11 and Figure 9-2 and Figure 9-3, for Alt 3-PR and -RC, respectively.

The model (i.e., Alt 3-TM) is nested within the alternative model 1 which employed team members' ratings as team outcome measures (i.e., Alt 1-TM). Direct comparison of the two models shows that the overall fit of the alternative model 1 (i.e., Alt 1-TM) were significantly worse than the overall fit for the alternative model 3 when team members ratings were used as team outcome measures (i.e., Alt 3-TM;  $\chi^2/df = 7.53, p < .01$ ). Therefore, the models with no covariance between transformational leadership and the number of individualists/collectivists within a team (i.e., alternative model 1s) were rejected in favor of the models with covariances (i.e., alternative model 3s).









### Summary of Results

The major findings of this study are summarized below, based on the alternative model 3 in which both direct path from transformational leadership to team performance and covariances between transformational leadership and team-level individualism-collectivism are added on the hypothesized model.

First, team-level LMX appears to be positively affected by both transformational leadership and team members' collectivism across all the models tested.

Second, team-member exchange also appeared to be positively affected by transformational leadership and team members' collectivism and those relationships were significant across all three models. Team members' individualism shows negative association with team-member exchange, though the relationship was non-significant.

Third, overall, team-member exchange shows strong positive association with team social cohesion across all the models. Team-level LMX was a significant predictor of team social cohesion in one of the three models, in which RU commanders' ratings were used as team outcome measures, but the relationship was only marginally significant in the other two models, in which either RU-wide peers' ratings or RU commanders ratings were used as team outcomes.

Fourth, variables predicting team performance show the most unstable results across the three models. Specifically, team performance was positively affected by TMX, team social cohesion, and transformational leadership in one of the models, in which (non-rated) team members' ratings were used as team outcome measures. When the ratings from RU-wide peers were used as team outcome measures, the path from team

social cohesion to team performance remained significant but the other two paths became non-significant. However, none of the three variables significantly predicted team performance when it was measured from RU commanders.

Fifth, team-level LMX was a significant predictor of team performance in one of the hypothesized models (i.e., the Model Hypo-TM). However, after adding the direct path from transformational leadership to team performance (i.e., the Model Alt 1-TM), the relationship became non-significant. The results were replicated after replacing the team outcome ratings with the ratings from all team members (i.e., Model Hypo-TM-a and Model Alt 1-TM-a), allowing equal competition between transformational leadership and team-level LMX in predicting team-level performance. These findings suggest that transformational leadership explains more variance in team-level performance than team-level LMX. However, the relationship between team-level LMX and team performance was non-significant when ratings from either RU-wide peers or RU commanders were used as team performance measures.

Sixth, while TMX appears to predict team viability in one of the models (i.e., Model Alt 3-TM), but it did not predict team viability when the ratings from either RU-wide peers or RU commanders were used as team viability measure. However, team social cohesion showed a significant positive association with team viability regardless of the data sources used in team outcome measures.

Seventh, even though it was not hypothesized *a priori*, transformational leadership showed a significant positive relationship with the number of collectivists

within a team across all three models, and showed a significant negative relationship with the number of individualists within a team.

## CHAPTER V. DISCUSSION

The primary purpose of this dissertation was to investigate antecedents and team-level outcomes of the team relational environment. More specifically, the present study sought to extend leader-member exchange theory to the team-level by including the two distinct team-level exchange relationship constructs (i.e., team-level LMX and TMX) and the team social cohesion construct simultaneously, and by examining the antecedents along with outcomes of these variables. To achieve this, every model tested in this study contained data from multiple sources to avoid same source effects on the hypotheses tested.

Overall, the results were consistent with the hypothesized model and contribute to the existing literatures concerning leadership and team functioning. In the following sections the specific contributions of the present study to these areas of research is discussed. Finally, the limitations of the present study and recommendations for future research are presented.

### Theoretical Implications and Contributions

Most importantly, the present study provides an example of “Stage 4” (Graen & Uhl-Bien, 1995) LMX research using intact teams in a real organization. Therefore, it was possible to assess the relative contributions of LMX, TMX, and team social cohesion in team functioning. Through this study, I tried to find answers to the research questions raised by Graen and Uhl-Bien (1995) such as ‘how higher-quality and lower-quality exchanges are aggregated within a single work unit and what their combined effect is on group-level work processes and outcomes’ (p. 234). It is the first study of its kind to

investigate roles of both LMX and TMX together at team-level along with team social cohesion in predicting team-level outcomes.

The other important contribution of this study is that it amplifies our understanding of the significance of group process variables in understanding team effectiveness. Specifically, the results suggest that team social cohesion is a key group process variable in explaining team performance and team viability. Specific theoretical contributions and implications of the results from the present study will be discussed in the following sections.

#### The Influence of Transformational Leadership on Team Performance

Regarding the relationship between transformational leadership and team performance, three issues need to be considered: (1) do individuals agree about their leader's transformational leadership? (2) does transformational leadership predict team performance? and (3) does data source affect the relationship? Each of these issues is discussed in the following sections.

#### Do individuals agree about their leader's transformational leadership?

Yammarino, Spangler, and Dubinsky (1998) proposed that there are individual differences in followers' perceptions and ratings of their leaders; each follower views his/her leader uniquely and does not agree with other followers about a leader's behavior and effectiveness. Their conclusion is that transformational leadership is an individual-based phenomenon which is a result of one-to-one interactions between a leader and a subordinate and, in turn, the relationships involving transformational leadership and

outcomes appear to have their basis “in the eye of the beholder,” i.e., what one individual perceives differs from what others perceive (p. 50).

However, the present study shows somewhat different results from Yammarino et al.’s conclusion. Given that the within group variance was significantly smaller than the between group variance in appraisals of leaders’ transformational leadership (Mean Square<sub>wg</sub> = .294; Mean Square<sub>bg</sub> = .851,  $t=2.898$ ,  $p<.001$ ), presented earlier in Table 2, team members share a similar mental portrait of their leader. Put differently, even though a leader may be seen differently by each of his/her subordinates, between-leader differences across teams is more prominent than the ‘individualized leadership’ perspective of transformational leadership which emphasizes within team differences.

Does transformational leadership predict team performance?

In Bass’ (1985) model of transformational-transactional leadership, a key tenet is the distinction between transformational and transactional leadership and the ability of each to predict performance. Transformational leadership is purported to lead to performance beyond expectations. Yammarino and his colleagues (1998) proposed the importance of a multi-level perspective on the relationship between transformational leadership and performance rather than merely showing the relationship at an individual-level (i.e., individual performance). However, a series of studies focused on leader-follower interactions using multiple levels of analysis (Avolio & Yammarion, 1990; Avolio, Yammarino, & Bass, 1991; Yammarino & Bass, 1990; Yammarino, Spangler, & Dubinsky, 1998) led Yammarino and his colleagues to conclude that the relationship



between transformational leadership and performance operates only at the individual level of analysis.

The results of the present study disagree with Yammarino and colleagues' conclusion. Results show that leaders' transformational leadership behaviors are directly related to team performance even when team members' ratings of leader's transformational leadership are aggregated at the team-level. Furthermore, as shown in Figure 7, even when transformational leadership and team performance are rated by some team members (i.e., non-rated team members) and by all team members, respectively, the relationship was significant. Therefore, current results are consistent with the other group of researchers (e.g., Howell & Avolio, 1993; Bass, Avolio, Jung, & Berson, 2003) who found significant effects of aggregated ratings of transformational leadership on team performance.

The present study also shows that transformational leadership affects team performance indirectly through the team relational environment. Examinations of direct and indirect path coefficients in the Model Alt 3-TM (refer to Figure 9-1) show that both the direct and indirect (i.e., through positive team relational environment) effects of transformational leadership on team performance are significant ( $\beta = .27, p < .01$ , for direct path;  $\beta = .24, p < .05$ , for indirect path). This result supports the need for researchers to examine the indirect (i.e., partially mediating) route of transformational leadership on team performance through team cohesion and the role that visioning behaviors play in promoting team cohesion (e.g., Dionne et al., 2004). Within charismatic leadership theory, Shamir, House, and Arthur (1993) represented visioning as empathetic language that

involves the reinforcement of the group's collective identity. Similarly, Sullivan (1988) suggested that visioning also involves expressions of sharing, which are directed at building rapport and bonding the team. However, the role of sub-dimensions of transformational leadership (e.g., visioning) on the team relational environment was not a main focus of this study. In addition, as shown from exploratory and confirmatory factor analyses results, transformational leadership components formed a single transformational factor. Therefore, the role of visioning behavior in forming team relational environment was not tested in this study.

#### Does data source affect the relationship?

The type of criteria used to measure performance appears to moderate the relationship between transformational leadership and team performance. When same source data are used as performance criteria, Bass' model has been supported in the literature; when more objective or cross-source criteria are used, the results are not as robust.

Whereas transformational leadership shows a significant association with team performance when it is rated by team members in the present study, neither the direct nor indirect effect of transformational leadership on team performance was significant in the other two models (i.e., models in which team performance was rated either by RU-wide peers or RU commanders).

Comparison of the explained variance of team performance in this study further clarifies the data source effect. The explained variances of team performance were .60 (disturbance=.63), .10 (disturbance=.94), and .04 (disturbance=.98) in the final

alternative models in which team performance was rated by team members, RU-wide peers, and RU commanders, respectively (refer to Figure 9-1, 9-2, and 9-3, respectively). Thus, the final model explains 60 percent of the variance in team members' ratings of team performance. However, the model explains only 10 and four percent of the variance in team performance rated by peers and RU commanders, respectively.

Therefore, the results in this study show the data source issues documented in existing literature. The inability of Bass' model to predict team performance ratings obtained from outsiders of the team (i.e., from RU-wide peers and RU commanders) is demonstrated in the present study. Specifically, the path coefficient between transformational leadership and team-level performance failed to reach significance when team performance was rated by either RU-wide peers (in Alt 1-PR) or RU commanders (in Alt 1-RC), but the relationship was significant when team performance was rated by either non-rated team members who also rated leader's transformational leadership (i.e., in Alt 1-TM) or all team members (in Alt 1-TM-a).

One possible explanation of these results is that the effect of transformational leadership may be most dominant in follower groups' perception of team performance. Team members' rating of team performance in this study may be a reflection of either 'morale', 'group-potency (Guzzo, Yost, Campbell, & Shea, 1993)' or 'collective efficacy' (Zaccaro, Blair, Peterson, and Zazanis, 1995) rather than a measure of current performance level. Military leaders are required to gain the confidence of their followers so that the followers will make appropriate sacrifices for their unit (Bass et al., 2003, p. 211). Research shows that when leadership of the group provides encouragement for

members to work together, group members' collective confidence is expected to be higher (Guzzo et al., 1995). Given that 'morale' is an important aspect of team performance in military organization (Shamir et al., 1998), therefore, it is an indirect reflection of current team performance level. However, this measure of current team performance is also meaningful because, in Korean military organizations, team performance level is measured periodically either through aggregating individual team members' level of specialty skills or through competition among teams. In that sense, unfortunately, there was no objective numeric team effectiveness measure which may reflect the synergetic effect of team processes.

The differences in the explained variance of team performance across the three data sources also suggest that we should not neglect the existence of other predictors of team performance, which may be more salient to the people outside the teams. For example, prior research includes several other predictors of team performance such as team members' expertise, skills, and flexibility (Campion et al., 1993) and general mental ability (Barrick et al., 1998). In addition, the LMX literature shows that leaders' ratings of subordinates' job performance are significantly associated with LMX relationship quality (Gerstner & Day, 1997; Graen et al., 1982). Given that team leaders in this study are direct reports of RU commanders, team performance ratings by the RU commanders (i.e., leaders) may be (partly) the results of their current dyadic-level LMX relationship quality with the team leader (i.e., subordinates).

### The Influence of Transformational Leadership on Team Relational Environment

Transformational leadership significantly predicts both team-level LMX and TMX in this study. Although the independence of the LMX construct from transformational leadership is debated in literature, the factor analysis results in this study show that LMX is an independent construct from transformational leadership, providing support for some prior findings (Ko et al., 2004; Wang, Law, Hackett, Wang, & Chen, 2005). However, the current study goes beyond prior findings as the relationship between transformational leadership and team-level LMX, which was significant even when each construct was measured from different sources (i.e., in this study, one group of team members rated transformational leadership and the other group of team members rated their individual-level LMX relationship quality with the leader). Again, this result suggests that followers' perceptions of a leader's transformational leadership do not reside only in one-on-one relationships. Put differently, team members who report directly to a team leader share similar perceptions of leadership to each other.

This result also has an important implication for the temporal relationship between transformational leadership and LMX. As reviewed briefly in Chapter Two, some researchers (e.g., Howell & Hall-Merenda, 1999) with same source data conceptualized transformational leadership as a consequence of individual-level LMX relationship quality. From Howell and Hall-Merenda's perspective, leaders show transformational leadership behaviors more frequently to the subordinates who maintain high LMX relationship quality with the leader. However, the results from the present study provide support for the opposite directionality (also see, Deluga, 1992; Ko et al.,

2004; Wang et al., 2005). Therefore, as proposed in this study, leaders who show high transformational leadership behaviors maintain overall higher team-level LMX than leaders who do not. These results also support the proposition that team-level LMX is determined by the leader's characteristics (e.g., transformational leadership) rather than environmental constraints such as group size, which is based on 'the limited resource perspective on differential LMX development' (refer to Coglister & Schriesheim, 2000).

Regarding TMX development, as mentioned in Chapter Four, Dunegan et al. (1992) suggested the possibility that leaders will have only indirect influence on TMX through individual exchange relationships (i.e., LMX) with subordinates. However, as shown in the testing of the alternative model 2, transformational leadership affects TMX perception directly rather than indirectly. For example, examinations of direct and indirect path coefficients in one of the alternative model 2s, in which team members' ratings were used as team outcome measures (i.e., Alt 2-TM), show that direct path was significant ( $\beta = .24, p < .05$ ) but the indirect path through team-level LMX was only marginally significant ( $\beta = .11, p < .10$ )<sup>12</sup>.

Theoretical base of transformational leadership implicates its direct influence on subordinates' peer relationship. Therefore, the significant associations of transformational leadership with both team-level LMX and TMX in this study also suggests that earlier models on the influence of transformational leadership on work groups were underspecified. As they did not consider team-level LMX along with TMX, they may have been incorrect in showing full potential of transformational leadership in team

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<sup>12</sup> Although I exemplified the Alt 2-TM, results from the other two models (i.e., Alt 2-PR and -RC) are quite similar to those from Alt 2-TM.

functioning. As there is no accumulated research evidence, however, it is still pre-mature to make any conclusive remarks on the direct/indirect effect of transformational leadership on TMX. Thus, this result raises the role of transformational leadership on TMX as a future research direction.

The Influence of Team Members' Individualism and Collectivism on Team Processes  
and The Role of Transformational Leadership

In this study, I sought to determine if teams benefit (*or* are disadvantaged) from the inclusion of a greater proportion of individuals having relatively high scores on collectivism (*or* individualism) presumed to be relevant to team functioning. As supported by the results, team members' collectivism was an important predictor of exchange relationship quality both with the leader and with the team members, suggesting the importance of more research attention on the individualism-collectivism of team members. Because individual level variation in value profiles should be closely tied to individual's attitude on (*or* actual development of) the exchange relationship, these results are an empirical confirmation of the characteristics of collectivists in organization settings.

Although it was not hypothesized in the present study, the results from the final alternative models (i.e., Alt 3s) show that transformational leadership has a significant positive correlation with team-level collectivism and a significant negative correlation with team-level individualism.

Since the relationship between transformational leadership and individualism-collectivism has not received much research attention, little evidence accumulated. One

of the reasons for this paucity of research attention on individualism-collectivism in organizational settings is that individualism-collectivism has been considered as a stable characteristic representing personal value profiles and, therefore, lacks managerial interventions. For example, Triandis (2001) emphasized genetic bases of collectivism and individualism, over and above the environmental bases. He proposed that child-rearing and personality consequences of these constructs. Therefore, although he did not reject the possibility that situation is an important predictor of behavior of collectivists, Triandis (2001) suggested that individualism-collectivism does include elements that are trans-situational.

The remaining questions are ‘why transformational leadership correlates positively with team-level collectivism and negatively with team-level individualism’ and ‘which direction of causality is more reasonable in understanding the relationships.’ Research on transformational leadership in cross-cultural settings suggests that transformational leadership is coherent with collectivistic values. In collectivistic societies, there is an implicit preference for a dependent, nurturant, personal relationship with the leader than for a contractual relationship (Sinha, 1984) and a leader is expected to act as a father figure, viewing his role in a ‘highly personalized manner characterized by providing caring for employees and favoring individuals within the family over outsiders (Dorfman, 1996, p. 307). In addition, the mutual obligation between the leaders and the followers in collectivistic cultures facilitates the transformational leaders’ individualized consideration (Bass, 1997, p. 136). As an example of collectivistic countries, Korean society traditionally emphasizes the virtue of obedience to vertical



authority relationships and the specific virtues in each type of vertical relationship has been socially prescribed, based on Chinese moral principles (e.g., *wu-lun*, so called ‘five moral principles’). Specifically, ‘loyalty’ is the most important virtue in the relationship between the Emperor and his followers; ‘warmth and paternal care’ in the relationship between father and children; ‘segregation (i.e., unconditional obedience)’ in the relationship between a husband and a wife; ‘order’ in the relationship between elderly and youngsters; and ‘belief’ in the relationship between friends. Hence, in work relationships, subordinates have a moral obligation to provide unquestioning loyalty and obedience to their leader and, in addition, compliance to moral obligations will be more prominent in the subordinates who are highly collectivistic. In turn, leaders in collectivistic cultures already have a moral responsibility to take care of their subordinates, to help them prepare a career development plan, to attend their funeral ceremonies and birthday parties (even in case of subordinate’s father’s birthday), and to counsel followers about personal problems, which is consistent with the unique characteristics of transformational leadership. Indeed, transformational leadership was far more pervasive in collectivistic societies than in the individualistic societies of the West (Jung, Bass, & Sosik, 1995). Therefore, the positive correlation between team-level collectivism and transformational leadership may have resulted from the chain of socially-prescribed moral obligation (e.g., unconditional loyalty and obedience of collectivistic subordinates → leader’s reciprocating behaviors to the dedications of collectivistic subordinates → being perceived as transformational leader by the subordinates).

However, the opposite direction also appears feasible. Converting followers' motivation from self-interest to collective interest has been proposed to be an important aspect of transformational leadership (Bass, 1985). Recent research on charismatic leadership also suggests that leadership may change the way in which followers perceive their self-concept. For example, Lord and Brown (2001) proposed a theoretical model in which both culture and leadership impact subordinates' values and, in turn, those personal values affect personal identity and behavior. Therefore, tying sense of self to the collective has been proposed to be an important aspect of leadership effectiveness (De Cremer & van Knippenberg, 2002; Lord & Brown, 2001; Lord, Brown, & Freiberg, 1999; Reicher & Hopkins, 2001). As evidence of this proposition, Paul, Costley, Howell, and Trafimow (2001) conducted a scenario experiment in which they exposed participants to alleged leader communications that either were inspired by the idealized influence (charisma) aspect of transformational leadership proposed by Bass (1985) or by the individualized consideration aspect of transformational leadership proposed by Bass (1985). A self-description measure showed that the communication inspired by idealized influence made collective self-construal salient, whereas the communication inspired by individualized consideration made personal self-construal salient. Shamir, Zakey, Breinin, and Popper (1998) also found that leader emphasis on collective identity was positively related to follower identification with their unit. However, at this stage, it is unclear if the changes in followers' self-perception are transitory or persistent.

Therefore, in terms of the directionality between transformational leadership and individualism-collectivism, both directions look feasible. Without longitudinal exploration on the relationship, the directionality may not be confirmed.

#### Importance of the Team Relational Environment in Achieving Team Effectiveness

The exploration of the influence of team-level LMX and TMX on team social cohesion and team outcomes in a single study is a meaningful contribution of this study as the inclusion of all three measures of the relational aspects within a team provides us more comprehensive picture of the association between relational aspect of team functioning and team-level outcomes. Specifically, the results from the present study show that all the team relational environment variables significantly predict team effectiveness in the models in which team members' ratings were used as team outcome measures. Among those three team relational environment variables, team social cohesion shows the strongest association with team effectiveness across different data sources. The effect of team social cohesion was stronger in predicting team viability (i.e., future team effectiveness) than team performance (i.e., current team effectiveness). The effect of team social cohesion on team effectiveness is clearer with team outcomes rated by people outside the teams. These results may suggest that team social cohesion is easier to observe by those outside of the team than either team-level LMX or TMX. Alternatively, TMX may be a more inward-oriented construct and thus relatively hard to observe by people outside of the team. In the present study, overall model testing results show the importance of social cohesion over team-level LMX and TMX, as it is more reliable and significant predictor of team effectiveness than team-level LMX and TMX

across all three data sources. The finding regarding team social cohesion complements Barrick et al. (1998) and Jordan et al. (2004). In their study, Barrick et al. (1998) showed that social cohesion was related to team viability perceptions at the individual level and this relationship was confirmed with team-level analysis in Jordan et al. (2004).

A remaining question from the model testing the relationship between team social cohesion and team performance is ‘why the relationship is significant only in the model which used team members’ rating as a team performance measure?’ Research shows that team cohesion could enhance internal attribution and lead team members to perceive that they are more responsible for performance outcomes (Michalisin, Karau, & Tangpong, 2004). Because members of cohesive teams expect the team to embody positive characteristics (e.g., Hogg, 1992), they may attributed high levels of effort and responsibility to their teammates and expect the team to be able to exert a fair degree of control over its performance. Similarly, members of cohesive teams tend to report high levels of self-esteem and security, and low levels of anxiety (e.g., Pepitone and Reichling, 1955). Cohesive teams may influence their members to feel higher levels of control and self-efficacy on team tasks and lead to internal attributions for performance. Therefore, social identity (i.e., belongingness) motivations may have been reflected in team members rating. According to group-level social comparison theory (Goethals & Darley, 1987), social comparison can be driven either by a concern for self-knowledge or a concern for self-enhancement. A recent meta-analysis (Campbell & Sedikides, 1999) found that self-serving bias is most prominent under conditions that intensify potential threats to individual self-evaluation.

### The Effect of Data Source in Leadership Research

In terms of research methodology, the present study has a number of improvements over past research on both LMX and teams.

First, I collected data from three different sources, with unique strengths. Specifically, in case of data from team members, I divided the responded surveys into split-half. By doing so, I was able to obtain three different measures from team member surveys (i.e., appraisals by rated team members; non-rated team members; and all team members by combining both groups). Although the appraisals from all team members are related to the appraisals from the other split-halved groups, the appraisals from both rated and non-rated team members are independent from each other while referencing the same targets, such as focal leader and team. In case of data from RU-wide peers, since I've collected up to 51 surveys from a single RU, even after eliminating ratings on their own team, the measures are mean scores of ratings from 31~42 persons who are interacting directly/indirectly with the focal team. Therefore, the measures are more reliable than any ratings by single person. In case of ratings from RU commanders, the data was collected one month later than the other two datasets, allowing longitudinal test of the team relational environment on team outcomes. In addition, given the fact that the RU commanders who are one level above the ASO team leaders interact more frequently with team leaders than team members, they may have different understandings on team effectiveness. Therefore, team effectiveness ratings by RU commanders (i.e., Majors) may be qualitatively different from the other two datasets in which both rater groups are the same level (i.e., mostly Non-Coms).

Second, with the three different datasets, I was able to test the hypothesized model while largely avoiding same source bias, which has been the most biasing factor of results in leadership research. The most stringent research design to avoid the same source effect is to have one source describe the leadership, another party complete the team relational environment measures, and the other party complete the team outcome measures. Specifically, to avoid the same source bias, I used measures from different data sources for the relationship between Stage 1 and Stage 2 variables and between Stage 2 and Stage 3 variables, and tested the hypothesized and the alternative models three times by employing data from different sources in the team outcome variables. In addition, in the alternative model testing, if same source effect was conspicuous on the newly added path, I tested the alternative model again after replacing the target measure with relatively neutral data (i.e., ratings by all team members) to examine which independent variables showed stronger relationships with the dependent variable after excluding same source advantage.

Therefore, the present study attempts to move beyond the prior research paradigm of evaluating same source relationships either between the leadership construct (i.e., transformational leadership) and the relational constructs (LMX, TMX, and team social cohesion) or between the relational constructs and team outcome measures of the study. As shown repeatedly within this dataset, support for the specific research hypotheses vary somewhat depending upon the data source. When examining members' data (i.e., in Hypo-TM), the effects of all three team relational environment variables on both team performance and viability are powerful. From either the RU-wide peers' (i.e., in Hypo-

PR) or RU commander's perspective (i.e., in Hypo-RC), the effects become less pronounced, but still noteworthy. Thus, the present study demonstrates that if we employ a more careful research approach and control for source effects, many of the conclusions in past leadership research become untenable.

### Practical Implications

The results of the present study provide insight as to which aspects of team functioning should receive more attention in the future interventions to improve team effectiveness: (1) gaps between leaders' and subordinates' ratings, (2) team social cohesion, and (3) team members' value system.

Successful training programs depend on effective information on training needs (Kolb, 1995). The defensive responses in leader's own ratings on transformational leadership and LMX in this study restate the importance of multi-source ratings in identifying leadership development needs. Results of this study suggest that feedback from subordinates should be a part of an organization's leadership assessment program. Such feedback, along with self-assessment, provides useful information for leadership development purposes and may help close the gap between actual and desired leadership performance. This difference in perception is important since member perceptions may be the perceptions that are related to actual organizational outcomes (Kolb, 1995). Feedback from multiple sources is used by an increasing number of organizations for review purposes on leadership practice (Harris & Schaubroeck, 1988; Mount, 1988) as is the use of multiple feedback sources is helpful in identifying such gaps (Wohlers &

London, 1989). Furthermore, awareness of one's own strengths and weaknesses is in itself a managerial ability (Thornton & Byham, 1982).

Leaders and subordinates do not always agree in their assessment of current leadership, whether it is leadership practice or relationship quality appraisals. Self-raters perceive themselves as engaging in a greater frequency of desirable behaviors than do outside sources assessing the same behaviors. Self-appraisals of leadership tend to be more lenient, more biased, and less variable than superior, peer, or subordinate appraisals (Kolb, 1995; Mount, 1984). Thus, leaders may have an inflated view of their own leadership behaviors. Relating these findings to the current study, leaders' own ratings may reflect 'ought to be' leadership while subordinates' ratings reflect 'current practices', especially because there was a strong within-group agreement among subordinates' ratings. The gaps between the ideal leadership within a leader's mind and the current leadership perceived by subordinates may be an important target of leadership training interventions.

The present study provides evidence that TMX relationships are indeed related to effectiveness either directly or indirectly through increased team social cohesion. Therefore, it would be valuable to focus more attention on the peer relationships within a team and how team members could be trained to develop high quality working relationships with each other. The current study also suggests that we should pay more attention to team social cohesion to achieve improved team effectiveness. The success of team approaches rides on the attainment of relational cohesion within the team members. Therefore, the strength of social cohesion within the team may be a practical key to



transforming a collection of individual members into a performing team in which members want to remain as a team in the future. Thus, future research to identify variables enhancing team social cohesion is also needed.

Scott, Ciarrochi, and Deane (2004) show the detrimental effects of being individualists in individualistic culture, i.e., smaller social support networks, lower emotional competence, lower intention to seek help from a variety of sources, and poorer mental health. Conversely, this study provides evidence of the advantages of being collectivists in a collectivistic society. Specifically, the present study shows that team members' collectivism does more good than individualism does harm. For example, team-level collectivism contributed positively and significantly to both team-level LMX and TMX, but team-level individualism did not harm TMX significantly. Therefore, this study shows that collectivists maintain higher LMX relationship quality with the leader and have better work relationships with peers. Furthermore, although team members' individualism is negatively associated with transformational leadership ( $r = -.20 \sim -.22$ ,  $p < .01$ ), team members' collectivism shows a stronger association with transformational leadership than individualism does ( $r = .34 \sim .35$ ,  $p < .01$ ) across the three models in which different data sources were used as team outcome measures. Therefore, whereas high levels of collectivism may also be detrimental in certain ways (e.g., wasting much of individual's energy in social relationships, thus decreasing productivity (Triandis & Gelfand, 1998)), the results of the present study generally emphasize the importance of being collectivistic within an organizational setting, especially in organizations which work under team systems.

Although personal value systems are stable over time and consistent across different situations, they are not solid structures. As proposed by Lord and Brown (2001), leadership may change subordinates' value systems by emphasizing common goals, by stimulating subordinates' collective self, and by sharing a collective vision with the team. Therefore, leadership may make both individualistic and collectivistic subordinates more collectivistic.

#### Limitations and Future Research Directions

The results of this study have a number of limitations that should temper any conclusions drawn from it.

First, because of the complexity of the hypothesized model, it is important that it be fully tested with a larger sample. Because of limitations in the final number of teams acquired, I was unable to use full latent variable model testing. Therefore, although I was able to avoid one of traditional criticisms on path analysis (i.e., model specification error) by conducting path analysis with EQS, the other criticism of path analysis (i.e., measurement error) is still valid in this study.

Second, because all the measures in the hypothesized model tested were collected at one point in time except for RU commanders' team effectiveness ratings, causality can not be established with certainty. I attempted to address this concern by relying on theoretical as well as empirical support for the specific directionality. In addition, the findings are strengthened somewhat by the use of structural equation modeling which improves our ability to make causal inferences over other analytical techniques such as multiple regression or correlational analysis (Bentler & Chou, 1988). Furthermore, given

that similar results were obtained in both Hypo-PR (in which team outcomes were rated by RU-wide peers using a cross-sectional design) and Hypo-RC (in which team outcomes were rated by RU commanders using a longitudinal design), causality assumptions in this study may be non-spurious. These results suggest that even though some of the results in this study were fortified by cross-sectional design, overall results show strong supports for the research hypotheses.

Nevertheless, the associations in structural equation modeling are necessary but not sufficient to establish directionality. Snapshot pictures of leadership and group effectiveness may produce erroneous or misleading results because the impact of leadership changes over the course of a group's lifecycle (Phillips et al., 1997). Therefore, longitudinal studies are necessary to understand the causal direction for the leadership behaviors as well as how general leadership dynamics unfold over time.

Third, the final alternative model resulted from a series of analyses using a single set of data. On the basis of statistical criteria such as fit indices, I added paths. Therefore, it is possible that support for the final model is based in part on capitalization on chance. Further research should be undertaken to validate the final model in other samples.

Fourth, research setting and characteristics of subjects may limit generalizability of the results from the present study. This study was conducted in a field setting and conducted within the confines of the Korean Army. The population of ASO Brigades in the Korean Army is extremely homogeneous; not only were virtually all the subjects were males of approximately the same age and education, but all of the individuals had previously been through an extensive selection and training processes which further

limits external validity. Therefore, examining the generalizability of the results to other team leader and members in other types of jobs and organizations is necessary. Although these findings have valuable implications for ASO teams and similar units, generalizations based on these results must be approached with caution. The hierarchical structure and nature of interaction of these all-male, military special force units may differ from those of work units in civilian and other military environments.

However, in defense of the study, field research is sorely needed in all areas of managerial/psychological research. Field research is even more critical in the area of leadership and team research, as both of them are truly practiced in field settings. It also should be noted that those homogeneous characteristics across teams may exclude other explanations in the specific model testing since the situational factors (such as leader's rank, education, and age, team members mean age, education, and rank, work characteristics, number of team members, job positions, and so on) are set extremely constant across teams. Even though generalizability of the results to different organizational settings may be a problem, those situational aspects of the sampled organization exclude other competing explanations of the results within this sample.

In addition, even though those who were considered as non-collectivistic in my sample would be classified as collectivistic cross-culturally, and thus considered relatively non-collectivistic in a collectivistic culture. Future research is needed to evaluate whether the results generalize to an individualist culture and, importantly, to organizations which has an individualistic culture within individualistic cultures.

Although the impact of this single study on the leadership and team literature is admittedly questionable, the issues raised are critical and I am hopeful that other researchers will continue to investigate this area.

## APPENDIX A. HUMAN SUBJECTS APPROVAL

24 February 2005

Jaewon Ko, Ph.D. Candidate  
Advisor: Russell Cropanzano, Ph.D.  
Department of Management/Policy  
McClelland Hall, Room 405F  
P O Box 210108

**RE: IMPACT OF LEADERSHIP AND TEAM MEMBERS' EMOTIONAL INTELLIGENCE AND INDIVIDUALISM-COLLECTIVISM ON TEAM PROCESSES AND OUTCOMES: A LEADER-MEMBER EXCHANGE PERSPECTIVE**

Dear Mr. Ko:

We received documents concerning your above cited project. Regulations published by the U.S. Department of Health and Human Services [45 CFR Part 46.101(b) (2)] exempt this type of research from review by our Institutional Review Board. **Note: A copy of your disclaimer form, with IRB approval stamp affixed, is enclosed for duplication and use in enrolling subjects.**

Please be advised that **clearance from academic and/or other official authorities for site(s) where proposed research is to be conducted must be obtained prior to performance of this study. Evidence of this must be submitted to the Human Subjects Protection Program office.**

Exempt status is granted with the understanding that no further changes or additions will be made either to the procedures followed or to the consenting instrument used (copies of which we have on file) without the review and approval of the Human Subjects Committee and your College or Departmental Review Committee. Any research related physical or psychological harm to any subject must also be reported to each committee.

Thank you for informing us of your work. If you have any questions concerning the above, please contact this office.

Sincerely,



Rebecca Dahl, R. N., Ph.D.  
Director  
Human Subjects Protection Program

cc: Departmental/College Review Committee

## APPENDIX B. TEAM MEMBER SURVEY

### Korea Military Academy & The University of Arizona Participant Disclaimer Form

Title of Project: The Impact of Leadership and Team-members' Individualism-Collectivism on Team Processes and Team Outcomes

You are being invited to voluntarily participate in the above-titled research study. The purpose of the study is to investigate and further improve team interpersonal dynamics and ultimately team effectiveness. You are eligible to participate because you are a(n) officer/non-com/private of the Korean Army. My hope is to use your responses to the survey to improve the teamwork and team effectiveness for all teams within the Korean Army. This survey is expected to take 30 minutes of your time.

If you agree to participate, your participation will involve completing a survey. You may choose not to answer some or all of the questions (although it will be helpful if you are willing to complete all questions). Your name will not appear on the survey, but I would strongly encourage you to write your team affiliation and job position because matching your response with the responses from both your team-leader and team-peers is a critical part of this study. To maintain the confidentiality of your responses, please seal the survey in the enclosed return envelope and mail it by yourself to me after completing it. Neither the commanders nor staff officers in your Brigade will receive a copy of your survey responses.

Any questions you have will be answered by Assistant Professor Jaewon Ko of the Korea Military Academy and you may withdraw from completion of the survey at any time. There are no known risks from your participation and no direct benefit from your participation is expected. There is no cost to you except for your time and you will not be compensated for your participation.

Replied surveys will be stored in a locked stock room and the information will be recorded in a password protected personal computer, once the entire survey processes are completed.

You can obtain further information about this research from Major Jaewon Ko, Assistant Professor, Korea Military Academy, at (02) 2197-2687. Since I'm currently working in the U.S., email contact is preferred (jaeko@email.arizona.edu; wonko@kma.ac.kr). If you have questions concerning your rights as a research participant you can call the Human Subjects Protection Program at 1-520-626-5925.

By participating in the survey, you are giving permission for researchers at Korea Military Academy to use your information for research purposes.

Thank you.

Major Jaewon Ko, M.A.  
Assistant Professor  
Department of Psychology  
Korea Military Academy

## KOREA MILITARY ACADEMY LEADERSHIP SURVEY

Type I

*This survey concerns your work team and how it operates. It is not a test; there are no right or wrong answers. Your responses will help in identifying what conditions make work teams more effective in your organization. The responses will not be tied to you as an individual, but will be averaged with those of your work team. No brigade administrative personnel (including team leaders/regional unit commanders/battalion commander) will have access to your responses. Please complete the following confidential survey and return it in the enclosed self-addressed, stamped envelope. No postage is necessary. For questions, please call or email Professor Jaewon Ko (02-2197-2687; 001-1-520-621-1911, jaeko@email.arizona.edu; wonko@kma.ac.kr).*

### Section 1: Personal Values and Attributes

*Instructions: Please write the number that best describes the extent to which you agree with each statement. Please use the following scale to indicate your agreement or disagreement with each statement:*

<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Slightly Disagree</i>	<i>Neither Agree nor Disagree</i>	<i>Slightly Agree</i>	<i>Agree</i>	<i>Strongly Agree</i>
1 -----	2 -----	3 -----	4 -----	5 -----	6 -----	7 -----

1. \_\_\_\_\_ Family members should stick together; no matter what sacrifices are required.
2. \_\_\_\_\_ If a coworker gets a prize, I would feel proud.
3. \_\_\_\_\_ When I succeed, it is usually because of my abilities.
4. \_\_\_\_\_ It is my duty to take care of my family, even when I have to sacrifice what I want.
5. \_\_\_\_\_ My personal identity, independent of others, is very important to me.
6. \_\_\_\_\_ Winning is everything.
7. \_\_\_\_\_ I usually sacrifice my self-interest for the benefit of my group.
8. \_\_\_\_\_ I enjoy working in situations involving competition with others.
9. \_\_\_\_\_ It is important to maintain harmony within my group.
10. \_\_\_\_\_ It is important that I do my job better than others.
11. \_\_\_\_\_ One should live one's life independently of others.
12. \_\_\_\_\_ The well-being of my coworkers is important to me.
13. \_\_\_\_\_ Competition is the law of nature.
14. \_\_\_\_\_ I hate to disagree with others in my group.
15. \_\_\_\_\_ To me, pleasure is spending time with others.
16. \_\_\_\_\_ When another person does better than I do, I get tense and aroused.
17. \_\_\_\_\_ I often do "my own thing."
18. \_\_\_\_\_ It is important to me that I respect the decisions made by my groups.
19. \_\_\_\_\_ I rely on myself most of the time; I rarely rely on others.
20. \_\_\_\_\_ I would do what would please my family, even if I detested that activity.
21. \_\_\_\_\_ I am a unique individual.
22. \_\_\_\_\_ I feel good when I cooperate with others.
23. \_\_\_\_\_ Without competition, it is not possible to have a good society.
24. \_\_\_\_\_ If a relative were in financial difficulty, I would help within my means.



Section 2: Leadership Style of Your Team-Leader
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*Instructions:* The items ask you to describe the leadership style of your team-leader as you perceive it. Judge how frequently each statement fits the team-leader you are describing. Please use the following scale to indicate the frequencies of your leader's behavior with each sentence:

*Not at all*                      *A little*                      *Sometimes*                      *Quite a bit*                      *Frequently*  
 1 ----- 2 ----- 3 ----- 4 ----- 5

My team leader ....

1. \_\_\_\_\_ Provides me with assistance in exchange for my efforts.
2. \_\_\_\_\_ Re-examines critical assumptions to question whether they are appropriate.
3. \_\_\_\_\_ Fails to interfere until problems become serious.
4. \_\_\_\_\_ Focuses attention on irregularities, mistakes, exceptions, and deviations from standards.
5. \_\_\_\_\_ Avoids getting involved when important issues arise.
6. \_\_\_\_\_ Talks about their most important values and beliefs.
7. \_\_\_\_\_ Is absent when needed.
8. \_\_\_\_\_ Seeks differing perspective when solving problems.
9. \_\_\_\_\_ Talks optimistically about the future.
10. \_\_\_\_\_ Instills pride in me for being associated with him/her.
11. \_\_\_\_\_ Discusses in specific terms who is responsible for achieving performance targets.
12. \_\_\_\_\_ Waits for things to go wrong before taking action.
13. \_\_\_\_\_ Talks enthusiastically about what needs to be accomplished.
14. \_\_\_\_\_ Specifies the importance of having a strong sense of purpose.
15. \_\_\_\_\_ Spends time teaching and coaching.
16. \_\_\_\_\_ Makes clear what one can expect to receive when performance goals are achieved.
17. \_\_\_\_\_ Shows a firm belief in "If it ain't broke, don't fix it."
18. \_\_\_\_\_ Goes beyond self-interest for the good of the group.
19. \_\_\_\_\_ Treats me as an individual rather than just as a member of a group.
20. \_\_\_\_\_ Demonstrates that problems must become chronic before taking action.
21. \_\_\_\_\_ Acts in ways that builds my respect.
22. \_\_\_\_\_ Concentrates his/her full attention on dealing with mistakes, complaints, and failures.
23. \_\_\_\_\_ Considers the moral and ethical consequences of decisions.
24. \_\_\_\_\_ Keeps track of all mistakes.
25. \_\_\_\_\_ Displays a sense of power and confidence.
26. \_\_\_\_\_ Articulates a compelling vision of the future.
27. \_\_\_\_\_ Directs my attention toward failures to meet standards.
28. \_\_\_\_\_ Avoids making decisions.
29. \_\_\_\_\_ Considers me as having different needs, abilities, and aspirations from others.
30. \_\_\_\_\_ Gets me to look at problems from many different angles.

*Not at all*                      *A little*                      *Sometimes*                      *Quite a bit*                      *Frequently*  
 1 ----- 2 ----- 3 ----- 4 ----- 5

- 31. \_\_\_\_\_ Helps me to develop my strengths.
- 32. \_\_\_\_\_ Suggests new ways of looking at how to complete assignments.
- 33. \_\_\_\_\_ Delays responding to urgent questions.
- 34. \_\_\_\_\_ Emphasizes the importance of having a collective sense of mission.
- 35. \_\_\_\_\_ Expresses satisfaction when I meet expectations.
- 36. \_\_\_\_\_ Expresses confidence that goals will be achieved.

**Section 3: Current Relationship with Your Team-Leader**

*Instructions:* Please write the number that best describes the extent to which you agree with each statement. Please use the following scale to indicate your agreement or disagreement with each statement:

*Strongly Disagree*                      *Disagree*                      *Slightly Disagree*                      *Neither Agree nor Disagree*                      *Slightly Agree*                      *Agree*                      *Strongly Agree*  
 1 ----- 2 ----- 3 ----- 4 ----- 5 ----- 6 ----- 7

- 1. \_\_\_\_\_ Regardless of how much power he/she has built into his/her position, my team leader would be personally inclined to use his/her power to help me solve problems in my work (*LMX-7*).
- 2. \_\_\_\_\_ I can count on my team leader to “bail me out” even at his or her own expense, when I really need it (*LMX-7*).
- 3. \_\_\_\_\_ My team leader understands my problems and needs (*LMX-7*).
- 4. \_\_\_\_\_ My team leader recognizes my potential (*LMX-7*).
- 5. \_\_\_\_\_ My team leader has enough confidence in me that he/she would defend and justify my decisions if I were not present to do so (*LMX-7*).
- 6. \_\_\_\_\_ I usually know where I stand with my team leader (*LMX-7*).
- 7. \_\_\_\_\_ I have a good working relationship with my team leader (*LMX-7*).

*Instructions:* Please think about the rankings of all the team members within your team in terms of intimacy with your current leader (*Intimacy* means general closeness of personal and work-related relationships with the leader) and fill in the blanks with an appropriate number.

8. If a team member who keeps currently the highest intimacy with your team leader needs to be ranked as ‘the number 1’, you are ranked at the number (    ) among (    ) members (*LMX-rank*).

#### Section 4: Questions about Your Team and Peer Members

*Instructions: Please write the number that best describes the extent to which you agree with each statement. Please use the following scale to indicate your agreement or disagreement with each statement:*

<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Slightly Disagree</i>	<i>Neither Agree nor Disagree</i>	<i>Slightly Agree</i>	<i>Agree</i>	<i>Strongly Agree</i>
1	2	3	4	5	6	7

1. \_\_\_\_\_ I feel that I am included by the team in the team's activities. (*Team social cohesion*)
2. \_\_\_\_\_ The team is honest and straight-forward with me. (*Team social cohesion*)
3. \_\_\_\_\_ There are not many people like as individuals in this team. (*Team social cohesion*)
4. \_\_\_\_\_ I don't think this team has been very helpful to me. (*Team social cohesion*)
5. \_\_\_\_\_ Team members are hard to communicate with. (*Team social cohesion*)
6. \_\_\_\_\_ Team has strong sense of togetherness. (*Team social cohesion*)
7. \_\_\_\_\_ Team members generally trust each other. (*Team social cohesion*)
8. \_\_\_\_\_ Members of my team get along very well together. (*Team social cohesion*)
9. \_\_\_\_\_ I often suggest better work methods to others. (*TMX*)
10. \_\_\_\_\_ Other members recognize my potential. (*TMX*)
11. \_\_\_\_\_ Other members understand my problem. (*TMX*)
12. \_\_\_\_\_ I am flexible about switching jobs with others. (*TMX*)
13. \_\_\_\_\_ I often ask others for help. (*TMX*)
14. \_\_\_\_\_ I often volunteer extra help to others. (*TMX*)
15. \_\_\_\_\_ I am willing to finish work assigned to others. (*TMX*)
16. \_\_\_\_\_ Others are willing to help to finish work assigned to me. (*TMX*)
17. \_\_\_\_\_ As a team, this work group shows signs of falling apart. (*Team viability, reversed*)
18. \_\_\_\_\_ This team should not continue to function as a team. (*Team viability, reversed*)
19. \_\_\_\_\_ This team is not capable of working together as a team. (*Team viability, reversed*)
20. \_\_\_\_\_ Overall, this team has been effectively fulfilling its roles and responsibilities. (*Team performance*)
21. \_\_\_\_\_ Overall, this team been performing its job the way you would like it to be performed. (*Team performance*)
22. \_\_\_\_\_ Overall, team members have strong loyalty to the team leader. (*Team performance*)
23. \_\_\_\_\_ This team is ready to accomplish any type of assigned missions. (*Team performance*)
24. \_\_\_\_\_ This team has produced reliable work outcomes. (*Team performance*)
25. \_\_\_\_\_ In my estimation, this team gets its work done very effectively. (*Team performance*)
26. \_\_\_\_\_ All in all this team is very competent. (*Team performance*)

**Section 5: Questions about Teams in Your Regional Unit**

*Instructions: On the following scales, please write the names for each of the teams in your regional unit above the scale number that indicates where the team falls on that scale. More than one team can be given the same rating, but please try to make some distinctions among teams (do not rate all teams the same). Also, please try to think about each scale separately. Your answers will remain completely confidential. A sample is shown below.*

<SAMPLE>

	<i>Team 2</i>		<i>Team 1</i>		<i>Team 5</i>		<i>Team 3</i>		<i>Team 4</i>	
<u>Team which has the Lowest probability to succeed in the given mission</u>	1	2	3	4	5	6	7	8	<u>Team which has the Highest probability to succeed in the given mission</u>	

1. Situation #1: Let's suppose a situation in which you are the commander of your current regional unit and were ordered by your Brigade Commander to pick a team in your current regional unit to assign an extremely important mission (but you don't know the specific characteristics of the mission.) Under the given situation, please rate all the five teams in your regional unit on the scale below. (*One item ordered-rating scale: Team performance*)

<u>Team which has the Lowest probability to succeed in the given mission</u>	1	2	3	4	5	6	7	8	<u>Team which has the Highest probability to succeed in the given mission</u>	

2. Situation #2: Let's suppose a situation in which you are the commander of your current regional unit and were ordered by your Brigade Commander to pick a team in your current regional unit to dissolve or to transfer to the other brigade. Under the given situation, please rate all the five teams in your regional unit on the scale below. (*One item ordered-rating scale: Team viability*)

<u>Team that I want to dissolve LEAST</u>	1	2	3	4	5	6	7	8	<u>Team that I want to dissolve MOST</u>	

Section 6: Demographic Information
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*The following items ask general information about yourself. This information will not be used to identify you in any way; as a result, your confidentiality will be protected. If you have no idea how to answer, just leave the question blank.*

1. Your Gender (*check one*):  Male     Female
  
2. Your Age (*fill in the blank*): \_\_\_\_\_ years
  
3. Marital Status (*check one*):  Married     Single     Etc.
  
4. Education (*check one*):  High school     In college     College graduate  
 BA degree     MA degree or higher
  
5. Current Rank (*check one*):  Private     Ha-sa/Chung-sa     Sang-sa/Won-sa  
 2<sup>nd</sup> Lieut./Lieut.     Captain
  
6. Job Position (*check one*):  
 Assistant-to-the-leader     Information/Operations  
 Explosive I     Explosive II  
 Communications I     Communicaitons II     Communications III  
 Medical I     Medical II  
 Weaponry I     Weaponry II  
 Other (*please specify* \_\_\_\_\_)
  
7. Years of work for the ROK Army (*fill in the blank*): \_\_\_\_\_ years
  
8. Years of work in the team (*fill in the blank*): \_\_\_\_\_ years
  
9. Months of work with the team leader (*fill in the blank*): \_\_\_\_\_ months

## APPENDIX C. TEAM LEADER SURVEY

### Korea Military Academy & The University of Arizona Participant Disclaimer Form

Title of Project: The Impact of Leadership and Team-members' Individualism-Collectivism on Team Processes and Team Outcomes

You are being invited to voluntarily participate in the above-titled research study. The purpose of the study is to investigate and further improve team interpersonal dynamics and ultimately team effectiveness. You are eligible to participate because you are an officer of the Korean Army. My hope is to use your responses to the survey to improve the teamwork and team effectiveness for all teams within the Korean Army. This survey is expected to take 30 minutes of your time.

If you agree to participate, your participation will involve completing a survey. You may choose not to answer some or all of the questions (although it will be helpful if you are willing to complete all questions). Your name will not appear on the survey, but I would strongly encourage you to write your team affiliation and job position because matching your response with the responses from both your team-members and the RU commander is a critical part of this study. To maintain the confidentiality of your responses, please seal the survey in the enclosed return envelope and mail it by yourself to me after completing it. Neither the commanders nor staff officers in your Brigade will receive a copy of your survey responses.

Any questions you have will be answered by Assistant Professor Jaewon Ko of the Korea Military Academy and you may withdraw from completion of the survey at any time. There are no known risks from your participation and no direct benefit from your participation is expected. There is no cost to you except for your time and you will not be compensated for your participation.

Replied surveys will be stored in a locked stock room and the information will be recorded in a password protected personal computer, once the entire survey processes are completed.

You can obtain further information about this research from Major Jaewon Ko, Assistant Professor, Korea Military Academy, at (02) 2197-2687. Since I'm currently working in the U.S., email contact is preferred (jaeko@email.arizona.edu; wonko@kma.ac.kr). If you have questions concerning your rights as a research participant you can call the Human Subjects Protection Program at 1-520-626-5925.

By participating in the survey, you are giving permission for researchers at Korea Military Academy to use your information for research purposes.

Thank you.

Major Jaewon Ko, M.A.  
Assistant Professor  
Department of Psychology  
Korea Military Academy

## KOREA MILITARY ACADEMY LEADERSHIP SURVEY

Type II
---------

*This survey concerns your work team and how it operates. It is not a test; there are no right or wrong answers. Your responses will help in identifying what conditions make work teams more effective in your organization. The responses will not be tied to you as an individual, but will be averaged with those of your work team. No brigade administrative personnel (including team members/regional unit commanders/battalion commander) will have access to your responses. Please complete the following confidential survey and return it in the enclosed self-addressed, stamped envelope. No postage is necessary. For questions, please call or email Professor Jaewon Ko (02-2197-2687; 001-1-520-621-1911, jaeko@email.arizona.edu; wonko@kma.ac.kr).*

### Section 1: Your Own Leadership Style

***Instructions:** The items ask you to describe your leadership style as a team-leader as you perceive it. Judge how frequently each statement fits your behavior as a team-leader. Please use the following scale to indicate the frequencies of your behavior with each sentence:*

Not at all	A little	Sometimes	Quite a bit	Frequently
1 -----	2 -----	3 -----	4 -----	5 -----

#### As a Team Leader, I ....

1. \_\_\_\_\_ Provide subordinates with assistance in exchange for their efforts.
2. \_\_\_\_\_ Re-examine critical assumptions to question whether they are appropriate.
3. \_\_\_\_\_ Fail to interfere until problems become serious.
4. \_\_\_\_\_ Focus attention on irregularities, mistakes, exceptions, and deviations from standards.
5. \_\_\_\_\_ Avoid getting involved when important issues arise.
6. \_\_\_\_\_ Talk about my most important values and beliefs.
7. \_\_\_\_\_ Am absent when needed.
8. \_\_\_\_\_ Seek differing perspective when solving problems.
9. \_\_\_\_\_ Talk optimistically about the future.
10. \_\_\_\_\_ Instills pride in subordinates for being associated with me.
11. \_\_\_\_\_ Discuss in specific terms who is responsible for a achieving performance targets.
12. \_\_\_\_\_ Wait for things to go wrong before taking action.
13. \_\_\_\_\_ Talk enthusiastically about what needs to be accomplished.
14. \_\_\_\_\_ Specify the importance of having a strong sense of purpose.
15. \_\_\_\_\_ Spend time teaching and coaching.
16. \_\_\_\_\_ Make clear what one can expect to receive when performance goals are achieved.
17. \_\_\_\_\_ Show a firm belief in "If it ain't broke, don't fix it."
18. \_\_\_\_\_ Go beyond self-interest for the good of the group.
19. \_\_\_\_\_ Treat subordinates as an individual rather than just as a member of a group.
20. \_\_\_\_\_ Demonstrate that problems must become chronic before taking action.
21. \_\_\_\_\_ Act in ways that builds subordinates' respect.

*Not at all*                      *A little*                      *Sometimes*                      *Quite a bit*                      *Frequently*  
 1 ----- 2 ----- 3 ----- 4 ----- 5

*As a Team Leader, I ....*

22. \_\_\_\_\_ Concentrate my full attention on dealing with mistakes, complaints, and failures.
23. \_\_\_\_\_ Consider the moral and ethical consequences of decisions.
24. \_\_\_\_\_ Keep track of all mistakes.
25. \_\_\_\_\_ Display a sense of power and confidence.
26. \_\_\_\_\_ Articulate a compelling vision of the future.
27. \_\_\_\_\_ Direct subordinates' attention toward failures to meet standards.
28. \_\_\_\_\_ Avoid making decisions.
29. \_\_\_\_\_ Consider subordinates as having different needs, abilities, and aspirations from others.
30. \_\_\_\_\_ Get subordinates to look at problems from many different angles.
31. \_\_\_\_\_ Help subordinates to develop their strengths.
32. \_\_\_\_\_ Suggest new ways of looking at how to complete assignments.
33. \_\_\_\_\_ Delay responding to urgent questions.
34. \_\_\_\_\_ Emphasize the importance of having a collective sense of mission.
35. \_\_\_\_\_ Express satisfaction when subordinates meet my expectations.
36. \_\_\_\_\_ Express confidence that goals will be achieved.



**Section 2: Questions about Teams in Your Regional Unit**

*Instructions: On the following scales, please write the names for each of the teams in your regional unit above the scale number that indicates where the team falls on that scale. More than one team can be given the same rating, but please try to make some distinctions among teams (do not rate all teams the same). Also, please try to think about each scale separately. Your answers will remain completely confidential. A sample is shown below.*

<SAMPLE>

		<i>Team 2</i>		<i>Team 1</i>	<i>Team 5</i>		<i>Team 3</i>	<i>Team 4</i>	
<u>Team which has the Lowest probability to succeed in the given mission</u>	1	2	3	4	5	6	7	8	<u>Team which has the Highest probability to succeed in the given mission</u>

1. Situation #1: Let's suppose a situation in which you are the commander of your current regional unit and were ordered by your Brigade Commander to pick a team in your current regional unit to assign an extremely important mission (but you don't know the specific characteristics of the mission.) Under the given situation, please rate all the five teams in your regional unit on the scale below. (*One item ordered-rating scale: Team performance*)

<u>Team which has the LOWEST probability to succeed in the given mission</u>	1	2	3	4	5	6	7	8	<u>Team which has the HIGHEST probability to succeed in the given mission</u>
--	---	---	---	---	---	---	---	---	---

2. Situation #2: Let's suppose a situation in which you are the commander of your current regional unit and were ordered by your Brigade Commander to pick a team in your current regional unit to dissolve or to transfer to the other brigade. Under the given situation, please rate all the five teams in your regional unit on the scale below. (*One item ordered-rating scale: Team viability*)

<u>Team that I want to dissolve LEAST</u>	1	2	3	4	5	6	7	8	<u>Team that I want to dissolve MOST</u>
---	---	---	---	---	---	---	---	---	--

Section 3: Demographic Information
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*The following items ask general information about yourself. This information will not be used to identify you in any way; as a result, your confidentiality will be protected. If you have no idea how to answer, just leave the question blank.*

1. Your Gender (*check one*):  Male  Female
2. Your Age (*fill in the blank*): \_\_\_\_\_ years
3. Marital Status (*check one*):  Married  Single  Etc.
4. Education (*check one*):  High school  In college  College graduate  
 BA degree  MA degree or higher
5. Current Rank (*check one*):  2<sup>nd</sup> Lieut./Lieut.  Captain  Major  LTC.
6. Route of being commissioned:  
 KMA  ROTC  Sam-sa  BA officer  Others  N/A
7. Job Position (*check one*):  
 Team leader  Assistant-to-the-leader  Other (*please specify* \_\_\_\_\_)
8. Years of work for the ROK Army (*fill in the blank*): \_\_\_\_\_ years
9. Years of work in the team (*fill in the blank*): \_\_\_\_\_ years
10. Months of work with the regional unit commander (*fill in the blank*): \_\_\_\_\_ months

## INSTRUCTIONS

From the next page, there are SIX identical pages of survey.

In completing these, you'll be asked to appraise SIX of your subordinates in your team in terms of overall relationship with you.

To provide equal condition to all team leaders in your brigade, the positions of subordinate being appraised are randomly pre-selected by me: (1) Assistant-to-the-team-leader, (2) Explosive I, (3) Communications II, (4) Weaponry I, (5) Medical II, and (6) I/O.

If there is any job position (or incumbent) that (or whom) you're currently unable to rate (because of either vacancy or long-term hospitalization/training), then please pick other job position in the order provided below and rate him/her:

(7) Communications III → (8) Medical I → (9) Explosive II → (10) Weaponry II → (11) Communications I → (12) Other

Because this is not an official job performance appraisal and will not be revealed to anybody in your Brigade, PLEASE rate each of them AS HONESTLY AS YOU CAN.

**YOUR RESPONSES will be used ONLY FOR RESEARCH PURPOSES**

**IF YOU FEEL UNCOMFORTABLE IN APPRAISING ANY OF THE ITEMS, YOU MAY LEAVE IT AS A BLANK. HOWEVER, YOUR SUPPORT FOR THIS STUDY WILL BE GREATLY APPRECIATED.**

Subordinate being appraised (1): Assistant-to-the-team-leader

*Instructions: Please write the number that best describes the extent to which you agree with each statement. Please use the following scale to indicate your agreement or disagreement with each statement:*

<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Slightly Disagree</i>	<i>Neither Agree nor Disagree</i>	<i>Slightly Agree</i>	<i>Agree</i>	<i>Strongly Agree</i>
1 -----	2 -----	3 -----	4 -----	5 -----	6 -----	7 -----

1. \_\_\_\_\_ Regardless of how much power I have built into my position, I would be personally inclined to use my power to help this subordinate solve problems in his or her work. (*LMX-7*)
2. \_\_\_\_\_ I would be willing to “bail out” this subordinate, even at my own expense, if he or she really needs it. (*LMX-7*)
3. \_\_\_\_\_ I think that I understand this subordinate’s problems and needs. (*LMX-7*)
4. \_\_\_\_\_ I think that I recognize this subordinate’s potential. (*LMX-7*)
5. \_\_\_\_\_ I have enough confidence in this subordinate that I would defend and justify his or her decisions if he or she were not present to do so. (*LMX-7*)
6. \_\_\_\_\_ I usually let this subordinate know where he or she stands with me. (*LMX-7*)
7. \_\_\_\_\_ I have a good working relationship with this subordinate. (*LMX-7*)

*Instructions:* Please think about the rankings of all the subordinates within your team in terms of intimacy with you (*Intimacy* means general closeness of personal and work-related relationships with you) and fill in the blanks with an appropriate number.

8. If a team member who keeps currently the highest intimacy with you needs to be ranked as ‘the number 1’, this subordinate is ranked at the number (    ) among (    ) members. (*LMX-rank*)

Subordinate being appraised (2): Explosive I

*Instructions: Please write the number that best describes the extent to which you agree with each statement. Please use the following scale to indicate your agreement or disagreement with each statement:*

<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Slightly Disagree</i>	<i>Neither Agree nor Disagree</i>	<i>Slightly Agree</i>	<i>Agree</i>	<i>Strongly Agree</i>
1 -----	2 -----	3 -----	4 -----	5 -----	6 -----	7 -----

1. \_\_\_\_\_ Regardless of how much power I have built into my position, I would be personally inclined to use my power to help this subordinate solve problems in his or her work. (*LMX-7*)
2. \_\_\_\_\_ I would be willing to “bail out” this subordinate, even at my own expense, if he or she really needs it. (*LMX-7*)
3. \_\_\_\_\_ I think that I understand this subordinate’s problems and needs. (*LMX-7*)
4. \_\_\_\_\_ I think that I recognize this subordinate’s potential. (*LMX-7*)
5. \_\_\_\_\_ I have enough confidence in this subordinate that I would defend and justify his or her decisions if he or she were not present to do so. (*LMX-7*)
6. \_\_\_\_\_ I usually let this subordinate know where he or she stands with me. (*LMX-7*)
7. \_\_\_\_\_ I have a good working relationship with this subordinate. (*LMX-7*)

*Instructions:* Please think about the rankings of all the subordinates within your team in terms of intimacy with you (*Intimacy* means general closeness of personal and work-related relationships with you) and fill in the blanks with an appropriate number.

8. If a team member who keeps currently the highest intimacy with you needs to be ranked as ‘the number 1’, this subordinate is ranked at the number (    ) among (    ) members.

Subordinate being appraised (3): Communications II

*Instructions: Please write the number that best describes the extent to which you agree with each statement. Please use the following scale to indicate your agreement or disagreement with each statement:*

<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Slightly Disagree</i>	<i>Neither Agree nor Disagree</i>	<i>Slightly Agree</i>	<i>Agree</i>	<i>Strongly Agree</i>
1 -----	2 -----	3 -----	4 -----	5 -----	6 -----	7 -----

1. \_\_\_\_\_ Regardless of how much power I have built into my position, I would be personally inclined to use my power to help this subordinate solve problems in his or her work. (*LMX-7*)
2. \_\_\_\_\_ I would be willing to “bail out” this subordinate, even at my own expense, if he or she really needs it. (*LMX-7*)
3. \_\_\_\_\_ I think that I understand this subordinate’s problems and needs. (*LMX-7*)
4. \_\_\_\_\_ I think that I recognize this subordinate’s potential. (*LMX-7*)
5. \_\_\_\_\_ I have enough confidence in this subordinate that I would defend and justify his or her decisions if he or she were not present to do so. (*LMX-7*)
6. \_\_\_\_\_ I usually let this subordinate know where he or she stands with me. (*LMX-7*)
7. \_\_\_\_\_ I have a good working relationship with this subordinate. (*LMX-7*)

*Instructions:* Please think about the rankings of all the subordinates within your team in terms of intimacy with you (*Intimacy* means general closeness of personal and work-related relationships with you) and fill in the blanks with an appropriate number.

8. If a team member who keeps currently the highest intimacy with you needs to be ranked as ‘the number 1’, this subordinate is ranked at the number (    ) among (    ) members.

Subordinate being appraised (4): Weaponry I

*Instructions: Please write the number that best describes the extent to which you agree with each statement. Please use the following scale to indicate your agreement or disagreement with each statement:*

<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Slightly Disagree</i>	<i>Neither Agree nor Disagree</i>	<i>Slightly Agree</i>	<i>Agree</i>	<i>Strongly Agree</i>
1 -----	2 -----	3 -----	4 -----	5 -----	6 -----	7 -----

1. \_\_\_\_\_ Regardless of how much power I have built into my position, I would be personally inclined to use my power to help this subordinate solve problems in his or her work. (*LMX-7*)
2. \_\_\_\_\_ I would be willing to “bail out” this subordinate, even at my own expense, if he or she really needs it. (*LMX-7*)
3. \_\_\_\_\_ I think that I understand this subordinate’s problems and needs. (*LMX-7*)
4. \_\_\_\_\_ I think that I recognize this subordinate’s potential. (*LMX-7*)
5. \_\_\_\_\_ I have enough confidence in this subordinate that I would defend and justify his or her decisions if he or she were not present to do so. (*LMX-7*)
6. \_\_\_\_\_ I usually let this subordinate know where he or she stands with me. (*LMX-7*)
7. \_\_\_\_\_ I have a good working relationship with this subordinate. (*LMX-7*)

*Instructions:* Please think about the rankings of all the subordinates within your team in terms of intimacy with you (*Intimacy* means general closeness of personal and work-related relationships with you) and fill in the blanks with an appropriate number.

8. If a team member who keeps currently the highest intimacy with you needs to be ranked as ‘the number 1’, this subordinate is ranked at the number (    ) among (    ) members.

Subordinate being appraised (5): Medical II

*Instructions: Please write the number that best describes the extent to which you agree with each statement. Please use the following scale to indicate your agreement or disagreement with each statement:*

<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Slightly Disagree</i>	<i>Neither Agree nor Disagree</i>	<i>Slightly Agree</i>	<i>Agree</i>	<i>Strongly Agree</i>
1 -----	2 -----	3 -----	4 -----	5 -----	6 -----	7 -----

1. \_\_\_\_\_ Regardless of how much power I have built into my position, I would be personally inclined to use my power to help this subordinate solve problems in his or her work. (*LMX-7*)
2. \_\_\_\_\_ I would be willing to “bail out” this subordinate, even at my own expense, if he or she really needs it. (*LMX-7*)
3. \_\_\_\_\_ I think that I understand this subordinate’s problems and needs. (*LMX-7*)
4. \_\_\_\_\_ I think that I recognize this subordinate’s potential. (*LMX-7*)
5. \_\_\_\_\_ I have enough confidence in this subordinate that I would defend and justify his or her decisions if he or she were not present to do so. (*LMX-7*)
6. \_\_\_\_\_ I usually let this subordinate know where he or she stands with me. (*LMX-7*)
7. \_\_\_\_\_ I have a good working relationship with this subordinate. (*LMX-7*)

*Instructions:* Please think about the rankings of all the subordinates within your team in terms of intimacy with you (*Intimacy* means general closeness of personal and work-related relationships with you) and fill in the blanks with an appropriate number.

8. If a team member who keeps currently the highest intimacy with you needs to be ranked as ‘the number 1’, this subordinate is ranked at the number (    ) among (    ) members.



Subordinate being appraised (6): Information/Operations

*Instructions: Please write the number that best describes the extent to which you agree with each statement. Please use the following scale to indicate your agreement or disagreement with each statement:*

<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Slightly Disagree</i>	<i>Neither Agree nor Disagree</i>	<i>Slightly Agree</i>	<i>Agree</i>	<i>Strongly Agree</i>
1 -----	2 -----	3 -----	4 -----	5 -----	6 -----	7 -----

1. \_\_\_\_\_ Regardless of how much power I have built into my position, I would be personally inclined to use my power to help this subordinate solve problems in his or her work. (*LMX-7*)
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6. \_\_\_\_\_ I usually let this subordinate know where he or she stands with me. (*LMX-7*)
7. \_\_\_\_\_ I have a good working relationship with this subordinate. (*LMX-7*)

*Instructions: Please think about the rankings of all the subordinates within your team in terms of intimacy with you (Intimacy means general closeness of personal and work-related relationships with you) and fill in the blanks with an appropriate number.*

8. If a team member who keeps currently the highest intimacy with you needs to be ranked as ‘the number 1’, this subordinate is ranked at the number (    ) among (    ) members.

## APPENDIX D. REGIONAL UNIT COMMANDER SURVEY

### Korea Military Academy & The University of Arizona Participant Disclaimer Form

Title of Project: The Impact of Leadership and Team-members' Individualism-Collectivism on Team Processes and Team Outcomes

You are being invited to voluntarily participate in the above-titled research study. The purpose of the study is to investigate and further improve team interpersonal dynamics and ultimately team effectiveness. You are eligible to participate because you are an officer of the Korean Army. My hope is to use your responses to the survey to improve the teamwork and team effectiveness for all teams within the Korean Army. This survey is expected to take 30 minutes of your time.

If you agree to participate, your participation will involve completing a survey. You may choose not to answer some or all of the questions (although it will be helpful if you are willing to complete all questions). Your name will not appear on the survey, but I would strongly encourage you to write your team affiliation and job position because matching your response with the responses from subordinates is a critical part of this study. To maintain the confidentiality of your responses, please seal the survey in the enclosed return envelope and mail it by yourself to me after completing it. Neither the commanders nor staff officers in your Brigade will receive a copy of your survey responses.

Any questions you have will be answered by Assistant Professor Jaewon Ko of the Korea Military Academy and you may withdraw from completion of the survey at any time. There are no known risks from your participation and no direct benefit from your participation is expected. There is no cost to you except for your time and you will not be compensated for your participation.

Replied surveys will be stored in a locked stock room and the information will be recorded in a password protected personal computer, once the entire survey processes are completed.

You can obtain further information about this research from Major Jaewon Ko, Assistant Professor, Korea Military Academy, at (02) 2197-2687. Since I'm currently working in the U.S., email contact is preferred (jaeko@email.arizona.edu; wonko@kma.ac.kr). If you have questions concerning your rights as a research participant you can call the Human Subjects Protection Program at 1-520-626-5925.

By participating in the survey, you are giving permission for researchers at Korea Military Academy to use your information for research purposes.

Thank you.

Major Jaewon Ko, M.A.  
Assistant Professor  
Department of Psychology  
Korea Military Academy

**KOREA MILITARY ACADEMY  
LEADERSHIP SURVEY**

Type III
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*This survey concerns your work team and how it operates. It is not a test; there are no right or wrong answers. Your responses will help in identifying what conditions make work teams more effective in your organization. The responses will not be tied to you as an individual, but will be averaged with those of your work team. No brigade administrative personnel (including team members/team leaders /battalion commander) will have access to your responses. Please complete the following confidential survey and return it in the enclosed self-addressed, stamped envelope. No postage is necessary. For questions, please call or email Professor Jaewon Ko (02-2197-2687; 001-1-520-621-1911, jaeko@email.arizona.edu; wonko@kma.ac.kr).*

<b>Section 1: Demographic Information</b>
---

*The following items ask general information about yourself. This information will not be used to identify you in any way; as a result, your confidentiality will be protected. If you have no idea how to answer, just leave the question blank.*

1. Your Gender (*check one*):  Male     Female
2. Your Age (*fill in the blank*): \_\_\_\_\_ years
3. Marital Status (*check one*):  Married     Single     Etc.
4. Education (*check one*):  High school     In college     College graduate  
 BA degree     MA degree or higher
5. Current Rank (*check one*):  Captain     Major     LTC.
6. Route of being commissioned:  
 KMA     ROTC     Sam-sa     BA officer     Others     N/A
7. Years of work for the ROK Army (*fill in the blank*): \_\_\_\_\_ years
8. Months of work as the regional unit commander (*fill in the blank*): \_\_\_\_\_ months

**Section 2: Questions about Teams in Your Regional Unit**

*Instructions: On the following scales, please write the names for each of the teams in your regional unit above the scale number that indicates where the team falls on that scale. More than one team can be given the same rating, but please try to make some distinctions among teams (do not rate all teams the same). Also, please try to think about each scale separately. Your answers will remain completely confidential. A sample is shown below.*

<SAMPLE>

		<i>Team 2</i>		<i>Team 1</i>	<i>Team 5</i>		<i>Team 3</i>	<i>Team 4</i>	
<u>Team which has the Lowest probability to succeed in the given mission</u>	1	2	3	4	5	6	7	8	<u>Team which has the Highest probability to succeed in the given mission</u>

1. Situation #1: Let's suppose a situation in which you were ordered by your Brigade Commander to pick a team in your current regional unit to assign an extremely important mission (but you don't know the specific characteristics of the mission.) Under the given situation, please rate all the five teams in your regional unit on the scale below. (*One item ordered-rating scale: Team performance*)

<u>Team which has the Lowest probability to succeed in the given mission</u>	1	2	3	4	5	6	7	8	<u>Team which has the Highest probability to succeed in the given mission</u>
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2. Situation #2: Let's suppose a situation in which you were ordered by your Brigade Commander to pick a team in your current regional unit to dissolve or to transfer to the other brigade. Under the given situation, please rate all the five teams in your regional unit on the scale below. (*One item ordered-rating scale: Team viability*)

<u>Team that I want to dissolve LEAST</u>	1	2	3	4	5	6	7	8	<u>Team that I want to dissolve MOST</u>
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