UNDERSTANDING LEADERSHIP EMERGENCE: A LONGITUDINAL INVESTIGATION AS GROUPS DEVELOP OVER TIME

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ABSTRACT

UNDERSTANDING LEADERSHIP EMERGENCE:
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Scholars have discussed the spontaneous emergence of leader-follower structures even when groups set out to be leaderless. Given leaders' impact on individual, group, and organizational performance, it is important understand the process through which leaders emerge. Using a longitudinal design, the current study investigates the factors that predict leadership emergence as groups develop over time. Results based on 41 newly formed teams find that possessing the leaderlike characteristic of dynamism and fulfilling task roles are the strongest predictors of leadership emergence across time. Results also indicate that leadership emergence at the initial interaction is positively related to leadership emergence in the early and later phases of group development. Fluctuations in leadership emergence occur over time and can be predicted by fluctuations in role behaviors over time.

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INTRODUCTION

In the organizational sciences, there is a large body of evidence that supports the idea that leadership matters. In fact, research is clear in demonstrating that leaders significantly affect individual, group, and organizational performance (Gerstner & Day, 1997; Judge, Piccolo, & Ilies, 2004; Lowe, Kroeck & Sivasubramaniam, 1996). As an area of research, leadership is one of the most often studied constructs, with volumes appearing every year on the topic, as evidenced by over 23,000 articles which can be found when searching on the topic of leadership (ISI, 2007).

In addition to the evidence that leaders influence follower behaviors and group and organizational outcomes, is evidence that a leader-follower structure emerges spontaneously even when groups set out to be leaderless (Bass, 1954; Van Vugt, 2006). In organizations where leaderless groups such as project teams, autonomous work teams, and quality circles are present, individuals emerge as leaders in these groups and assume the leadership responsibilities (Bass, 1990; Guzzo & Salas, 1995). Thus, not only is it important to determine when, where, and how leadership affects organizational effectiveness and to help organizations choose better leaders (Hogan, Curphy & Hogan, 1994), it is equally important to understand the process through which leadership emerges, or come to influence a group of individuals. Unfortunately, emergent leadership has received considerably less research attention than leaders with "legitimate" authority (i.e., elected or appointed leaders) (Kickul & Neuman, 2000). Thus, several questions remain to be investigated regarding emergent leadership.

First, why does leadership emerge? Second, do different leaders emerge as a group develops? Or does the same individual emerge as the leader as the group develops,

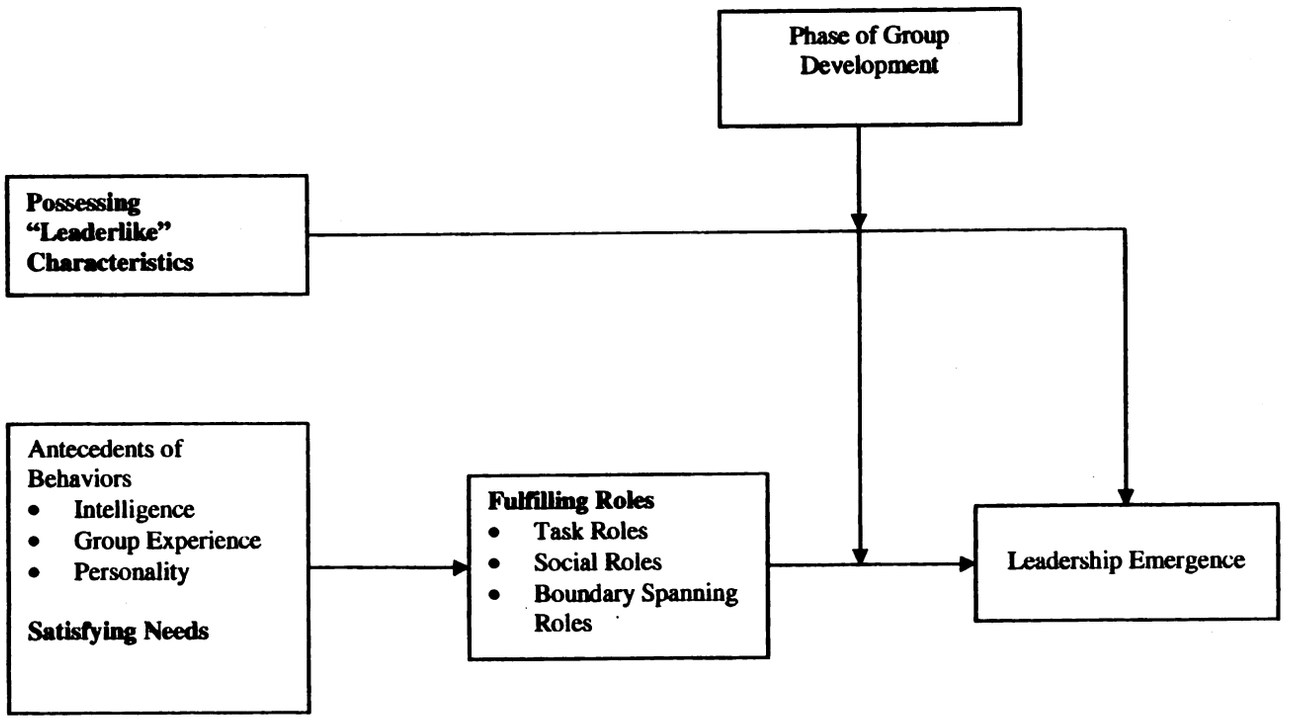
but for different reasons? Third, what predicts the emergence of leadership? More specifically, is the possession of "leaderlike" characteristics the only predictor of leadership emergence? Or do factors such as abilities, experience, and personality combine with the leaderless group context to determine the roles that individuals fulfill in the group and ultimately who emerges as the leader? Fourth, how does an individual's needs influence the roles they fulfill in the group? The present research attempts to address these general questions by constructing a model of leadership emergence and then empirically testing the model.

OVERVIEW

Understanding the leadership emergence process takes place in four distinct stages. First, I briefly define leadership and the context of the current study, that of initially leaderless or equal status groups. Second, I provide a review of literature on leadership and groups relevant to the current study. Third, I develop a conceptual model of leadership emergence which explains the process through which leaders emerge. Fourth, I use this model as the basis for developing specific hypotheses which are then empirically tested.

Figure 1 depicts the model that serves as a backdrop for this dissertation. The model proposes that leadership emerges due to three primary reasons: possessing leaderlike characteristics, fulfilling roles, and satisfying needs (Mann, 1959). The model also examines leadership emergence as groups develop over time. More specifically, the model examines whether different factors predict the emergence of leadership at the initial interaction of a group, versus early phases of group development, versus later phases of group development.

Figure 1. Model of Leadership Emergence



Definitions and Distinctions in Leadership Emergence

Context and Purposes of Current Study

In order to understand the definition of leadership used in the current study, it is important to understand the context and purposes of the study (Bass, 1960; 1990). First, the current study focuses on initially leaderless groups or equal status groups. In these groups, individuals are viewed as similar to one another, or equal, in terms of their role and status in the group. Each individual occupies the same role, that of a member in the group (Forsyth, 1990). These groups are ubiquitous in organizations, especially with the increased use of teams in organizations (Ilgen, 1999). Examples of these groups include project teams, autonomous work teams, and quality circles. Likewise, there is equality in each individual's position, such that each individual has the same status in the group (Bass, 1990). In terms of group development and structure, in the initially leaderless group or equal status group, the process of role differentiation (i.e., the emergence of roles in the group) has not yet occurred. As the group develops, however, it is likely that they will go through the process of role differentiation, in which various roles emerge. The roles that emerge within a group may vary according to the particular group, however, evidence indicates that group roles become increasing differentiated over time and can be classified into one of two basic categories: task roles and social roles (Benne & Sheats, 1948; Forsyth, 1990). The various roles that emerge within a group will be discussed in later sections of this dissertation.

Within the initially leaderless group or equal status group, the purpose of the current study is to examine three concepts. First, the current study will focus on leadership emergence in which an individual emerges from within a group to become the

leader of the group (Judge, Bono, Ilies, & Gerhardt, 2002; Mann, 1959). Leadership emergence focuses on the degree to which an individual is viewed as a leader by others (Hogan et al., 1994; Judge et al., 2002; Lord, DeVader, & Alliger, 1986) as well as the extent to which an individual comes to influence the group (Hollander, 1964). It should be noted that leadership emergence differs from leader effectiveness, which compares the performance of leaders in different groups (Judge et al., 2002). Thus, leadership effectiveness focuses on a leader's performance in influencing and guiding the activities of a group toward the achievement of its goals and is usually measured in terms of team, group, or organizational effectiveness (Judge et al., 2002; Stogdill, 1950).

Second, the current study will focus on how and why leadership emerges from initially leaderless or equal status groups. The current study will investigate three mechanisms through which leadership emerges: possessing leaderlike characteristics, fulfilling roles, and satisfying needs. The study will also provide theoretical justification for these mechanisms of leadership emergence based on existing theories. Third, the purpose of the current study is to examine the impact of group development on the emergence of a leader. The present research empirically examines leadership emergence as a group develops over time in order to understand whether different factors predict leadership emergence as a group develops. Thus the study will investigate the factors that predict leadership emergence during the initial interactions of the group versus early and later phases of group development and if these factors indeed differ over time. The study will also specifically examine the groups as they go through role differentiation and provide an understanding of the roles that are important for a group to function effectively and whether performance of these roles determines leadership emergence.

Definition of Leadership for Current Study

The current study utilizes the following definition of leadership: "the perception of influence by members of a group as well as the process through which an individual influences a group to achieve a common goal." This definition takes into account several components which have been identified as key to leadership such as 1) leadership is a perception, 2) leadership is a process, 3) leadership involves influence, 4) leadership occurs within a group, and 5) leadership involves group goal attainment (Bass, 1990; Northouse, 1997). The current definition ties to existing definitions of leadership as "the process whereby an individual influences a group of individuals to achieve a common goal" (Northouse, 1997, p. 3). The definition is also consistent with Yukl's summary of leadership as "the process of influencing others to understand and agree about what needs to be done and how it can be done effectively, and the process of facilitating individual and collective efforts to accomplish the shared objectives" (Yukl, 2002, p. 7) as well as Bass's summary of leadership as "an interaction between two or more members of a group that often involves a structuring or restructuring of the situation and the perceptions and expectations of the members" (Bass, 1990, p. 19).

The definition ties to the purposes of the current study in the following ways. First, it is clear that leadership takes place within a group in that the leader is perceived by members of the group as having influence and that the leader actually influences the group. The current study examines individuals emerging as leaders within a group and investigates the impact of group development on leadership emergence. Second, the definition discusses the influence process that takes place within the group. The current study examines the initially leaderless group and how an individual comes to influence,

or lead the group. Third, the definition also discusses two key distinctions of influence: the perception of influence as well as the process of influence. These tie to the current study which examines the extent to which group members perceive an individual as possessing leaderlike characteristics predicting leadership emergence (i.e., perception) and the extent to which the individual fulfills important roles within the group predicting leadership emergence (i.e., process).

LITERATURE REVIEW

In this section, I review the literature relevant to the current study. Due to the focus on leadership emergence, I will not review all theories or concepts in leadership, but only those that pertain to leadership emergence. These include trait based theories of leadership, situational/contingency theories of leadership, leadership behaviors, team leadership, and substitutes for leadership. After reviewing the relevant leadership theories, I will also review the relevant literature on groups. Group literature relevant to the current study includes the literature on group roles and group development. Finally, I will address gaps in the previous literature and how the current study will address these gaps.

Literature Review of Leadership

Trait Theories of Leadership

Much like that of the broader leadership literature, early work on leadership emergence was dominated by "great man theories" of leaders or trait based theories of leaders (Bowden, 1926; Carlyle, 1907; Judge et al., 2002; Kohs & Irle, 1920; Terman, 1904). Under this view, leadership was proposed to depend on the personal qualities of a leader which clearly differentiated leaders from followers (Bass, 1990; Jago, 1982). A

key study that supported the great man theory of leadership was conducted by Terman (1904) among school age children. The purpose of the study was to discover the individuals who were termed "leaders" by their classmates and to understand the qualities of these individuals. Results of the experiment found that individuals who were chosen as leaders by their classmates were perceived by their teachers to possess the traits of intelligence, congeniality, liveliness, and goodness (Terman, 1904).

Despite the dominance of trait based approaches to studying leadership, several studies investigating personality traits to leadership were inconsistent and often disappointing (Judge et al., 2002). For example, Goodenough (1930) reported a correlation of $r = .46$ between extraversion and leadership, thus lending support to the trait based approach. Other studies, such as one conducted by Richardson and Hanawalt (1943) did not support the trait based approach. Although the study found that college leaders scored lower in introversion than nonleaders, the difference was not significant. Further skepticism of great man theories was supported by other studies which failed to find a difference between leaders and nonleaders on extraversion (Hunter & Jordan, 1939; Remmelin, 1938) or found no significant correlation between extraversion and leadership (Bellingrath, 1930; Drake, 1944).

Skepticism of trait based approaches to leadership culminated in two different reviews which advocated for the importance of the situation over particular traits in leadership (Mann, 1959; Stogdill, 1948). In his review of the literature, Stogdill (1948) did find consistent relationships between traits and leadership and concluded "the average person who occupies a position of leadership exceeds the average member of his group in the following respects: intelligence, scholarship, dependability in exercising

responsibilities, activity and social participation, and socio-economic status" (p. 63). Stogdill (1948) also concluded "the qualities, characteristics, and skills required in a leader are determined in a large extent by the demands of the situation in which he is to function as a leader" (p. 63). In summarizing his findings, Stogdill (1948) remarked that "leadership is not a matter of passive status or of the mere possession of some combination of traits" (p. 66). Similarly, Mann (1959) found that intelligence, adjustment, and extraversion were positively related to leadership, but also concluded that a number of situational factors can influence this relationship.

These reviews were very influential on the leadership literature. Although the reviews by Stogdill (1948) and Mann (1959) focused on the relationship between traits and leadership emergence, the findings were also generalized to that of leadership effectiveness (Lord et al., 1986). The impact of the reviews on the leadership emergence literature was that leadership theorists began to generally disregard trait explanations of leadership emergence (Zaccaro, Foti, & Kenny, 1991). Thus, it was concluded that traits alone could not be used as reliable predictors of leadership emergence because traits could not consistently differentiate leaders from non leaders across a variety of situations (Garland & Beard, 1979; Lord et al., 1986).

Later work by Lord and colleagues reexamined the relationship between traits and leadership emergence as they believed the reviews by Stogdill (1948) and Mann (1959) were often misinterpreted, and that there were theoretical and methodological reasons for reconsidering the relationship (Lord et al., 1986). In their meta-analysis, intelligence, dominance, masculinity–femininity, and extraversion were found to significantly relate to leadership emergence with effect sizes of $\rho = .50$, $\rho = .13$, $\rho = .34$, and $\rho = 26$,

respectively. Thus, the review did provide some important support for the relationship between traits and leadership emergence. More recent meta-analytic work has further clarified the relationship between traits and leadership emergence (Judge, Colbert, & Ilies, 2004; Judge et al., 2002). Findings from the meta-analysis on intelligence and perceived leadership emergence found a significant positive relationship between intelligence and perceived leadership emergence ($\rho = .19$ corrected for unreliability; $\rho = .25$ corrected for range restriction). Overall, however, the results suggested that the relationship between intelligence and leadership was considerably lower than previously thought (Judge et al., 2004).

In their meta-analysis examining personality and leadership, Judge and colleagues (Judge et al., 2002) hoped to clarify the inconsistent results from previous reviews by using the Big Five personality framework (Goldberg, 1990) for classifying and organizing personality traits. Findings from the meta-analysis found extraversion, openness, and conscientiousness to be significantly related to leadership emergence ($\rho = .33$, $\rho = .24$, $\rho = .33$, respectively). Although the results from the study provide support for the trait based theory of leadership, the authors also noted that they believed "there are many situational factors that may moderate the validity of personality in predicting leadership" (Judge et al., 2002, p. 774).

Recent research in leadership emergence has begun to investigate other variables which relate to the emergence of leaders. Rather than taking the traditional variable approach to studying personality and leadership emergence, more recent research has taken a pattern approach to studying the impact of personality. The traditional variable approach focuses on classic individual differences, or variables, studied across persons,

and their relationship to leadership emergence. An example of this research includes studies which examine variables such as extraversion and its correlation with leadership (e.g. Gough, 1990, Judge et al., 2002). In contrast, the pattern approach focuses on the pattern of individual differences, or variables, and their relationship to leadership emergence. Recent research in this area studied the pattern of individual differences of intelligence, dominance, general self-efficacy, and self-monitoring. Thus, rather than focusing on whether high intelligence, dominance, general self-efficacy, or self-monitoring individually related to leadership emergence, the research examined whether an individual who is high on all four variables, versus an individual who is high on two of the variables, or low on all four variables related to leadership emergence. The research found that a pattern of high intelligence, high dominance, high general self-efficacy, and high self-monitoring was associated with leadership emergence (Foti & Hauenstein, 2007; Smith & Foti, 1998) versus a mixed pattern (i.e. high on two variables, low on two variables or low pattern (i.e. low on all four variables).

Situational/Contingency Theories of Leadership

After the reviews by Stogdill (1948) and Mann (1959), the leadership literature focused on situational based theories of leadership (Bass, 1990). Researchers reasoned that any trait's effect on leadership behavior would depend on the situation (Yukl & Van Fleet, 1992). By taking a situational based approach, leadership was seen as a matter of situational demands such that situational factors determined the emergence of a leader (Bass, 1990). In the leadership emergence literature, researchers used the interactional interpretation of leadership emergence to examine factors such as the composition of the group and type of task as determinants of the emergence of a leader.

Examples of this interactional approach include research which contrasted a trait based approach to leadership emergence with an interactionist approach. In this research, rotation designs were used in which some aspects of the group, such as member composition and type of task, were varied over a series of interaction sessions. In Barnlund's (1962) study, the degree of consistency in leadership emergence was examined with changing tasks and changing membership. Results of the study supported the view that leadership emergence was dependent on situational variables such as group tasks and membership. However, in 1983 the data was reanalyzed by Kenny and Zaccaro and found that 49% of the variance in leadership emergence can be attributed to the traits of the leaders (Kenny & Zaccaro, 1983). Other research also confirmed this finding in that there was a significant tendency for a person to be seen as a leader across a variety of group situations (Zaccaro et al., 1991).

The situational approach to leadership was also investigated more broadly in the leadership literature where researchers theorized that the traits of a leader which were effective in one group or situation might be quite different from those of another leader in a different group or situation (Cartwright & Zander, 1956). This approach to leadership was theorized as early as Hegel, who believed that the great man was an expression of the needs of his time (Bass, 1990). The basic premise of the situational view is that different situations demand different types of leadership and an effective leader is the individual who can adapt his or her style to the demands of the situation (Northouse, 1997).

An example of the situational view of leadership includes Hersey and Blanchard's model (1969a; 1969b) which takes into account both the leadership style and the developmental level of subordinates. In their model, leaders can have two different styles:

a directive style or a supportive style. With a directive style, leaders assist group members in goal accomplishment by clarifying what is to be done, how it is to be done, and who is responsible for doing it. A supportive style of leadership shows social and emotional support to group members. Based on the developmental level of their subordinates, the leader adopts some combination of a directive and supportive leadership style (Blanchard, Zigarmi, & Zigarmi, 1985).

Support for the Hersey and Blanchard (1969a; 1969b) model is mixed. For example, one study supported the model as an approach to improve learning during a management training seminar. Results of the study found that the experimental group, who was trained using the four different styles based on their maturity level, or time in training, did learn significantly more than the control group (Hersey, Angelini, & Carakushansky, 1982). Other research has also found a statistically significant increase in the job performance of subordinates when supervisors applied the Hersey-Blanchard model (Hambleton & Gumpert, 1982). In contrast, other research found no relation between manager's self reported styles and employees' description of the manager's style and found no connection with organizational productivity (Narayanan, Venkatachalam, & Bharathiar, 1982). Research by Vecchio (1987) also found mixed support for the model when investigating the satisfaction and performance of high school teachers. Results of the study found that the style of leadership suggested by the model was appropriate for relationships between newly hired, or inexperienced, teachers and their principals as they were more satisfied and performed better. The study did not find support for the model when it was applied to teachers of moderate to high maturity as their performance was unrelated to the style their principals exhibited (Vecchio, 1987).

Similar to situational theories of leadership are contingency theories of leadership in which the leader's effectiveness depends on how well the leader's style fits the context (Northouse, 1997). The key contingency theory of leadership is Fiedler's contingency theory (1964, 1967; Fiedler & Garcia, 1987). Like situational theories of leadership, contingency theory is concerned with leadership styles and situations and effectively matching the leader and the situation. The style of the leader is described as either task-motivated or relationship-motivated. Task-motivated leaders are concerned with their group's achievement of goals, whereas relationship-motivated leaders are concerned with developing close, interpersonal relationships within their group. The style of the leader is measured using the Least Preferred Co-worker (LPC) scale, where a high score is a relationship-motivated style and a low score is a task-motivated style (Fiedler & Chemers, 1974). Under the contingency theory of leadership, leaders who are task-motivated will be effective in both favorable and unfavorable situations, whereas leaders who are relationship-motivated will be most effective in moderately favorable situations (Fiedler, 1967; Fiedler & Garcia, 1987).

As one of the most well-known and widely researched theories of leadership (Bass, 1990; Schriesheim, Tepper, & Tetrault, 1994), Fiedler's contingency theory (1964, 1967; Fiedler & Garcia, 1987) has also had its share of controversy. Several meta-analyses have been conducted on the model (e.g. Crehan, 1984; Peters, Hartke, & Pohlmann,1985; Schriesheim et al., 1994; Strube & Garcia, 1981). Two of the meta-analyses concluded there was sufficient evidence to warrant further investigation and exploration, rather than abandonment, of the model (Peters et al., 1985; Strube & Garcia, 1981). Results from the most recent meta-analysis also provided cautious support of the

contingency model, by finding that both high- and low-LPC leaders were more effective in certain situations versus others (Schriesheim et al., 1994).

Leadership Behaviors

In the leadership emergence literature, two types of leader behaviors are often studied, task related behavior and social related behavior (e.g. Ellis, 1998; Kellett, Humphrey, & Sleeth, 2006; Kickul & Neuman, 2000; Marta, Leritz, & Mumford, 2005). The concept of these two types of leader behaviors comes from previous research which examined effective leadership behavior. Research at Ohio State University and the University of Michigan identified two broadly defined categories of leader behavior. The Ohio State studies identified the two leader behaviors of consideration and initiating structure. Consideration includes behavior by the leader which supports and shows concerns for subordinates whereas initiating structure includes behaviors in which the leader defines and structures his or her own role as well as the role of the subordinates toward goal attainment (Stogdill, 1974).

Research at the University of Michigan produced similar findings by identifying support, interaction facilitation, goal emphasis, and work facilitation (Bowers & Seashore, 1966). Support and interaction facilitation focused on social and supportive aspects of the leader's behaviors such as enhancing someone's feeling of worth and encouraging members to develop close relationships. Goal emphasis and work facilitation focused on the task behavior of the leader such as stimulating enthusiasm for the group's goal and behavior that helps achieve goal attainment (Bowers & Seashore, 1966).

These factors were similar to that of work by Likert (1961, 1967), which were summarized as task-oriented behavior and relations oriented behavior. Task oriented

behavior by the leader focuses on getting work accomplished and includes concentrating on task oriented functions such as planning and scheduling, coordinating, and providing necessary support. Employee or relations oriented behavior by the leader has a human relations emphasis and includes being supportive and helpful to subordinates (Likert, 1961, 1967). As one can see, task oriented behaviors, or goal emphasis and work facilitation, are similar to that of initiating structure. Relations oriented behaviors, or support and interaction facilitation, are also similar to consideration.

Research on leader behaviors has been substantiated by multiple research studies (Northouse, 1997) and consideration and initiating structure have been noted to be "among the most robust of leadership concepts" (Fleishman, 1995, p. 51). In their meta-analytic summary of consideration and initiating behavior, Judge and colleagues (Judge et al., 2004) found that both behaviors had moderately strong, nonzero relations with leadership outcomes ($\rho = .48$ and $\rho = .29$, respectively). Among the two behaviors, the results found that consideration was more strongly related to follower job satisfaction ($\rho = .46$), leader satisfaction ($\rho = .78$), motivation ($\rho = .50$), and leader effectiveness ($\rho = 52$). In contrast, initiating structure was more strongly related to leader job performance ($\rho = .24$) and group–organization performance ($\rho = .30$) (Judge et al., 2004).

The leadership emergence literature has utilized task and social behaviors such as initiating structure and consideration as indicators of leadership in the group, and thus indictors of leadership emergence (Ellis, 1998; Kickul & Neuman, 2000; Marta et al., 2005). In addition, research has utilized these two types of leader behaviors as the basis for examining the emergence of a task and social leader in a group. In an empirical study, Kellett and colleagues (Kellett et al., 2006) investigated relationships among emotional

abilities, cognitive abilities, and leadership emergence. In the study, they posited that there were two types of leadership in a group: task leadership and relations (i.e., social) leadership. In the study, task leadership was concerned with maintaining or improving processes that facilitated the accomplishment of tasks. Relations leadership was concerned with maintaining or improving cooperative interpersonal relationships that built trust and loyalty (Kellett et al., 2006). Results of the study indicated that cognitive ability ($\beta = .13, p < .05$), complex tasks ($\beta = .16, p < .01$), empathy ($\beta = .29, p < .01$), and the ability to express one's own emotions ($\beta = .30, p < .01$) were related to task leadership, whereas the ability to identify others' emotions was unrelated to task leadership. Empathy ($\beta = .43, p < .01$) and the ability to identify others' emotions ($\beta = .19$, $p < .05$) were related to relations leadership, whereas cognitive ability, complex tasks, and the ability to express one's own emotions were unrelated to relations leadership (Kellett et al., 2006).

Team Leadership

Given the increased use of teams in organizations (Ilgen, 1999), a rapidly growing area of leadership theory and research is on team leadership theory (Hill, 1997). Although it is a rapidly growing area, functional leadership theory was first theorized by McGrath (1962) over 40 years ago. According to functional leadership theory, "[the leader's] main job is to do, or get done, whatever is not being adequately handled for group needs" (McGrath, 1962, p. 5). An effective leader is one that ensures that all functions critical to both task accomplishment and group maintenance are adequately taken care of by the group (Zaccaro, Rittman, & Marks, 2001). Key leadership functions identified by this theory are diagnosing group deficiencies, taking action to correct deficiencies, forecasting

environmental changes, and taking action in response to environmental changes (Hackman & Walton, 1986).

One important caveat to team leadership is that the functions need not be carried out by a hierarchical leader, but instead, the functions may be performed by the group as a whole. This is especially the case in the context of self-managing teams who have a large amount of autonomy and control over their immediate work environment (Cohen, Chang, & Ledford, 1997). Self-managing teams are often lead by an "external" leader (Manz & Sims, 1987; Morgeson, 2005; Wageman, 2001), whose behaviors differ from that of the informal leader of the team (Manz & Sims, 1987). Results of empirical work on self-managing teams finds that the informal team leader performs key leader behaviors such as facilitating resources, training team members, and working alongside team members (Manz & Sims, 1987).

Leadership emergence has also been studied within the context of self-managing teams. In an empirical investigation, Taggar and colleagues (Taggar, Hackew, & Saha, 1999) investigated the relationship between individual differences and leadership emergence and the influence of leadership emergence on team performance in teams without a formal leader. Results of the study found that cognitive ability contributed most to explaining leadership emergence, followed by conscientiousness, extraversion, and neuroticism. The study also found an interaction between the ratings of the team leader's leadership and the ratings of other team members' leadership in that higher leadership on the part of both the team leader and the rest of the team yielded higher team performance. Lower leadership on the part of the other team members neutralized the effect of a high leadership from the team leader. Likewise, lower leadership on the part of the team leader

neutralized the effects of higher leadership from the other team members. Thus high leadership on the part of the team leader or the other team members alone was insufficient for bringing about higher team performance. The study concluded that the team leader is a facilitator of team performance, rather than being the dominant contributor to team performance (Taggar et al., 1999).

Substitutes for Leadership

The final leadership theory relevant to the current study is Kerr and Jermier's (1978) substitutes for leadership theory. According to this theory, two kinds of situational variables, substitutes and neutralizers, reduce the importance of leadership and therefore may inhibit the emergence of a leader. Substitutes for leadership include characteristics of the subordinates, task, or organization that ensure that subordinates will clearly understand their roles, know how to do the work, be motivated to perform, and be satisfied with their jobs. Substitutes make leader behavior unnecessary and redundant and include experience of subordinates, structured, routine tasks, and formal roles and procedures. Neutralizers include any characteristic of the subordinate or organization that prevent the leader from acting in a certain way or nullify the effects of the leader's actions. Examples of neutralizers include subordinate's indifference toward rewards and dispersed work sites for subordinates (Kerr & Jermier, 1978).

Support for the theory has been limited and empirical research on the theory has concluded that few leadership substitutes actually moderate leader behaviors and subordinate criterion variable relationships. In addition, in those cases in which a substitute variable has a moderating effect, it has been found to account for little variance in the criterion measure and has no consistent moderating pattern across studies

(Podsakoff, MacKenzie, & Bommer, 1996). In a comprehensive review and meta-analysis of the substitutes for leadership theory, it was found that the substitutes explained substantial proportions of the variance in subordinate criterion variables. The model, however, proposes that the substitutes serve as moderators of the leader behavior-subordinate criterion variable relationships. Results of the meta-analysis found little evidence for the substitutes moderating the relationship between leader behavior and subordinate motivation or satisfaction (Podsakoff et al., 1996).

Literature Review of Groups

As leadership emergence focuses on an individual emerging from within a group to become the leader of the group (Judge, et al., 2002; Mann, 1959), it is important to understand the characteristics and processes of groups which may impact the emergence of a leader. A group is defined as "two or more interdependent individuals who influence one another through social interaction" (Forsyth, 1990, p. 7). Despite differences in size, structure, and activities, all groups can be said to have interdependence among their members (Lewin, 1948). Key characteristics of groups relevant to the current study include their development and role structure.

Group Development

A key characteristic of groups is the fact that they typically change and are continually developing. Research on group dynamics identifies two patterns of change that groups tend to follow: cyclical models and successive-stage theories (Forsyth, 1990; Shambaugh, 1978). Cyclical models posit that during various phases of group development, certain issues tend to dominate group interaction and that these issues recur later in the life of the group. One early example of a cyclical model is Bales' model

(1965) which proposed that groups oscillate between task and social concerns and strive to maintain a balance between the two concerns.

A recent example similar to the cyclical models is the recurring phase model of group development (Marks, Mathieu, & Zaccaro, 2001). In their model, Marks and colleagues view group performance episodes as consisting of multiple input-process-output (I-P-O) cycles that run sequentially and simultaneously. Thus, groups perform in temporal cycles of goal-directed activity, called "episodes" (Weingart, 1997; Zaheer, Albert & Zaheer, 1999). Episodes are defined "as distinguishable periods of time over which performance accrues and feedback is available" (Marks et al., 2001, p. 359; Mathieu & Button, 1992). The duration of episodes can vary depending on the nature of the task, the technology, and the method in which the task is completed. Groups continue to cycle through the episodes, as completion of one episode normally marks the start of another episode (Marks et al., 2001).

In their model, episodes are marked by identifiable periods of action and transition periods between actions. Action phases are periods of time when the group is engaged in acts that contribute directly to goal accomplishment. Transition phases are periods of times when the group focuses on evaluation and planning activities in order to guide their accomplishment of the team's goal or objective. Over time, groups will go through multiple action and transition phases in order to accomplish their task (Marks et al., 2001).

Successive-stage theories specify the order of group development phases. An early successive-stage model is Tuckman's (1965) model of group development. The model specifies that groups move through four distinct stages: forming, storming,

norming, and performing. The forming stage is characterized by uncertainty and anxiety. During this stage, group members primarily focus on becoming familiar with one another's views and abilities. Group members also discuss general work issues, appropriate behaviors, and expected contributions. The storming stage is characterized by intragroup conflict in which the group conflicts as they try to reach agreement on the purpose, goals, and objectives of the group. Differences of opinion often emerge in this stage as members try to achieve consensus on how to accomplish the group's task. In this stage, the structure of the group begins to form through various roles and norms which will allow the group to accomplish the task.

The third stage of the Tuckman (1965) model is the norming stage in which the purpose of the group is reestablished based on the structure of roles developed in the previous phase. In this stage, group harmony replaces group conflict and reaching a consensus on the purpose of the group also allows the members to develop additional rules, norms, and procedures for coordination in the group. The performing stage represents the final stage in the group's development which is where group members perform theirs roles and the group works toward attaining its goals (Tuckman, 1965).

A similar successive stage model of group development is the team compilation model by Kozlowski and colleagues (Kozlowski, Gully, Nason, & Smith, 1999). Due to the criticism that previous models conceptualize that groups proceed through the same sequence without variation (Sundstrom, De Meuse, & Futrell, 1990), Kozlowski et al.'s (1999) model conceptualizes group development as a more continuous series of stages with overlap at the transitions. In the model, group development is represented as a

waveform with peaks corresponding to in-phase activity and troughs corresponding to transition points.

The model is similar to that of Tuckman (1965) in that is also proposes four phases of group development: team formation, task compilation, role compilation, and team compilation. However, the model views the process as proceeding across levels and time. The model specifies the content, processes, and outcomes that are relevant at different levels and at different stages in the group's development. The first stage of the model, the team formation stage focuses on the individual and the content of social knowledge. The primary process in this stage is socialization in which group members gain interpersonal knowledge of one another and orienting themselves to the team. The second stage of task compilation also focuses on the individual as well as on the content of task knowledge. Skill acquisition is the primary process in this stage as group members focus on mastery of the task and self-regulation (Kozlowski et al., 1999).

The third stage in the model is the role compilation model in which the focus now turns to the dyad and the content of role knowledge. The primary process in this stage is role negotiation in which members begin to identify and routinize their roles in the group. The final stage in the model is team compilation where the focal level is the team. In this stage, the group has developed a sense of group capabilities and come to be self-managing. The group may also focus on continuous improvement and adaptability in this stage (Kozlowski et al., 1999; Kozlowski, Watola, Jensen, Kim, & Botero, 2009).

The final model of group development that builds from the Tuckman (1965) model is Gersick's (1988, 1989) punctuated equilibrium model. The model posits that groups do not move through the four developmental stages in a predictable, stepwise

manner, but instead follow a more erratic method. In the research, Gersick (1988, 1989) found that project-based groups experience a punctuated equilibrium near the halfway point of the project. At the halfway point, group members are able to estimate their progress toward the final goal of the project and whether or not they will reach their goal. This estimation often leads groups that have stalled in the second and third stages of development to progress to the final stage (Gersick, 1988, 1989).

Group Roles

As groups interact and develop, they begin to define the roles needed in the group and what members will occupy the different roles in the group. The defining and differentiation of roles between group members occurs primarily in the early phases of group development (Kozlowski et al., 1999). Roles are defined as sets of behaviors, or clusters of related and goal-directed behaviors, that are characteristic of an individual in a specific situation or particular social context (Biddle, 1979; Stewart, Manz & Sims, 1999). Roles are one of the key characteristics of groups and important determinants of group performance. Thus, it is important to understand how individuals contribute to the group through the roles they occupy in the group (Belbin, 1993; Hackman, 1990; Sundstrom et al., 1990).

Although there are a variety of roles that emerge in group development, evidence indicates that roles become differentiated into one of two basic categories: task roles and social roles (Benne & Sheats, 1948; Forsyth, 1990). Task roles are concerned with accomplishing the task at hand, organizing the group to attain goals, and providing support for other group members. Social roles include performing actions that help satisfy the emotional needs of the group members (Benne & Sheats, 1948; Forsyth,

1990). The task and social roles that develop in teams are similar to the leader behaviors identified in the leadership literature, which were reviewed in the previous section on leader behaviors.

In their work on group roles, Mumford and colleagues identified ten different roles which operate in groups, which can be classified under three basic categories of task roles, social roles, and boundary spanning roles (Mumford, Campion, and Morgeson, 2006). Table 1 provides a summary of the group roles. The task roles include five roles which include behaviors such as planning, organizing, and completing the work, sharing information among group members, and helping to solve problems. The first task role, the contractor role, focuses on efficiency and performs behaviors which provide structure to the task such as organizing the work and clarifying responsibilities. The second task role, the contributor role, functions to contribute critical information or expertise to the team and includes behaviors such as sharing knowledge and communicating ideas (Mumford et al., 2006).

The third task role, the completer role, represents behaviors that contribute to the effectiveness of the group by members of the group taking personality responsibility for tasks and following through on commitments to the group. The fourth task role, the critic role, focuses on the critical evaluation of the group's ideas and decisions. Thus, the critic role questions the actions of the group, and may point out flaws or assumptions the group is making. The final task role, the creator role, provides new and innovative approaches to the task of the group. Behaviors of the creator role include seeing the big picture, and emphasizing creative approaches to the tasks that go beyond organizing (Mumford et al., 2006).

Table 1. *Taxonomy of Group Roles*

Type of Role	Specific Role	Description	
Task	Contractor	Organizes the work and keeps others focused on getting it done efficiently.	• Organizes the team's work to get important work done on time • Coordinates the work done by others so that things are done in the right order. • Helps the team focus on getting the job done efficiently
	Contributor	Shares information and advice with the team in areas where he/she has a lot of experience.	• Speaks out when he/she knows the most about the work to be done. • Shares with the team any knowledge he/she has about the work to be done • Takes the lead in the team when he/she has a lot of experience in that area of work
	Completer	Takes personal responsibility for the team's work, volunteers for new jobs and follows through on the commitments made.	• Takes personal responsibility for getting the work done • Finishes work for the team on time without being reminded • Follows through on commitments made to the team
	Critic	Thoroughly thinks through what the team is doing to make sure they are not rushed and consider both positive and negative aspects.	• Speaks up if he/she has concerns with the work the team is doing • Makes sure the team talks about both positive and negative consequences of decisions. • Shares honest opinions about how the team is working, even if the opinion is not favorable
	Creator	Has new and creative ideas for solving problems and getting the work done.	• Suggests creative ways to solve the team's problems. • Helps the team take a fresh perspective on problems • Sees the "big picture" and has creative ideas for handling problems

Table 1 continued. *Taxonomy of Group Roles*

Type of Role	Specific Role	Description	
Social	Calibrator	Helps the team get along together by helping to settle conflicts, deal with difficult problems, and be respectful.	• Helps settle conflicts between members of the team • Suggests positive ways for the team to interact such as taking turns, showing respect, and being open to new ideas • Steps in if there are negative feelings in the team to help resolve the difficulties
	Communicator	Communicates clearly, honestly, and respectfully with others, making the work atmosphere more comfortable because he/she is pleasant to work with.	• Makes the work pleasant and comfortable by being happy and easy to work with • Communicates personal feelings and thoughts respectfully and without offending anyone • Listens carefully to the thoughts and feelings of others
	Cooperator	Supports the team and other team members in their work even if he/she would have personally done it differently	• Supports the team and its goals after having given input, even if he/she would have personally set different goals • Admits when others have more experience in particular areas and trusts their judgment • Recognizes the expertise of others and allows them to take a leadership role in the team
Boundary Spanning	Coordinator	Interacts with people outside of the team to coordinate the sharing of information, money, ideas, and other resources.	• Goes outside the team to bring in new resources that help the team work effectively • Gets information from sources outside the team before making an important decision • Interacts with people outside the team to get special knowledge about the work, the product, customers or management.
	Consul	Interacts with supervisors and managers outside of the team to present the team and its accomplishments in a favorable light.	• Gets support for the team with important people outside the team such as supervisors and managers. • Tells the supervisors and managers favorable information about the team and its goals • Tries to provide supervisors and managers with frequent updates about the team's accomplishments

Sources: Mumford, et al., 2006, 2008.

The social roles include the three roles of calibrator, communicator, and cooperator, which include behaviors such as managing conflict in the group, communicating with the group, and supporting the group. The first social role, the calibrator role, focuses on the social processes in the group and suggests changes to the processes in order to improve group functioning. Behaviors of the calibrator role include initiating discussions of power struggles in the group and settling disputes among group members. The second social role, the communicator role, is primarily concerned with making the group social environment positive, open, and conducive to collaboration. Thus, the communicator role pays attention to the feeling of group members, listens to the opinions of others, and communicates personal sentiments effectively. The final social role, the cooperator role, focuses on supporting the progress of the group by conforming to expectations and influence attempts of other group members. Behaviors of the cooperator role include a willingness to support the decision of the group, even if they originally disagreed with the group's position (Mumford et al., 2006).

The final roles include the boundary spanning roles, which recognize that important behaviors by group members often occur outside the group. The two boundary spanning roles include the coordinator role and consul role, which are primarily concerned with interacting with people outside the group. The coordinator role involves interactions that take place outside the group that function to interface with constituents and coordinate group efforts with others. Behaviors of the coordinator role include visiting other groups, passing on information to other groups, or communicating with outside constituents about their needs. The consul role involves interactions that take place outside the group that function to present the group, its goals, and its interests in a

favorable light. The consul role also attempts to influence constituent perceptions of the likelihood of group success and willingness to provide resources (Mumford et al., 2006).

Empirical research has examined the performance of task, social, and boundary spanning roles in a group. In a sample of undergraduate student project teams, group members rated the extent to which a group member carried out the role behaviors in the group. Performance of task roles were positively correlated with both the social and boundary spanning roles ($r = .61, p < .01$; $r = .54, p < .01$, respectively). Performance of social roles and boundary spanning roles were also positively correlated ($r = .48, p < .01$; Mumford, Van Iddekinge, Morgeson, & Campion, 2008). The study also examined the performance of the roles in a sample of production and maintenance groups in the food manufacturing industry. Results found that performance of task roles were positively correlated with both the social and boundary spanning roles ($r = .49, p < .01$; $r = .30, p < .01$, respectively). Performance of social roles and boundary spanning roles were also positively correlated, but not significantly ($r = .18$, *n.s.*; Mumford et al., 2008.).

Gaps in the Previous Literature

Although the past research has advanced the knowledge of who emerges as a leader, several gaps still remain in the current state of the literature. First, the trait based approaches to leadership emergence have primarily focused on personality and intelligence as predictors of leadership emergence (Judge et al., 2002; Judge et al., 2004; Lord et al., 1986). This overlooks the fact that personality and intelligence can also combine with experience and motivation to satisfy needs to predict the behavior of individuals (Mitchell & Daniels, 2003). Furthermore, the previous literature on leadership emergence has not taken into account the implicit beliefs individuals have concerning

leadership (e.g., Lord, 1985; Lord & Alliger, 1985; Lord & Maher, 1993) and how these impact leadership emergence.

Second, although the leadership emergence literature has examined factors such as composition of the group and type of task as predictor of leadership emergence (e.g. Barnlund, 1962), it has neglected to examine the role of group development as a potential determinant of leadership emergence. Thus, we know nothing about whether different leaders emerge as a result of the amount of time a group has interacted, or if the same leader emerges at different phases, but for different reasons. This is an interesting area of investigation given the fact that in other leadership research it has been suggested and empirically demonstrated that there are different influences on the leader-member relationship depending on the stage or maturity of the relationship (Bauer & Green, 1996; Dienesch & Liden, 1986).

Third, previous research in leadership and group roles has primarily focused on two types of behaviors or roles, task and social. This neglects a third area of roles, the boundary spanning roles, which have been found to be important for the effectiveness of groups (Ancona, 1990; Marrone, Tesluk, & Carson, 2007). The team leadership literature would indicate a leader's job is to perform the functions needed for group to function effectively (McGrath, 1962). Thus, performance of the boundary spanning roles may be an important determinant of leadership emergence. Finally, previous research has neglected to examine the performance of group roles as the process through which a leader emerges in a group.

Overview of Predictions in Current Study

The current study will address these gaps by examining leadership emergence as groups develop over time. Figure 2 models the predictions of the current study, and will serve as the basis for organizing the hypotheses development in the following section. Table 2 also summarizes the hypotheses of the current study. The model proposes that different leaders may emerge at different time periods. That is, in the initial interaction of a group, a leader may emerge, whereas in early or later phases of group development, a different leader may emerge, or the same leader may emerge, but for different reasons. This is consistent with previous work which defined differences between ascribed and achieved status (Arnoff & Wilson, 1985). Ascribed status in a group includes obtaining status based on observable individual differences which result in attributions of competency or leadership ability. Individuals obtain ascribed status based on implicit leadership theories, schemas, or stereotypes, with or without accompanying behavioral support. Achieved sources of status result from a person earning status in a group based on their over-time valued behaviors and tangible contributions to others (Arnoff & Wilson, 1985; Neubert & Taggar, 2004).

The notion of ascribed and achieved status are similar to Mann's (1959) conceptualization of why leaders emerge in that leaders may emerge in leaderless or equal status teams because they exhibit the traits associated with the leadership expectations of their group members. Thus, members of the group ascribe status by means of identifiable individual differences. Achieved status is similar to Mann's (1959) proposition that leaders emerge because they fulfill roles necessary for the group to function successfully and because they satisfy their needs through interaction (Mann,

Table 2. *Summary of Hypotheses*

	Leadership Emergence Composite		Leadership Emergence Ratings	
Hypothesis	Peer	Observer	Peer	Observer
Hypothesis 1: The prototypical leader characteristics of (a) sensitivity, (b) intelligence, (c) dedication, and (d) dynamism will be positively related to leadership emergence at the initial interaction of a group.	• 1a-1c Not Supported • 1d Supported	• 1a-1c Not Supported • 1d Supported	• 1a and 1c Not Supported • 1b and 1d Supported	• 1a-1c Not Supported • 1d Supported
Hypothesis 2: The antiprototypical leader characteristic of tyranny will be negatively related to leadership emergence at the initial interaction of a group.	• Not Supported	• Not Supported	• Not Supported	• Not Supported
Hypothesis 3: The antiprototypical leader characteristic of masculinity will be positively related to leadership emergence at the initial interaction of a group.	• Not Supported	• Not Supported	• Not Supported	• Not Supported
Hypothesis 4: Intelligence will be positively related to engagement in the task roles in the early phases of group development.	• Not Supported		• Not Supported	
Hypothesis 5: Group experience will be positively related to engagement in the (a) task roles and the (b) social roles in the early phases of group development.	• Not Supported		• 5a Supported • 5b Not Supported	
Hypothesis 6: Group experience will be positively related to engagement in the boundary spanning roles in the later phases of group development.	• Not Supported		• Not Supported	
Hypothesis 7: The conscientiousness facets of (a) orderliness, (b) achievement-striving, and (c) self-discipline will be positively related to engagement in the task roles in the early phases of group development.	• Not Supported		• Not Supported	

Table 2 continued. *Summary of Hypotheses*

Hypothesis	Leadership Emergence Composite		Leadership Emergence Ratings	
	Peer	Observer	Peer	Observer
Hypothesis 8: The extraversion facet of assertiveness will be positively related to engagement in the task roles in the early phases of group development.	• Not Supported		• Supported	
Hypothesis 9: The openness to experience facets of (a) intellect and (b) imagination will be positively related to engagement in the task roles in the early phases of group development.	• Not Supported		• Not Supported	
Hypothesis 10: The extraversion facet of friendliness will be positively related to engagement in the social roles in the early phases of group development.	• Not Supported		• Not Supported	
Hypothesis 11: The extraversion facet of assertiveness will be negatively related to engagement in the social roles in the early phases of group development.	• Marginally Supported		• Marginally Supported	
Hypothesis 12: The extraversion facets of (a) gregariousness and (b) assertiveness will be positively related to engagement in the boundary spanning roles in the later phases of group development.	• 12a Supported • 12b Not Supported		• Not Supported	
Hypothesis 13: Intelligence, group experience, conscientiousness facets of orderliness, achievement-striving, and self-discipline; extraversion facet of assertiveness; and openness to experience facets of intellect and imagination will incrementally predict engagement in the task roles.	• Not Supported		• Not Supported	

Table 2 continued. *Summary of Hypotheses*

	Leadership Emergence Composite		Leadership Emergence Ratings	
Hypothesis	Peer	Observer	Peer	Observer
Hypothesis 14: Group experience and extraversion facets of friendliness and assertiveness will incrementally predict engagement in the social roles.	• Not Supported		• Not Supported	
Hypothesis 15: Group experience and extraversion facets of gregariousness and assertiveness will incrementally predict engagement in the boundary spanning roles.	• Not Supported		• Not Supported	
Hypothesis 16: Fulfillment of the (a) task and (b) social roles will be positively related to leadership emergence in the early phases of group development.	• 16a Supported • 16b Not Supported	• 16a Supported • 16b Not Supported	• 16a Supported • 16b Not Supported	• 16a Supported • 16b Not Supported
Hypothesis 17: Fulfillment of the boundary spanning roles will be positively related to leadership emergence in the later phases of group development.	• Not Supported	• Marginally Supported	• Not Supported	• Marginally Supported
Hypothesis 18: Fulfillment of the task and social roles will mediate the relationship between (a) intelligence, (b) group experience, and (c) personality and leadership emergence in the early phases of group development.	• Not Supported	• Not Supported	• 18b Supported • 18c Supported for Assertiveness • 18a Not Supported	• 18c Supported for Assertiveness • 18a-b Not Supported
Hypothesis 19: Fulfillment of the boundary spanning roles will mediate the relationship between (a) group experience and (b) personality and leadership emergence in the later phases of group development.	• Not Supported	• Not Supported	• Not Supported	• Not Supported

1959). Hollander (1964) also described similar status differences in his work by defining status achievement and status maintenance. In status achievement, an individual attains the necessary power to direct the group, primarily influenced by the individual's characteristics, such as perceived competency. Status maintenance occurs once influence in the group is achieved, and the individual is working to retain their influence in the group. In order to retain influence, a leader must take into account the working relationships in the group and must innovate and change in order to maintain leadership (Hollander, 1964).

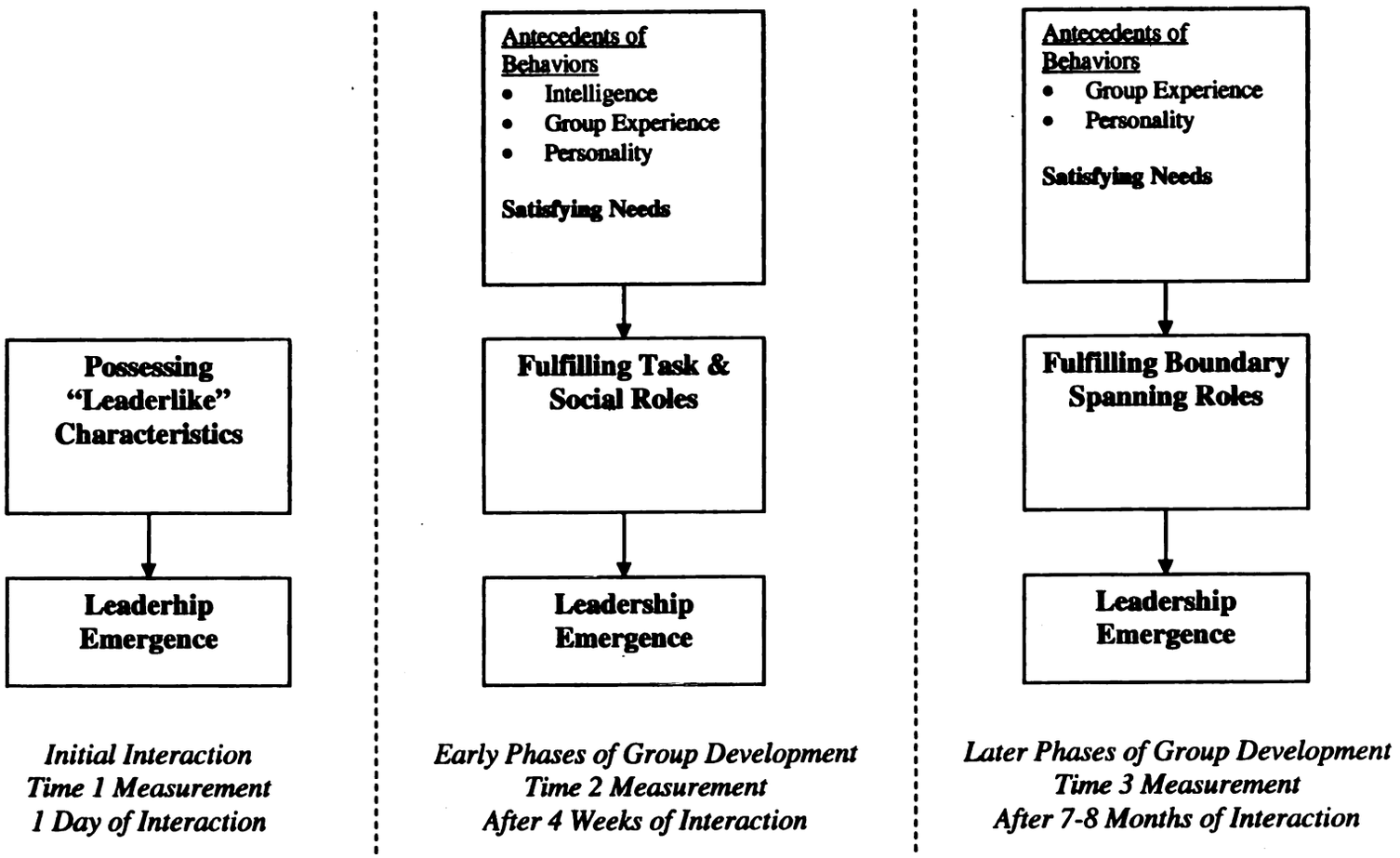
In the left panel of Figure 2, I predict the emergence of a leader at the initial interaction of a group. In this stage, I expect that a leader will emerge based on characteristics of the individual which members perceive to be "leaderlike" (Mann, 1959). Research on implicit leadership theory (ILT) suggests that individuals have implicit assumptions about the traits and abilities that characterize an ideal, or prototypical, leader. Prototypical leader characteristics include sensitivity, intelligence, dedication, and dynamism; whereas antiprototypical leader characteristics include tyranny, and masculinity (Epitropaki & Martin, 2004). ILT research posits that the cognitive structures of the prototypical leader are activated from members of a group when interacting with a person, or stimulus (e.g. Lord, 1985; Kenney, Schwartz-Kenney, & Blascovich, 1996). When the stimulus, or person evaluated, is seen as a more prototypical leader, they are also rated higher on general leadership impressions, and leadership behaviors (e.g. Fraser & Lord, 1988; Lord, Foti, & DeVader, 1984).Thus, at the initial interaction of a group, I expect that group members will rely on these cognitive

structures when rating the emergence of a leader. The individuals who possess the characteristics of a prototypical leader will emerge as the leader.

A large limitation of this research is that it has been studied with subjects rating prototypical, neutral, and antiprototypical individuals in vignettes. ILTs have not been used to explain leadership emergence in actual interactive groups, and have not been studied across different phases of group development, as the current study aims to examine. This addresses the gap in the previous literature on leadership emergence which has not taken into account how ILTs impact leadership emergence.

In the central panel of Figure 2, I predict leadership emergence in the early phases of group development. In the right panel of Figure 2, I predict leadership emergence in the later phases of group development. In both of these panels, I expect that the fulfillment of roles necessary for the group to function successfully will determine leadership emergence (Mann, 1959). Role theory helps explain emergent leadership in that the theory predicts that as groups interact and develop, they go through role differentiation which structures the group into various roles for members (Katz & Kahn, 1966). According to role theory, members of a role set, which can include all members of a group, will send expectations for leadership behavior to other group members who respond if they are willing and capable, and thus reinforce the role expectations sent by other group members by exhibiting effective leadership behavior (Taggar et al., 1999). Leaders emerge because they are the group members who are the most willing and able to perform the necessary roles and functions for task accomplish (i.e., task and boundary spanning roles) and the most willing and able to guide and encourage other members of the group (i.e. social roles; Stein, Hoffman, Cooley, & Pearse, 1979).

Figure 2. Model of Leadership Emergence as Groups Develop Over Time



The model posits that several individual differences are antecedents to the behavior of individuals in the group, and ultimately who is willing and capable to perform the roles needed in the group. As seen in Figure 2, the following factors are antecedents to the role behaviors of individuals in the group: intelligence, personality, experience, and satisfying needs. These individual differences determine the extent to which individuals will fulfill certain roles in the group.

In addition, the current study addresses gaps in the previous literature by examining the satisfaction of needs as antecedents to role behaviors. Mann (1959) theorized that the third reason why leaders emerge is because individuals have various needs and are motivated to satisfy some of these needs through interactions with others. For example, some individuals have a high need for achievement, affiliation, power, or autonomy (McClelland & Boyatzis, 1982; Steers & Braunstein, 1976). Thus, in order to satisfy these needs, these individuals may choose to take on certain roles which eventually lead to their emergence as a leader. Another contribution of the current study is that these predictors will be used to predict the performance of role behaviors in the group, and ultimately, leadership emergence, which allows the study to examine the process through which leaders emerge in a group.

Finally, as can be seen in the central and right panels of Figure 2, the current study predicts that leadership emergence will be predicted by the fulfillment of task, social, or boundary spanning roles, depending on the phase of group development. As can be seen in the central panel of Figure 2, the current study predicts that in the early phases of group development, the fulfillment of task and social roles will predict leadership emergence. The early phases of group development are characterized by group members

demonstrating their task mastery and monitoring and regulating their individual performance. In these phases, group members begin to understand their roles in the group and coordinate interactions between group members (Kozlowski et al., 1999). The task roles are important in these two stages as they provide opportunities for group members to demonstrate their task competencies by organizing the work, sharing information, and taking personal responsibility for the work. In addition, as the group begins to differentiate their roles, it is important to think through what the group is doing and have new and creative ideas for getting the work done. The social roles are important in these two stages because as the group begins to coordinate their interactions, it will be necessary to communicate, manage conflict, and cooperate with other group members. Thus, I expect that the fulfillment of task and social roles will predict the emergence of the leader in the early phases of group development. As can be seen in the right panel of Figure 2, I expect that fulfillment of the boundary spanning roles will predict leadership emergence in the later phases of group development. In this final phase of group development, the group has developed a sense of group capabilities and come to be self-managing (Kozlowski et al., 1999, 2009). Thus, I would expect that the fulfillment of the boundary spanning roles, which involve going outside the group to get resources and information (i.e., furthering the self-management of the group) will predict the emergence of the leader in the later phases of group development.

HYPOTHESES DEVELOPMENT

Predicting Leadership Emergence at the Initial Interaction

Possessing Leaderlike Characteristics

The initial group interactions that take place in a leaderless or equal status group are usually the first time individuals in the group have interacted with one another. As mentioned previously, at this point in the group's development, each member of the group has the same role and status in the group, that of being a member in the group (Bass, 1990; Forsyth, 1990). It has been suggested that during this initial phase, socialization is the key process as group members seek to gain social knowledge about one another and seek information about the basic nature of the group, its purpose, and their place in the group (Kozlowski et al., 1999).

Key components of individuals' perceptions of leaders in a group are the extent to which the individuals are perceived to possess leaderlike traits. Research by Lord and colleagues on implicit theories of leadership (ILT) has played a large role in explaining the importance of perception on leadership emergence. According to implicit leadership theory, individuals have implicit assumptions about the traits and abilities that characterize an ideal or "prototypical" leader. Thus, as members of group initially interact with one another they compare the traits of the other members in the group to their "prototypical" leader. The extent to which an individual matches the "prototypical" leader makes it more likely that that individual will be perceived as a leader, and thus, emerge as the leader (e.g., Lord, 1985; Lord & Alliger, 1985; Lord & Maher, 1993).

Recent empirical work has tested the components, generalizbility, and stability of ILTs in organizational settings. Based on this work, it was found that six factors can be

used to describe a leader. Prototypical factors include sensitivity, intelligence, dedication, and dynamism; whereas antiprototypical factors include tyranny and masculinity (Epitropaki & Martin, 2004). These factors are consistent with the traits that Lord and colleagues found to be positively related to leadership emergence in their meta analysis, which were: intelligence, dominance, masculinity, and extraversion (Lord et al., 1986). As stated previously, in laboratory-based research where the prototypicality of a leader in a vignette was manipulated, research found that the manipulation of the prototypicality of the stimulus had significant effects on leadership perceptions. Stimuli which were more prototypical were rated higher on general leadership impressions and leader behaviors (Foti, Fraser, & Lord, 1982; Fraser & Lord, 1988; Lord & Alliger, 1985; Lord et al., 1984). Further empirical work has also found that the closer employees perceive their actual manager's profile to be to the ILTs they endorse, the higher quality relationship they have with their manager (Epitropaki & Martin, 2005).

The current study proposes that the extent to which an individual in a group displays characteristics which are viewed as leaderlike will predict their emergence as a leader at the initial interaction of a group. To start with, the prototypical characteristic of sensitivity describes someone who is understanding, sincere, and helpful (Epitropaki & Martin, 2004). The ability to maintain and improve cooperative relationships in the group, which are key leadership behaviors (Bass, 1990; Yukl, 2002), would likely depend on an individual possessing these characteristics. It has been suggested that individuals described as helpful, trusting, and sympathetic (Costa & McCrae, 1992; McCrae & Costa, 1987) are more likely to work cooperatively with others (Hogan & Holland, 2003; LePine & Van Dyne, 2001) due to their helpful nature (Neumann & Wright, 1999). Indeed,

research on social relationships has found that these individuals prevent the emergence of conflict with peers (Asendorpf & Wilpers, 1998). Thus, the extent to which an individual is perceived to possess these characteristics would also determine their emergence as a leader.

Other prototypical leader characteristics include intelligence, dedication, and dynamism. The intelligence characteristic describes someone as intelligent, clever, knowledgeable, and educated (Epitropaki & Martin, 2004). An individual perceived as intelligent by other group members would be perceived to have the ability to facilitate the accomplishment of the group's task, another key leadership behavior (Bass, 1990; Yukl, 2002). Indeed, empirical evidence has found that cognitive ability predicts leadership emergence (Judge et al., 2004). Thus, it follows that the perception of intelligence, or cognitive ability, would also predict the emergence of a leader. Research supports this assertion in that perceptual measures of intelligence show stronger correlations with leadership than objective measures of intelligence (ρ = .60 vs. ρ =.19, respectively; Judge et al., 2004). An individual perceived as motivated, dedicated, and hardworking, characteristics of the dedication ILT (Epitropaki & Martin, 2004) would also be perceived to be able to facilitate the accomplishment of the task. Empirical research demonstrates that individuals described as hardworking, persevering, and ambitious (Costa & McCrae, 1992; McCrae & Costa, 1987) consistently perform well across a variety of occupations (Barrick & Mount, 1991). Thus, it follows that the extent to which an individual is perceived to possess these characteristics would also be perceived to be someone who can facilitate the accomplishment of the task, and thus emerge as a leader. Likewise, an individual perceived with the ILT characteristic of dynamism would be

perceived as dynamic, strong, and energetic (Epitropaki & Martin, 2004) and thus able to facilitate the accomplishment of the task. Individuals described as active, passionate, and bold (Costa & McCrae, 1992; McCrae & Costa, 1987) have also been found to perform well, especially in occupations requiring social interactions (Barrick & Mount, 1991). Thus, one would expect that in their interactions with other group members, individuals with these characteristics would also be seen as someone who can facilitate the accomplishment of the task, and thus emerge as a leader.

The tyranny characteristic describes someone who is domineering, pushy, manipulative, conceited, selfish, and loud (Epitropaki & Martin, 2004). It is likely that someone who is perceived to possess these characteristics would be negatively related to their perception as a leader. That is, they would be perceived to be neither someone who could facilitate the accomplishment of the task nor someone who could build and maintain cooperative interpersonal relationships in the group. Indeed, research demonstrates that the tyranny characteristic is negatively related to the characteristics of an ideal leader (Epitropaki & Martin, 2004). Thus, individuals who are perceived to possess this characteristic would be negatively related to their emergence as a leader.

The final ILT characteristic is masculinity, which describes someone as masculine or male (Epitropaki & Martin, 2004). Although viewed as an antiprototypical characteristic in ILT theory (Epitropaki & Martin, 2004), evidence finds that masculinity is positively related to leadership emergence. Meta-analytic estimates find a positive relationship between masculinity and leadership emergence (r = .24; Lord et al., 1986; Mann, 1959). This is further supported by gender role theory (Eagly, 1987). The theory predicts that men tend to emerge as leaders in initially leaderless groups due to societal

gender roles. As most groups tend to focus on the accomplishment of the task (Eagly & Karau, 1991), it more likely that at least initially men will be perceived as the leader. However, over time the tendency for men to lead should diminish as group members obtain additional information about group members beyond that of their gender, such as their competencies (Eagly & Karau, 1991). Meta-analytic evidence supports this in that men were found to emerge as leaders to a greater extent than women (d = .32; 95% CI = .28, .37). Furthermore, men were even more likely to emerge as leaders in short-term groups (less than 20 minute interaction: d = .58; 95% CI = .49, .67; more than 20 minute interaction in one meeting: d = .38; 95% CI = .30, .46) compared to groups that met more than once (d = .09; 95% CI = .01, .16; Eagly & Karau, 1991). Based on this, one would expect that an individual who possesses masculine characteristics would emerge as the leader.

The current study proposes that the relationship between possession of prototypical and antiprototypical leader characteristics and leadership emergence will be influenced by the phase of group development. At the initial interaction of a group, group members are subjected to a variety of stimuli as they begin to become familiar with one another's views and abilities and understand appropriate behaviors and expected contributions (Kozlowski et al., 1999). Due to limited attentional capacity, members will rely on cognitive schemas to form perceptions of one another. That is, members will simplify their perceptions of other members by relying on cognitive schemas and categorizing group members as leaders versus non leaders based on the schema of a prototypical leader (Lord, 1985; Lord, Foti & Phillips, 1982). Thus, the prototypical and

antiprototypical leader characteristics will predict leadership emergence at the initial interaction of a group.

Hypothesis 1: The prototypical leader characteristics of (a) sensitivity, (b) intelligence, (c) dedication, and (d) dynamism will be positively related to leadership emergence at the initial interaction of a group.

Hypothesis 2: The antiprototypical leader characteristic of tyranny will be negatively related to leadership emergence at the initial interaction of a group.

Hypothesis 3: The antiprototypical leader characteristic of masculinity will be positively related to leadership emergence at the initial interaction of a group.

Predicting Leadership Emergence in Early and Later Phases of Group Development

Fulfilling Roles

Beyond that of possessing leaderlike qualities, individuals also emerge as leaders in an initially leaderless or equal status team because they fulfill roles necessary for the group to function successfully (Mann, 1959). The current study predicts that the fulfillment of roles will predict leadership emergence in the early and later phases of group development. Roles are defined as sets of behaviors, or clusters of related and goal-directed behaviors, that are characteristic of an individual in a specific situation or particular social context (Biddle, 1979; Stewart et al., 1999). In the context of a leaderless or equal status group, role differentiation eventually occurs in which different individuals occupy the various roles needed for the group to function effectively. According to role theory (Katz & Kahn, 1966), individuals in the group send expectations for the roles that

need to be filled, and other team members respond if they are willing and able to perform the role. This then reinforces the role expectations sent by other group members because the individuals have fulfilled the roles in the group (Taggar et al., 1999). Individuals who are the most willing and able to perform the necessary roles and functions for task accomplish and the most willing and able to guide and encourage other members of the group, are the individuals who emerge as the leader (Stein et al., 1979). Thus, it is important to understand the characteristics of the individuals who are most willing and able to perform the necessary roles in the group.

Antecedents of Role Behavior

The fulfillment of roles in a group can be characterized by the behaviors that the individuals exhibit when fulfilling the roles. Individual behavior is determined by a variety of factors, which include individual inputs, motivation, and contextual factors (Mitchell & Daniels, 2003). The individual inputs which help to determine behavior include ability and skills, dispositions and traits, affect and mood, and beliefs and values. These individual inputs combine with motivation to produce behavior and are also impacted by contextual factors such as task design, rewards, norms, and culture (Mitchell & Daniels, 2003).

The current study focuses on all three of these components to predict the behavior of individuals in a leaderless group. First, the behavior of individuals is impacted by the fact that they are interacting within the context of an initially leaderless or equal status group, rather than a group with an appointed or formal leader. This context impacts individual behavior in two ways. First, as individuals in a group, they are collectively pursuing common goals which are achieved by individuals in the group fulfilling specific

roles within the group. Second, because they are a leaderless group, any individual can fulfill the roles in the group and thus become the leader. The current study proposes that it is the individual with the ability, personality, and experience who fulfill the roles necessary for the group to function effectively.

The other two components which influence behavior include individual inputs and motivation. In terms of individual inputs, the current study will examine an individual's ability (i.e., intelligence), experience, and personality which influence the behaviors of individuals. Finally, the current study examines the motivation of individuals to satisfy certain needs by engaging in specific role behaviors. The following discussion will be organized around the phase of group development and follow that of Figure 2. Thus, my hypotheses will be organized around predicting the task and social roles in the early phases of group development and then around predicting the boundary spanning roles in the later phases of group development.

Intelligence

It has been suggested that intelligence is a critical feature that must be possessed by all leaders (Lord et al., 1984). An individual's ability, or intelligence, is a key individual input into their behavior (Mitchell & Daniels, 2003). A positive relationship between intelligence and leadership has been established in research. In their meta-analysis on leader traits, Lord and colleagues found that intelligence was positively related to leadership emergence (r = .37) and concluded that "Intelligence is a key characteristic in predicting leadership perceptions" (Lord et al., 1986, p. 407). Likewise, more recent meta-analyses have also found a positive relationship between objective measures of intelligence and leadership emergence (ρ = .19; Judge et al., 2004).

There are at least three reasons why intelligence would be related to leadership emergence (Judge et al., 2004). First, intelligence may cause an individual to appear as leaderlike. At the initial interaction of a group, the current study predicted that the perception of intelligence would be positively related to leadership emergence due to the fact that intelligence is seen as a prototypical leader characteristic (Epitropaki & Martin, 2004). In addition to this prediction, the current study predicts that intelligence will also predict leadership emergence in the early phases of group development as individuals high in intelligence are more capable of engaging in the task roles. This prediction relates to the last two reasons why intelligence would be related to leadership emergence (Judge et al., 2004).

The second explanation for the relationship between intelligence and leadership emergence is that intelligence is one of the best predictors of job performance in professional-managerial jobs (r = .58). Furthermore, intelligence has a stronger relationship with complex jobs (r = .56 for high-level complex technical jobs) versus non-complex jobs (r = .23 for completely unskilled jobs; Schmidt & Hunter, 1998). It has been suggested that the tasks performed by leaders are generally complex (Judge et al., 2004). In the current study, the task roles are also complex in that they require organizing the work, sharing information and advice based on experience, taking personal responsibility for the work, and thoroughly thinking through what the group is doing (Mumford et al., 2006). Thus, individuals high in intelligence will be more capable of handling the complexity of these roles.

Third, intelligence is related to leadership due to the creativity that is required in leadership (Jung, 2001). In the current study, one of the task roles is the creator role,

which requires someone to have new and creative ideas for solving problems. Empirical research supports the positive relationship between intelligence and creativity (Rushton, 1990). Thus, it is likely that individuals high in intelligence are more likely to engage in the task role behaviors, especially that of the creator role.

Based on the ability to handle complex roles and the creativity required in the task roles, the current study predicts that individuals high in intelligence will be more likely to engage in the task roles. I do not expect that intelligence will be related to engagement in the social or boundary spanning roles, as these roles tend to be more relational in nature. Most ties to the relationship between intelligence and leadership are based on demonstration of task relevant competence on part of the leader (Bass, 1990), rather than social and boundary spanning competence. Furthermore, recent empirical evidence supports a null relationship between boundary spanning behavior and intelligence in that intelligence did not predict engagement in boundary spanning behavior (Marrone et al., 2007).

Hypothesis 4: Intelligence will be positively related to engagement in the task roles in the early phases of group development.

Experience

Another antecedent which the current study predicts will be related to an individual's engagement in the role behaviors in the group is the extent of the individual's group experience. Beyond that of intelligence, experience in a group also helps individuals to develop competence related to group roles. It has been suggested that this competence allows group members to be flexible and assume different roles depending on the situation (Mumford et al., 2008). Thus, the current study predicts that

individuals with higher levels of experience working in groups will be more likely to engage in the task, social, and boundary spanning roles.

Empirical research on the relationship between work experience and job performance has shown that an individual's experience has positive implications for that individual's job performance (McEnrue, 1988). In the study, results found that an individual's experience as a restaurant manager was positively related to both the profits and sales increases of the restaurant the individual was managing ($r = .50, p < .01$; McEnrue, 1988). Meta-analytic estimates also support the positive relationship between experience and performance ($r = .21$; McDaniel, Schmidt, & Hunter, 1988; $r = .22$; Quinones, Ford, & Teachout, 1995). From a group perspective, there is also reason to believe that experience working in groups will be positively related to engagement, or performance, of the task, social, and boundary spanning roles. This is expected due to two mechanisms. First, experience is expected to develop knowledge of groups and the roles needed for a group to function effectively. Second, this knowledge is expected to be related to engagement in the roles.

There are good reasons to believe that experience working in groups will lead to individuals developing knowledge of groups and the roles needed for a group to function effectively. First, as has been suggested, new groups tend to be confused regarding the necessary roles, social relationships, goals, and group processes needed in a group (Abselson & Woodson, 1983). Furthermore, group members tend to understand the processes of group work differently and their knowledge is based in large part on their past experience in groups (Rentsch, Heffner, & Duffy, 1994). Although group members may have developed their group knowledge within a specific group, it is likely that this

experience allowed them to acquire and develop a core knowledge of groups that applies more generally to various types of groups (Rentsch et al., 1994). Thus, prior experience working in groups develops a general knowledge of groups that can be applied to future groups.

Some of the core knowledge that individuals are likely to acquire and develop from prior group experience include the roles necessary for groups to function effectively, or the task, social, and boundary spanning roles. Research supports the link between prior group experience and knowledge of groups by finding that individuals with more group experience develop higher levels of general group knowledge than individuals with less group experience. Furthermore, individuals with more group experience have well articulated group knowledge that they are able to express via different methods. This has led researchers to conclude that not only do these individuals have greater knowledge of groups, but they are also aware of how they understand groups (Rentsch et al., 1994).

There are also good reasons to believe that knowledge of groups is positively related to engagement in the task, social, and boundary spanning roles. It has been suggested that knowledge of the roles necessary for a group to function effectively increases the total number of role behaviors an individual is able to display (Cameron, 1950; Sarbin & Allen, 1968). Furthermore, the increased number of role behaviors an individual is able to display allows individuals to adapt their role in response to changing situations (Ginnett, 1990; McIntyre & Salas, 1995; Parker, 1990). Thus, in the current study, the knowledge of groups, and necessary roles in the group, is more likely to lead individuals to engage in the task, social, and boundary spanning roles across early and

later phases of group development. In an empirical study investigating the relationship between role knowledge and engagement in role behaviors results found a positive relationship in both an academic and work setting. In the academic setting using undergraduate students, the study found that knowledge of roles in groups was positively related to engagement in task roles ($r = .39, p < .01$, one-tailed) and social roles ($r = .27$, $p < .01$, one-tailed). The study also found a positive relationship between knowledge and engagement in boundary spanning roles, although the relationship was not statistically significant ($r = .07$, *n.s.*; Mumford et al., 2008). In the work setting, the study found that knowledge of roles was also positively related to engagement in task roles ($r = .27, p <$ .01, one-tailed) and boundary spanning roles ($r = .20, p < .05$, one-tailed). The study also found a positive relationship between knowledge and engagement in social roles, although the relationship was not statistically significant ($r = .11$, *n.s;* Mumford et al., 2008).

Based on the above arguments the current study expects that individuals with more group experience will have developed general knowledge of groups and the roles necessary for a group to function effectively. This knowledge will lead to engagement in the task, social, and boundary spanning roles. The current study does not directly test the experience to knowledge and knowledge to engagement links, but instead expects that individuals with more group experience will engage in the task, social, and boundary spanning roles. Empirical evidence which finds that tenure, (i.e., experience), in a team significant predicts engagement in task roles ($\beta = .41, p < .01$, one-tailed), social roles ($\beta = 31, p < .01$, one-tailed), and boundary spanning roles ($\beta = 20, p < .05$, one-tailed; Mumford et al., 2008) supports this expectation.

Hypothesis 5: Group experience will be positively related to engagement in the (a) task roles and the (b) social roles in the early phases of group development.

Hypothesis 6: Group experience will be positively related to engagement in the boundary spanning roles in the later phases of group development.

Personality Characteristics and Satisfying Needs

The final antecedent of role behavior predicted in the current study is an individual's personality. Expectations for a given role are met most easily by the individual who is most willing and capable to perform the role (Stein et al., 1979). It has been suggested that the individual most capable to perform the role is the individual whose personality fits the role (Hare, 1962). Previous work on roles in groups has suggested that individual differences are predictors of which roles individuals are likely to take within groups (Belbin, 1981, 1993; Blumberg, 2001; Parker, 1990; Stewart, Fulmer, & Barrick, 2005).

Personality characteristics are most often described using a five factor taxonomy, or the Big Five (Goldberg, 1990; Costa & McCrae, 1992). Research on personality demonstrates that the five-factor model is robust across cultures, languages, rating sources, gender, and types of assessments (Hough & Furnham, 2003). The five-factor structure, however, is not without its critics which criticize the heterogeneous nature of the taxonomy. For example, openness to experience is one of the least replicable of the Big Five factors, primary due to the fact that it contains both an artistic component and an intellectual component (Hough & Ones, 2001). Other examples of heterogeneity in the five factor structure can be found in conscientiousness which confounds dependability

with achievement and extraversion which confounds sociability with dominance (e.g. Hough & Furnham, 2003).

Some researchers believe that merging heterogeneous variables into the five factor structure obscures relationships between personality and criteria of interest (e.g. Aston, Jackson, Paunonen, Helmes, & Rothstein, 1995; Hough, Eaton, Dunnette, Kamp, & McCloy, 1990; Hough & Schneider, 1996; Paunonen & Nicol, 2001). Thus, some researchers argue for considering more narrow measures of personality especially in order to match the bandwidth of the predictor and the criterion (Hogan & Roberts, 1996). Other researchers agree and suggest that researchers take a construct-oriented approach to match predictors to criteria. Thus, predictors should match criteria in terms of specificity (Schneider, Hough, & Dunnette, 1996).

The current study aims to take a construct-oriented approach to match personality as predictors of specific roles in teams. Given the specificity of the roles outlined in the current study, the current study will consider the facets of personality which underlie factors of the Big Five (Costa & McCrae, 1992; Goldberg, 1999; Goldberg et al., 2006). Thus, the predictors will match the criteria in terms of specificity. Using facets of personality will shed some light on the conflicting findings regarding the prediction of roles in teams based on Big Five personality characteristics. Only two studies have examined the relationship between Big Five factors and roles in teams. In a study based on self-reported data from 217 undergraduate students, Blumberg (2001) found that agreeableness ($r = .23, p < .01$) and conscientiousness ($r = .41, p < .01$) correlated positively with the task role. Results of the study also found that the social role correlated positively with agreeableness ($r = .45, p < .01$), conscientiousness ($r = .24, p < .01$), and

extraversion ($r = .26, p < .01$). Neuroticism correlated negatively with the social role ($r = -.42, p < .01$; Blumberg, 2001).

Results of this study were not replicated in a study conducted by Stewart and colleagues with data from 220 master students working in teams. In this study, agreeableness was positively correlated with the social role ($r = .25, p < .01$), but they did not find a correlation between conscientiousness, extraversion, and neuroticism and the social role. With regards to the task role, the only replicated result was a positive correlation with conscientiousness ($r = .25, p < .01$). Results also found a negative correlation between the task role and neuroticism ($r = -.15, p < .05$), openness to experience ($r = -.16, p < .05$), and extraversion ($r = -.13, p < .10$; Stewart et al., 2005).

One explanation for the different findings is that in the Blumberg (2001) study, the role measures were self-reported and not provided in reference to a specific group setting. In the Stewart study, team roles were assessed via peer ratings based on their interactions as a team (Stewart et al., 2005). Given the lack of context-specificity and common method bias, the correlations found in Blumberg (2001) may not be representative of actual relationships between personality and context-specific roles within a team (Stewart et al., 2005). In both studies, the correlations are relatively small, accounting for little variance in team roles. This may be due to the fact that both studies used broad measures of personality and roles rather focusing on the facets of personality and more specific roles in teams. Thus, the current study may be able to clarify the conflicting findings by focusing on facets of personality and their relationship to specific roles in teams.

Rather than focusing on all five personality characteristics, the current study will focus on the three factors found to be most relevant to leadership emergence. Meta-analytic evidence finds extraversion, openness, and conscientiousness to be significantly related to leadership emergence ($\rho = .33$, $\rho = .24$, $\rho = .33$, respectively; Judge et al., 2002) Thus, the current study will focus on these three broad dimensions and the relevant facets underlying each dimension. The current study will utilize the conceptual model of the Big Five facets as outlined by Goldberg's International Personality Item Pool (IPIP; Goldberg, 1999; Goldberg et al., 2006; IPIP, 2007), which is similar to the NEO-PI-R (Costa & McCrae, 1992). The facets of extraversion, openness, and conscientiousness used in the current study are those facets that are expected to be related to specific role behaviors. For example, as shown in Table 3, a specific task role is the contractor role which organizes the work and keeps others focused on getting it done efficiently. The facet of conscientiousness expected to be related to this role is orderliness which describes someone who likes order, and does thing according to a plan (IPIP; Goldberg, 1999; Goldberg et al., 2006; IPIP, 2007).

Furthermore, the current study will also utilize some of the personality facets in support of the third reason why leaders emerge – because individuals have various needs which they satisfy through interactions with others (Mann, 1959). Thus, not only does personality influence the role behaviors an individual engages in, but also describes the needs of an individual. Individuals with certain needs may fulfill the task, social, and boundary spanning roles in order to satisfy these needs. In his theory of manifest needs, Murray defined needs as recurrent concerns for particular goals or end states. The theory proposed more than twenty needs, and posited that an individual could be motivated by

Table 3. *Personality Facets as Predictors of Group Roles*

Type of Role	Specific Role	Description	Personality Facet	Manifest Need
Task	Contractor	Organizes the work and keeps others focused on getting it done efficiently.	C: Orderliness (+)	Achievement (+)
	Contributor	Shares information and advice with the team in areas where he/she has a lot of experience.	C: Achievement-Striving (+) E: Assertiveness (+)	Achievement (+) Power (+)
	Completer	Takes personal responsibility for the team's work, volunteers for new jobs and follows through on the commitments made.	C: Self-Discipline (+)	Achievement (+)
	Critic	Thoroughly thinks through what the team is doing to make sure they are not rushed and consider both positive and negative aspects.	E: Assertiveness (+)	Power (+)
	Creator	Has new and creative ideas for solving problems and getting the work done.	O: Intellect (+) O: Imagination (+)	Achievement (+)
Social	Calibrator	Helps the team get along together by helping to settle conflicts, deal with difficult problems, and be respectful.	E: Friendliness (+)	Affiliation (+)
	Communicator	Communicates clearly, honestly, and respectfully with others, making the work atmosphere more comfortable because he/she is pleasant to work with.	E: Friendliness (+)	Affiliation (+)
	Cooperator	Supports the team and other team members in their work even if he/she would have personally done it differently	E: Assertiveness (-)	Affiliation (+) Power (-)

Table 3 continued. *Personality Facets as Predictors of Group Roles*

Type of Role	Specific Role	Description	Personality Facet	Manifest Need
Boundary Spanning	Coordinator	Interacts with people outside of the team to coordinate the sharing of information, money, ideas, and other resources.	E: Gregariousness (+) E: Assertiveness (+)	Affiliation (+) Power (+)
	Consul	Interacts with supervisors and managers outside of the team to present the team and its accomplishments in a favorable light.	E: Gregariousness (+) E: Assertiveness (+)	Affiliation (+) Power (+)

more than one need simultaneously. A central tenant of manifest needs theory is that individuals have specific needs which motivate them to behave in certain ways (Murray, 1938). The key to motivating individuals is to place them in situations which are conducive to fulfilling, or satisfying their needs (McClelland, 1961). Thus, in the context of initially leaderless or equal status groups, individuals with needs for achievement, power, and affiliation are motivated to satisfy these needs by fulfilling (or not fulfilling) certain roles in the groups.

In the following discussion I will predict engagement in the task, social, and boundary spanning roles based on an individual's personality. In some cases, an individual's need to satisfy achievement, power, and affiliation will also be used as support to predict engagement in the roles. This is consistent with prior research which found that the needs can be meaningfully organized within the framework of the five factor model (Costa & McCrae, 1988). Indeed, empirical evidence finds that need for achievement is strongly correlated with conscientiousness ($r = .46, p < .01$), and most likely correlates even higher with the achievement-striving facet of conscientiousness. Need for dominance (i.e., power) is also highly related to the extraversion facet of assertiveness ($r = .64, p < .01$). Finally, need for affiliation is highly correlated with both the friendliness and gregariousness facets of extraversion ($r = .64, p < .01$, for both; Costa & McCrae, 1988).

Table 3 provides a summary of the roles in teams and the personality facets and manifest needs that predict the group roles. The following discussion will be organized around the phase of group development and follow that of Figure 2. Thus, I will first start with personality characteristics which predict the task and social roles in the early phases

of group development. Then I will discuss the personality characteristics which predict the boundary spanning roles in the later phases of group development. Although the hypotheses will be predicted at the task, social, and boundary spanning role categories, I will build my arguments based on the specific roles included in each of these categories.

Early phases of group development. The first category of roles is the task roles which include the contractor, contributor, completer, critic, and creator roles. The current study predicts that some of the most relevant facets of personality for the task roles are facets of conscientiousness. This prediction is consistent with previous research which has found conscientiousness to be positively related to task roles (Blumberg, 2001; Stewart et al., 2005). The current study also predicts that certain facets of extraversion and openness to experience will be positively related to task roles. Examining the facets of personality and their relation to task roles may shed light on the null and negative results found in previous studies (Blumberg, 2001; Stewart et al., 2005, respectively).

The contractor role organizes the work and keeps others in the team focused on getting the work done efficiently. Descriptors of the types of behavior the person in this role exhibits includes organizing the teams' work, coordinating the work done by the team, and helping the team focus on getting the job done efficiently (Mumford et al., 2006). The individual likely to engage in the contractor role has been described as mature, confident, and someone who promotes good decision making. Furthermore, they have been described as challenging, dynamic, and someone who thrives on pressure (Belbin, 1981, 1993). The personality facet important for this role includes the orderliness facet of conscientiousness. The orderliness facet describes someone who likes order, does things according to a plan, and wants everything to be "just right" (Goldberg,

1999; Goldberg et al., 2006). Thus, someone with these characteristics would be likely to assume the role of contractor because the key behaviors for this role include organizing and coordinating the team's work.

The contributor role is the role that shares information and advice with the team. Key behaviors of the role include speaking out when he/she knows the most about the work, sharing knowledge with the team, and taking the lead in the team when he/she has a lot of experience in the area (Mumford et al., 2006). Someone likely to engage in this role has been described as that of a specialist who is single-minded, self-starting, and dedicated (Belbin, 1981, 1993). Group members predisposed to engage in the contributor role include individuals described as achievement-striving, a facet of conscientiousness, and assertive, a facet of extraversion. Achievement-striving describes someone who works hard, turn plans into action, and goes straight for the goal (Goldberg, 1999; Goldberg et al., 2006). Thus, someone with these characteristics is likely to engage in the contributor role by turning their knowledge into action and leading the team. Assertiveness describes someone who takes charge, seeks to influence others, and takes control of things (Goldberg, 1999; Goldberg et al., 2006). Individuals who are assertive will also be likely to engage in the contributor role because they like to take charge and would be willing to lead the team in an area where he/she has a lot of experience.

The next task role is the completer role, which is the role that takes personal responsibility for the team. Specific actions of the completer role include taking personal responsibility for getting the work done, finishing work on time, and following through on commitments (Mumford et al., 2006). An individual likely to engage in the completer role has been described as someone who is painstaking, conscientious, and delivers on

time (Belbin, 1981, 1993). They have also been described as disciplined, dependable, reliable, responsible, organized, systematic, and efficient (Belbin, 1981, 1993; Parker, 1990). Someone who fulfills the completer role is likely to be described by the self-discipline facet of conscientiousness. The facet of self-discipline describes someone who is always prepared, carries out his/her plans, and gets chores done right away (Goldberg, 1999; Goldberg et al., 2006). Thus, someone who is described by these characteristics will assume the completer role in that they will take responsibility for the work, and actually get the work done.

The critic role thoroughly thinks through the team's actions. The type of behavior this person exhibits include speaking up if he/she has concerns, making sure the team talks about both positive and negative consequences of their decisions, and sharing honest opinions with the team (Mumford et al., 2006). It has been suggested that someone who fulfills this role is candid, ethical, questioning, honest, truthful, outspoken, principled, adventurous, aboveboard, and brave (Parker, 1990). Likewise, they have been described as someone who is strategic and discerning, and who sees all options and judges accurately (Belbin, 1981, 1993). The personality facet relevant for this role is assertiveness, a facet of extraversion. As stated previously, the facet of assertiveness describes someone who takes charge, seeks to influence others, and takes control of things. It also describes someone who does not hold back their opinions (Goldberg, 1999; Goldberg et al., 2006). Thus, this person is likely to assume the critic role in that they would be assertive in voicing their opinion to the team regarding issues as they arise in the group.

The final task role is the creator role which is the role that has new and creative ideas for solving problems or getting the work done. Specific behaviors of this role include suggesting creative ways to solve the teams' problems, helping the team take a fresh perspective, and seeing the "big picture." Individuals likely to engage in this role have been described as creative, imaginative, unorthodox, and able to solve difficult problems (Belbin, 1981, 1993).

Individuals with the predisposition to engage in the creator role are likely to be described as intellectual and imaginative, which are facets of openness to experience. A key component of openness to experience is the intellect facet which describes someone who likes to solve complex problems, can handle a lot of information, and enjoys thinking about things (Goldberg, 1999; Goldberg et al., 2006). As stated previously, openness to experience is one of the least replicable of the Big Five factors because it contains both the intellect facet as well as an artistic component (Hough & Ones, 2001). This may also help to explain why in previous studies of the Big Five and team roles, openness to experience did not impact task roles or demonstrated a negative relationship with task roles (Blumberg, 2001; Stewart et al, 2005). In the current study, I separate the facets and focus on the intellect facet. The person described by the intellect facet is likely to assume the creator role in that they like to solve complex problems and are thus likely to suggest creative ways to solving problems.

Another key component of the creator role is the creative component, or suggesting creative ways to solve the problem. The personality facet of imagination helps to describe someone who would also assume the creator role in a team. The imagination facet describes someone who spends time reflecting, has a vivid imagination, and likes to

get lost in thought (Goldberg, 1999; Goldberg et al., 2006). Thus someone with these characteristics is likely to assume the creator role and help the team take a fresh perspective on the team's task. It should be noted that the personality facet of imagination is separate from another facet of openness to experience, the artistic interest facet (Goldberg, 1999; Goldberg et al., 2006), which has caused problems in replicating the openness to experience factor (Hough & Ones, 2001).

In addition to the personality facets predicting engagement in role behaviors, they also identify the needs of an individual which need to be satisfied. The current study expects individuals will be motivated to engage in the task roles in order to satisfy their need for achievement and power. Individuals high in need for achievement prefer situations where they can take personal responsibility, desire to accomplish tasks requiring skill and effort, and desire to perform a difficult job well (McClelland, 1977; Murray, 1938). Empirical evidence supports this in that individual high in need for achievement preferred moderately difficult tasks ($r = .17, p < .05$) and also indicated a preference to play a major role in determining group performance ($r = .27, p < .01$; Steers & Braunstein, 1976).

Thus, one would expect that individuals will be motivated to engage in the contractor, contributor, completer, and creator roles in order to fulfill their need for achievement, or need to play a major role in determining group performance. These roles allow them to organize the work and keep the group focused on getting the job done (contractor), share their experiences with the group (contributor), take personal responsibility for the work (completer), and suggest ways to solve the group's problems

(creator). Thus, these roles provide opportunities for individuals high in need for achievement to satisfy their need.

I also expect that individuals will be motivated to engage in the contributor and completer roles in order to satisfy their need for power. Individuals with a high need for power desire to be a leader in groups, to persuade and influence others, and to supervise and direct the actions of others (Murray, 1938). Empirical research also supports this in that individuals with a high need for power indicated a preference to be a group leader (r = .47, p < .01) and to play a major role in determining group performance (r = .39, p < .01; Steers & Braunstein, 1976). Furthermore, evidence also showed that need for power was positively related to overall leadership ability (r = .32, p < .01; Steers & Braunstein, 1976). The contributor role allows individuals to satisfy their need for power by taking the leadership of the team, whereas the critic role allows individuals to satisfy this need by persuading and influencing others through sharing opinions and discussing the consequences of the group's decision.

Hypothesis 7: The conscientiousness facets of (a) orderliness, (b) achievement-striving, and (c) self-discipline will be positively related to engagement in the task roles in the early phases of group development.

Hypothesis 8: The extraversion facet of assertiveness will be positively related to engagement in the task roles in the early phases of group development.

Hypothesis 9: The openness to experience facets of (a) intellect and (b) imagination will be positively related to engagement in the task roles in the early phases of group development.

The social roles include the calibrator, communicator, and cooperator roles. The current study predicts that two facets of extraversion, friendliness and assertiveness will predict engagement in these social roles. The current research aims to shed light on the conflicting findings of previous research that found a positive relationship between extraversion and social roles (Blumberg, 2001) and a null relationship (Stewart et al., 1999).

The first social role is the calibrator role which helps the team get along together through specific actions such as helping settle conflicts, suggesting positive ways for the team to interact, and stepping in if there are negative feelings in the team. The individual with the tendency to engage in this role is described as supportive, encouraging, helpful, friendly, and considerate (Parker, 1990). Thus, the most relevant Big Five personality facet is friendliness, a facet of extraversion. The friendliness facet describes someone who makes friends easily, cheers people up, and feels and acts comfortably with others (Goldberg, 1999; Goldberg et al., 2006). Given this, I would expect that this individual would be likely to engage in the calibrator role as they would be willing to settle the conflict within the team and to suggest positive ways to interact.

The second social role is the communicator role whose primary role is to communicate with the group. Specific behaviors of this role include making the work pleasant and comfortable by being happy to work with, communicating personal feelings respectfully, and listening carefully to the thoughts and feelings of others (Mumford et al., 2006). The individual predisposed to engage in this role is described as cooperative, mild, perceptive, and diplomatic. Furthermore, they are described as someone who listens, averts friction, and calms the waters (Belbin, 1981, 1993). Just like that of the

calibrator role, one would expect that individuals characterized by the friendliness facet of extraversion would assume the communicator role as well. This is due to the fact that they make friends easily, cheer people, and are interested in others (Goldberg, 1999; Goldberg et al., 2006). Thus, they would make the work pleasant and comfortable and be easy to work with.

The final social role is the cooperator role which is the role that supports the team in their work even if he/she would have done it differently. Other specific actions of this role include admitting when others have more experience, and recognizing the expertise of others and allowing them to take the leadership role. An individual who is unlikely to engage in this role, is someone described by the personality facet of assertiveness, a facet of extraversion. Assertiveness describes someone who takes charge, seeks to influence others, and takes control of things (Goldberg, 1999; Goldberg et al., 2006). The current study predicts that assertiveness will be negatively related to the cooperator role. Someone who is assertive is unlikely to assume the cooperator role because the role requires allowing others to take a leadership role, whereas an individual characterized by assertiveness usually takes charge and tries to lead others (Goldberg, 1999; Goldberg et al., 2006). Thus, it is unlikely that an assertive individual would assume the cooperator role.

In addition, the current study expects that individuals will be motivated to engage in the social roles in order to satisfy needs for affiliation and power. Individuals with a high need for affiliation have a need to be loyal to friends, to participate in friendly groups, and to form strong attachments (Murray, 1938). Thus, engagement in the social roles is likely to satisfy this need. Empirical research finds that individuals with a high

need for affiliation prefer to work together and help one another on tasks ($r = .22, p < .01$; Steers & Braunsteain, 1976). Thus, the need for affiliation will be satisfied by engaging in the calibrator role which enables them to participate in friendly groups by helping to reduce the conflict. Likewise, the need for affiliation is satisfied by the communicator and cooperator roles will allow individuals to form strong attachments with others in the group by supporting other members of the team. Finally, I also expect that individuals with a high need for power will be negatively motivated to engage in the cooperator role. The cooperator role requires an individual to support the team in their work. A need for power, or the preference to lead others, is unlikely to be satisfied by fulfilling the cooperator role which requires allowing someone else in the group to take the leadership role.

Hypothesis 10: The extraversion facet of friendliness will be positively related to engagement in the social roles in the early phases of group development.

Hypothesis 11: The extraversion facet of assertiveness will be negatively related to engagement in the social roles in the early phases of group development.

Later phases of group development. The final two roles are the boundary spanning roles which are roles that work with others outside the team. The current study is the first to examine the relationship between personality and boundary spanning roles. I predict that two facets of extraversion, gregariousness and assertiveness, will positively predict the performance of the boundary spanning roles. The first boundary spanning role is the coordinator role. The coordinator role interacts with people outside the team to

coordinate sharing of information and resources. An individual likely to engage in the coordinator role has been described as extraverted, enthusiastic, and communicative (Belbin, 1981, 1993). The second boundary spanning role, the consul role, includes getting support for the team from supervisors and managers as well as providing information to the supervisors and managers (Mumford et al., 2006). Personality facets which would predict an individual's engagement in these roles include the gregariousness and assertiveness facets of extraversion.

Someone characterized by the facets of gregariousness and assertiveness would be able to easily assume the coordinator and consul roles. A gregarious individual is described as someone who talks to a lot of different people, enjoys being part of a group, and involves others (Goldberg, 1999; Goldberg et al., 2006). Thus, a gregarious person would likely assume the boundary spanning roles because the roles would enable them to interact with people outside of the group. The assertiveness facet describes someone who takes control, takes charge, and seeks to influence people (Goldberg, 1999; Goldberg et al., 2006). Someone with these characteristics is also likely to engage in the boundary spanning roles because it enables them to influence people outside the team as well as take control of new resources and information for the team.

I expect that engagement in the boundary spanning roles will satisfy the need for affiliation and need for power. Individuals with a high need for affiliation desire to participate in friendly groups and to form strong attachments (Murray, 1938). Individuals with a high need for power desire to be a leader in groups, to persuade and influence others, and to supervise and direct the actions of others (Murray, 1938). Thus, the coordinator and consul roles allow these types of individuals to satisfy these needs by

forming affiliations with groups outside of their current group and to lead and influence their current group with the information and resources they receive from outside the group.

Hypothesis 12: The extraversion facets of (a) gregariousness and (b) assertiveness will be positively related to engagement in the boundary spanning roles in the later phases of group development.

Incremental Validity

Hypotheses 4-12 predicted that intelligence, group experience, and personality would predict the fulfillment of roles in the group. Another important question concerns whether these constructs will incrementally predict engagement in group roles. If incremental prediction does not occur, there is unnecessary redundancy with other constructs and measures (Morgeson, Reider, & Campion, 2005). I believe each of these will incrementally predict the fulfillment of the task, social, and boundary spanning roles. It has been suggested that individual behavior is determined by a variety of factors (Mitchell & Daniels, 2003), which include an individual's ability (i.e., intelligence), experience, personality characteristics, and motivation to satisfy needs. Thus, I expect that each of these will contribute their own unique prediction of engagement in role behaviors.

Hypothesis 13: Intelligence, group experience, conscientiousness facets of orderliness, achievement-striving, and self-discipline; extraversion facet of assertiveness; and openness to experience facets of intellect and imagination will incrementally predict engagement in the task roles.

Hypothesis 14: Group experience and extraversion facets of friendliness and assertiveness will incrementally predict engagement in the social roles.

Hypothesis 15: Group experience and extraversion facets of gregariousness and assertiveness will incrementally predict engagement in the boundary spanning roles.

Fulfillment of Roles Determines Leadership Emergence

In this section, I explore how an individual's fulfillment of the roles necessary for the group to function successfully determines the emergence of a leader in the group. First, role theory (Katz & Kahn, 1966) predicts that as the group interacts and develops, role differentiation occurs in which the group becomes structured in terms of roles. The roles in the current study include the task, social, and boundary spanning roles. It has been suggested that in the context of a leaderless or equal status team, emergent leaders are the individuals who establish conditions that promote the movement toward accomplishment of goals and objectives and assist in developing a cohesive group (Bass, 1990). Thus, emergent leaders promote the movement toward accomplishing the groups' goals and objectives through fulfilling the task and boundary spanning roles, which are concerned with accomplishing the task, organizing the group to attain goals, and providing support for other group members (Benne & Sheats, 1948; Forsyth, 1990). Likewise, emergent leaders develop a cohesive group by fulfilling the social roles, which help satisfy the emotional needs of group members (Benne & Sheats, 1948; Forsyth, 1990).

Leadership Emergence in Early Phases of Group Development

Once the group passes the initial interaction, they enter into the early phases of group development. These phases are characterized by group members developing knowledge of the group tasks, trying to demonstrate their task competencies, and developing a sense of individual capability. In addition, during these phases group members develop knowledge of their role in the group and begin to establish their role in the group (Kozlowski et al., 1999) The tasks roles are important predictors of leadership emergence in these two phases as they provide opportunities for group members to organize the work, share knowledge based on their experience, take personal responsibility, think through what the group is doing, and come up with creative ideas for solving problems. All of these task roles provide opportunities for group members to develop knowledge, demonstrate task competencies, and develop a sense of individual capabilities, which are important in the early phases. In addition, through these roles, group members begin to develop knowledge of the roles in the group and by engaging in these roles, begin to establish their role in the group, which is important in the early phases.

The social roles are important roles in these two phases as they help the group settle conflict, communicate, and support the group. As group members develop knowledge of group tasks, as they do in the early phases, it is helpful for group members to communicate and support the group. In addition, it has been theorized that as groups begin to differentiate their roles, which takes place in the early phases, they can experience some conflict (Tuckman, 1965). This conflict is managed by individuals who fulfill the social roles. Thus, the current study expects that fulfilling the task and social

roles would be important predictors of leadership emergence in early phases of group development.

Hypothesis 16: Fulfillment of the (a) task and (b) social roles will be positively related to leadership emergence in the early phases of group development.

Leadership Emergence in Later Phases of Group Development

Once a group reaches the later phases of group development, the roles in the group are clearly defined. Furthermore group members are developing a sense of the group capabilities and come to work as a self-managing group (Kozlowski et al, 1999, 2009). Thus, it is likely that it is in this phase that group members will begin to perform the boundary spanning roles, which are concerned with getting support from outside for the work. Empirical evidence supports the fact that boundary spanning behavior on the part of group members is positively related to both group viability and group performance ($r = .37, p < .05$; $r = .47, p < .01$, respectively; Marrone et al., 2007). Thus, it is likely that individuals who engage in these behaviors will emerge as the leader.

Hypothesis 17: Fulfillment of the boundary spanning roles will be positively related to leadership emergence in the later phases of group development.

Fulfillment of Roles as Mediator

Thus far I have suggested that intelligence, group experience, and personality facets will predict engagement in the task, social, and boundary spanning roles. Thus an individuals' intelligence, group experience, and personality will determine their behavior and the extent to which they fulfill the roles in the group. Likewise, individuals will be

motivated to fulfill the roles in order to satisfy particular needs. I also hypothesized that individuals who fulfill the task, social, and boundary spanning roles will emerge as the leaders of the group. Given this, a remaining question concerns how intelligence, group experience, and personality are translated into leadership emergence.

Previous research demonstrates that intelligence is positively related to leadership emergence (Judge et al., 2004). Likewise, experience in a group is likely to predict leadership emergence as experience has been shown to be positively related to performance (McEnrue, 1988). The personality characteristics of conscientiousness, extraversion, and openness to experience have also been shown to be positively related to leadership emergence (Judge et al., 2002). Finally, as Mann (1959) theorized, one of the reasons why leaders emerge is because they have a desire to satisfy certain needs in a group. Thus, the hypotheses forwarded earlier suggest that the fulfillment of roles will mediate the relationship between intelligence, group experience, and personality and leadership emergence. That is, individuals with high intelligence, prior group experience, and certain personality characteristics are more likely to fulfill the task, social, and boundary spanning roles. Additionally, individuals will satisfy their needs through fulfillment of the roles. These roles are the necessary roles needed for the group to function effectively. Thus, the fulfillment of these roles will lead to emergence as a leader.

Hypothesis 18: Fulfillment of the task and social roles will mediate the relationship between (a) intelligence, (b) group experience, and (c) personality and leadership emergence in the early phases of group development.

Hypothesis 19: Fulfillment of the boundary spanning roles will mediate the relationship (a) group experience and (b) personality and leadership emergence in the later phases of group development.

METHOD

Understanding Leadership Emergence

Research Setting and Sample

Participants in the current study included 41 newly formed Master's of Business Administration (MBA) project teams at a large Midwestern United States university. The teams are formed to collaborate on projects such as business cases, presentations, and group-based assignments. Each team included an average of 5 members, for a total individual-level sample size of 199. The average age of the participants was 29.6 years (SD = 4.7 years) with 5.9 years of work experience (SD = 4.1 years). Seventy-eight percent of the participants were male and 54 percent were Caucasian.

This sample was appropriate for this study because the newly formed teams allowed the study to follow the emergence of leadership from the interactions of a group through the later phases of group development. The current study design offers several advantages to studying leadership emergence as groups develop over time. First, the study is able to assess leadership emergence from the initial group interactions through later phases of group development. Assessing groups from their initial interactions enables the study to examine the extent to which group members are perceived to possess leaderlike characteristics. Thus, the study is able to examine whether group members rely on cognitive schemas to evaluate group members as leaders.

Second, the group members work together intensively which allows the study to assess the development of the group across the early and later phases of group development. Thus, the study is able to assess whether different variables predict leadership emergence in different phases of group development. Third, given the focus on understanding the predictors of leadership emergence across various phases of group development, the study design also minimizes differences in tasks, tenure, and group size as these might otherwise influence leadership emergence. Finally, due to the intensive nature of their interactions, the groups can be likened to other organizational groups such as project teams, semiautonomous work teams, and quality circles.

Procedure

This research was conducted in four distinct phases, which will be referred to as Time 0, 1, 2, and 3 with Time 1 marking the initial interaction of the group. All survey instruments are found in Appendix A and Table 4 summarizes the data collection schedule described here. Time 0 used archival data to collect basic demographics (gender, citizenship, age, and years of work experience) on each participant. The measure for intelligence, GMAT score, was also collected from archival data. Time 0 also utilizes surveys to collect self-ratings of personality and group experience. These surveys were administered approximately one month prior to Time 1, and 100% of the initial sample returned their surveys.

Time 1 used surveys to collect perceptions of group member's leaderlike characteristics and role behaviors. Each group member rated themselves as well as their other group members. This measurement period was conducted after one day of interactions between group members. Thus, the group members had enough interactions

Table 4. Data Collection

Construct	Measure	Source	Methodology	Time 0	Time 1	Time 2	Time 3
Demographics	Gender, International status, Age, Years Work Experience	Archival	Archival	X			
Intelligence	GMAT	Archival	Archival	X			
Personality	IPIP - Goldberg et al., 1999, 2006	Self	Survey	X			
Group Experience	Rentsch & Klimoski, 2001	Self	Survey	X			
Leaderlike Characteristics	Epitropaki & Martin, 2004	360 ratings	Survey		X	X	X
Role Behaviors	Mumford et al., 2006; 2008	360 ratings	Survey		X	X	X
Leadership Ratings	Lord et al., 1984; Taggar et al., 1999	360 ratings; Observers	Survey		X	X	X
Leadership Rankings	Zaccaro et al., 1991	360 ratings; Observers	Survey		X	X	X
Group Development Stage	New	Self	Survey		X	X	X

to form perceptions of one another, but would still be in the initial interaction phase. Ratings of leadership emergence and group development stage were also taken at Time 1. The survey response rate for Time 1 was 99% of the initial sample. Time 2 and Time 3 also used surveys to collect perceptions of group member's leaderlike characteristics, role behaviors, group development stage, and leadership emergence. Each group member rated themselves as well as their other group members. Time 2 was conducted after approximately 4 weeks of interactions between group members. After 4 weeks of interaction, the groups have gone through at least one period of intense group interaction which would enable the establishment of task competency and role differentiation in the group. Thus, they would likely be proceeding through the early phases of group development. Time 3 was conducted after approximately 7-8 months of interactions. By this time, group norms and roles would be well established and the group would have a sense of group capabilities, and thus would be in the later phases of group development. The survey response rate for Time 2 and Time 3 was 98% and 90% of the initial sample, respectively.

Measures

There are three broad classes of measures investigated in this study: (a) individual differences, (b) 360 peer-ratings of leaderlike characteristics and role behaviors, and (c) peer-assessed leadership emergence. Common method variance was mitigated for all hypotheses by having observer-assessed leadership emergence which could then be correlated with peer-assessed leadership emergence. Observers in the current study included group mentors and faculty members who interacted with the groups on a routine basis and thus could accurately observe leadership within the teams. Observers were

blind to the hypotheses of the study. Scale means, standard deviations, and reliability estimates for these measures are provided in Table 5. For peer ratings, r_{wg}, ICC(1), and ICC(2) are also provided in Table 5. I organize my discussion of these measures by time period which they were collected.

Time 0. In time 0 of the data collection, I gathered demographic data using archival data. I gathered data on individual differences via electronic surveys where participants provided self ratings.

Demographic data provided from archival files included gender, citizenship, age, and years of work experience prior to admission into the MBA program. Due to the large percentage of international participants in the study (31%) and concerns regarding the potential impact on leadership emergence, the presence of non-US citizens were operationalized in 4 different ways. The first was as a dummy code to indicate whether or not they were an international participant where 1=international and 0=non-international based on citizenship status in the United States. The second was based on scores on the verbal GMAT. The third was a dummy code which indicated whether or not a participant took the TOEFL where 1=took TOEFL and 0=did not take TOEFL. The fourth operationalization was based on whether or not a participant came from an English-speaking nation and was dummy coded into three groups: US, Non-US-English speaking, and Non-US-Non-English speaking with US as the referent group. Based on whether or not English was one of the country's official languages, the following were coded into the Non-US categories. Non-US English speaking nations included Ghana, Hong Kong, India, Ireland, Pakistan, and Singapore. Non-US-Non-English speaking nations included

Table 5. Means, Standard Deviations, and Reliabilities

Variable	Phase	# of Items	M	SD	α	r_{wg}	ICC(1)	ICC(2)
Big 5 Conscientiousness	Time 0							
Orderliness		10	3.68	.52	.73			
Achievement Striving		10	4.37	.41	.76			
Self-Discipline		10	3.83	.59	.84			
Big 5 Extraversion	Time 0							
Assertiveness		10	3.79	.56	.83			
Friendliness		10	4.13	.64	.90			
Gregariousness		10	3.66	.67	.85			
Big 5 Openness to Experience	Time 0							
Intellect		10	4.04	.60	.85			
Imagination		10	3.57	.68	.85			
Group Experience	Time 0							
Group Experience		13	4.18	.41	.83			
Self Leaderlike Characteristics	Time 1							
Sensitivity		3	4.37	.52	.70			
Intelligence		4	4.13	.57	.82			
Dedication		3	4.49	.57	.85			
Dynamism		3	4.06	.63	.76			
Tyranny		6	2.27	.79	.83			
Masculinity		2	3.54	1.30	.86			
Peer Leaderlike Characteristics	Time 1							
Sensitivity		3	4.40	.31	.76	.75	.08	.30
Intelligence		4	4.27	.31	.82	.76	.05	.22
Dedication		3	4.44	.35	.87	.74	.05	.22
Dynamism		3	3.94	.48	.80	.65	.22	.59
Tyranny		6	1.99	.45	.85	.62	.09	.34
Masculinity		2	3.46	1.07	.89	.52	.51	.84

Table 5 continued. Means, Standard Deviations, and Reliabilities

Variable	Phase	# of Items	M	SD	α	rwg	ICC(1)	ICC(2)
Self Role Behaviors	Time 1							
Task Roles		5	4.03	.54	.73			
Social Roles		3	4.17	.61	.76			
Boundary Spanning Roles		2	3.89	.83	.80			
Peer Role Behaviors	Time 1							
Task Roles		5	4.03	.34	.78	.71	.10	.37
Social Roles		3	4.20	.36	.77	.69	.09	.34
Boundary Spanning Roles		2	3.91	.44	.82	.47	.05	.22
Self Leadership Ratings	Time 1	4	3.96	.64	.88			
Peer Leadership Ratings	Time 1	4	3.88	.49	.89	.68	.22	.59
Observer Leadership Ratings	Time 1	4	3.38	.90	.94			
Group Development Stage	Time 1							
Team Formation		5	4.64	.23	.87	.91	.01	.06
Task Compilation		5	4.23	.32	.85	.69	.07	.27
Role Compilation		5	3.73	.33	.91	.63	-.02	-.09
Team Compilation		5	3.76	.36	.91	.68	-.02	-.14
Self Leaderlike Characteristics	Time 2							
Sensitivity		3	4.42	.49	.66			
Intelligence		4	4.32	.49	.75			
Dedication		3	4.55	.49	.79			
Dynamism		3	4.11	.67	.77			
Tyranny		6	2.35	.83	.84			
Masculinity		2	3.59	1.30	.86			

Table 5 continued. Means, Standard Deviations, and Reliabilities

Variable	Phase	# of Items	M	SD	α	rwg	ICC(1)	ICC(2)
Peer Leaderlike Characteristics	Time 2							
Sensitivity		3	4.34	.32	.71	.73	.06	.23
Intelligence		4	4.31	.28	.77	.80	.03	.13
Dedication		3	4.40	.40	.84	.75	.15	.47
Dynamism		3	3.93	.50	.78	.65	.22	.58
Tyranny		6	2.14	.54	.84	.72	.20	.55
Masculinity		2	3.53	1.02	.86	.53	.47	.82
Self Role Behaviors	Time 2							
Task Roles		15	3.94	.47	.89			
Social Roles		9	3.99	.55	.87			
Boundary Spanning Roles		6	3.27	.72	.84			
Peer Role Behaviors	Time 2							
Task Roles		15	3.80	.34	.91	.88	.14	.46
Social Roles		9	3.93	.31	.87	.80	.03	.15
Boundary Spanning Roles		6	3.26	.40	.85	.66	.06	.25
Self Leadership Ratings	Time 2	4	3.74	.73	.92			
Peer Leadership Ratings	Time 2	4	3.50	.57	.91	.76	.32	.71
Observer Leadership Ratings	Time 2	4	3.66	.97	.93			
Group Development Stage	Time 2							
Team Formation		5	4.25	.31	.85	.80	.10	.36
Task Compilation		5	4.17	.32	.88	.82	.07	.27
Role Compilation		5	3.99	.34	.93	.84	.05	.22
Team Compilation		5	3.95	.39	.91	.74	.09	.33

Table 5 continued. ***Means, Standard Deviations, and Reliabilities***

Variable	Phase	# of Items	M	SD	α	rwg	ICC(1)	ICC(2)
Self Leaderlike Characteristics	Time 3							
Sensitivity		3	4.50	.52	.70			
Intelligence		4	4.41	.47	.73			
Dedication		3	4.52	.50	.80			
Dynamism		3	4.18	.65	.78			
Tyranny		6	2.35	.87	.84			
Masculinity		2	3.65	1.44	.91			
Peer Leaderlike Characteristics	Time 3							
Sensitivity		3	4.33	.42	.82	.72	.03	.14
Intelligence		4	4.33	.38	.84	.78	.07	.28
Dedication		3	4.28	.55	.90	.71	.18	.52
Dynamism		3	3.91	.53	.81	.64	.15	.46
Tyranny		6	2.17	.57	.86	.79	.13	.43
Masculinity		2	3.50	1.05	.89	.58	.35	.73
Self Role Behaviors	Time 3							
Task Roles		15	4.04	.52	.91			
Social Roles		9	4.04	.62	.90			
Boundary Spanning Roles		6	3.35	.79	.85			
Peer Role Behaviors	Time 3							
Task Roles		15	3.81	.46	.94	.89	.18	.53
Social Roles		9	3.93	.42	.92	.78	.05	.22
Boundary Spanning Roles		6	3.34	.46	.89	.73	.02	.10
Self Leadership Ratings	Time 3	4	3.85	.72	.92			
Peer Leadership Ratings	Time 3	4	3.53	.67	.92	.66	.30	.68
Observer Leadership Ratings	Time 3	4	3.57	.96	.96			
Group Development Stage	Time 3							
Team Formation		5	4.01	.46	.95	.82	.00	.01
Task Compilation		5	4.18	.34	.90	.84	.00	-.01
Role Compilation		5	4.13	.39	.94	.89	.03	.14
Team Compilation		5	4.17	.36	.91	.85	.06	.25

Bolivia, China, Germany, Italy, Lithuania, Mexico, Netherlands, Peru, Republic of Korea, Taiwan, Venezuela, and Vietnam.

Analysis of the extent to which the four operationalizations explained variance in leadership emergence was conducted. Across time, international explained 15.1%, verbal GMAT explained 1.0%, Took TOEFL explained 7.2%, and the English speaking dummy codes explained 15.6% of the variance in peer-assessed leadership emergence. For observer-assessed leadership emergence, international explained 16.0%, verbal GMAT explained 0.0%, Took TOEFL explained 7.6%, and the English speaking dummy codes explained 16.7% of the variance over time. Thus, the dummy code for international and English speaking both explained similar amounts of variance in leadership emergence. The dummy code for international was chosen as the control variable in order to maximize the amount of variance explained with the least degrees of freedom.

Intelligence was captured by obtaining the group members' score on the GMAT.

Big Five personality facets were assessed using 10-item scales from the International Personality Item Pool (IPIP) (Goldberg, 1999; Goldberg et al., 2006; IPIP, 2007). Participants rated the extent to which statements accurately described themselves using a 5-point scale (1 = very inaccurate; 5 = very accurate). In the current study, three facets of conscientiousness were assessed which included the facets of orderliness, achievement-striving, and self-discipline. These scales have demonstrated acceptable reliability (α = .82; α = .78; α = .85; respectively; IPIP, 2007). Internal consistency reliability in the current study was .73; .76; .84, respectively. Three facets of extraversion were assessed including assertiveness, friendliness, and gregariousness. These scales have demonstrated acceptable reliability (α = .84; α = .87; α = .79, respectively; IPIP,

2007). Internal consistency reliability in the current study was .83; .90; .85, respectively. Two facets of openness to experience were assessed including intellect and imagination. These scales have demonstrated acceptable reliability (α = .86; α = .83, respectively; IPIP, 2007). Internal consistency reliability in the current study was .85; .85, respectively.

Group experience was assessed with the 13-items from Rentsch and Klimoski (2001). Participants rated their agreement with the items using a 5-point scale (1 = strongly disagree; 5 = strongly agree). A 7-item version of this measure demonstrated acceptable reliability (α = 80; Rentsch & Klimoski, 2001). Internal consistency reliability in the current study was .83.

Time 1. In Time 1, each group member was asked to rate their perceptions of their own as well as other group member's leaderlike characteristics and the role behaviors in the group. Ratings of leadership emergence and group development stage were also taken in Time 1.

Leaderlike characteristics. Self perceptions and perceptions of other member's leaderlike characteristics were assessed with a 21-item measure developed by Epitropaki and Martin (2004). The characteristics are categorized into prototypical leader characteristics of sensitivity, intelligence, dedication, and dynamism and antiprototypical leader characteristics of tyranny and masculinity. A 5-point rating scale was used, with response options ranging from 1 = not at all characteristic to 5 = extremely characteristic. In previous work, sensitivity, intelligence, dedication, and dynamism demonstrated acceptable reliabilities (α = .88; α = .79; α = .77; α = .70, respectively) as did tyranny and masculinity (α =.88; α = .83, respectively; Epitropaki & Martin, 2004).

In Time 1, internal consistency reliability was .70; .82; .85; .76 for self ratings of sensitivity, intelligence, dedication, and dynamism, respectively. Internal consistency reliability for self ratings of tyranny and masculinity was .83; .86. Internal consistency reliability was .76; .82; .87; .80 for peer ratings of sensitivity, intelligence, dedication, and dynamism, respectively. Internal consistency reliability for peer ratings of tyranny and masculinity was .85; .89. In the analyses, leaderlike characteristics for each individual was calculated as the average of peer ratings. Because of bias due to self-enhancement, self-ratings were excluded from these derived measures (Zaccaro et al, 1991).

I also investigated the degree to which these perceptions were shared within the group for each group member. An investigation of within-group agreement (r_{wg}) with a negative skew distribution revealed acceptable levels of agreement (sensitivity r_{wg} = .75; intelligence r_{wg} = .76; dedication r_{wg} = .74; dynamism r_{wg} = .65; tyranny r_{wg} = .62; masculinity r_{wg} = .52; Bliese, 2000; James, Demaree, & Wolf, 1993). There was significant between-individual variance in sensitivity $F(196, 575) = 1.432$, $p < .01$; intelligence $F(196, 575) = 1.282$, $p < .05$; dedication $F(196, 575) = 1.274$, $p < .05$; dynamism $F(196, 575) = 2.423$, $p < .01$; tyranny $F(196, 575) = 1.511$, $p < .01$; and masculinity $F(196, 566) = 6.247$, $p < .01$.

Intraclass correlations (ICCs) were as follows: sensitivity ICC(1) = .08; intelligence ICC(1) = .05; dedication ICC(1) = .05; dynamism ICC(1) = .22; tyranny ICC(1) = .09; masculinity ICC(1) = .51. Sensitivity ICC(2) = .30; intelligence ICC(2) = .22; dedication ICC(2) = .22; dynamism ICC(2) = .59; tyranny ICC(2) = .34; masculinity ICC(2) = .84. Thus, there were acceptable levels of within-group agreement (r_{wg} and

ICC[1]) as well as a reliable mean score (i.e., ICC[2]). Given this, I aggregated group member responses to form a single leaderlike characteristics score for each group member.

Role behaviors. Self perceptions and perceptions of other member's role behaviors were assessed using ten items from Mumford and colleagues (Mumford et al., 2006; Mumford et al., 2008). The task roles were assessed using 5 items, the social roles were assessed using 3 items, and the boundary spanning roles were assessed using 2 items. Participants were asked to rate to what extent they agreed that the group member engaged in the behaviors. The items were assessed on a 5-point scale ranging from 1 = not at all to 5 = to a very great extent.

In the current study, internal consistency reliability for self ratings was .73 for task roles, .76 for social roles, .80 for boundary spanning roles. Internal consistency reliability for peer ratings was .78 for task roles, .77 for social roles, .82 for boundary spanning roles. The 10-item measure was measured in Time 2 and Time 3 in addition to the 30-item measure and demonstrated strong convergent validity. For peer ratings, the 5-item task role measure correlated $r = .90$ and $r = .95$ with the 15-item task role measure in Time 2 and Time 3, respectively. For peer ratings, the 3-item social role measure correlated $r = .87$ and $r = .89$ with the 9-item social role measure in Time 2 and Time 3, respectively. Finally, for peer ratings, the 2-item boundary spanning role measure correlated $r = .73$ and $r = .89$ with the 6-item boundary spanning role measure in Time 2 and Time 3, respectively.

I also investigated the degree to which these perceptions were shared within the group for each group member. An investigation of within-group agreement (r_{wg}) with a

negative skew distribution revealed acceptable levels of agreement (task roles r_{wg} = .71; social roles r_{wg} = .69; boundary spanning roles r_{wg} = .47; Bliese, 2000; James et al., 1993). In addition, there was significant between-individual variance in task roles F(196, 575) = 1.581, $p < .01$; social roles F(196, 571) = 1.510, $p < .01$; boundary spanning roles F(196, 566) = 1.282, $p < .05$. Intraclass correlations (ICCs) were as follows: task roles ICC(1) = .10; social roles ICC(1) = .09; boundary spanning roles ICC(1) = .05. Task roles ICC(2) = .37; social roles ICC(2) = .34; boundary spanning roles ICC(2) = .22. Thus, there were acceptable levels of within-group agreement (r_{wg} and ICC[1]) as well as a reliable mean score (i.e., ICC[2]). Given this, I aggregated group member responses to form a single task, social, and boundary spanning roles score for each group member.

Leadership emergence was assessed using both ratings and rankings. The combination of both ratings and rankings is the most common form of measurement for leadership emergence (see Dobbins, Long, Dedrick & Clemons, 1990; Eby, Cader & Noble, 2003; Garland & Beard, 1979; Hall, Workman, & Marchioro, 1998; Smith & Foti, 1998; Zaccaro et al., 1991). The measures are used as separate indicators of leadership emergence (e.g., Smith & Foti, 1998; Zaccaro et al., 1991), as they will be in the current study.

Ratings leadership emergence were assessed with 5 items modified from the General Leadership Impressions (GLI) scale developed by Lord and colleagues (Lord et al., 1984) and items utilized by Taggar and colleagues (Taggar et al., 1999). In previous research, the items were shown to have acceptable reliabilities (α = .88 in Lord et al., 1984; α = .72 in Taggar et al., 1999). Participants were asked to assess the extent to which group members exhibit leadership in the team, are a desirable leader of the team

(items taken from Lord et al., 1984), exemplifies strong leadership in the team, assumes leadership in the team (items taken from Taggar et al., 1999), and influences the team (new). The items were assessed with a 5-point scale with anchors ranging from 1 = almost never to 5 = almost always. Participants rated themselves and the other members of the group on these items. Internal consistency reliability for self ratings in the current study was .88 and for peer ratings was .89. Observers also rated each individual on these items as well. Internal consistency reliability in the current study was .94.

I also investigated the degree to which these perceptions were shared within the group for each group member. An investigation of within-group agreement (r_{wg}) with a negative skew distribution revealed acceptable levels of agreement (leadership ratings r_{wg} = .68; Bliese, 2000; James et al., 1993). In addition, there was significant between-individual variance in leadership ratings $F(196, 571) = 2.409$, $p < .01$. Intraclass correlations (ICCs) were as follows: leadership ratings ICC(1) = .22; ICC(2) = .59. Thus, there were acceptable levels of within-group agreement (r_{wg} and ICC[1]) as well as a reliable mean score (i.e., ICC[2]). Given this, I aggregated group member responses to form a single leadership rating score for each group member.

Rankings of leadership were assessed using modified instructions Zaccaro, Foti, and Kenny (1991). For the task leader ranking, participants were given the instructions that their team would continue to work together on a variety of team projects and then asked to rank in order, their preference for the group member who would best facilitate accomplishments on the future tasks. Participants then gave a rank of 1 to their top choice, 2 to their second choice, and 3 to third choice, and so on. For the social leader ranking, participants were asked to rank in order, their preference for the group member

who would best facilitate the cohesiveness of the team during the future tasks. Participants then gave a rank of 1 to their top choice, 2 to their second choice, and 3 to third choice, and so on. The ranks were then reversed scored so that 1 = low task or social leadership and 5 = high task or social leadership.

I investigated the degree to which perceptions of leader task rank and leader social rank were shared within each group for each group member. An investigation of within-group agreement (r_{wg}) with a rectangular distribution revealed acceptable levels of agreement (leader task rank r_{wg} = .47; leader social rank r_{wg} = .37; Bliese, 2000; James et al., 1993). In addition, intraclass correlations (ICCs) were as follows: leader task rank ICC(1) was .31, ICC(2) was .69, and there was significant between-individual variance in leader task rank, $F(198, 572) = 3.252$, $p < .01$. Leader social rank ICC(1) was .16, ICC(2) was .49, and there was significant between-individual variance in leader social rank, $F(198, 571) = 1.949$, $p < .01$. Thus, there were acceptable levels of within-group agreement (r_{wg} and ICC[1]) as well as a reliable mean score (i.e., ICC[2]). Given this, I aggregated group member responses to form a single leadership emergence ranking score for each group member. In the analyses, leadership emergence was calculated as the average of peer rankings. Because of bias due to self-enhancement, self-ratings and self-rankings were excluded from these derived measures (Zaccaro et al, 1991).

Ranks are rectangularly distributed and therefore, it is recommended to normalize the original ranks (Cohen, Cohen, West, & Aiken, 2003). I normalized the original ranks by team for self, peer, and observer rankings. A composite leadership rank was also calculated by calculating the mean of the standardized leader task rank and standardized leader social rank. An overall leadership score was also calculated by calculating the

mean of the standardized leadership emergence rating, standardized leader task rank, and standardized leader social rank. The overall leadership score will be used in all regression analyses.

Group development stage was assessed using a scale developed in the current study. The development of the group development stage scale will be explained later in the methods section. Twenty items were used to assess the four developmental stages of team formation, task compilation, role compilation, and team compilation. Participants were asked to rate their perceptions of their team and its stage of team development. The items were assessed on a 5-point scale ranging from 1 = strongly disagree to 5 = strongly agree. Internal consistency reliability was .87 for team formation, .85 for task compilation, .91 for role compilation, and .91 for team compilation.

I also investigated the degree to which these perceptions were shared within the group. An investigation of within-group agreement (r_{wg}) with a negative skew distribution revealed acceptable levels of agreement (team formation r_{wg} = .91; task compilation r_{wg} = .69; role compilation r_{wg} = .63; team compilation r_{wg} = .68; Bliese, 2000; James et al., 1993). There was not significant between-team variance in team formation F(40, 155) = 1.067, *n.s.*; task compilation F(40, 154) = 1.377, *n.s.*; role compilation F(40, 154) = 0.915, *n.s.*; team compilation F(40, 154) = 0.882, *n.s.*. Intraclass correlations (ICCs) were as follows: team formation ICC(1) = .01; task compilation ICC(1) = .07; role compilation ICC(1) = -.02; team compilation ICC(1) = -.02. Team formation ICC(2) = .06; task compilation ICC(2) = .27; role compilation ICC(2) = -.09; team compilation ICC(2) = -.14. The non-significant between-team variance and low intraclass correlations are not surprising given the fact that all 41 teams were in the same

stage of development based on time and thus, there was low between team variance. Given the acceptable levels of within-group agreement (r_{wg}), I aggregated group member responses to form a single team formation, task compilation, role compilation, and team compilation score for each group.

Time 2 and Time 3. In both time periods, group members were asked to rate themselves and other group member's leaderlike characteristics and role behaviors in the group. Ratings of leadership emergence and group development stage were also taken in Time 2 and Time 3.

Leaderlike characteristics were assessed using the same scales outlined in Time 1. In Time 2, internal consistency reliability was .66; .75; .79; .77 for self ratings of sensitivity, intelligence, dedication, and dynamism, respectively. Internal consistency reliability for self ratings of tyranny and masculinity was .84; .86. In Time 3, internal consistency reliability was .70; .73; .80; .78 for self ratings of sensitivity, intelligence, dedication, and dynamism, respectively. Internal consistency reliability for self ratings of tyranny and masculinity was .84; .91. In Time 2, internal consistency reliability was .71; .77; .84; .78 for peer ratings of sensitivity, intelligence, dedication, and dynamism, respectively. Internal consistency reliability for peer ratings of tyranny and masculinity was .84; .86. In Time 3, internal consistency reliability was .82; .84; .90; .81 for peer ratings of sensitivity, intelligence, dedication, and dynamism, respectively. Internal consistency reliability for peer ratings of tyranny and masculinity was .86; .89. In the analyses, leaderlike characteristics for each individual was calculated as the average of peer ratings. Because of bias due to self-enhancement, self-ratings were excluded from these derived measures (Zaccaro et al, 1991).

I also investigated the degree to which these perceptions were shared within the group for each group member. For Time 2 measures, an investigation of within-group agreement (r_{wg}) with a negative skew distribution revealed acceptable levels of agreement (sensitivity r_{wg} = .73; intelligence r_{wg} = .80; dedication r_{wg} = .75; dynamism r_{wg} = .65; tyranny r_{wg} = .72; masculinity r_{wg} = .53; Bliese, 2000; James et al., 1993). There was significant between-individual variance in sensitivity $F(198, 572) = 1.293$, $p < .05$; dedication $F(198, 567) = 1.892$, $p < .01$; dynamism $F(198, 567) = 2.400$, $p < .01$; tyranny $F(198, 567) = 2.237$, $p < .01$; and masculinity $F(198, 571) = 5.462$, $p < .01$. Only intelligence did not demonstrate significant between-individual variance $F(198, 572) = 1.149$, *n.s.*

Intraclass correlations (ICCs) were as follows: sensitivity ICC(1) = .06; intelligence ICC(1) = .03; dedication ICC(1) = .15; dynamism ICC(1) = .22; tyranny ICC(1) = .20; masculinity ICC(1) = .47; Sensitivity ICC(2) = .23; intelligence ICC(2) = .13; dedication ICC(2) = .47; dynamism ICC(2) = .58; tyranny ICC(2) = .55; masculinity ICC(2) = .82. There were acceptable levels of within-group agreement (r_{wg} and ICC[1]) as well as a reliable mean score (i.e., ICC[2]). Although intelligence did not have reliable mean scores (ICC[2] = .13), it did have acceptable levels of within-group agreement (r_{wg} = .80). Given this, I aggregated group member responses to form a single leaderlike characteristics score for each group member.

For Time 3 measures, an investigation of within-group agreement (r_{wg}) with a negative skew distribution revealed acceptable levels of agreement (sensitivity r_{wg} = .72; intelligence r_{wg} = .78; dedication r_{wg} = .71; dynamism r_{wg} = .64; tyranny r_{wg} = .79; masculinity r_{wg} = .58; Bliese, 2000; James et al., 1993). There was significant between-

individual variance in intelligence $F(198, 508) = 1.385$, $p < .01$; dedication $F(198, 508) = 2.070$, $p < .01$; dynamism $F(198, 508) = 1.845$, $p < .01$; tyranny $F(198, 508) = 1.762$, $p < .01$; and masculinity $F(198, 508) = 3.736$, $p < .01$. Only sensitivity did not demonstrate significant between-individual variance $F(198, 505) = 1.186$, *n.s.*

Intraclass correlations (ICCs) were as follows: sensitivity ICC(1) = .03; intelligence ICC(1) = .07; dedication ICC(1) = .18; dynamism ICC(1) = .15; tyranny ICC(1) = .13; masculinity ICC(1) = .35; Sensitivity ICC(2) = .14; intelligence ICC(2) = .28; dedication ICC(2) = .52; dynamism ICC(2) = .46; tyranny ICC(2) = .43; masculinity ICC(2) = .73. There were acceptable levels of within-group agreement (r_{wg} and ICC[1]) as well as a reliable mean score (i.e., ICC[2]). Although sensitivity did not have reliable mean scores (ICC[2] = .14), it did have acceptable levels of within-group agreement (r_{wg} = .72). Given this, I aggregated group member responses to form a single leaderlike characteristics score for each group member.

Role behaviors were assessed using thirty items from Mumford and colleagues (Mumford et al., 2006; Mumford et al., 2008). The task roles were assessed using 15 items, the social roles were assessed using 9 items, and the boundary spanning roles were assessed using 6 items. Participants were asked to rate to what extent they agreed that the group member performed the behaviors. The items were assessed on a 5-point scale ranging from 1 = strongly disagree to 5 = strongly agree. Internal consistency reliability for self ratings was .89 for task roles, .87 for social roles, .84 for boundary spanning roles in Time 2 and .91 for task roles, .90 for social roles, .83 for boundary spanning roles in Time 3. Internal consistency reliability for peer ratings was .91 for task roles, .87 for

social roles, .85 for boundary spanning roles in Time 2 and .94 for task roles, .92 for social roles, .89 for boundary spanning roles in Time 3.

I also investigated the degree to which these perceptions were shared within the group for each group member. For Time 2, an investigation of within-group agreement (r_{wg}) with a negative skew distribution revealed acceptable levels of agreement (task roles $r_{wg} = .88$; social roles $r_{wg} = .80$; boundary spanning roles $r_{wg} = .66$; Bliese, 2000; James et al., 1993). In addition, there was significant between-individual variance in task roles $F(198, 572) = 1.843$, $p < .01$ and boundary spanning roles $F(198, 572) = 1.336$, $p < .01$. Social roles did not have significant between-individual variance $F(198, 572) = 1.176$, *n.s.* Intraclass correlations (ICCs) were as follows: task roles ICC(1) = .14; social roles ICC(1) = .03; boundary spanning roles ICC(1) = .06. Task roles ICC(2) = .49; social roles ICC(2) = .15; boundary spanning roles ICC(2) = .25. There were acceptable levels of within-group agreement (r_{wg} and ICC[1]) as well as a reliable mean score (i.e., ICC[2]). Although social roles did not have reliable mean scores (ICC[2] = .15), it did have acceptable levels of within-group agreement ($r_{wg} = .80$). Given this, I aggregated group member responses to form a single task, social, and boundary spanning roles score for each group member.

For Time 3, an investigation of within-group agreement (r_{wg}) with a negative skew distribution revealed acceptable levels of agreement (task roles $r_{wg} = .89$; social roles $r_{wg} = .78$; boundary spanning roles $r_{wg} = .73$; Bliese, 2000; James et al., 1993). In addition, there was significant between-individual variance in task roles $F(198, 508) = 2.131$, $p < .01$ and social roles $F(198, 508) = 1.278$, $p < .05$. Boundary spanning roles did not have significant between-individual variance $F(198, 508) = 1.110$, *n.s.* Intraclass

correlations (ICCs) were as follows: task roles ICC(1) = .18; social roles ICC(1) = .05; boundary spanning roles ICC(1) = .02. Task roles ICC(2) = .53; social roles ICC(2) = .22; boundary spanning roles ICC(2) = .10. There were acceptable levels of within-group agreement (r_{wg} and ICC[1]) as well as a reliable mean score (i.e., ICC[2]). Although boundary spanning roles did not have reliable mean scores (ICC[2] = .10), it did have acceptable levels of within-group agreement (r_{wg} = .73). Given this, I aggregated group member responses to form a single task, social, and boundary spanning roles score for each group member.

Leadership emergence was assessed using the same scales outlined in Time 1. Internal consistency reliability for self ratings in the current study was .92 in both Time 2 and Time 3. For peer ratings, internal consistency reliability was .91 and .92 for Time 2 and Time 3, respectively. Observers also rated each individual on these items as well. Internal consistency reliability in the current study was .93 in Time 2 and .96 in Time 3.

I also investigated the degree to which these perceptions were shared within the group for each group member. An investigation of within-group agreement (r_{wg}) with a negative skew distribution revealed acceptable levels of agreement (leadership ratings r_{wg} = .76 in Time 2, r_{wg} = .66 in Time 3; Bliese, 2000; James et al., 1993). In addition, there was significant between-individual variance in leadership ratings $F(198, 572) = 3.391$, $p < .01$ in Time 2 and $F(198, 505) = 3.119$, $p < .01$ in Time 3. Intraclass correlations (ICCs) were as follows: leadership ratings ICC(1) = .32 in Time 2; ICC(1) = .30 in Time 3. Leadership ratings ICC(2) = .71 in Time 2 and ICC(2) = .68 in Time 3. Thus, there were acceptable levels of within-group agreement (r_{wg} and ICC[1]) as well as a reliable mean

score (i.e., ICC[2]). Given this, I aggregated group member responses to form a single leadership rating score for each group member.

Rankings of leadership were assessed using modified instructions Zaccaro, Foti, and Kenny (1991) as explained in Time 1. The ranks were then reversed scored so that 1 = low task or social leadership and 5 = high task or social leadership.

I investigated the degree to which perceptions of leader task rank and leader social rank were shared within each group for each group member. For Time 2, an investigation of within-group agreement (r_{wg}) with a rectangular distribution revealed acceptable levels of agreement (leader task rank r_{wg} = .52; leader social rank r_{wg} = .41; Bliese, 2000; James et al., 1993). In addition, intraclass correlations (ICCs) were as follows: leader task rank ICC(1) was .36, ICC(2) was .73, and there was significant between-individual variance in leader task rank, $F(200, 578) = 3.833$, $p < .01$. Leader social rank ICC(1) was .25, ICC(2) was .63, and there was significant between-individual variance in leader social rank, $F(200, 578) = 2.692$, $p < .01$.

For Time 3, an investigation of within-group agreement (r_{wg}) with a rectangular distribution revealed acceptable levels of agreement (leader task rank r_{wg} = .60; leader social rank r_{wg} = .50; Bliese, 2000; James et al., 1993). In addition, intraclass correlations (ICCs) were as follows: leader task rank ICC(1) was .45, ICC(2) was .81, and there was significant between-individual variance in leader task rank, $F(200, 513) = 5.133$, $p < .01$. Leader social rank ICC(1) was .32, ICC(2) was .70, and there was significant between-individual variance in leader social rank, $F(200, 513) = 3.327$, $p < .01$.

Thus, there were acceptable levels of within-group agreement (r_{wg} and ICC[1]) as well as a reliable mean score (i.e., ICC[2]). Given this, I aggregated group member

responses to form a single leadership emergence ranking score for each group member. In the analyses, leadership emergence was calculated as the average of peer rankings. Because of bias due to self-enhancement, self-ratings and self-rankings were excluded from these derived measures (Zaccaro et al, 1991). I again normalized the original ranks by team for self, peer, and observer rankings. A composite leadership rank was also calculated using the mean of the standardized leader task rank and standardized leader social rank. An overall leadership score was also calculated by using the mean of the standardized leadership emergence rating, standardized leader task rank, and standardized leader social rank. The overall leadership score will be used in all regression analyses.

Group development stage was assessed using the same scale outlined in Time 1. In Time 2, internal consistency reliability was .85 for team formation, .88 for task compilation, .93 for role compilation, and .91 for team compilation. In Time 3, internal consistency reliability was .95 for team formation, .90 for task compilation, .94 for role compilation, and .91 for team compilation.

I also investigated the degree to which these perceptions were shared within the group. In Time 2, an investigation of within-group agreement (r_{wg}) with a negative skew distribution revealed acceptable levels of agreement (team formation r_{wg} = .80; task compilation r_{wg} = .82; role compilation r_{wg} = .84; team compilation r_{wg} = .74; Bliese, 2000; James et al., 1993). There was not significant between-team variance in task compilation F(40, 154) = 1.368, *n.s.* or role compilation F(40, 154) = 1.288, *n.s.*. There was significant between-team variance in team formation F(40, 154) = 1.569, $p < .05$ and team compilation F(40, 154) = 1.493, $p < .05$. Intraclass correlations (ICCs) were as follows: team formation ICC(1) = .10; task compilation ICC(1) = .07; role compilation

ICC(1) = .05; team compilation ICC(1) = .09. Team formation ICC(2) = .36; task compilation ICC(2) = .27; role compilation ICC(2) = .22; team compilation ICC(2) = .33.

In Time 3, an investigation of within-group agreement (r_{wg}) with a negative skew distribution revealed acceptable levels of agreement (team formation r_{wg} = .82; task compilation r_{wg} = .84; role compilation r_{wg} = .89; team compilation r_{wg} = .85; Bliese, 2000; James et al., 1993). There was not significant between-team variance in team formation F(40, 154) = 1.007, *n.s.;* task compilation F(40, 154) = 0.988, *n.s.*; role compilation F(40, 154) = 1.164, *n.s.;* team compilation F(40, 154) = 1.332, *n.s.*. Intraclass correlations (ICCs) were as follows: team formation ICC(1) = .00; task compilation ICC(1) = .00; role compilation ICC(1) = .03; team compilation ICC(1) = .06. Team formation ICC(2) = .01; task compilation ICC(2) = -.01; role compilation ICC(2) = .14; team compilation ICC(2) = .25.

The non-significant between-team variance and low intraclass correlations are not surprising given the fact that all 41 teams were in the same stage of development based on time and thus, there was low between team variance. Given the acceptable levels of within-group agreement (r_{wg}), I aggregated group member responses to form a single team formation, task compilation, role compilation, and team compilation score for each group.

Measuring Phases of Group Development

The current study is investigating the processes through which leaders emerge as groups develop over time. It is expected the over time, groups will develop over time and progress through the four phases of group development as outlined by Kozlowski and colleagues (Kozlowski et al., 1999; 2008). The stage of group development is expected to

determine the extent to which various factors are related to leadership emergence. Thus, rather than merely relying on time as an indicator of group development, an additional goal of the present study is to measure the phases of group development.

It has been noted that perhaps the greatest difficulty in conducting research in organizations is assuring the accuracy of measurement of the constructs (Barrett, 1972). A construct represents something that does not exist as an isolated, observable dimension of behavior. The more abstract the construct, the more difficult it is to measure (Nunnally, 1978). Phases of group development are abstract in that they represent a collection of behaviors and activities in the group. Furthermore, the phases of group development are difficult to measure as groups constantly change and continuously develop. As groups may vary in their procession through the various stages, it becomes even more important to capture the behaviors and activities that characterize a group in these stages in order to accurately measure the stages.

Literature searches revealed that there have been few attempts to measure the phases of group development. Most measures of group development are either not available, report no evidence of reliability or validity, or report poor reliability and validity (Carew & Parisi-Carew, 1988; Drexler, Sibbet, & Forrester, 1988; Jones, 1982; Jones & Bearley, 1986; Thelen, 1974; Thelen, Hawkes, & Strattner, 1969). Although there are existing measures which measure the phases of group development as outlined by Tuckman (1965; see Miller, 2003; Wheelan & Hochberger, 1996), there is not an existing measure which measures the phases of group development as outlined by Kozlowski and colleagues. Thus, the current study sought to develop a measure of group development for the Kozlowski model (Kozlowski et al., 1999, 2009).

The American Psychological Association (APA, 1995) states that an appropriate operational definition of the construct a measure declares to represent should demonstrate content validity, internal consistency, and criterion-related validity. Together, these provide evidence of the extent to which the scale measures what is declares to measure, or construct validity (Hinkin, 1998). There are three key components to construct validation: first, specifying the domain of the construct; second, empirically determining the extent to which items measure that domain; and third, examining the extent to which the measure produces results that are predictable from theory (Nunnally, 1978). Construct validation is essential for the development of quality measures (Schmitt & Klimoski, 1991) and forms the link between theory and psychometric measurement (Kerlinger, 1986). The following outlines the development of the measure which followed recommendations for development of measures in survey questionnaires as outlined by Hinkin (1995, 1998).

Assessing Content Validity

Content Domain Specification

Before generating items to assess the construct under examination, it is important to understand the theoretical foundation for the construct. From this theoretical foundation, the researcher can develop a clear, operational definition of the constructs (Hinkin, 1998). In the current study, I used Kozlowski and colleagues (1999, 2009) conceptualization of group development stages as the theoretical foundation and defined each of the following stages: team formation, task compilation, role compilation, and team compilation. The definitions of each stage can be seen in Table 6.

Table 6. *Definitions of Group Development Stages*

Development Stage	Definition	Items
Team Formation	First phase of group development marked by members seeking information about other group members as well as the basic nature of the group, its purpose, and their place in the group. The key process is socialization and key outcomes include developing interpersonal knowledge of other group members and becoming oriented to the group.	1. Members of our group are working on establishing relationships with each other. 2. Members of our group are focusing on learning about each other's skills, abilities, personalities, and attitudes. 3. Members of our group are getting to know each other. 4. Members of our group seek information about what the group is trying to accomplish. 5. Members of our group are trying to understand what it is like to be a part of this group. 6. Members of our group are focusing on understanding what is acceptable behavior and what is not acceptable behavior. 7. Members of our group are developing an understanding of the group, its purpose, and its requirements.
Task Compilation	Second phase of group development marked by group members developing knowledge of group tasks, trying to demonstrate their task competencies, and developing a sense of individual capability. The key process is skill acquisition and key outcomes include developing a mastery of the group's tasks and building self-efficacy related to tasks and responsibilities.	8. Members of our group are focusing on how to perform tasks needed in the group. 9. Members of our group are focusing on how well they are performing their individual responsibilities in the group. 10. Members of our group are trying to demonstrate their individual competencies within the group. 11. Members of our group are focusing on developing the knowledge, skills, and strategies to successfully perform their individual tasks and responsibilities in the group. 12. Members of our group are developing a sense of their individual capabilities. 13. Members of our group are beginning to feel confident in their skills and abilities to perform group tasks. 14. Members of our group are starting to feel secure with their tasks and responsibilities in the group.

Table 6 continued. *Definitions of Group Development Stages*

Development Stage	Definition	Items
Role Compilation	Third phase of group development marked by group members developing knowledge of their role in the group and establishing their role in the group. The key process is role negotiation and key outcomes include identifying with their role in the group and routinizing their role in the group.	15. Members of our group are establishing their roles in the group. 16. Members of our group are beginning to understand their boundaries of responsibility in the group. 17. Members of our group are starting to understand their roles and responsibilities in the group. 18. Members of our group are beginning to understand what is required of them. 19. Members of our group are developing an understanding of how their role fits with other roles in the group. 20. Members of our group are starting to understand each other's roles in the group. 21. Members of our group are beginning to coordinate their roles and responsibilities with other members of the group.
Team Compilation	Fourth phase of group development marked by clear roles in the group and group members developing a sense of group capabilities and self-management. The key process is teamwork and key outcomes include team efficacy, coordination, and shared mental models.	22. Members of our group understand our capabilities as a group. 23. Members of our group are confident in our group's ability to perform group tasks. 24. Members of our group are secure with each other's tasks and responsibilities in the group. 25. Members of our group clearly understand every group member's role and responsibility within the group. 26. Members of our group coordinate their actions with one another. 27. As members of this group, we clearly understand one another's role in the group. 28. Members of our group understand our group's norms, strategies, and goals.

Item Generation

The definitions of each group development stage were used as the basis for generating items which represented each development stage. Thus, I used a deductive method to generate items (Schwab, 1980). I reviewed Kozlowski and colleagues (1999, 2009) model describing the behaviors and characteristics of groups in each phase of group development as well as discussed the model personally with Steve W.J. Kozlowski (personal communication, March 19, 2008). From this, I developed 7 items for each phase of group development. My goal is to develop a measure which ultimately has 5 items for each stage of development, for a total of 20 items. Table 6 shows the 7 items developed for each stage based on Kozlowski and colleagues (1999, 2009) description of group development stages. The level of theory for group development stage was the group. In keeping with recommendations regarding multilevel research (e.g., Chan, 1998; Klein, Dansereau, & Hall, 1994; Morgeson & Hofmann, 1999), the items referenced the appropriate level of analysis (i.e., reference the group).

Content Validity Assessment

After generating the 28 items, they were subjected to an assessment of content validity by 27 team subject matter experts (SMEs). SMEs where defined as individuals whom had previously published one or more studies on teams. Collectively, the SMEs had published over 133 articles on teams and 70% of the SMEs had published 3 or more articles on teams. Each SME was emailed an information letter and a content validation questionnaire. Content validation was assessed through two methods. First, the SMEs were asked to classify each item into one of the four group stages. An option to label the items as unidentifiable was also included among the construct classification options. This

technique has been employed by other researchers in assessing content validity (see Bernerth, Armenakis, Feild, Giles, & Walker, 2007; MacKenzie, Podsakoff, & Fetter, 1991). Second, the SMEs were asked to rate the extent to which each item matched the given definition, following the approach developed by Schriesheim and colleagues (Schriesheim, Powers, Scandura, Gardiner, & Lankau, 1993). Thus, they were provided the definitions of each stage and then asked to rate the extent to which each item corresponded to each definition. The response scale used was: 1 = not at all, 2 = to a limited extent, 3 = to a moderate extent, 4 = to a large extent, 5 = to a very large extent, which is a modified version of the scale used by Schreisheim et al, 1993). The information provided to each SME can be found in Appendix B.

Results of the content validation were assessed in three different ways, the results of which are shown in Table 7. First, the percentage of SMEs who classified an item to the phase of group development was assessed. Second, the mean rating of the extent to which the SMEs thought the items matched the given definition of group development stage was also calculated. Third, the content validity ratio (CVR) for each item was also calculated (Lawshe, 1975). The CVR was calculated using the following formula: CVR = $(n_e - N/2)/ (N/2)$. n_e represents the number of experts who identified the item as assessing the particular group development stage and who also rated it as reflecting the stage to a large extent or to a very large extent (4 or 5). N is the total number of SMEs. Therefore, a CVR of 1.0 indicates the item was perfectly content valid in the eyes of the SMEs and a CVR of -1.0 indicates the item was perfectly content invalid in the eyes of the SMEs (Lawshe, 1975). These are the same criteria used to assess the content validity of a new measure of leader-member exchange relationships (Bernerth et al., 2007).

Table 7. *Subject Matter Experts' Judgments of Constructs Assessed by Group Development Stage Items*

Item	Team Formation				Task Compilation				Role Compilation				Team Compilation			
Team Formation Items	%	M	SD	CRV	%	M	SD	CRV	%	M	SD	CRV	%	M	SD	CRV
1. Members of our group are working on establishing relationships with each other.	74	4.42	0.97	0.67	0	1.77	0.75	-1.00	22	2.41	1.56	-0.45	4	1.59	1.05	-0.91
2. Members of our group are focusing on learning about each other's skills, abilities, personalities, and attitudes.	78	3.88	1.30	0.44	15	2.39	1.20	-0.65	7	2.35	1.40	-0.57	0	1.57	0.73	-1.00
3. Members of our group are getting to know each other.	100	4.96	0.20	1.00	0	2.00	1.04	-0.83	0	1.87	1.01	-0.91	0	1.22	0.52	-1.00
4. Members of our group seek information about what the group is trying to accomplish.	78	4.38	1.17	0.75	19	2.63	1.17	-0.58	4	1.78	0.90	-0.91	0	1.61	0.94	-0.91
5. Members of our group are trying to understand what it is like to be a part of this group.	100	4.88	0.34	1.00	0	1.68	0.95	-0.82	0	1.64	1.00	-0.91	0	1.18	0.39	-1.00
6. Members of our group are focusing on understanding what is acceptable behavior and what is not acceptable behavior.	81	4.28	1.06	0.60	0	1.87	1.01	-0.83	7	2.13	1.25	-0.65	0	1.35	0.65	-1.00
7. Members of our group are developing an understanding of the group, its purpose, and its requirements.	93	4.63	0.92	0.83	7	2.00	1.22	-0.75	0	1.57	0.79	-0.91	0	1.35	0.71	-0.91

Table 7 continued. *Subject Matter Experts' Judgments of Constructs Assessed by Group Development Stage Items*

Item	Team Formation				Task Compilation				Role Compilation				Team Compilation			
Task Compilation Items	%	M	SD	CRV	%	M	SD	CRV	%	M	SD	CRV	%	M	SD	CRV
8. Members of our group are focusing on how to perform tasks needed in the group.	0	1.64	0.79	-0.91	96	4.50	0.83	0.75	4	2.18	1.18	-0.73	0	1.41	0.91	-0.82
9. Members of our group are focusing on how well they are performing their individual responsibilities in the group.	0	1.43	0.73	-1.00	93	4.00	1.22	0.52	0	2.35	1.27	-0.74	4	1.61	0.78	-1.00
10. Members of our group are trying to demonstrate their individual competencies within the group.	4	1.91	1.02	-0.82	96	4.58	0.72	0.92	0	2.18	1.22	-0.73	0	1.64	1.05	-0.91
11. Members of our group are focusing on developing the knowledge, skills, and strategies to successfully perform their individual tasks and responsibilities in the group.	0	1.39	0.50	-1.00	96	4.52	0.92	0.84	0	2.26	1.21	-0.74	0	1.52	0.99	-0.91
12. Members of our group are developing a sense of their individual capabilities.	4	1.48	0.67	-1.00	85	4.32	0.80	0.76	0	2.13	1.10	-0.74	0	1.30	0.56	-1.00
13. Members of our group are beginning to feel confident in their skills and abilities to perform group tasks.	0	1.23	0.43	-1.00	59	3.42	1.47	0.17	0	2.00	1.02	-0.82	33	2.77	1.80	-0.18
14. Members of our group are starting to feel secure with their tasks and responsibilities in the group.	0	1.36	0.73	-0.91	59	3.65	1.34	0.22	22	3.39	1.27	0.13	11	1.82	1.01	-0.82

Table 7 continued. *Subject Matter Experts' Judgments of Constructs Assessed by Group Development Stage Items*

Item	Team Formation				Task Compilation				Role Compilation				Team Compilation			
Role Compilation Items	%	M	SD	CRV	%	M	SD	CRV	%	M	SD	CRV	%	M	SD	CRV
15. Members of our group are establishing their roles in the group.	0	1.74	0.92	-0.91	0	1.70	0.70	-1.00	100	4.76	0.44	1.00	0	1.57	0.99	-0.91
16. Members of our group are beginning to understand their boundaries of responsibility in the group.	0	1.36	0.58	-1.00	4	2.32	0.89	-0.82	93	4.13	0.90	0.50	0	1.86	1.21	-0.73
17. Members of our group are starting to understand their roles and responsibilities in the group.	4	1.52	0.73	-1.00	0	2.26	1.01	-0.74	89	4.56	0.77	0.84	4	1.74	1.14	-0.83
18. Members of our group are beginning to understand what is required of them.	15	3.20	1.29	-0.28	30	3.22	1.28	0.04	41	2.82	1.40	-0.36	0	1.09	0.29	-1.00
19. Members of our group are developing an understanding of how their role fits with other roles in the group.	0	1.35	0.57	-1.00	0	1.87	1.01	-0.91	96	4.44	0.65	0.84	4	2.13	1.49	-0.57
20. Members of our group are starting to understand each other's roles in the group.	0	1.48	0.59	-1.00	0	1.83	0.65	-1.00	93	4.76	0.44	1.00	4	2.00	1.38	-0.65
21. Members of our group are beginning to coordinate their roles and responsibilities with other members of the group.	0	1.22	0.52	-1.00	4	1.58	0.78	-1.00	74	4.20	0.96	0.60	22	2.70	1.72	-0.22

Table 7 continued. *Subject Matter Experts' Judgments of Constructs Assessed by Group Development Stage Items*

Item	Team Formation				Task Compilation				Role Compilation				Team Compilation			
Team Compilation Items	%	M	SD	CRV	%	M	SD	CRV	%	M	SD	CRV	%	M	SD	CRV
22. Members of our group understand our capabilities as a group.	0	1.39	0.66	-1.00	0	1.91	1.16	-0.83	0	2.13	1.01	-0.74	100	4.40	1.00	0.84
23. Members of our group are confident in our group's ability to perform group tasks.	0	1.23	0.43	-1.00	7	1.50	0.60	-1.00	4	1.86	0.89	-0.91	85	4.79	0.41	1.00
24. Members of our group are secure with each other's tasks and responsibilities in the group.	0	1.09	0.29	-1.00	7	1.82	1.01	-0.82	15	2.83	1.15	-0.30	78	4.39	0.99	0.74
25. Members of our group clearly understand every group member's role and responsibility within the group.	0	1.22	0.42	-1.00	0	1.52	0.79	-0.91	22	3.17	1.27	-0.22	78	4.16	1.31	0.60
26. Members of our group coordinate their actions with one another.	0	1.26	0.45	-1.00	0	1.83	0.87	-0.92	11	2.83	1.24	-0.33	81	4.44	1.00	0.84
27. As members of this group, we clearly understand one another's role in the group.	0	1.17	0.39	-1.00	0	1.61	0.78	-1.00	26	3.04	1.33	-0.30	74	4.52	1.00	0.84
28. Members of our group understand our group's norms, strategies, and goals.	15	1.96	1.26	-0.74	4	1.71	1.00	-0.83	0	2.41	1.56	-0.91	70	4.08	1.38	0.58

Following recommendations from Hinkin (1998), the minimum correct item classification of 75% of SME was required to provide evidence of content adequacy. For the team formation items, there were 6 items that met this criterion, with the exception of item 1. Item 1 was correctly classified to the team formation stage 74% of the time. Five out of seven task compilation items met this criterion, with the exception of item 13 and item 14 which were both classified to the task compilation stage 59% of the time. For the role compilation items, five items also met the criterion, with the exception of item 18 and item 21 which were classified to the role compilation stage 41% and 74% of the time. Finally, five items from the team compilation stage met the criterion with the exception of items 27 and 28 which were classified to the team compilation stage 74% and 70% of the time.

The mean ratings in Table 7 summarize the extent to which the SMEs judged the items to adequately represent the definitions of the various phases of group development. Results indicate that the appropriate items adequately represented the various phases. Specifically, items that were representative of a particular stage had higher mean ratings for the particular stage they were to represent rather than for the stages they did not represent. For example, all of the team formation items had mean ratings higher than 4 for the team formation stage with the exception of item 2, which had a mean rating of 3.88. These same team formation items had mean ratings lower than 2.63 in terms of their representation of the task compilation, role compilation, and team compilation stages. For the task compilation stage, five out of seven task compilation items also had mean ratings higher than 4, with the exception of items 13 and 14, which had mean ratings of 3.42 and 3.65, respectively. These same 7 task compilation items had mean ratings lower than 3.39

in the team formation, role compilation, and team compilation stage. Six out of 7 role compilation items had mean ratings higher than 4 for the role compilation stage. The exception was item 18, which had a mean rating of 2.82. These same 7 items had mean ratings less than 3.22 when representing the team formation, task compilation, and team compilation stages. Finally, all 7 of the team compilation items had mean ratings higher than 4 for the team compilation stage. The lowest mean was 4.08 for item 28. These same 7 items had mean ratings less than 3.17 when representing the team formation, task compilation, and role compilation stages.

Finally, a minimum CVR value was calculated for what was needed to indicate that an item had content validity. With a panel of 25 experts, a minimum CVR value of 0.37 ($p < .05$) indicates that an item has content validity (Lawshe, 1975). For the team formation items, all items passed the minimum CVR threshold. For the task compilation items, 2 items did not pass the minimum CVR threshold. These items were items 13 and 14, which had CRV values of 0.17 and 0.22, respectively. Six out of 7 role compilation items passed the minimum CVR threshold with the exception of item 18, which had a CVR value of -0.36. Finally, all team compilation items passed the minimum CVR threshold.

In summary, the content validation indicated there were some items which would not be deemed as content valid for particular phases of group development, or received mixed support for their content validity. In the team formation stage, there is mixed support for the content validity of items 1 and 2. Item 1 did not mean the minimum correct item classification of 75%, although it was correctly classified to the team formation stage 74% of the time. Item 1 also passed the minimum CVR threshold, with

the CVR of 0.67. Item 2 passed both the minimum correct item classification at 78% and minimum CVR threshold at 0.44, but did have lower mean ratings at 3.88. In the task compilation stage, two items did not meet either the minimum correct item classification or the minimum CVR threshold. These were items 13 and 14 which had item classifications of 59% and CVR values of 0.17 and 0.22, respectively. For the role compilation stage, item 18 did not meet either the minimum correct item classification or the minimum CVR threshold with values of 41% and -0.36, respectively. There was also mixed support for item 21, which had an item classification of 74% and a CVR of 0.60. For the team compilation items, there was mixed support for items 27 and 28, which had item classifications of 74% and 70%, but did meet the minimum CVR threshold with 0.84 and 0.58 CVR values, respectively. Results of the content validity analysis suggest deleting some of the items from the 28 item measure. For the items with mixed support, further analysis will be conducted to assess their internal consistency with other items measuring a particular phase of group development.

Assessing Dimensionality and Internal Consistency

Pilot Test of Questionnaire

The questionnaire was first pilot tested with 95 teams comprised of undergraduate students at a large Midwestern University. Each team included 4 to 5 members, for a total individual *n* of 447. The average age of the participants was 20.8 years (SD = 1.5 years). Sixty-one percent of the participants were male and 83 percent were Caucasian. Schwab (1980) recommends a 1:10 item-to-response ratio for each set of scales to be factor analyzed. The current study has a 1:15 item-to-response ratio. Each group member was asked to assess their group's stage of development using a simple 5-point "strongly

disagree" to "strongly agree" scale. Because negatively worded items have been shown to produce factor structure problems in other measures (Idazak & Drasgow, 1987), items were positively worded such that greater levels of agreement indicated the group existing in the phase of group development. In half of the teams, each group member was also asked to assess their group's stage of development with four items which described the 4 stages of group development using a simple 5-point "not at all descriptive" to "extremely descriptive." In half of the teams, group members also assessed their group's stage of development by responding to 12 published items from the Group Development Questionnaire (GDQ; Wheelan & Hochberger, 1996). The 12 items include 3 items each used to assess the four group development stages as outlined by Tuckman (1965). The response scale used for the GDQ was a simple 5-point "strongly disagree" to "strongly agree" scale.

An exploratory factor analysis was conducted using principal axis factor with varimax rotation. Two factors with eigenvalues greater than 1.0 emerged. Examination of the rotated component matrix indicated that the two factors included a team formation-task compilation factor and a role compilation-team compilation factor. The intercorrelations and reliabilities of the 4 factor scale are shown in Table 8 along with their intercorrelations with the stage descriptions and four factors of the Group Development Questionnaire (GDQ; Wheelan & Hochberger, 1996). Intercorrelations between the 4 factors ranged from $r = .85$ to .91 with an average $r = 0.88$). Cronbach's alpha for each of the scales was acceptable as it ranged from $\alpha = .97$ to .98. Based on these reliabilities, all 28 items were used in the current study to assess group development stage.

Table 8. *Descriptive Statistics and Correlations of Pilot Study for Group Development Stage Measure*

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Team Formation Scale	3.95	.90	(.97)											
2. Task Compilation Scale	4.00	.85	.89	(.97)										
3. Role Compilation Scale	3.99	.91	.86	.89	(.98)									
4. Task Compilation Scale	4.00	.89	.85	.90	.91	(.97)								
5. Team Formation Description	3.96	.94	.71	.67	.64	.62	–							
6. Task Compilation Description	3.99	.94	.67	.66	.62	.61	.89	–						
7. Role Compilation Description	3.94	.99	.63	.61	.58	.57	.80	.84	–					
8. Task Compilation Description	3.96	1.05	.57	.55	.53	.50	.72	.76	.69	–				
9. GDQ Stage 1	3.67	.87	.57	.62	.67	.65	.46	.42	.40	.30	(.68)			
10. GDQ Stage 2	3.16	1.19	.23	.25	.28	.25	.10	.06	.08	.00	.65	(.89)		
11. GDQ Stage 3	3.85	.91	.74	.76	.81	.76	.58	.56	.53	.46	.76	.47	(.84)	
12. GDQ Stage 4	3.95	.95	.73	.78	.83	.80	.62	.62	.59	.59	.69	.30	.86	(.90)

Note: *N* ranges from 226-447. Cronbach's alphas appear on diagonal. Correlations greater than $r = .23$ significant at $p < .01$. GDQ = Group Development Questionnaire.

Results from Current Study

The questionnaire was then used with the 41 teams in the present study and measured at Time 1, 2, and 3 as previously described. The results presented here represent the results from the measure used in the 41 teams. First, I reviewed the average interitem correlations and factor loadings. Any item that correlates at less than .4 with other items assessing the construct should be deleted (Hinkin, 1998; Kim & Mueller, 1978). In the current study, item 6 correlated less than .4 with other items assessing team formation at both Time 1 and Time 2. Likewise, item 13 correlated less than .4 with other items assessing task compilation in Time 1.

The group development stage theory would predict that four factors should emerge from the scale. Confirmatory factor analysis was conducted for the measure at Time 1, 2, and 3. The standardized factor loadings can be seen in Table 9. Fit statistics for each of the time periods indicated sufficient fit for a four-factor model. At Time 1, fit statistics were: $\chi 2 = 856.05$ ($df = 344$), CFI = .97, RMSEA = .087. At Time 2, fit statistics were: $\chi 2 = 789.18$ ($df = 344$), CFI = .98, RMSEA = .082. At Time 3, fit statistics were: $\chi 2 = 1062.58$ ($df = 344$), CFI = .97, RMSEA = .108.

Based on the results of the content validity and confirmatory factor analysis, items 4, 6, 13, 14, 18, 21, 23, and 26 were dropped from the appropriate scales to leave 5 items per scale for a total of 20 items. Internal consistency reliabilities and assessment of shared perceptions within the team are provided in the measure section above.

Assessing Criterion-Related Validity

The final step in assessing construct validity is to examine relationships between the new measure and variables with which they could be hypothesized to relate to in

Table 9. *Standardized Factor Loadings from Confirmatory Factor Analysis of 28 Group Development Stage Items*

	Item	Time 1	Time 2	Time 3
	Factor 1: Team Formation Stage			
1.	Members of our group are working on establishing relationships with each other.	.77	.68	.88
2.	Members of our group are focusing on learning about each other's skills, abilities, personalities, and attitudes.	.78	.71	.89
3.	Members of our group are getting to know each other.	.75	.73	.86
4.	Members of our group seek information about what the group is trying to accomplish.	.77	.76	.76
5.	Members of our group are trying to understand what it is like to be a part of this group.	.75	.73	.85
6.	Members of our group are focusing on understanding what is acceptable behavior and what is not acceptable behavior.	.57	.68	.79
7.	Members of our group are developing an understanding of the group, its purpose, and its requirements.	.75	.80	.91
	Factor 2: Task Compilation Stage			
8.	Members of our group are focusing on how to perform tasks needed in the group.	.66	.75	.84
9.	Members of our group are focusing on how well they are performing their individual responsibilities in the group.	.71	.76	.76
10.	Members of our group are trying to demonstrate their individual competencies within the group.	.66	.7	.80
11.	Members of our group are focusing on developing the knowledge, skills, and strategies to successfully perform their individual tasks and responsibilities in the group.	.72	.81	.81
12.	Members of our group are developing a sense of their individual capabilities.	.71	.78	.80
13.	Members of our group are beginning to feel confident in their skills and abilities to perform group tasks.	.73	.81	.77
14.	Members of our group are starting to feel secure with their tasks and responsibilities in the group.	.79	.85	.74
	Factor 3: Role Compilation Stage			
15.	Members of our group are establishing their roles in the group.	.73	.80	.76
16.	Members of our group are beginning to understand their boundaries of responsibility in the group.	.73	.82	.90
17.	Members of our group are starting to understand their roles and responsibilities in the group.	.82	.89	.91
18.	Members of our group are beginning to understand what is required of them.	.66	.80	.87
19.	Members of our group are developing an understanding of how their role fits with other roles in the group.	.83	.87	.89
20.	Members of our group are starting to understand each other's roles in the group.	.92	.89	.90
21.	Members of our group are beginning to coordinate their roles and responsibilities with other members of the group.	.86	.77	.87

Table 9 continued. *Standardized Factor Loadings from Confirmatory Factor Analysis of 28 Group Development Stage Items*

Item	Time 1	Time 2	Time 3
Factor 4: Team Compilation Stage			
22. Members of our group understand our capabilities as a group.	.77	.76	.72
23. Members of our group are confident in our group's ability to perform group tasks.	.58	.71	.82
24. Members of our group are secure with each other's tasks and responsibilities in the group.	.81	.79	.85
25. Members of our group clearly u.74nderstand every group member's role and responsibility within the group.	.88	.82	.84
26. Members of our group coordinate their actions with one another.	.78	.74	.78
27. As members of this group, we clearly understand one another's role in the group.	.92	.87	.81
28. Members of our group understand our group's norms, strategies, and goals.	.73	.87	.85

Table 10. *Mean Scores of Group Development Stage Over Time*

	Mean Ratings		
Group Development Stage	Time 1	Time 2	Time 3
Team Formation	4.64	4.25	4.01
Task Compilation	4.23	4.17	4.18
Role Compilation	3.73	3.99	4.13
Team Compilation	3.76	3.95	4.17

order to develop a nomological network and establish criterion-related validity (Cronbach & Meehl, 1955; Hinkin, 1998). The criterion-related validity of the measure will be established in the study by the phases of group development across time, as shown in Table 10. Table 10 provides a summary of the ratings of group development stage over time. As shown, in Time 1, the team formation stage had a mean of 4.64, which was higher than the task, role, and team compilation stage means of 4.23, 3.73, and 3.76. Paired samples t-tests comparing the means determined that the team formation stage mean was significantly different from the other means in Time 1 ($t(40) = 9.83, p < .01$; $t(40) = 18.98, p < .01$; $t(40) = 17.53, p < .01$, respectively). The team formation stage in Time 1 was also higher than the team formation stage mean in Time 2 ($M = 4.25$) and the team formation stage mean in Time 3 ($M = 4.01$). Paired samples t-tests comparing the means determined that the team formation stage mean was significantly different from the other team formation means in Time 2 and 3 ($t(40) = 7.07, p < .01$; $t(40) = 8.33, p < .01$, respectively). Thus, it reasonable that Time 1 represents the team formation stage.

As shown, in Time 2, the task and role compilation stages had means of 4.17 and 3.99, respectively, which were lower than the team formation mean of 4.25 and higher than the team compilation mean of 3.95. Paired sample t-tests comparing the means determined that the task and role compilation stage means were significantly different from one another ($t(40) = 5.45, p < .01$). Additionally, paired sample t-tests comparing the task and role compilation means to the team formation and team compilation means in Time 2 found that the task compilation mean was significantly different from the team formation mean ($t(40) = 2.02, p < .05$) and team compilation mean ($t(40) = 5.87, p < .01$). The role compilation mean was significantly different from the team formation mean

($t(40) = 5.73, p < .01$), but not significantly different from the team compilation mean ($t(40) = 1.06$, *n.s.*).

The task compilation mean in Time 2 was lower than the task compilation mean in Time 1 ($M = 4.23$) and Time 3 ($M = 4.18$), although they were not significantly different. The role compilation mean in Time 2 was higher than the role compilation mean in Time 1 ($M = 3.73$), which was a significant difference ($t(40) = 3.95, p < .01$), and lower than the role compilation mean in Time 3 ($M = 4.13$), but the difference was not statistically significant. These results suggest that in Time 2, the teams are moving from the team formation stage into the task and role compilation stages.

Finally, in Time 3, the team compilation stage had a mean of 4.17, which was higher than the team formation mean of ($M = 4.01$), a statistically significant difference ($t(40) = -2.67, p < .05$). The team compilation mean was almost equal to the task compilation mean of 4.17 and higher than the role compilation mean of 4.13, although neither of the differences was statisically significant. The team compilation stage in Time 3 was also higher than the team compilation stage mean in Time 1 ($M = 3.76$; $t(40) = 5.42, p < .01$) and the team compilation stage mean in Time 2 ($M = 3.95$; $t(40) = 3.22, p < .01$), both of which were statistically significant differences. These results suggest that by Time 3, the teams have moved out of the team formation stage and are progressing toward the team compilation stage, although they are not fully in the team compilation stage.

Analyses

Power Analysis

The hypotheses of the current study are at the individual level. Thus, assuming a moderate effect size (d = .30; Cohen, 1988), coefficient alpha of .05, a power analysis indicates that approximately 84 individuals are needed to achieve a power level of .80.

Data Analysis

I analyzed the data by means of a two-level hierarchical linear model (HLM; Raudenbush & Byrk, 2002). HLM allows one to analyze variables at multiple levels of analysis in a series of regression equations. In the current study, individuals are nested within groups. Thus, Level 1 was at the individual level and included all individual differences, and perceptions of individual members' leaderlike characteristics, role behaviors, and leadership emergence, whereas Level 2 was the group level. To control for potential differences in leadership emergence due to differences in tasks or team interdependence, the dependent variables were centered by MBA program rather than creating a three level model with MBA program as Level 3.

In the current study, I have three assessments of leadership emergence as well as assessments of group development stage at each of these phases. I expect that leaderlike characteristics will predict leadership emergence at the initial interaction of a group, which will be the Time 1 assessments of leadership emergence. I also expect that the fulfillment of task and social roles will predict leadership emergence in the early phases of group development, which will be the Time 2 assessments of leadership emergence. Finally, I expect that the fulfillment of boundary spanning roles will predict leadership emergence in the later phases of group development, which will be the Time 3 assessments of leadership emergence. Figure 2 summarizes these expectations.

Results

Intercorrelations Among Variables

Table 11 present the intercorrealtions of the major constructs in the study. In Appendix C, Tables 11a-11j presents the means, standard deviations, and intercorrelations of the complete list of study variables. Table 11a presents the means, standard deviations, and intercorrelations of the Time 0 variables. Group experience does not have a significant relationship with age (r = .01, *n.s.*) or years of work experience (r = -.02, *n.s.*). Certain personality facets within the same Big Five personality characteristic demonstrate strong correlations (e.g., gregariousness correlates r = .66, p < .01 with friendliness), but demonstrate low to moderate correlations with personality facets with other Big Five personality characteristics (e.g., gregariousness correlates r = .20, p < .01 with self discipline; imagination correlates r = .05, *n.s.* with self discipline).

Table 11b presents the means, standard deviations, and intercorrelations of the Time 1 variables. Self and peer ratings of the leaderlike characteristics of dedication, dynamism, tyranny, and masculinity are positively related, whereas self and peer ratings of the leaderlike characteristics of sensitivity and intelligence are not related. In terms of role behaviors, self and peer ratings of task role behaviors are also positively related (r = .16, p < .05). Self and peer-assessed leadership emergence were positively related (r = .37, p < .01), self and observer-assessed leadership emergence were positively related (r = .25, p < .01), and peer and observer-assessed leadership emergence were positively related (r = .42, p < .01).

Table 11c presents the means, standard deviations, and intercorrelations of the Time 2 variables. Similar to Time 1, self and peer ratings of the leaderlike characteristics

Table 11. *Intercorrelations of Major Constructs Across Time*

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. International															
2. Intelligence (GMAT)	0.34	–													
3. C-Orderliness	0.23	-0.14	–												
4. C-Achievement Striving	-0.06	-0.19	0.04	–											
5. C-Self-Discipline	0.05	-0.19	0.28	0.56	–										
6. E-Assertiveness	-0.15	-0.10	0.07	0.41	0.31	–									
7. E-Friendliness	0.07	-0.02	0.13	0.30	0.30	0.51	–								
8. E-Gregariousness	0.13	0.03	0.09	0.27	0.20	0.49	0.66	–							
9. O-Intellect	0.01	0.20	-0.18	0.24	0.20	0.30	0.22	0.14	–						
10. O-Imagination	-0.08	0.07	-0.14	0.07	0.05	0.17	0.11	0.07	0.39	–					
11. Group Experience	0.08	-0.07	0.05	0.38	0.31	0.45	0.42	0.39	0.36	0.15	–				
12. Peer ILT – Sensitivity (T1)	-0.03	-0.14	0.08	0.09	0.00	-0.04	-0.05	-0.02	-0.11	-0.02	0.07	–			
13. Peer ILT – Intelligence (T1)	0.05	0.02	0.05	0.03	-0.07	0.03	-0.10	-0.03	-0.02	-0.06	0.10	0.61	–		
14. Peer ILT – Dedication (T1)	0.03	-0.06	0.14	0.10	0.05	0.10	-0.02	0.05	-0.06	-0.05	0.12	0.61	0.69	–	
15. Peer ILT – Dynamism (T1)	-0.35	-0.22	-0.04	0.12	0.03	0.24	0.10	0.17	0.05	0.04	0.12	0.40	0.48	0.41	–
16. Peer ILT – Tyranny (T1)	-0.31	-0.13	-0.11	0.09	0.01	0.26	0.11	0.16	0.07	0.05	0.09	-0.25	-0.11	-0.07	0.35
17. Peer ILT – Masculinity (T1)	-0.11	-0.05	0.01	0.01	-0.03	0.13	-0.04	-0.04	0.13	0.02	0.11	0.11	0.24	0.17	0.29
18. Peer Leadership Composite Score (T1)	-0.45	-0.24	-0.01	0.07	0.00	0.21	0.02	0.02	0.08	0.07	0.12	0.28	0.28	0.24	0.58
19. Observer Leadership Composite Score (T1)	-0.46	-0.21	-0.07	0.08	0.03	0.27	0.13	0.13	0.11	0.11	0.11	0.07	0.00	0.00	0.40

Note: N ranges from 178-199. Correlations greater than $r = .14$ significant at $p < .05$. Correlations greater than $r = .19$ significant at $p < .01$.

Table 11 continued. *Intercorrelations of Major Constructs Across Time*

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
20. Peer Task Roles (T2)	-0.22	-0.07	0.02	0.12	0.02	0.24	0.05	0.02	0.04	-0.02	0.17	0.11	0.23	0.22	0.34
21. Peer Social Roles (T2)	-0.14	-0.23	0.03	0.11	0.06	0.03	0.04	-0.03	0.06	0.11	0.14	0.13	0.05	0.11	0.10
22. Peer Boundary Spanning Roles (T2)	-0.23	-0.26	0.04	0.19	0.12	0.24	0.15	0.14	0.06	-0.01	0.17	-0.04	0.04	0.01	0.20
23. Peer Leadership Composite Score (T2)	-0.37	-0.11	-0.01	0.06	-0.03	0.20	0.03	-0.01	0.06	0.00	0.15	0.19	0.17	0.18	0.34
24. Observer Leadership Composite Score (T2)	-0.30	-0.28	-0.06	0.16	0.07	0.13	0.01	0.01	0.03	-0.02	0.10	0.08	0.10	0.09	0.34
25. Peer Task Roles (T3)	-0.29	-0.04	0.02	0.06	-0.02	-0.04	-0.04	-0.01	-0.12	-0.08	-0.07	0.13	0.18	0.16	0.24
26. Peer Social Roles (T3)	-0.11	-0.09	0.03	-0.02	0.00	-0.10	0.01	-0.01	-0.12	0.03	-0.02	0.14	0.12	0.14	0.06
27. Peer Boundary Spanning Roles (T3)	-0.14	-0.05	0.04	0.09	0.04	0.02	0.09	0.14	-0.05	-0.03	-0.02	0.00	0.07	0.07	0.18
28. Peer Leadership Composite Score (T3)	-0.34	-0.08	0.03	-0.02	-0.05	0.02	-0.05	-0.02	-0.10	-0.09	-0.02	0.12	0.12	0.14	0.20
29. Observer Leadership Composite Score (T3)	-0.41	-0.16	-0.06	0.05	0.06	0.15	-0.01	0.01	-0.02	-0.04	0.00	0.05	0.12	0.04	0.27

Note: N ranges from 178-199. Correlations greater than $r = .14$ significant at $p < .05$. Correlations greater than $r = .19$ significant at $p < .01$.

Table 11 continued. *Intercorrelations of Major Constructs Across Time*

Variable	16	17	18	19	20	22	22	23	24	25	26	27	28	29
16. Peer ILT – Tyranny (T1)	–													
17. Peer ILT – Masculinity (T1)	0.23	–												
18. Peer Leadership Composite Score (T1)	0.29	0.21	–											
19. Observer Leadership Composite Score (T1)	0.29	0.10	0.42	–										
20. Peer Task Roles (T2)	0.20	0.12	0.37	0.13	–									
21. Peer Social Roles (T2)	-0.14	0.04	0.17	0.00	0.46	–								
22. Peer Boundary Spanning Roles (T2)	0.22	0.04	0.27	0.17	0.55	0.36	–							
23. Peer Leadership Composite Score (T2)	0.20	0.21	0.59	0.19	0.64	0.29	0.33	–						
24. Observer Leadership Composite Score (T2)	0.24	0.05	0.33	0.24	0.36	0.12	0.23	0.43	–					
25. Peer Task Roles (T3)	0.16	0.00	0.31	0.21	0.49	0.28	0.25	0.51	0.31	–				
26. Peer Social Roles (T3)	-0.04	0.02	0.17	0.00	0.19	0.43	0.11	0.27	0.12	0.64	–			
27. Peer Boundary Spanning Roles (T3)	0.15	-0.04	0.24	0.17	0.39	0.18	0.52	0.31	0.26	0.62	0.37	–		
28. Peer Leadership Composite Score (T3)	0.16	0.11	0.45	0.20	0.44	0.24	0.26	0.74	0.36	0.72	0.45	0.42	–	
29. Observer Leadership Composite Score (T3)	0.20	0.07	0.40	0.27	0.28	0.10	0.21	0.44	0.43	0.40	0.18	0.31	0.47	–

Note: N ranges from 178-199. Correlations greater than $r = .14$ significant at $p < .05$. Correlations greater than $r = .19$ significant at $p < .01$.

of dedication, dynamism, tyranny, and masculinity are positively related, whereas self and peer ratings of the leaderlike characteristics of sensitivity and intelligence are not related. In terms of role behaviors, self and peer ratings of task role behaviors are also positively related ($r = .24, p < .01$) as was self and peer ratings of social role behaviors ($r = .19, p < .01$). Self and peer-assessed leadership emergence were positively related ($r = .45, p < .01$), self and observer-assessed leadership emergence were positively related ($r = .25, p < .01$, and peer and observer-assessed leadership emergence were positively related ($r = .43, p < .01$).

Table 11d presents the means, standard deviations, and intercorrelations of the Time 3 variables. Self and peer ratings of the leaderlike characteristics of sensitivity, dedication, dynamism, tyranny, and masculinity are positively related, whereas self and peer ratings of the leaderlike characteristics of intelligence are not related. In terms of role behaviors, self and peer ratings of task role behaviors are also positively related ($r = .18, p < .05$) as was self and peer ratings of social role behaviors ($r = .25, p < .01$). Self and peer-assessed leadership emergence were positively related ($r = .47, p < .01$), self and observer-assessed leadership emergence were positively related ($r = .33, p < .01$), and peer and observer-assessed leadership emergence were positively related ($r = .42, p < .01$).

Tables 11e through 11j provide the correlations between the various phases. Table 11h, which provides the correlations between Time 1 and Time 2 variables, shows that self-assessed leadership emergence in Time 1 and Time 2 were positively related ($r = .63$, $p < .01$). Peer-assessed leadership emergence in Time 1 and Time 2 were also positively related ($r = .59, p < .01$) as were observer-assessed leadership emergence in Time 1 and

Time 2 ($r = .25, p < .01$). In Table 11i, which provides the correlations between Time 1 and Time 3 variables, self-assessed leadership emergence in Time 1 and Time 3 were positively related ($r = .48, p < .01$). Peer-assessed leadership emergence in Time 1 and Time 3 were also positively related ($r = .45, p < .01$) as were observer-assessed leadership emergence in Time 1 and Time 3 ($r = .27, p < .01$).

Finally, in Table 11j, which provides the correlations between Time 2 and Time 3, self-assessed leadership emergence between phases 3 and 4 were also positively related ($r = .70, p < .01$). Peer-assessed leadership emergence in Time 2 and Time 3 were also positively related ($r = .74, p < .01$) as were observer-assessed leadership emergence in Time 2 and Time 3 ($r = .43, p < .01$.

Predicting Leadership Emergence in Initial Interaction

Hypotheses 1a-d, 2, and 3 concerned predictions regarding the prototypical and antiprototypical leader characteristics predicting leadership emergence at the initial interaction of a group. Specifically, Hypotheses 1b-d predicted that the prototypical leader characteristics of sensitivity, intelligence, dedication, and dynamism would be positively related to leadership emergence at the initial interaction. Hypothesis 2 predicted that the antiprototypical leader characteristic of tyranny would be negatively related to leadership emergence at the initial interaction. Finally, Hypothesis 3 predicted that the antiprototypical leader characteristic of masculinity would be positively related to leadership emergence at the initial interaction.

HLM results for the prediction of leadership emergence at Time 1, the initial interaction, are show in Table 12. In Model 1, the prototypical and antiprototypical leader characteristics are predicting peer-assessed leadership emergence in Time 1, the initial

Table 12a. *Results for Leadership Emergence at Initial Interaction*

Model	Parameter estimates								
	γ_{00}	γ_{10}	γ_{20}	γ_{30}	γ_{40}	γ_{50}	γ_{60}	γ_{70}	R^2
Model 1: Peer-assessed leadership emergence (T1)									.39
Hypotheses 1a, 1b, 1c, 1d, 2, 3									
L1: $PLET1_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(SEN_{ij}) + \beta_{3j}(INT_{ij}) + \beta_{4j}(DED_{ij}) + \beta_{5j}(DYN_{ij}) + \beta_{6j}(TYR_{ij}) + \beta_{7j}(MAS_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	.00	-.47**	.33	.13	-.06	.63**	.18	.02	
Model 2: Observer-assessed leadership emergence (T1)									.29
Hypotheses 1a, 1b, 1c, 1d, 2, 3									
L1: $OLET1_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(SEN_{ij}) + \beta_{3j}(INT_{ij}) + \beta_{4j}(DED_{ij}) + \beta_{5j}(DYN_{ij}) + \beta_{6j}(TYR_{ij}) + \beta_{7j}(MAS_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	.00	-.60**	.19	-.28	-.18	.54**	.15	-.02	

Note. † $p < .10$, *$p < .05$, **$p < .01$. PLE = Peer-assessed leadership emergence; INTL = International; SEN = Sensitivity; INT = Intelligence; DED=Dedication; DYN = Dynamism; TYR = Tyranny; MAS = Masculinity; OLE = Observer-assessed leadership emergence. R^2 = pseudo R^2 or proportional reduction in residual variance due to addition of predictors.

Table 12b. *Results for Leadership Emergence at Initial Interaction (Ratings only)*

Model	Parameter estimates								R^2
	γ_{00}	γ_{10}	γ_{20}	γ_{30}	γ_{40}	γ_{50}	γ_{60}	γ_{70}	
Model 1: Peer-assessed leadership emergence (T1)									.67
Hypotheses 1a, 1b, 1c, 1d, 2, 3									
L1: $PLET1_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(SEN_{ij}) + \beta_{3j}(INT_{ij}) + \beta_{4j}(DED_{ij}) + \beta_{5j}(DYN_{ij}) + \beta_{6j}(TYR_{ij}) + \beta_{7j}(MAS_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	-.01	-.18**	.12	.37**	.17	.45**	.19*	.02	
Model 2: Observer-assessed leadership emergence (T1)									.31
Hypotheses 1a, 1b, 1c, 1d, 2, 3									
L1: $OLET1_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(SEN_{ij}) + \beta_{3j}(INT_{ij}) + \beta_{4j}(DED_{ij}) + \beta_{5j}(DYN_{ij}) + \beta_{6j}(TYR_{ij}) + \beta_{7j}(MAS_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	-.01	-.54**	.28	-.28	-.14	.47**	-.02	.08	

Note. † $p < .10$, *$p < .05$, **$p < .01$. PLE = Peer-assessed leadership emergence; INTL = International; SEN = Sensitivity; INT = Intelligence; DED=Dedication; DYN = Dynamism; TYR = Tyranny; MAS = Masculinity; OLE = Observer-assessed leadership emergence. R^2 = pseudo R^2 or proportional reduction in residual variance due to addition of predictors.

interaction. In Model 2, the prototypical and antiprototypical leader characteristics are predicting observer-assessed leadership emergence in Time 1. HLM results revealed that the prototypical leader characteristic of sensitivity was not significantly related to peer-assessed leadership emergence (γ_{20} = .33, *n.s.*) and was not significantly related to observer-assessed leadership emergence (γ_{20} = .19, *n.s.*). The prototypical leader characteristic of intelligence was not significantly related to peer-assessed leadership emergence (γ_{30} = .13, *n.s.*) and was not significantly related to observer-assessed leadership emergence (γ_{30} = -.28, *n.s.*). Dedication was not significantly related to peer-assessed leadership emergence (γ_{40} = -.06, *n.s.*) and was not significantly related to observer-assessed leadership emergence (γ_{40} = -.18, *n.s.*). Dynamism was significantly related to peer-assessed leadership emergence (γ_{50} = .63, $p < .01$) and was significantly related to observer-assessed leadership emergence (γ_{50} = .54, $p < .01$). The antiprototypical leader characteristic of tyranny was not significantly related to peer-assessed leadership emergence (γ_{60} = .18, *n.s.*) and was not significantly related to observer-assessed leadership emergence (γ_{60} = .15, *n.s.*). Finally, masculinity was not significantly related to peer-assessed leadership emergence (γ_{70} = .02, *n.s.*) and was not significantly related to observer-assessed leadership emergence (γ_{70} = -.02, *n.s.*).

These do not support Hypothesis 1a which predicted that sensitivity would be positively related to leadership emergence at the initial interaction, do not support Hypothesis 1b which predicted that intelligence would be positively related to leadership emergence at the initial interaction, and do not support Hypothesis 1c which predicted that dedication would be positively related to leadership emergence at the initial interaction. The results do support Hypothesis 1d which predicted that dynamism would

be positively related to leadership emergence at the initial interaction. The results also do not support Hypothesis 2 which predicted that tyranny would be negatively related to leadership emergence at the initial interaction. Finally, the results do not support Hypothesis 3 which predicted that masculinity would be positively related to leadership emergence at the initial interaction.

Predicting Fulfillment of Roles

Early phases of group development. Hypotheses 4, 5, 7, 8, 9, 10, and 11 concerned predictions regarding intelligence, group experience, and personality predicting the fulfillment of the task and social roles in the early phases of group development. Hypothesis 4 predicted that intelligence would be positively related to engagement in the task roles in the early phases of group development; whereas Hypotheses 5 predicted that group experience would be positively related to engagement in the (a) task roles and the (b) social roles in the early phases of group development. Hypothesis 7 predicted that the conscientiousness factes of (a) orderliness, (b) achievement-striving, and (c) self-discipline would be positively related to engagement in the task roles in the early phases of group development. Hypothesis 8 predicted that the extraversion facet of assertiveness would be positively related to engagement in the task roles in the early phases of group development. Hypothesis 9 predicted that the openness to experience facets of (a) intellect and (b) imagination would be positively related to engagement in the task roles in the early phases of group development. Hypothesis 10 predicted that the extraversion facet of friendliness would be positively related to engagement in the social roles in the early phases of group development. Hypothesis 11

predicted that the extraversion facet of assertiveness would be negatively related to engagement in the social roles in the early phases of group development.

HLM results for the prediction of fulfillment of task roles in Time 2, the early phases of group development are show in Table 13. Intelligence, group experience, and personality facets are predicting task roles in Time 2. HLM results revealed intelligence was not significantly related to task roles in Time 2 (γ_{20} = .00, *n.s.*). Group experience was not significantly related to task roles in Time 2 (γ_{30} = .10, *n.s.*). The conscientiousness facet of orderliness was not significantly related to task roles in Time 2 (γ_{40} = .05, *n.s.*). Achievement-striving was not significantly related to task roles in Time 2 (γ_{50} = .01, *n.s.*). Self-discipline was not significantly related to task roles in Time 2 (γ_{60} = -.04, *n.s.*). The extraversion facet of assertiveness was significantly related to task roles in Time 2 (γ_{70} = .09, $p < .05$). Intellect was not significantly related to task roles in Time 2 (γ_{80} = -.04, *n.s.*). Imagination was not significantly related to task roles in Time 2 (γ_{90} = -.04, *n.s.*).

HLM results for the prediction of fulfillment of social roles in Time 2, the early phases of group development are show in Table 13. Group experience and personality facets are predicting social roles in Time 2. HLM results revealed that group experience was not significantly related to social roles in Time 2 (γ_{20} = .06, *n.s.*). HLM results revealed that the extraversion facet of friendliness was not significantly related to social roles in Time 2 (γ_{30} = .03, *n.s.*). Assertiveness was marginally related to social roles in Time 2 (γ_{40} = -.08, $p < .10$).

These results do not support Hypothesis 4 which predicted that intelligence would be positively related to engagement in the task roles in the early phases of group

Table 13. *Results for Fulfillment of Task and Social Roles in Early Phases of Group Development*

Model	Parameter estimates										R^2
	γ_{00}	γ_{10}	γ_{20}	γ_{30}	γ_{40}	γ_{50}	γ_{60}	γ_{70}	γ_{80}	γ_{90}	
Task Roles (T2)											.08
Hypotheses 4, 5a, 7, 8, 9											
L1: $TASKT2_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(GMAT_{ij}) + \beta_{3j}(GE_{ij}) + \beta_{4j}(C\text{-}ORDER_{ij}) + \beta_{5j}(C\text{-}ACHIEVE_{ij}) + \beta_{6j}(C\text{-}SELF_{ij}) + \beta_{7j}(E\text{-}ASSERT_{ij}) + \beta_{8j}(O\text{-}INTEL_{ij}) + \beta_{9j}(O\text{-}IMAG_{ij}) + r_{ij}$	3.80	-.18**	.00	.10	.05	.01	-.04	.09*	-.04	-.04	
L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$											
Social Roles (T2)											.01
Hypotheses 5b, 10, 11											
L1: $SOCT2_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(GE_{ij}) + \beta_{3j}(E\text{-}FRIEND_{ij}) + \beta_{4j}(E\text{-}ASSERT_{ij}) + r_{ij}$	3.93	-.08†	.06	.03	-.08†						
L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$											

Note. † $p < .10$, *$p < .05$, **$p < .01$. TASK = Task roles; INTL = International; GMAT = Intelligence; GE = Group experience; C-ORDER = Orderliness; C-ACHIEVE = Achievement-Striving; C-SELF = Self-Discipline; E-ASSERT = Assertiveness; O-INTEL = Intellect; O-IMAG = Imagination; SOC = Social roles; E-FRIEND = Friendliness. R^2 = pseudo R^2 or proportional reduction in residual variance due to addition of predictors.

development. Hypothesis 5 which predicted that group experience would be positively related to engagement in the (a) task roles and the (b) social roles in the early phases of group development was not supported. Hypothesis 7a which predicted the conscientiousness facet of orderliness would be positively related to engagement in the task roles in the early phases of group development was not supported. Hypothesis 7b which predicted the conscientiousness facet of achievement-striving would be positively related to engagement in the task roles in the early phases of group development was not supported. Hypothesis 7c which predicted the conscientiousness facet of self-discipline would be positively related to engagement in the task roles in the early phases of group development was not supported.

The results do provide support for Hypothesis 8 which predicted that the extraversion facet of assertiveness would be positively related to engagement in the task roles in the early phases of group development. Hypothesis 9a, which predicted that the openness to experience facet of intellect would be positively related to engagement in the task roles in the early phases of group development was not supported. Hypothesis 9b, which predicted that the openness to experience facet of imagination would be positively related to engagement in the task roles in the early phases of group development was not supported. These results do not support Hypothesis 10 which predicted the extraversion facet of friendliness would be positively related to engagement in the social roles in the early phases of group development. The results provide marginal support for Hypothesis 11 which predicted that the extraversion facet of assertiveness would be negatively related to engagement in the social roles in the early phases of group development.

Hypothesis 13 predicted that intelligence, group experience, conscientiousness facets of orderliness, achievement-striving, and self-discipline; the extraversion facet of assertiveness; and the openness to experience facets of intellect and imagination; would incrementally predict engagement in the task roles in the early phases of group development. Results in Table 13 do not support Hypothesis 13, nor do they support Hypothesis 14 which predicted that group experience and the extraversion facets of friendliness and assertiveness would incrementally predict the performance of the social roles.

Later phases of group development. Hypotheses 6 and 12 concerned predictions regarding group experience and personality predicting the fulfillment of the boundary spanning roles in the later phases of group development. Hypothesis 6 predicted that group experience (GE) would be positively related to engagement in the boundary spanning roles in the later phases of group development. Hypothesis 12 predicted that the extraversion facets of (a) gregariousness and (b) assertiveness would be positively related to engagement in the boundary spanning roles in the later phases of group development.

HLM results for the prediction of fulfillment of boundary spanning roles in the later phase of group development are show in Table 14. Group experience and personality facets are predicting boundary spanning roles in Time 3. HLM results revealed that group experience was not significantly related to boundary spanning roles in Time 3 (γ_{20} = -.10, *n.s.*). HLM results revealed that the extraversion facet of gregariousness was significantly related to boundary spanning roles in Time 3 (γ_{30} = .11, $p < .05$). Assertiveness was not significantly related to boundary spanning roles in Time 3 (γ_{40} = -.06, *n.s.*).

Table 14. *Results for Fulfillment of Boundary Spanning Roles in Later Phases of Group Development*

Model	Parameter estimates					
	γ_{00}	γ_{10}	γ_{20}	γ_{30}	γ_{40}	R^2
Boundary Spanning Roles (T3)						.06
Hypotheses 6 and 12						
L1: $BOUNDT3_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(GE_{ij}) + \beta_{3j}(E\text{-}GREG_{ij}) + \beta_{4j}(E\text{-}ASSERT_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	3.34	-.20**	-.10	.11*	-.06	

Note. † $p < .10$, *$p < .05$, **$p < .01$. BOUND = Boundary Spanning roles; INTL = International; GE = Group experience; E-GREG = Gregariousness; E-ASSERT = Assertiveness. R^2 = pseudo R^2 or proportional reduction in residual variance due to addition of predictors.

These results do not support Hypothesis 6 which predicted group experience would be positively related to engagement in the boundary spanning roles in the later phases of group development. These results support Hypothesis 12a which predicted the extraversion facet of gregariousness would be positively related to engagement in the boundary spanning roles in the later phases of group development. Hypothesis 12b which predicted the extraversion facets of assertiveness would be positively related to engagement in the boundary spanning roles in the later phases of group development was not supported. Results in Table 14 also do not support Hypothesis 15 which predicted that group experience and the extraversion facets of gregariousness and assertiveness would incrementally predict engagement in the boundary spanning roles in the performing stage.

Predicting Leadership Emergence with Fulfillment of Roles

Early phases of group development. Hypothesis 16 predicted that the fulfillment of (a) task and (b) social roles would be positively correlated with leadership emergence in the early phases. HLM results for the prediction of leadership emergence at Time 2, the early phases of group development, are show in Table 15. In Model 1, the task, social, and boundary spanning roles of Time 2 are predicting peer-assessed leadership emergence in Time 2, the early phases of group development. In Model 2, the task, social, and boundary spanning roles of Time 2 are predicting observer-assessed leadership emergence in Time 2.

Results revealed the task roles in Time 2 were significantly related to peer-assessed leadership emergence in Time 2 ($\gamma_{20} = 1.50, p < .01$) and was significantly related to observer-assessed leadership emergence in Time 2 ($\gamma_{20} = .75, p < .01$). The

Table 15a. *Results for Leadership Emergence in Early Phases of Group Development*

Model	Parameter estimates					R^2
	γ_{00}	γ_{10}	γ_{20}	γ_{30}	γ_{40}	
Model 1: Peer-assessed leadership emergence (T2)						.45
Hypothesis 16						
L1: $PLET2_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(TASKT2_{ij}) + \beta_{3j}(SOCT2_{ij}) + \beta_{4j}(BOUNDT2_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	.00	-.39**	1.50**	.02	-.17	
Model 2: Observer-assessed leadership emergence (T2)						.13
Hypothesis 16						
L1: $OLET2_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(TASKT2_{ij}) + \beta_{3j}(SOCT2_{ij}) + \beta_{4j}(BOUNDT2_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	.00	-.40**	.75**	-.19	.04	

Note. † $p < .10$, *$p < .05$, **$p < .01$. PLE = Peer-assessed leadership emergence; INTL = International; TASK = Task roles; SOC = Social Roles; BOUND = Boundary Spanning roles; OLE = Observer-assessed leadership emergence. R^2 = pseudo R^2 or proportional reduction in residual variance due to addition of predictors.

Table 15b. *Results for Leadership Emergence in Early Phases of Group Development (Ratings Only)*

Model	Parameter estimates					R^2
	γ_{00}	γ_{10}	γ_{20}	γ_{30}	γ_{40}	
Model 1: Peer-assessed leadership emergence (T2)						.72
Hypothesis 16						
L1: $PLET2_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(TASKT2_{ij}) + \beta_{3j}(SOCT2_{ij}) + \beta_{4j}(BOUNDT2_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	.00	-.21**	1.39**	-.31**	.06	
Model 2: Observer-assessed leadership emergence (T2)						.20
Hypothesis 16						
L1: $OLET2_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(TASKT2_{ij}) + \beta_{3j}(SOCT2_{ij}) + \beta_{4j}(BOUNDT2_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	.00	-.39**	1.03**	-.06	-.12	

Note. † $p < .10$, *$p < .05$, **$p < .01$. PLE = Peer-assessed leadership emergence; INTL = International; TASK = Task roles; SOC = Social Roles; BOUND = Boundary Spanning roles; OLE = Observer-assessed leadership emergence. R^2 = pseudo R^2 or proportional reduction in residual variance due to addition of predictors.

social roles in Time 2 were not significantly related to peer-assessed leadership emergence in Time 2 (γ_{30} = .02, *n.s.*) and was not significantly related to observer-assessed leadership emergence in Time 2 (γ_{30} = -.19, *n.s.*). The boundary spanning roles in Time 2 were not significantly related to peer-assessed leadership emergence in Time 2 (γ_{40} = -.17, *n.s.*) and was not significantly related to observer-assessed leadership emergence in Time 2 (γ_{40} = .04, *n.s.*). These results support Hypothesis 16a which predicted that the fulfillment of task roles would be positively related to leadership emergence in the early phases of group development. These results do noy support Hypothesis 16b which predicted that the fulfillment of social roles would be positively related to leadership emergence in the early phases of group development.

Later phases of group development. Hypothesis 17 predicted that the fulfillment of boundary spanning roles would be positively related with leadership emergence in the later phases of group development. HLM results for the prediction of leadership emergence at Time 3, the later phases of group development, are show in Table 16. In Model 1, the task, social, and boundary spanning roles of phase 5 are predicting peer-assessed leadership emergence in Time 3, the later phases of group development. In Model 2, the task, social, and boundary spanning roles of Time 3 are predicting observer-assessed leadership emergence in Time 3.

Results revealed the task roles in Time 3 were significantly related to peer-assessed leadership emergence in Time 3 (γ_{20} = 1.33, $p < .01$) and were significantly related to observer-assessed leadership emergence in Time 3 (γ_{20} = .53, $p < .01$). The social roles in Time 3 were not significantly related to peer-assessed leadership emergence in Time 3 (γ_{30} = .03, *n.s.*) and were not significantly related to observer-

Table 16a. *Results for Leadership Emergence in Later Phases of Group Development*

Model	Parameter estimates					R^2
	γ_{00}	γ_{10}	γ_{20}	γ_{30}	γ_{40}	
Model 1: Peer-assessed leadership emergence (T3)						.54
Hypothesis 17						
L1: $PLET3_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(TASKT3_{ij}) + \beta_{3j}(SOCT3_{ij}) + \beta_{4j}(BOUNDT3_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	.01	-.23*	1.33**	.03	-.05	
Model 2: Observer-assessed leadership emergence (T3)						.25
Hypothesis 17						
L1: $OLET3_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(TASKT3_{ij}) + \beta_{3j}(SOCT3_{ij}) + \beta_{4j}(BOUNDT3_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	.00	-.60**	.53**	-.17	.21†	

Note. † $p < .10$, *$p < .05$, **$p < .01$. PLE = Peer-assessed leadership emergence; INTL = International; TASK = Task roles; SOC = Social Roles; BOUND = Boundary Spanning roles; OLE = Observer-assessed leadership emergence. R^2 = pseudo R^2 or proportional reduction in residual variance due to addition of predictors.

Table 16b. *Results for Leadership Emergence in Later Phases of Group Development (Ratings Only)*

Model	Parameter estimates					R^2
	γ_{00}	γ_{10}	γ_{20}	γ_{30}	γ_{40}	
Model 1: Peer-assessed leadership emergence (T3)						.78
Hypothesis 17						
L1: $PLET3_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(TASKT3_{ij}) + \beta_{3j}(SOCT3_{ij}) + \beta_{4j}(BOUNDT3_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	.00	-.13*	1.35**	-.24**	.04	
Model 2: Observer-assessed leadership emergence (T3)						.32
Hypothesis 17						
L1: $OLET3_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(TASKT3_{ij}) + \beta_{3j}(SOCT3_{ij}) + \beta_{4j}(BOUNDT3_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	.01	-.51**	.75**	-.10	.29†	

Note. † $p < .10$, *$p < .05$, **$p < .01$. PLE = Peer-assessed leadership emergence; INTL = International; TASK = Task roles; SOC = Social Roles; BOUND = Boundary Spanning roles; OLE = Observer-assessed leadership emergence. R^2 = pseudo R^2 or proportional reduction in residual variance due to addition of predictors.

assessed leadership emergence in Time 3 (γ_{30} = -.17, *n.s.*). The boundary spanning roles in Time 3 were not significantly related to peer-assessed leadership emergence in Time 3 (γ_{40} = -.05, *n.s.*) and were marginally related to observer-assessed leadership emergence in Time 3 (γ_{40} = .21, $p < .10$). These results marginally support Hypothesis 17 which predicted that the fulfillment of boundary spanning roles would be positively related to leadership emergence in the later phases of group development.

Fulfillment of Roles as Mediator

The final hypotheses to be tested are Hypotheses 18 and 19 which predicted that the fulfillment of the task, social, and boundary spanning roles would mediate the relationship between intelligence, group experience, and personality and leadership emergence. According to Baron and Kenny (1986) a variable functions as a mediator when it meets the following conditions. First, the independent variable (intelligence, group experience, and personality) must be related to the mediator (task, social, boundary spanning roles). These results were previously reported in Tables 13 and 14. Second, the mediator (task, social, boundary spanning roles) must be related to the dependent variable (leadership emergence). These results were presented in Tables 15 and 16. Third, when these two relations are controlled for, the previously significant relationship between the independent variable (intelligence, group experience, and personality) and the dependent variable (leadership emergence) is no longer significant.

Early phases of group development. Hypothesis 18 predicted that the fulfillment of the task and social roles will mediate the relationships between (a) intelligence, (b) group experience, and (c) personality and leadership emergence. For the first step of mediation, only the extraversion facet of assertivness was significantly related to the

mediator of task roles and marginally related to the mediator of social roles (see Table 13). For the second step of mediation, only the task roles were significantly related to the dependent variable of leadership emergence. Thus, only the extraversion facet of assertiveness has the potential to be mediated by the task roles in the early phases of group development.

HLM results for the prediction of fulfillment of leadership emergence in Time 2, the early phases are show in Table 17. In Model 1, intelligence, group experience, and personality facets are predicting peer-assessed leadership emergence in Time 2. In Model 2, intelligence, group experience, and personality facets are predicting observer-assessed leadership emergence in Time 2. HLM results revealed that the extraversion facet of assertiveness was not significantly related to peer-assessed leadership emergence in Time 2 ($\gamma_{70} = .19$, *n.s.*) and was not significantly related to observer-assessed leadership emergence in Time 2 ($\gamma_{70} = .03$, *n.s.*). Although the first two conditions of mediation were met, the third condition of a significant relationship between the independent variable (assertiveness) to the dependent variable (leadership emergence), was not met. Thus, Hypothesis 18 was not supported.

Later phases of group development. Hypothesis 19 predicted that the fulfillment of the boundary spanning roles would mediate the relationship between (a) group experience and (b) personality and leadership emergence in Time 3, the later phases of group development. For the first step of mediation, results in Table 14 found that only the extraversion facet of gregariousness was significantly related to the mediator of boundary spanning roles. For the second step of mediation, results in Table 16 revealed that the

Table 17a. *Results for Mediation: Predicting Leadership Emergence in Early Phases with Independent Variables*

Model	Parameter estimates											R^2
	γ_{00}	γ_{10}	γ_{20}	γ_{30}	γ_{40}	γ_{50}	γ_{60}	γ_{70}	γ_{80}	γ_{90}	γ_{100}	
Model 1: Peer-assessed leadership emergence (T2)												.13
L1: $PLET2_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(GMAT_{ij}) + \beta_{3j}(GE_{ij}) + \beta_{4j}(C\text{-}ORDER_{ij}) + \beta_{5j}(C\text{-}ACHIEVE_{ij}) + \beta_{6j}(C\text{-}SELF_{ij}) + \beta_{7j}(E\text{-}ASSERT_{ij}) + \beta_{8j}(E\text{-}FRIEND_{ij}) + \beta_{9j}(O\text{-}INTEL_{ij}) + \beta_{10j}(O\text{-}IMAG_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	.00	-.68**	.00	.35*	.14	-.04	-.08	.19	-.05	.03	-.07	
Model 2: Observer-assessed leadership emergence (T2)												.06
L1: $OLET2_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(GMAT_{ij}) + \beta_{3j}(GE_{ij}) + \beta_{4j}(C\text{-}ORDER_{ij}) + \beta_{5j}(C\text{-}ACHIEVE_{ij}) + \beta_{6j}(C\text{-}SELF_{ij}) + \beta_{7j}(E\text{-}ASSERT_{ij}) + \beta_{8j}(E\text{-}FRIEND_{ij}) + \beta_{9j}(O\text{-}INTEL_{ij}) + \beta_{10j}(O\text{-}IMAG_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	.00	-.36**	.00	.16	-.08	.13	.07	.03	-.01	.02	-.06	

Note. † $p < .10$, *$p < .05$, **$p < .01$. PLE = Peer-assessed leadership emergence; INTL = International; GMAT = Intelligence; GE = Group experience; C-ORDER = Orderliness; C-ACHIEVE = Achievement-Striving; C-SELF = Self-Discipline; E-ASSERT = Assertiveness; O-INTEL = Intellect; O-IMAG = Imagination; OLE = Observer-assessed leadership emergence; E-FRIEND = Friendliness. R^2 = pseudo R^2 or proportional reduction in residual variance due to addition of predictors.

Table 17b. *Results for Mediation: Predicting Leadership Emergence in Early Phases with Independent Variables (Ratings Only)*

Model	Parameter estimates											R^2
	γ_{00}	γ_{10}	γ_{20}	γ_{30}	γ_{40}	γ_{50}	γ_{60}	γ_{70}	γ_{80}	γ_{90}	γ_{100}	
Model 1: Peer-assessed leadership emergence (T2)												.19
L1: $PLET2_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(GMAT_{ij}) + \beta_{3j}(GE_{ij}) + \beta_{4j}(C\text{-}ORDER_{ij}) + \beta_{5j}(C\text{-}ACHIEVE_{ij}) + \beta_{6j}(C\text{-}SELF_{ij}) + \beta_{7j}(E\text{-}ASSERT_{ij}) + \beta_{8j}(E\text{-}FRIEND_{ij}) + \beta_{9j}(O\text{-}INTEL_{ij}) + \beta_{10j}(O\text{-}IMAG_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	.00	-.45**	.00**	.20**	.12*	.05	.01	.25**	-.08	.00	-.02	
Model 2: Observer-assessed leadership emergence (T2)												.11
L1: $OLET2_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(GMAT_{ij}) + \beta_{3j}(GE_{ij}) + \beta_{4j}(C\text{-}ORDER_{ij}) + \beta_{5j}(C\text{-}ACHIEVE_{ij}) + \beta_{6j}(C\text{-}SELF_{ij}) + \beta_{7j}(E\text{-}ASSERT_{ij}) + \beta_{8j}(E\text{-}FRIEND_{ij}) + \beta_{9j}(O\text{-}INTEL_{ij}) + \beta_{10j}(O\text{-}IMAG_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	.00	-.45**	.00	.16	-.05	.14	.01	.23**	-.06	.18	-.11	

Note. † $p < .10$, *$p < .05$, **$p < .01$. PLE = Peer-assessed leadership emergence; INTL = International; GMAT = Intelligence; GE = Group experience; C-ORDER = Orderliness; C-ACHIEVE = Achievement-Striving; C-SELF = Self-Discipline; E-ASSERT = Assertiveness; O-INTEL = Intellect; O-IMAG = Imagination; OLE = Observer-assessed leadership emergence; E-FRIEND = Friendliness. R^2 = pseudo R^2 or proportional reduction in residual variance due to addition of predictors.

Table 18a. *Results for Mediation: Predicting Leadership Emergence in Early Phases*

	Parameter estimates													
	γ_{00}	γ_{10}	γ_{20}	γ_{30}	γ_{40}	γ_{50}	γ_{60}	γ_{70}	γ_{80}	γ_{90}	γ_{100}	γ_{110}	γ_{120}	γ_{130}	R^2
Model 1: Peer-assessed leadership emergence (T2)															.45
L1: $PLET2_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(GMAT_{ij}) + \beta_{3j}(GE_{ij}) + \beta_{4j}(C\text{-}ORDER_{ij}) + \beta_{5j}(C\text{-}ACHIEVE_{ij}) + \beta_{6j}(C\text{-}SELF_{ij}) + \beta_{7j}(E\text{-}ASSERT_{ij}) + \beta_{8j}(E\text{-}FRIEND_{ij}) + \beta_{9j}(O\text{-}INTEL_{ij}) + \beta_{10j}(O\text{-}IMAG_{ij}) + \beta_{11j}(TASKT2_{ij}) + \beta_{12j}(SOCT2_{ij}) + \beta_{13j}(BOUNDT2_{ij}) + r_{ij}$	.00	-.46**	.00	.18	.08	-.09	-.02	.01	.02	.06	-.02	1.48**	.07	-.18	
L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$															

Table 18a continued. *Results for Mediation: Predicting Leadership Emergence in Early Phases*

	Parameter estimates													
	γ_{00}	γ_{10}	γ_{20}	γ_{30}	γ_{40}	γ_{50}	γ_{60}	γ_{70}	γ_{80}	γ_{90}	γ_{100}	γ_{110}	γ_{120}	γ_{130}	R^2
Model 2: Observer-assessed leadership emergence (T2)															.13
L1: $OLET2_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(GMAT_{ij}) + \beta_{3j}(GE_{ij}) + \beta_{4j}(C\text{-}ORDER_{ij}) + \beta_{5j}(C\text{-}ACHIEVE_{ij}) + \beta_{6j}(C\text{-}SELF_{ij}) + \beta_{7j}(E\text{-}ASSERT_{ij}) + \beta_{8j}(E\text{-}FRIEND_{ij}) + \beta_{9j}(O\text{-}INTEL_{ij}) + \beta_{10j}(O\text{-}IMAG_{ij}) + \beta_{11j}(TASKT2_{ij}) + \beta_{12j}(SOCT2_{ij}) + \beta_{13j}(BOUNDT2_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	.00	-.26*	.00*	.08	-.11	.12	.09	-.08	.03	.06	-.03	.82**	-.32†	-.13	

Note. † $p < .10$, *$p < .05$, **$p < .01$. PLE = Peer-assessed leadership emergence; INTL = International; GMAT = Intelligence; GE = Group experience; C-ORDER = Orderliness; C-ACHIEVE = Achievement-Striving; C-SELF = Self-Discipline; E-ASSERT = Assertiveness; O-INTEL = Intellect; O-IMAG = Imagination; TASK = Task roles; SOC = Social roles; BOUND = Boundary Spanning Roles; OLE = Observer-assessed leadership emergence; E-FRIEND = Friendliness. R^2 = pseudo R^2 or proportional reduction in residual variance due to addition of predictors.

Table 18b. *Results for Mediation: Predicting Leadership Emergence in Early Phases (Ratings Only)*

	Parameter estimates													
	γ_{00}	γ_{10}	γ_{20}	γ_{30}	γ_{40}	γ_{50}	γ_{60}	γ_{70}	γ_{80}	γ_{90}	γ_{100}	γ_{110}	γ_{120}	γ_{130}	R^2
Model 1: Peer-assessed leadership emergence (T2)															.72
L1: $PLET2_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(GMAT_{ij}) + \beta_{3j}(GE_{ij}) + \beta_{4j}(C\text{-}ORDER_{ij}) + \beta_{5j}(C\text{-}ACHIEVE_{ij}) + \beta_{6j}(C\text{-}SELF_{ij}) + \beta_{7j}(E\text{-}ASSERT_{ij}) + \beta_{8j}(E\text{-}FRIEND_{ij}) + \beta_{9j}(O\text{-}INTEL_{ij}) + \beta_{10j}(O\text{-}IMAG_{ij}) + \beta_{11j}(TASKT2_{ij}) + \beta_{12j}(SOCT2_{ij}) + \beta_{13j}(BOUNDT2_{ij}) + r_{ij}$	.00	-.24**	.00*	03	.05	-.01	.06	.10*	-.02	.04	.03	1.32**	-.26**	.05	
L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$															

Table 18b continued. *Results for Mediation: Predicting Leadership Emergence in Early Phases (Ratings Only)*

	Parameter estimates													
	γ_{00}	γ_{10}	γ_{20}	γ_{30}	γ_{40}	γ_{50}	γ_{60}	γ_{70}	γ_{80}	γ_{90}	γ_{100}	γ_{110}	γ_{120}	γ_{130}	R^2
Model 2: Observer-assessed leadership emergence (T2)															.22
L1: $OLET2_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(GMAT_{ij}) + \beta_{3j}(GE_{ij}) + \beta_{4j}(C\text{-}ORDER_{ij}) + \beta_{5j}(C\text{-}ACHIEVE_{ij}) + \beta_{6j}(C\text{-}SELF_{ij}) + \beta_{7j}(E\text{-}ASSERT_{ij}) + \beta_{8j}(E\text{-}FRIEND_{ij}) + \beta_{9j}(O\text{-}INTEL_{ij}) + \beta_{10j}(O\text{-}IMAG_{ij}) + \beta_{11j}(TASKT2_{ij}) + \beta_{12j}(SOCT2_{ij}) + \beta_{13j}(BOUNDT2_{ij}) + r_{ij}$	.00	-.32*	.00	.05	0.10	.12	.05	.12	-.01	.20	-.08	1.03**	-.08	-.24	
L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$															

Note. † $p < .10$, *$p < .05$, **$p < .01$. PLE = Peer-assessed leadership emergence; INTL = International; GMAT = Intelligence; GE = Group experience; C-ORDER = Orderliness; C-ACHIEVE = Achievement-Striving; C-SELF = Self-Discipline; E-ASSERT = Assertiveness; O-INTEL = Intellect; O-IMAG = Imagination; TASK = Task roles; SOC = Social roles; BOUND = Boundary Spanning Roles; OLE = Observer-assessed leadership emergence; E-FRIEND = Friendliness. R^2 = pseudo R^2 or proportional reduction in residual variance due to addition of predictors.

Table 19a. *Results for Mediation: Predicting Leadership Emergence in Later Phases with Independent Variables*

Model	Parameter estimates					
	γ_{00}	γ_{10}	γ_{20}	γ_{30}	γ_{40}	R^2
Model 1: Peer-assessed leadership emergence (T3)						.09
L1: $PLET3_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(GE_{ij}) + \beta_{3j}(E\text{-}GREG_{ij}) + \beta_{4j}(E\text{-}ASSERT_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	.01	-.62**	.04	.09	-.12	
Model 2: Observer-assessed leadership emergence (T3)						.16
L1: $OLET3_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(GE_{ij}) + \beta_{3j}(E\text{-}GREG_{ij}) + \beta_{4j}(E\text{-}ASSERT_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	.01	-.74**	-.03	.04	.12	

Note. † $p < .10$, *$p < .05$, **$p < .01$. PLE = Peer-assessed leadership emergence; INTL = International; GE = Group experience; E-GREG = Gregariousness; E-ASSERT = Assertiveness; OLE = Observer-assessed leadership emergence. R^2 = pseudo R^2 or proportional reduction in residual variance due to addition of predictors.

Table 19b. *Results for Mediation: Predicting Leadership Emergence in Later Phases with Independent Variables (Ratings Only)*

Model	Parameter estimates					R^2
	γ_{00}	γ_{10}	γ_{20}	γ_{30}	γ_{40}	
Model 1: Peer-assessed leadership emergence (T3)						.13
L1: $PLET3_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(GE_{ij}) + \beta_{3j}(E\text{-}GREG_{ij}) + \beta_{4j}(E\text{-}ASSERT_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	.01	-.54**	.03	.04	.02	
Model 2: Observer-assessed leadership emergence (T3)						.13
L1: $OLET3_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(GE_{ij}) + \beta_{3j}(E\text{-}GREG_{ij}) + \beta_{4j}(E\text{-}ASSERT_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	.01	-.73**	.04	-.01	.12	

Note. † $p < .10$, *$p < .05$, **$p < .01$. PLE = Peer-assessed leadership emergence; INTL = International; GE = Group experience; E-GREG = Gregariousness; E-ASSERT = Assertiveness; OLE = Observer-assessed leadership emergence. R^2 = pseudo R^2 or proportional reduction in residual variance due to addition of predictors.

Table 20a. Results for Mediation: Predicting Leadership Emergence in Later Phases

Model	Parameter estimates								R^2
	γ_{00}	γ_{10}	γ_{20}	γ_{30}	γ_{40}	γ_{50}	γ_{60}	γ_{70}	
Model 1: Peer-assessed leadership emergence (T3)									.56
L1: $PLET3_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(GE_{ij}) + \beta_{3j}(E\text{-}GREG_{ij}) + \beta_{4j}(E\text{-}ASSERT_{ij}) + \beta_{5j}(TASKT3_{ij}) + \beta_{6j}(SOCT3_{ij}) + \beta_{7j}(BOUNDT3_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	.01	-.21*	.13	-.01	.04	1.37**	.08	-.04	
Model 2: Observer-assessed leadership emergence (T3)									.25
L1: $OLET3_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(GE_{ij}) + \beta_{3j}(E\text{-}GREG_{ij}) + \beta_{4j}(E\text{-}ASSERT_{ij}) + \beta_{5j}(TASKT3_{ij}) + \beta_{6j}(SOCT3_{ij}) + \beta_{7j}(BOUNDT3_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	.01	-.56**	.01	-.04	.18†	.54**	-.14	.21	

Note. † $p < .10$, *$p < .05$, **$p < .01$. PLE = Peer-assessed leadership emergence; INTL = International; GE = Group experience; E-GREG = Gregariousness; E-ASSERT = Assertiveness; TASK = Task roles; SOC = Social roles; BOUND = Boundary Spanning roles; OLE = Observer-assessed leadership emergence. R^2 = pseudo R^2 or proportional reduction in residual variance due to addition of predictors.

Table 20b. *Results for Mediation: Predicting Leadership Emergence in Later Phases (Ratings Only)*

Model	Parameter estimates								R^2
	γ_{00}	γ_{10}	γ_{20}	γ_{30}	γ_{40}	γ_{50}	γ_{60}	γ_{70}	
Model 1: Peer-assessed leadership emergence (T3)									.79
L1: $PLET3_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(GE_{ij}) + \beta_{3j}(E\text{-}GREG_{ij}) + \beta_{4j}(E\text{-}ASSERT_{ij}) + \beta_{5j}(TASKT3_{ij}) + \beta_{6j}(SOCT3_{ij}) + \beta_{7j}(BOUNDT3_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	.01	-.21*	.13	-.01	.04	1.37**	.08	-.04	
Model 2: Observer-assessed leadership emergence (T3)									.34
L1: $OLET3_{ij} = \beta_{0j} + \beta_{1j}(INTL_{ij}) + \beta_{2j}(GE_{ij}) + \beta_{3j}(E\text{-}GREG_{ij}) + \beta_{4j}(E\text{-}ASSERT_{ij}) + \beta_{5j}(TASKT3_{ij}) + \beta_{6j}(SOCT3_{ij}) + \beta_{7j}(BOUNDT3_{ij}) + r_{ij}$ L2: $\beta_{ij} = \gamma_{i0} + U_{ij}$	.01	-.44**	.10	-.11	.22†	.77**	-.08	.31†	

Note. † $p < .10$, *$p < .05$, **$p < .01$. PLE = Peer-assessed leadership emergence; INTL = International; GE = Group experience; E-GREG = Gregariousness; E-ASSERT = Assertiveness; TASK = Task roles; SOC = Social roles; BOUND = Boundary Spanning roles; OLE = Observer-assessed leadership emergence. R^2 = pseudo R^2 or proportional reduction in residual variance due to addition of predictors.

boundary spanning roles were not related to leadership emergence. Thus, the second condition of mediation was not met and Hypothesis 19 was not supported.

Supplemental Analyses

The above results find very little support for the current model as proposed. Out of the 31 hypotheses predicted, only 4 were supported for a percentage support of 13%. Thus, supplemental analyses were undertaken in order to further examine the data and understand how leadership emerges as groups develop over time.

Leadership Emergence Ratings. In the current study, leadership emergence was assessed using both ratings and rankings. Due to the rectangular distribution of ranks, the ranks were normalized (Cohen et al., 2003), and then standardized along with the leadership emergence ratings and averaged to create an overall leadership emergence score. The rectangular distribution of ranks is problematic because the difference in leadership emergence between the most and the next-most group member may be greater than between two adjacent group members at the bottom (e.g., those ranked 4 and 5). Thus, the scale provided by the ranks is not likely to produce linear relationships with other variables and therefore, it is suggested to normalize the ranks. The normalized scale, however, is still not optimal (Cohen et al., 2003). Based on this, the hypotheses were reanalyzed using only the leadership emergence ratings, which were assessed on a five point scale. The group experience variable was also recalculated to use only the 7 published items from Rentsch and Klimoski (2001). Results of this analysis can be seen in Tables 12b-20b. The summary findings of the results can also be found in Table 2.

When using a composite measure of leadership emergence, which included both ratings and rankings, only 4 hypotheses were supported (13%). In contrast, when using

only leadership emergence ratings, 8 hypotheses were supported (26%). At the initial interaction, the prototypical leader characteristic of intelligence was significantly related to peer-assessed leadership emergence ($\gamma_{30} = .37, p < .01$), which supports Hypothesis 1b. In the early phases of group development, group experience was significantly related to engagement in the task roles ($\gamma_{30} = .11, p < .05$), which supports Hypothesis 5a. In addition, the extraversion facet of assertiveness was also significantly related to engagement in the task roles ($\gamma_{30} = .09, p < .05$), supporting Hypothesis 8. Support for partial mediation was also found for Hypothesis 18b and 18c which expected that the fulfillment of the task and social roles would mediate the relationship between group experience and leadership emergence and personality and leadership emergence, respectively. Group experience and assertiveness were both significantly related to peer-assessed leadership emergence in the early phases of group development ($\gamma_{30} = .20, p < .01$; $\gamma_{70} = .25, p < .01$, respectively). In the presence of role behaviors, these relationships were either no longer significant, as was the case for group experience ($\gamma_{30} = .03$, *n.s.*) or were less significant, as was the case for assertiveness ($\gamma_{70} = .10, p < .05$).

Personality facets. Results of the current study did not find significant relationships between the personality facets and leadership emergence, using both the composite measure of leadership emergence and the ratings of leadership emergence. In addition, the relationships between the personality facets and role behaviors were not significant. The primary reason for measuring facets of personality rather than the five factor structure was to match the bandwidth of the predictor (i.e., personality characteristics) and the criterion (i.e., role behaviors; Hogan & Roberts, 1996). Given the specificity of the roles outlined in the current study, I chose to measure the facets of

personality which underlie factors of the Big Five (Costa & McCrae, 1992; Goldberg, 1999; Goldberg et al., 2006). In addition, the current study sought to shed some light on the conflicting findings regarding the prediction of roles in teams based on Big Five personality characteristics (Blumberg, 2001; Stewart et al., 2005).

The extraversion facet of assertiveness was one of the few personality facets that was positively related to task and social roles. The lack of a relationship between the personality facets and task roles could be due to several factors including reliability and bandwidth. In terms of reliability, all of the facets demonstrated acceptable reliabilities (ά >.73). Thus, I explored the extent to which the null findings could be related to bandwidth issues by examining the relationship between the personality facets and the ten specific roles of contractor, contributor, completer, critic, creator, calibrator, communicator, cooperator, coordinator, and consul. Table 3 summarizes the expectations for the relationship between these 10 specific roles and facets of personality.

The results of this analysis are shown in Table 21. As one can see, there are some expected relationships, such as the positive relationship between gregariousness and the coordinator role in Time 2 ($r = .19, p < .01$) and in Time 3 ($r = .14, p < .05$). With the exception of assertiveness, however, most of the facets still do not have a significant relationship with the specific role behaviors. The next step was to aggregate the measured facets into their five factor structure and investigate the relationship between the combined conscientiousness facets, extraversion facets, and openness facets and role behaviors. The results of this analysis are shown in Table 22. Results demonstrate that the combined facets of conscientiousness and extraversion are positively related to boundary spanning role in Time 2 ($r = .16, p < .05$; $r = .21, p < .01$, respectively). The combined

Table 21. *Personality Facets to Specific Role Behaviors*

Role Behaviors	Orderliness	Achievement	Self Discipline	Assertive	Friendly	Gregarious	Intellect	Imaginative
Time 2								
Contractor	0.07	0.01	-0.02	0.08	-0.05	-0.04	-0.03	-0.09
Contributor	-0.03	0.14	0.06	0.30	0.09	0.03	0.10	0.00
Completer	0.05	0.12	0.04	0.09	0.06	0.04	-0.01	0.04
Critic	-0.01	0.09	0.01	0.27	0.07	0.05	0.03	-0.02
Creator	0.00	0.12	0.01	0.20	0.03	0.01	0.08	0.00
Calibrator	0.05	0.18	0.10	0.16	0.03	-0.02	0.07	0.06
Communicator	0.05	0.04	0.00	-0.05	0.06	0.02	0.02	0.08
Cooperator	-0.05	0.04	0.05	-0.05	0.00	-0.07	0.06	0.15
Coordinator	0.04	0.14	0.08	0.27	0.17	0.19	0.02	-0.03
Consul	0.04	0.20	0.13	0.15	0.09	0.06	0.08	0.02
Time 3								
Contractor	0.09	-0.02	-0.01	-0.12	-0.07	0.00	-0.20	-0.13
Contributor	-0.06	0.10	-0.01	0.03	-0.02	0.03	-0.08	-0.09
Completer	0.05	0.09	-0.02	-0.11	-0.08	-0.08	-0.11	-0.07
Critic	-0.04	0.13	-0.02	0.09	0.02	0.03	-0.04	-0.03
Creator	0.04	-0.01	-0.02	-0.04	-0.02	0.00	-0.06	-0.03
Calibrator	-0.02	-0.03	-0.03	-0.09	-0.02	-0.02	-0.12	0.00
Communicator	0.06	-0.04	-0.03	-0.14	0.03	0.00	-0.10	0.08
Cooperator	0.06	0.03	0.07	-0.03	0.04	0.00	-0.10	-0.01
Coordinator	0.05	0.09	0.07	0.06	0.09	0.14	-0.07	-0.02
Consul	0.03	0.07	-0.01	-0.03	0.08	0.10	-0.01	-0.04

Note: $N = 199$. Correlations greater than $r = .14$ significant at $p < .05$. Correlations greater than $r = .19$ significant at $p < .01$.

Table 22. *Combined Personality Facets to Role Behaviors*

	Conscientiousness Facet	Extraversion Facet	Openness Facet
Time 1			
Task Roles	0.04	0.00	0.04
Social Roles	0.04	-0.06	-0.02
Boundary Spanning Roles	-0.01	0.13	0.06
All Roles	0.03	0.04	0.03
Time 2			
Task Roles	0.07	0.11	0.01
Social Roles	0.08	0.02	0.10
Boundary Spanning Roles	0.16	0.21	0.03
All Roles	0.13	0.15	0.05
Time 3			
Task Roles	0.03	-0.03	-0.12
Social Roles	0.01	-0.03	-0.05
Boundary Spanning Roles	0.07	0.10	-0.05
All Roles	0.04	0.02	-0.09

Note: N ranges from 197-199. Correlations greater than $r = .14$ significant at $p < .05$. Correlations greater than $r = .19$ significant at $p < .01$.

facet of extraversion is also positively related to all the role behaviors in Time 2 ($r = .15$, $p < .05$). Overall, the combined facets do not demonstrate significant relationships with the task, social, and boundary spanning roles or all the role behaviors when task, social, and boundary spanning roles are combined.

These results indicate that increasing the specificity of the role behaviors does not demonstrate significant relationships with the personality facets. Furthermore, combining the facets into their five factor structure does not reveal significant relationships with the role behaviors. It may be that the bandwidth of the combined facets do not have the same breadth as the task, social, and boundary spanning roles. Furthermore, missing facets which were not measured in the current study may help to increase the breadth of the personality factors and reveal significant relationships with the role behaviors. For example, the facets of conscientiousness such as self-efficacy, dutifulness, and cautiousness, which were not measured in the current study, may also have significant relationships with the task role behaviors, which combined with the other facets of conscientiousness may reveal a significant relationship between the Big Five factor of conscientiousness and task role behaviors.

Relative importance. One of the basic tenets of the current study is that leaders emerge in a group for different reasons as a group develops over time. Leaders may emerge or be ascribed status in a group because they exhibit the traits associated with the leadership expectations of their group members (Arnoff & Wilson, 1985; Mann, 1959). In contrast, leaders may emerge or achieve status in a group because they fulfill roles necessary for the group to function effectively (Arnoff & Wilson, 1985; Mann, 1959). Thus, an additional analysis was performed in order to understand the extent to which

leaderlike characteristics (i.e., ascribed status) and role behaviors (i.e., achieved status) predicated leadership emergence across time.

Although not hypothesized, role behaviors did predict leadership emergence in Time 1. Likewise, leaderlike characteristics also had significant relationships with leadership emergence in phases 3 and 4. Thus, rather than leaderlike characteristics predicting leadership emergence at the initial interaction and fulfillment of role behaviors predicting leadership emergence in the early and later phases of group development, leaderlike characteristics and role behaviors may both predict leadership emergence in all phases. In addition, there may be some leaderlike characteristics and role behaviors that are more important in predicting leadership emergence across time. Thus, the additional analysis will consider the relative importance of leaderlike characteristics and role behaviors in predicting leadership emergence.

Relative importance is defined as "the proportionate contribution each predictor makes to R^2, considering both its direct effect (i.e., its correlation with the criterion) and its effect when combined with the other variables in the regression equation" (Johnson & LeBreton, 2004: 240). Relative importance of predictors is often examined through regression coefficients or zero-order correlations with the criterion. When predictors are uncorrelated, these indices are appropriate for determining relative importance because they are equivalent, and the squares of the indices sum to R^2. Thus, relative importance can be expressed as the proportion of variance each variable explains. When predictor variables are correlated, however, these indices are considered inadequate for determining the relative importance of predictor variables because the indices are no longer equivalent, do not sum to R^2, and take on different meanings (Budescu, 1993;

Darlington, 1968; Green & Tull, 1975; Hoffman, 1960; Johnson, 2001; Tabachnick & Fidell, 2001).

A common way of determining relative importance when predictors are correlated is through the use of epsilon (Johnson, 2000). The epsilon statistic was designed to furnish meaningful estimates of relative importance in the presence of correlated predictors. The estimates derived from epsilon, often labeled relative weights, sum to the model R^2. Thus, the relative weights represent the proportionate contribution each predictor makes to R^2, considering the predictor's direct effect and its effect when combined with other predictors. Researchers can also calculate the percentage of R^2 explained by each predictor by dividing the relative weight of each predictor by the total R^2. Because of these attributes, epsilon is a preferred statistic for computing relative importance (Johnson & LeBreton, 2004; LeBreton, Binning, Adorno, Melcher, 2004).

Given the fact that leaderlike characteristics and role behaviors measured in time 1, 2, and 3, are correlated, I chose to use the epsilon statistic to examine the relative importance of leaderlike characteristics and role behaviors in explaining leadership emergence. The results of the analysis can be seen in Model 1 in Table 23, which provides the percentage of R^2 explained in peer and observer-assessed leadership emergence by the leaderlike characteristics and role behaviors. As one can see, dynamism and task roles have the strongest relationships with leadership emergence across time for both peers (19% and 32%, respectively) and observers (28% and 21%, respectively). For observers, tyranny also has a strong relationship with leadership emergence (12%) whereas for peers, dedication has a strong relationship (12%). Interestingly, for peers,

Table 23. *Relative Importance of Leaderlike Characteristics and Role Behaviors in Predicting Leadership Emergence Ratings*

	Time 1		Time 2		Time 3		Average over Time	
	Peer % R^2	Observer % R^2	Peer % R^2	Observer % R^2	Peer % R^2	Observer % R^2	Peer % R^2	Observer % R^2
Model 1								
Sensitivity	0.03	0.03	0.02	0.04	0.06	0.06	0.04	0.04
Intelligence	0.08	0.06	0.07	0.05	0.07	0.09	0.07	0.07
Dedication	0.04	0.03	0.11	0.13	0.21	0.10	0.12	0.09
Dynamism	0.20	0.43	0.20	0.13	0.16	0.28	0.19	0.28
Tyranny	0.09	0.07	0.10	0.23	0.01	0.06	0.07	0.12
Masculinity	0.04	0.03	0.06	0.02	0.03	0.07	0.04	0.04
Task Roles	0.32	0.25	0.32	0.22	0.31	0.17	0.32	0.21
Social Roles	0.06	0.05	0.04	0.12	0.05	0.04	0.05	0.07
Boundary Spanning Roles	0.13	0.05	0.09	0.05	0.10	0.12	0.10	0.07
Model 2								
Sensitivity	0.03	0.03	0.02	0.03	0.05	0.04	0.03	0.03
Intelligence	0.08	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Dedication	0.04	0.03	0.10	0.12	0.16	0.07	0.10	0.08
Dynamism	0.20	0.43	0.15	0.10	0.11	0.20	0.16	0.24
Tyranny	0.09	0.07	0.09	0.20	0.01	0.04	0.06	0.10
Masculinity	0.04	0.03	0.05	0.02	0.02	0.04	0.04	0.03
Task Roles	0.32	0.25	0.27	0.21	0.24	0.13	0.28	0.20
Social Roles	0.06	0.05	0.03	0.10	0.05	0.03	0.05	0.06
Boundary Spanning Roles	0.13	0.05	0.07	0.04	0.08	0.10	0.09	0.06
Prior Leadership Emergence (Time-1)			0.17	0.11	0.23	0.29	0.20	0.20

what group members contribute to the group, in terms of task role behaviors, has the strongest relationship with leadership emergence.

For peers, the fulfillment of task roles maintain a strong relationship with leadership emergence across time. Dynamism also maintains a strong relationship with peer-assessed leadership emergence across time, although the strength of the relationship decreases slightly at time 3. Interestingly, by time 3, a group member's dedication is the most important leaderlike characteristic and explains 21% of the variance in peer-assessed leadership emergence. For observers, both dynamism and task roles maintain a strong relationship with leadership emergence across time. Over time, for observers, the relative importance of the boundary spanning roles increases.

In Model 2, in Table 23, the previous ratings of leadership emergence are added to the analysis at Time 2 and Time 3. For peers, dynamism and task roles still maintain a strong relationship with leadership emergence. Similar to the previous analysis, dedication becomes the most important leaderlike characteristic at Time 3 (16%). Prior leadership emergence ratings explain 17% and 23% of the variance in current leadership emergence at Time 2 and Time 3. For observers, dynamism and task roles again have a strong relationship with leadership emergence. Prior leadership emergence ratings explain 11% and 29% of the variance in current leadership emergence at Time 2 and Time 3.

Changes in Leadership Emergence Over Time. The analysis of relative importance indicates that both leaderlike characteristics and role behaviors play an important role in leadership emergence over time. In terms of relative importance, prior ratings of leadership emergence also explain a large amount of variance in current

leadership emergence, but certainly do not explain all the variance. These results would indicate that the same group member is not being rated highly as a leader over time, and that in fact, there may be changes in leadership emergence over time. To test for intraindividual changes in leadership emergence over time, I used a 3-level HLM model in which the three waves of data by individual were included at level 1 and individual differences or average ratings over the three waves were included at level 2. All level-1 predictors were centered at the individuals' means to eliminate between-individual variance. Level 3 represented the team level.

Before conducting multilevel analyses, I first examined whether leadership emergence ratings varied substantially within, as well as between, group members. Results of a null model, where I partitioned the total variance into within- and between-individual variance, revealed that 44 percent of the variance for peer-assessed leadership emergence was within individuals and 61 percent of the variance for observer-assessed leadership emergence was within individuals. Between-individual variance for both peer-assessed and observer-assessed leadership emergence were meaningful. These results suggest that within-individual variations in leadership emergence were substantive rather than random. I then regressed the leadership emergence ratings on the role behaviors at the first level (across time periods). Results of this analysis can be seen in Table 24. The results show support that role behaviors have a significant intraindividual effect on leadership emergence ($\beta_1 = .50, p < .01$ for peers; $\beta_1 = .23, p < .01$ for observers). Thus, fluctuations in group members' role behaviors are positively related to fluctuations in leadership emergence. It should be noted, however, that although the parameter estimate

Table 24. *Results of HLM Analysis Testing Intraindividual and Cross-Level Interactions Effects on Leadership Emergence Ratings*

	Peer Assessments			Observer Assessments		
Model	β_0	β_1	R^2	β_0	β_1	R^2
Main effects model						
Role Behaviors	.00	.50**	.21	-.01	.23*	.01
Moderated effects model						
Effect of overall perceptions of:						
International Status	-.47**	.19†	.23	-.72**	.13	.27
Sensitivity	.42**	-.46*	.11	.11	-.81†	.22
Intelligence	.95**	-.58**	.42	.77**	-1.26**	.44
Dedication	.73**	-.52**	.46	.40*	-.63*	.31
Dynamism	.77**	-.25	.42	.69**	-.13	.17
Tyranny	.44**	-.28*	.17	.51**	-.20	.12
Masculinity	.14**	-.07	.11	.16**	.03	.06

† $p < .10$, *$p < .05$, **$p < .01$. R^2 = pseudo R^2 or proportional reduction in residual variance due to addition of predictors. For main effects model pseudo R^2 is the percentage of within-person variation explained by the predictors. For moderated effects model pseudo R^2 is the percentage of between-person variation explained by the predictors. ILT Characteristics were tested in separate models.

is significant for role behaviors predicting observer-assessed leadership emergence, the amount of explained within-individual variance is small (pseudo R^2 = .01).

The next step was to consider the role of leaderlike characteristics in leadership emergence over time. In his work on leadership emergence, Hollander (1964) discusses the term "idiosyncratic credits." An idiosyncratic credit is defined as the degree to which individuals in the group may deviate from the common expectancies of the group. The credit represents an accumulation of positively disposed impressions of a group member by other members of the group. In Hollander's work, idiosyncratic credits are built over time due to a group member's task competence or characteristics of the individual. Group members with idiosyncratic credits are less restricted in their behavior, whereas group members without the credits are much more restricted in their behavior and must continue to meet group expectations and norms for behavior (Hollander, 1964).

The notion of idiosyncratic credits led me to investigate the role of leaderlike characteristics in building the credits. If characteristics of the individual may be used to build up idiosyncratic credits, then it may well be that group members who are perceived to be "leaderlike" may also build idiosyncratic credits. With these credits, the more "leaderlike" group members will be less restricted in their behavior. To test this, at the second level, I modeled the interactive effects of peer perceptions of leaderlike characteristics (averaged over time) on the magnitude of the intraindivdiual effect of role behaviors on leadership emergence.

The moderated effects model results can be seen in Table 24. There was support for the interactive effect of leaderlike characteristics on leadership emergence. At the second level, leaderlike characteristics significantly predicted the first-level regression

coefficient of role behaviors. More specifically, for peer-assessed leadership emergence, all the leaderlike characteristics predicted the first-level intercept, and all but dynamism and masculinity predicted the first-level slope of role behaviors. For observer-assessed leadership emergence, all but sensitivity predicted the first-level intercept and sensitivity (marginally), intelligence, and dedication predicted the first-level slope of role behaviors. The cross-level moderator of international status was also significantly related the first-level regression coefficients. Thus, when investigating the cross-level moderator of leaderlike characteristics, international status was used as a control variable on the first-level intercept.

In terms of explained variance, not all of the cross-level moderators explain a large amount of between-individual variance. For peer-assessed leadership emergence, intelligence, dedication, and dynamism explained the most between-individual variance. Intelligence and dedication explained the most between-individual variance for observer-assessed leadership emergence. The descriptives for the variables in the cross-level analyses are shown in Table 25.

Figure 3 shows the cross level-moderating effect of dedication on the intraindivdiual relationship between group members' role behaviors over time and peer-assessed leadership emergence over time. The interaction indicates that group members who are seen as more dedicated are rated more highly on peer-assessed leadership emergence. In addition, when more dedicated group members are compared to less dedicated group members, the extent to which dedicated group members are rated highly on leadership emergence is less dependent on their fluctuations in role behaviors. Figure 4 shows the cross-level effect of intelligence on the intraindivdiual relationship between

Table 25. *Descriptives for Cross-Level Interactions on Leadership Emergence Ratings*

			Peer Assessments				Observer Assessments			
	Mean	SD	High Role Behavior-High Cross-Level Moderator	High Role Behavior-Low Cross-Level Moderator	Low Role Behavior-High Cross-Level Moderator	Low Role Behavior-Low Cross-Level Moderator	High Role Behavior-High Cross-Level Moderator	High Role Behavior-Low Cross-Level Moderator	Low Role Behavior-High Cross-Level Moderator	Low Role Behavior-Low Cross-Level Moderator
Role Behaviors	3.80	.37								
International status	.33	.47	-.01	.37	-.43	.09	-.26	.37	-.45	.27
Sensitivity	4.37	.25	.25	.12	-.02	-.33	.00	.09	.01	-.19
Intelligence	4.30	.26	.37	-.01	.13	-.48	.23	-.14	.13	-.29
Dedication	4.38	.34	.36	-.01	.14	-.49	.10	-.02	.13	-.30
Dynamism	3.92	.43	.47	-.11	.20	-.54	.32	-.22	.22	-.41
Tyranny	2.09	.43	.32	.03	.07	-.41	.24	-.13	.16	-.34
Masculinity	3.46	.99	.29	.07	-.02	-.34	.22	-.12	.05	-.24

Figure 3. The Moderating Effect of Dedication on the Intraindividual effect of Role Behaviors on Leadership Emergence

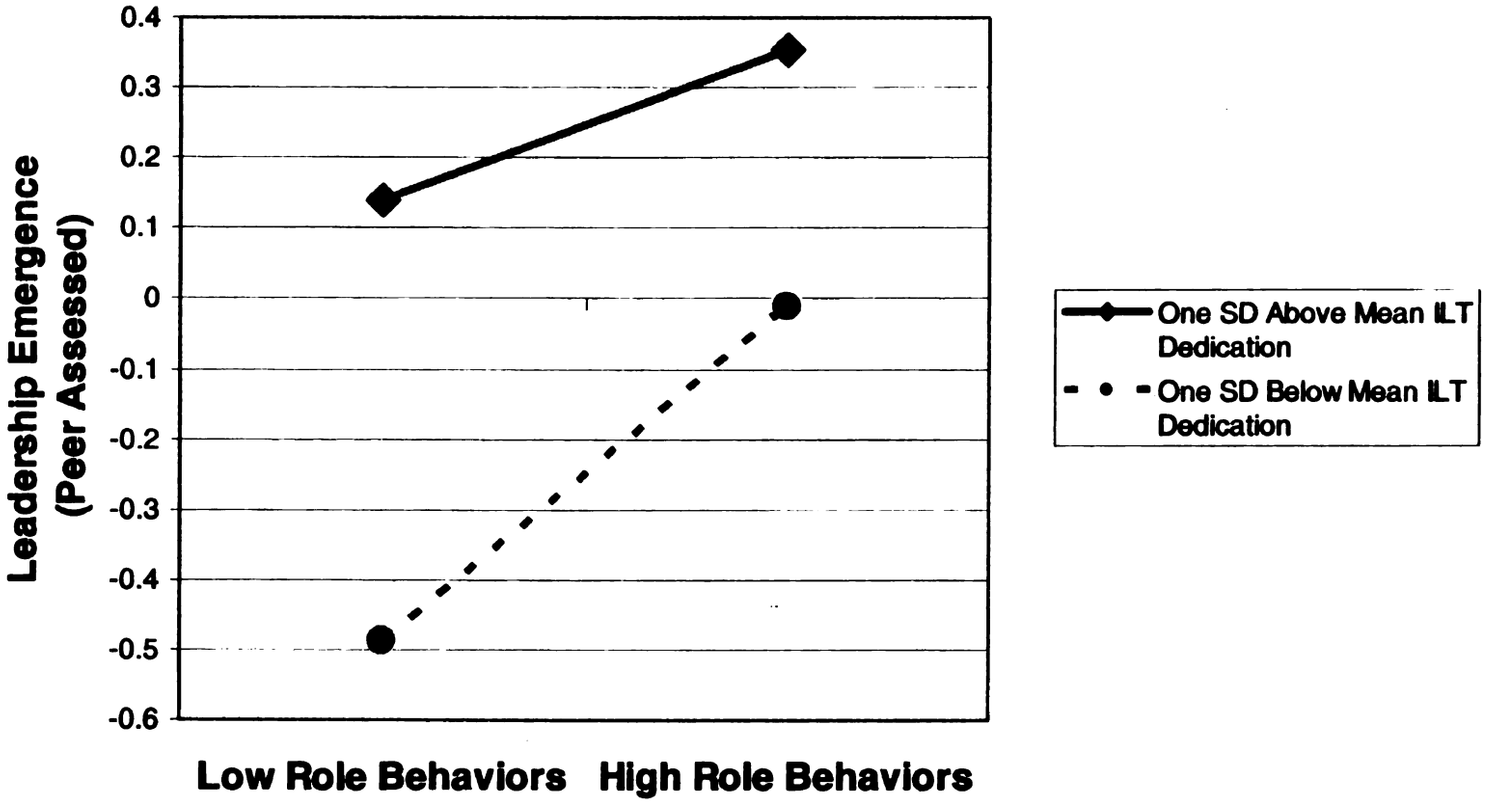
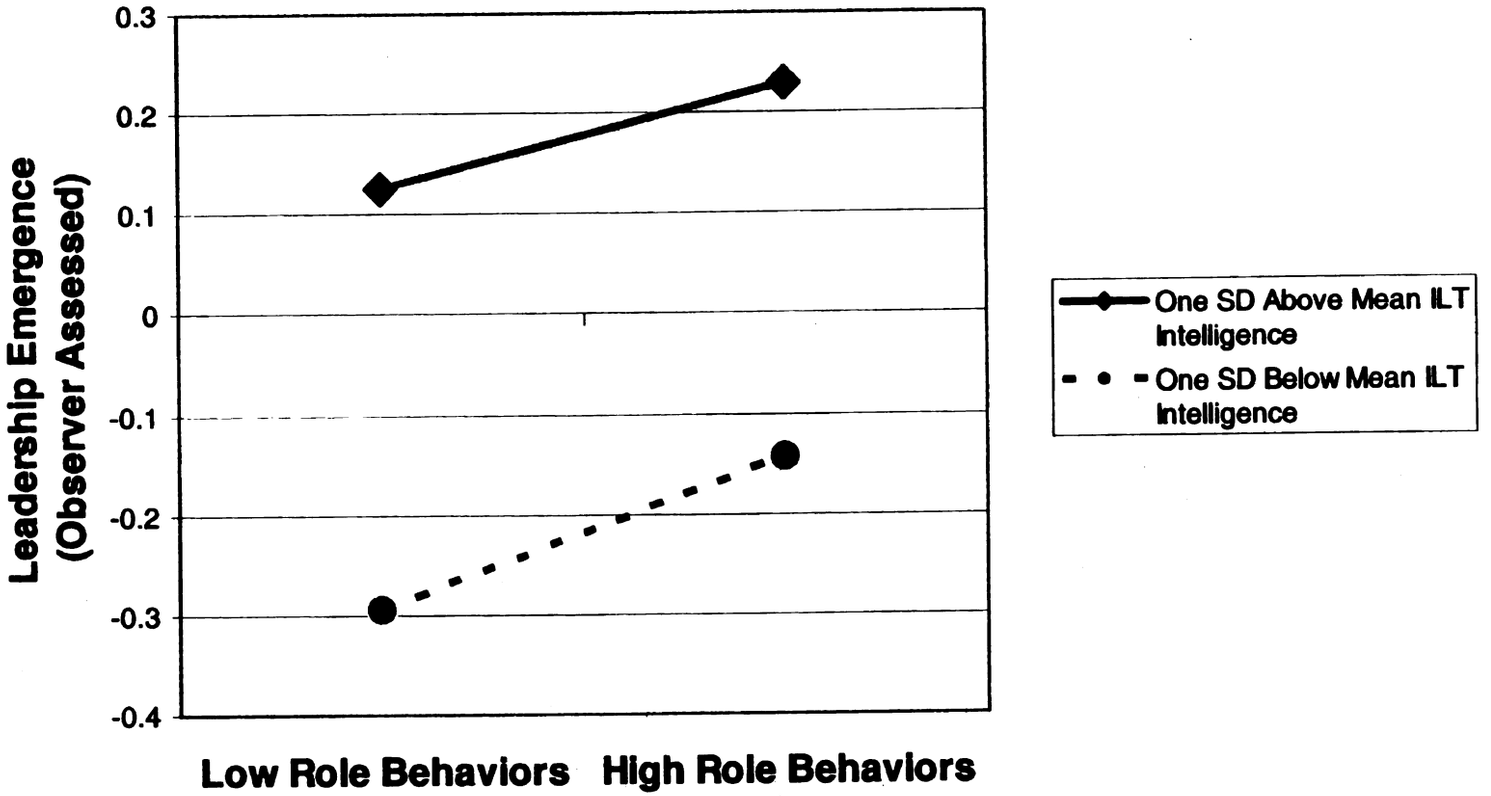


Figure 4. The Moderating Effect of Intelligence on the Intraindividual effect of Role Behaviors on Leadership Emergence



group members' role behaviors over time and observer-assessed leadership emergence over time. The pattern is consistent with Figure 3 in that more intelligent group members are rated more highly on leadership emergence and their rating on leadership emergence is less dependent on their fluctuations in their role behaviors. These results suggest that group members who are perceived to posssess leaderlike characteristics indeed build "idiosyncratic credits" and thus, their ratings of leadership emergence over time, are less dependent on their role behaviors in the group. In contrast, group members who do not posssess leaderlike characteristics are much more dependent on proving their value to the group through their role behaviors in order to be considered leaders in the group.

DISCUSSION

This research sought to address four primary research questions. First, was the question of why does leadership emerge? The second question was whether or not different leaders emerge as a group develops. Along with this question was the question of whether the same individual emerges as the leader as the group develops, but for different reasons. The third question was the examination of what predicts the emergence of leadership. More specifically, is the possession of "leaderlike" characteristics the only predictor of leadership emergence? Or do factors such as abilities, experience, and personality combine with the leaderless group context to determine the roles that individuals fulfill in the group and ultimately who emerges as the leader? Finally, the research sought to address the question of how an individual's needs influence the roles they fulfill in the group?

Based on these research questions, a model of leadership emergence which explains the process through which leaders emerge was developed and tested. The

research proposed that leadership emerges due to three primary reasons: possessing leaderlike characteristics, fulfilling roles, and satisfying needs (Mann, 1959). A key aspect of the model was examining leadership emergence as groups develop over time. Specifically, the study predicted that different factors would determine leadership emergence at the initial interaction of a group, versus early phases of group development, versus later phases of group development. In this following discussion, I first provide a brief overview of the study findings. I then discuss the strengths and limitations of the study, followed by a discussion of the implications for leadership emergence research.

Summary of Findings

The primary question the current study sought to understand was how leadership emerges as a group develops over time. The first set of predictions focused on the initial interaction of a group and expected that leadership would emerge based on the extent to which group members are perceived to be "leaderlike" (Mann, 1959). Implicit leadership theory would suggest that the characteristics of sensitivity, intelligence, dedication, and dynamism are prototypical leader characteristics and the characteristics of tyranny and masculinity are antiprototypical leader characteristics (Epitropaki & Martin, 2004). It was expected that at the initial interaction of a group, members would rely on these cognitive structures when deciding on the leadership of the group. Thus, the group members who possessed these characteristics would emerge as the leader. All of the bivariate relationships between leaderlike characteristics were positively related to peer-assessed leadership emergence. The bivariate relationship between dynamism and observer-assessed leadership emergence and tyranny and observer-assessed leadership emergence was also positive. Regression results found that the prototypical leader characteristic of

dynamism was the only leaderlike characteristic to be significantly related to peer-assessed and observer-assessed leadership emergence at the initial interaction, when all leaderlike characteristics were entered as predictors.

The second set of predictions focused on the early and later phases of group development, where it was expected that the fulfillment of roles necessary for the group to function successfully would be positively related to leadership emergence (Mann, 1959). In the early phases of group development, it was expected that fulfillment of task and social roles would be positively related to leadership emergence. The bivariate relationship between task and social roles and peer-assessed leadership emergence was positive and significant. Only the relationship between the task roles and observer-assessed leadership emergence was found to be significant. Regression results found that in the early phases of group development, the fulfillment of the task roles was positively related to peer-assessed and observer-assessed leadership emergence, when all roles were entered as predictors.

In the later phases of group development, the prediction was that the fulfillment of boundary spanning roles would be positively related to leadership emergence. The bivariate relationship between boundary spanning roles and leadership emergence (both peer and observer-assessed) was positive and significant. Regression results, however, found that the fulfillment of boundary spanning roles was not related to peer-assessed leadership emergence and only marginally related to observer-assessed leadership emergence in the later phase of group development.

The next set of predictions focused on the antecedents to the role behaviors of individuals in the group by examining the antecedents of intelligence, personality and

satisfaction of needs, and experience. It was expected that these individual differences would determine the extent to which individuals would fulfill certain roles in the group. Bivariate relationships found that the most consistent predictor of fulfillment of roles the in early phase was the extraversion facet of assertiveness and group experience. There were no significant bivariate relationships in the later phase of group development. Regression results found that the extraversion facet of assertiveness was significantly related to fulfillment of the task roles in the early phase and that the extraversion facet of gregariousness was significantly relate to fulfillment of the boundary spanning roles in the later phase. Support was not found for the mediation of the individual differences to leadership emergence relationship by the fulfillment of the roles.

Strengths, Limitations, and Areas for Future Research

The current study had several strengths and limitations that should be noted. First, although the leadership emergence literature has examined factors such as composition of the group and type of task as predictor of leadership emergence (e.g. Barnlund, 1962), it has neglected to examine the role of group development as a potential determinant of leadership emergence. In the current study, one purpose was to examine whether or not different factors were related to leadership emergence over time. The study hypothesized that leaderlike characteristics would be positively related to leadership emergence at the initial interaction, whereas fulfillment of role behaviors would be positively related to leadership emergence in the early and later phases of group development.

The arguments for the different factors predicting leadership emergence at different phases were predicated on the expectation that groups would proceed through the successive phases in a certain period of time. Analysis of the results from the group

development measure revealed that groups were indeed in the team formation phase at the initial interaction. At the early phase, although it was expected that groups would be in the task and role compilation phases, the results did not indicate that they were indeed in these phases. Although the groups were proceeding towards these phases, results indicated that the groups were also still in the team formation phase. Likewise, the study expected that at the later phase, groups would be in the team compilation phase. Instead, results indicated that groups were out of the team formation phases and somewhere between the task, role, and team compilation phases. It is perhaps not surprising, therefore, that the hypotheses were not supported.

Although the results of the study do not support the expectation that different factors predict leadership emergence as groups develop over time, the results do support the expectation that both ascribed status (i.e., leaderlike characteristics) and achieved status (i.e., fulfilling roles) are significantly related to leadership emergence. These factors continue to play a role as groups develop over time. Results from the study indicate that both leaderlike characteristics and role behaviors were positively related to leadership emergence as a group develops over time. Supplemental analysis of relative importance indicate that the leaderlike characteristic of dynamism and task role behaviors demonstrate the strongest relationships with leadership emergence as a group develops over time. More importantly, a group member's dedication to the group also becomes important in the later phases of the group's development.

Another purpose of the current study was to examine whether different leaders emerge as a result of the amount of time a group has interacted. Results of the current study indicate that leadership emergence at the initial interaction is positively related to

leadership emergence in the early phases of group development (r = .59 for peer-assessed; r = .25 for observer-assessed) as well as later phases of group development (r = .45 for peer-assessed; r = .27 for observer-assessed). This is notable given the fact that assessments of leadership emergence at the initial interaction took place after only one day of interaction. Thus, it would appear that these "thin slices" of leadership at the initial interaction continue to influence perceptions of leadership even as far as seven months later (Ambady & Rosenthal, 1992; Borkenau, Mauer, Riemann, Spinath, & Angleitner, 2004).

The results also demonstrate that leadership emergence in the early phases of group development is also positively related to leadership emergence in the later phases of group development (r = .74 for peer-assessed; r = .43 for observer-assessed). Thus, although previous assessments of leadership emergence predict later assessments of leadership emergence, they do not explain all of the variance, and when their relative importance is examined with the leaderlike characteristics and role behaviors, prior leadership emergence explains on average 20 percent of the variance in later leadership emergence. Thus, there is variation in leadership emergence over time. Supplemental analyses found that leadership emergence does indeed vary over time and can be predicted by variation in role behaviors. Interestingly, the relationship between role behaviors and leadership emergence fluctuations over time was not as strong for group members who were perceived to possess more "leaderlike" characteristics. In contrast, for group members who did not possess "leaderlike" characteristics, their leadership emergence was much more dependent on their role behaviors in the group. These results

suggest that "leaderlike" group members perhaps have "idiosyncratic credits" which allow them to deviate from the norm of fulfilling role behaviors.

Another key question is the extent to which "leaders" emerge versus "leadership" emerges in group. That is, is there one individual leading the group or several individuals which lead the group? To examine this, supplemental analysis was conducted to assess the extent to which individuals were rated much higher on their leadership in the group, thus indicating they were the "leader." To investigate this, individuals who were rated one-half a standard deviation and one standard deviation above other group members were identified as "leaders."

Results of the analysis for peer-assessed leadership emergence ratings found that at Time 1, 3 of the 41 groups were lead by individuals who were rated more than one standard deviation above other group members. Nineteen groups were lead by individuals who were rated more than one-half a standard deviation above other group members. At Time 2 and Time 3, 8 groups were lead by individuals who were rated more than one standard deviation above other group members and 21 groups were lead by individuals who were rated more than one-half a standard deviation above other group members. Interestingly, only 1 individual was rated more than one standard deviation above other group members across all three time periods. Eight individuals were rated more than one-half a standard deviation above other group members across all three time periods. In total, 14 individuals were rated more than one standard deviation above other group members in at least one of the three time periods and 37 individuals were rated more than one-half a standard deviation above other group members in at least one of the three time periods.

Results of the analysis for observer-assessed leadership emergence ratings found that at Time 1, 5 of the 41 groups were lead by individuals who were rated more than one standard deviation above other group members. Fourteen groups were lead by individuals who were rated more than one-half a standard deviation above other group members. At Time 2, 6 groups were lead by individuals who were rated more than one standard deviation above other group members and 18 groups were lead by individuals who were rated more than one-half a standard deviation above other group members. At Time 3, 18 groups were lead by individuals who were rated more than one standard deviation above other group members and 23 groups were lead by individuals who were rated more than one-half a standard deviation above other group members.

No individuals were rated more than one standard deviation or one-half a standard deviation above other group members across all three time periods. In total, 28 individuals were rated more than one standard deviation above other group members in at least one of the three time periods and 49 indivdiuals were rated more than one-half a standard deviation above other group members in at least one of the three time periods.

In summary, these results indicate that between 20-50 percent of the groups had "leaders" emerge. Thus, emergence in leaderless groups can take the form of both "leader" emergence and "leadership" emergence. Future research should examine the individual and contextual factors which predict the emergence of "leaders" versus "leadership".

In the current study, leaderlike characteristics, role behaviors, and leadership emergence were assessed from a variety of perspectives, including self, peer, and observer. Participants provided self and peer ratings of leaderlike characteristics, role

behaviors, and leadership emergence across three time periods. Self and peer ratings of leadership emergence were moderately related (r = .28, .49, .36). This is not surprising given previous findings of relatively moderate correlations between self-peer ratings of performance (ρ = .36; Harris & Schaubroeck, 1988). Across the three time periods, observers also assessed leadership emergence. Peer and observer assessments of leadership emergence were moderately to high related in all three time periods (r = .35, .52, .57), which is consistent with previous findings of higher correlations between peer and supervisors ratings of performance (ρ = .62; Harris & Schaubroeck, 1988). Self and observer assessments moderately related across time periods (r = .15, .41, .33), which is also consistent with prevous research of moderate correlations between self and supervisor ratings of performance (ρ = .35; Harris & Schaubroeck, 1988).

Although the ratings across sources were low to moderately correlated, ratings of leaderlike characteristics and role behaviors from each source were highly correlated in each time period. For example, in Time 1, self-peer ratings of task roles were correlated r = .16 whereas self ratings of task, social, and boundary spanning roles correlated between r = .49 to r = .65. Peer ratings of task, social, and boundary spanning roles correlated between r = .52 to r = .63. In Time 2, self-peer ratings of task roles were correlated r = .24 whereas self ratings of task, social, and boundary spanning roles ranged between r = .44 to r = .63. Peer ratings of task, social, and boundary spanning roles ranged between r = .36 to r = .55. In Time 3, self-peer ratings of task roles correlated r = .18. Self ratings of role behaviors correlated between r = .49 to r = .66 and peer ratings of role behaviors correlated between r = .37 to r = .64. The high correlations within a source versus low correlations between sources indicate a source effect. This source effect can somewhat be

attributed to common-source bias, but may also indicate that raters make perceptions of "role activity" rather than specific task, social, and boundary spanning role behaviors.

Finally, another strength of the current study was the diversity of the participant population in that 31% of the participants were international representing 19 different countries. Interestingly, international status was a significant predictor of leadership emergence. Across time, international status explained 15.1% of the variance in peer-assessed leadership emergence and 16.0% of the variance in observer-assessesd leadership emergence. Although used as a control variable in the current study, future research should investigate international status as a substantive predictor of leadership emergence.

Notwithstanding the strengths of this research, this study also had several limitations. In terms of predicting the fulfillment of roles in the group, the current study expected that individual differences such as intelligence, personality and satisfying needs, and experience, and would be related to fulfillment of roles. None of these individual differences consistently predicted fulfillment or roles or leadership emergence. Supplemental analysis did not reveal a specificity issue between the personality facet and role behaviors, or that the personality facets suffer from lack of reliability. Given the conflicting findings for the relationship between personality and role behaviors (Blumberg, 2001; Stewart et al., 2005), future research should investigate other predictors of role behaviors such as role knowledge (Mumford et al., 2008).

Another limitation of the current study was the use of a successive stage model of group development. Results from the group development measure indicate that although the formation phase is distinct from other phases of group development, it is not as easy

to distinguish between the task, role, and team compilation phases. Although the content validity of the group development measure was supportive of a four stage model of group development, results from the measurement across time were not as supportive. Not only was it difficult to distinguish between the task, role, and team compilation phases, but even after seven months of interactions, groups still endorsed the team formation stage as it had a mean of 4.01 at Time 3 and correlated .60, .65, and .49 with the task, role, and team compliation stages, respectively.

Although the correlations are certainly inflated due to common-source bias, it also potentially points to alternative models of group development. Rather than progressing through the four stages in succession, groups may instead be in the task, role, and team compilation stages at one time. Furthermore, once groups progress through the formation stage, groups may instead be revolving through multiple tasks in which at each task, they progress through task, role, and team compilation. This potentially points to a more "episodic" model of group development (Marks et al., 2001). Therefore, the importance of various role behaviors for leadership emergence varies depending on episodes, rather than stage of development. Future research should investigate the how episodes impact leadership emergence in a group.

Conclusion and Implications

The model and empirical evidence in this dissertation illustrate the value of examining leadership emergence as groups develop across time. Notwithstanding the limitations noted earlier, the results of this study have important implications for leadership emergence research. First, although research has identified a host of factors which help explain leadership emergence (e.g., Mann, 1959; Stogdill, 1948), there has yet

to be a unifying framework to explain why leadership emerges in leaderless groups. The current study proposed three mechanisms through which leadership emerges: possessing leaderlike characteristics, fulfilling roles, and satisfying needs (Mann, 1959). Findings from the current study indicate possessing the leaderlike characteristic of dynamism and fulfilling task roles in a group are key components of leadership emergence in groups.

Second, the present research empirically examined leadership emergence as groups develop across time. Thus, the study was able to understand whether different factors predict leadership emergence as a group develops. Results of the current study indicate that leaderlike characteristics and role behaviors are both significantly related to leadership emergence across time. Thus, leadership emergence in a group is related to both ascribed and achieved status (Arnoff & Wilson, 1985) and does not appear to differ based on the stage of group development. As previous research has found that type of task does not change the tendency for a person to be seen as a leader (Zaccaro et al., 1991), future research should investigate other moderating factors such as interdependence of the group or the context of the group. In the current study, verbal fluency and cultural norms appeared to strongly influence leadership emergence. It may well that in order to lead a group, group members must understand their current context.

Finally, the study indicates that although leadership emergence at the initial interaction is related to leadership emergence in the early and later phases of group development, there are indeed variations in leadership emergence over time. The current study found that role behaviors over time predict leadership emergence over time, but not as strongly for people who possess leaderlike characteristics. Future research should

investigate other factors which moderate the relationship between behaviors in a group and leadership emergence.

APPENDICES

APPENDIX A

MEASURES USED IN DISSERTATION

Construct	Measure and Items	Scale
Big 5 Conscientiousness	IPIP - Goldberg et al., 1999, 2006 Listed below are phrases describing people's behaviors. Please use the rating scale below to describe how accurately each statement describes you. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age. So that you can describe yourself in an honest manner, your responses will be kept in absolute confidence. Please read each statement carefully, and then indicate your response to each statement by choosing your answer in the right column. How accurately do these statements describe you?	
Orderliness	1. Like order. 2. Like to tidy up. 3. Want everything to be "just right." 4. Love order and regularity. 5. Do things according to a plan. 6. Often forget to put things back in their proper place. (Reversed) 7. Leave a mess in my room. (Reversed) 8. Leave my belongings around. (Reversed) 9. Am not bothered by messy people. (Reversed) 10. Am not bothered by disorder. (Reversed)	1 – Very Inaccurate 2 – Moderately Inaccurate 3 – Neither Inaccurate nor Accurate 4 – Moderately Accurate 5 – Very Accurate
Achievement Striving	1. Go straight for the goal. 2. Work hard. 3. Turn plans into actions. 4. Plunge into tasks with all my heart. 5. Do more than what's expected of me. 6. Set high standards for myself and others. 7. Demand quality. 8. Am not highly motivated to succeed. (Reversed) 9. Do just enough work to get by. (Reversed) 10. Put little time and effort into my work. (Reversed)	1 – Very Inaccurate 2 – Moderately Inaccurate 3 – Neither Inaccurate nor Accurate 4 – Moderately Accurate 5 – Very Accurate

Self-Discipline	1. Get chores done right away. 2. Am always prepared. 3. Start tasks right away. 4. Get to work at once. 5. Carry out my plans. 6. Find it difficult to get down to work. (Reversed) 7. Waste my time. (Reversed) 8. Need a push to get started. (Reversed) 9. Have difficulty starting tasks. (Reversed) 10. Postpone decisions. (Reversed)	1 – Very Inaccurate 2 – Moderately Inaccurate 3 – Neither Inaccurate nor Accurate 4 – Moderately Accurate 5 – Very Accurate
Big 5 Extraversion	IPIP - Goldberg et al., 1999, 2006	
Assertiveness	1. Take charge. 2. Try to lead others. 3. Can talk others into doing things. 4. Seek to influence others. 5. Take control of things. 6. Wait for others to lead the way. (Reversed) 7. Keep in the background. (Reversed) 8. Have little to say. (Reversed) 9. Don't like to draw attention to myself. (Reversed) 10. Hold back my opinions. (Reversed)	1 – Very Inaccurate 2 – Moderately Inaccurate 3 – Neither Inaccurate nor Accurate 4 – Moderately Accurate 5 – Very Accurate
Friendliness	1. Make friends easily. 2. Warm up quickly to others. 3. Feel comfortable around people. 4. Act comfortably with others. 5. Cheer people up. 6. Am hard to get to know. (Reversed) 7. Often feel uncomfortable around others. (Reversed) 8. Avoid contacts with others. (Reversed) 9. Am not really interested in others. (Reversed) 10. Keep others at a distance. (Reversed)	1 – Very Inaccurate 2 – Moderately Inaccurate 3 – Neither Inaccurate nor Accurate 4 – Moderately Accurate 5 – Very Accurate

Gregariousness	1. Love large parties. 2. Talk to a lot of different people at parties. 3. Enjoy being part of a group. 4. Involve others in what I am doing. 5. Love surprise parties. 6. Prefer to be alone. (Reversed) 7. Want to be left alone. (Reversed) 8. Don't like crowded events. (Reversed) 9. Avoid crowds. (Reversed) 10. Seek quiet. (Reversed)	1 – Very Inaccurate 2 – Moderately Inaccurate 3 – Neither Inaccurate nor Accurate 4 – Moderately Accurate 5 – Very Accurate
Big 5 Openness to Experience	IPIP - Goldberg et al., 1999, 2006	
Intellect	1. Like to solve complex problems. 2. Love to read challenging material. 3. Have a rich vocabulary. 4. Can handle a lot of information. 5. Enjoy thinking about things. 6. Am not interested in abstract ideas. (Reversed) 7. Avoid philosophical discussions. (Reversed) 8. Have difficulty understanding abstract ideas. (Reversed) 9. Am not interested in theoretical discussions. (Reversed) 10. Avoid difficult reading material. (Reversed)	1 – Very Inaccurate 2 – Moderately Inaccurate 3 – Neither Inaccurate nor Accurate 4 – Moderately Accurate 5 – Very Accurate
Imagination	1. Have a vivid imagination. 2. Enjoy wild flights of fantasy. 3. Love to daydream. 4. Like to get lost in thought. 5. Indulge in my fantasies. 6. Spend time reflecting on things. 7. Seldom daydream. (Reversed) 8. Do not have a good imagination. (Reversed) 9. Seldom get lost in thought. (Reversed) 10. Have difficulty imagining things. (Reversed)	1 – Very Inaccurate 2 – Moderately Inaccurate 3 – Neither Inaccurate nor Accurate 4 – Moderately Accurate 5 – Very Accurate

Group Experience	Rentsch & Klimoski, 2001 When responding to the following statements, please think about your experience with teams in general. A team is defined as individuals interacting interdependently to achieve a common objective. Please read each statement carefully, and then indicate your response to each statement by choosing your answer in the right column.	
Group Experience	1. I am an active team member. 2. I enjoy working on teams. 3. I have observed many other teams of which I am not a member. 4. My participation on a team facilitates how the team members work together. 5. I know how to make teams more effective. 6. I frequently interact with (e.g., work with, coach, train) teams of which I am not a member. 7. I understand how people should work together on as a team. 8. I contribute to the teams of which I am a member. 9. I understand why some teams are ineffective. 10. I contribute more than my fair share to the teams of which I am a member. 11. I can discuss how to improve a team. 12. I don't know much about teamwork. (Reversed) 13. I don't have much team experience. (Reversed)	1 – Strongly Disagree 2 – Disagree 3 – Neutral 4 – Agree 5 – Strongly Agree
Leaderlike Characteristics	Epitropaki & Martin, 2004 The following questions ask you to indicate how the characteristics listed below apply to your teammates. Please circle the number that corresponds to the characteristic as it applies to your teammate.	
Sensitivity	1. Understanding 2. Sincere 3. Helpful	1 – Not at all Characteristic 2 – Not Very Characteristic 3 – Neutral 4 – Somewhat Characteristic 5 – Extremely Characteristic
Intelligence	4. Intelligent 5. Clever 6. Knowledgeable 7. Educated	1 – Not at all Characteristic 2 – Not Very Characteristic 3 – Neutral 4 – Somewhat Characteristic 5 – Extremely Characteristic

Dedication	8. Motivated 9. Dedicated 10. Hard-working	1 – Not at all Characteristic 2 – Not Very Characteristic 3 – Neutral 4 – Somewhat Characteristic 5 – Extremely Characteristic
Dynamism	11. Dynamic 12. Strong 13. Energetic	1 – Not at all Characteristic 2 – Not Very Characteristic 3 – Neutral 4 – Somewhat Characteristic 5 – Extremely Characteristic
Tyranny	14. Domineering 15. Pushy 16. Manipulative 17. Conceited 18. Selfish 19. Loud	1 – Not at all Characteristic 2 – Not Very Characteristic 3 – Neutral 4 – Somewhat Characteristic 5 – Extremely Characteristic
Masculinity	20. Masculine 21. Male	1 – Not at all Characteristic 2 – Not Very Characteristic 3 – Neutral 4 – Somewhat Characteristic 5 – Extremely Characteristic
Leadership Emergence	Lord et al., 1984; Taggar et al., 1999 Please rate your perceptions of each team member's leadership using the scale provided below.	
Overall Leadership Emergence	1. This team member exhibits leadership in the team. 2. This team member is a desirable leader of the team. 3. This team member exemplifies strong leadership in the team. 4. This team member assumes leadership in the team. 5. This team member influences the team.	1 – Almost Never 2 – Rarely 3 – Sometimes 4 – Often 5 – Almost Always

Role Behaviors	Mumford et al., 2006; 2008 Please rate the extent to which the team member engages in the following roles in the team.	
Task Roles	1. Organizes the team's work to get important work done on time 2. Coordinates the work done by others so that things are done in the right order. 3. Helps the team focus on getting the job done efficiently 4. Speaks out when he/she knows the most about the work to be done. 5. Shares with the team any knowledge he/she has about the work to be done 6. Takes the lead in the team when he/she has a lot of experience in that area of work 7. Takes personal responsibility for getting the work done 8. Finishes work for the team on time without being reminded 9. Follows through on commitments made to the team 10. Speaks up if he/she has concerns with the work the team is doing 11. Makes sure the team talks about both positive and negative consequences of decisions. 12. Shares honest opinions about how the team is working, even if the opinion is not favorable 13. Suggests creative ways to solve the team's problems. 14. Helps the team take a fresh perspective on problems. 15. Sees the "big picture" and has creative ideas for handling problems	1 – Not at all 2 – To a limited extent 3 – To a moderate extent 4 – To a great extent 5 – To a very great extent

Social Roles	16. Helps settle conflicts between members of the team 17. Suggests positive ways for the team to interact such as taking turns, showing respect, and being open to new ideas 18. Steps in if there are negative feelings in the team to help resolve the difficulties 19. Supports the team and its goals after having given input, even if he/she would have personally set different goals 20. Admits when others have more experience in particular areas and trusts their judgment 21. Recognizes the expertise of others and allows them to take a leadership role in the team 22. Makes the work pleasant and comfortable by being happy and easy to work with 23. Communicates personal feelings and thoughts respectfully and without offending anyone 24. Listens carefully to the thoughts and feelings of others	1 – Not at all 2 – To a limited extent 3 – To a moderate extent 4 – To a great extent 5 – To a very great extent
Boundary Spanning Roles	25. Goes outside the team to bring in new resources that help the team work effectively 26. Gets information from sources outside the team before making an important decision 27. Interacts with people outside the team to get special knowledge about the work, the product, customers or management. 28. Gets support for the team with important people outside the team such as supervisors and managers. 29. Tells the supervisors and managers favorable information about the team and its goals 30. Tries to provide supervisors and managers with frequent updates about the team's accomplishments	1 – Not at all 2 – To a limited extent 3 – To a moderate extent 4 – To a great extent 5 – To a very great extent

10 item measure	1. Organizes the work and keeps others focused on getting it done efficiently. 2. Shares information and advice with the team in areas where he/she has a lot of experience. 3. Takes personal responsibility for the team's work, volunteers for new jobs and follows through on the commitments made. 4. Thoroughly thinks through what the team is doing to make sure they are not rushed and consider both positive and negative aspects. 5. Has new and creative ideas for solving problems and getting the work done. 6. Helps the team get along together by helping to settle conflicts, deal with difficult problems, and be respectful 7. Communicates clearly, honestly, and respectfully with others, making the work atmosphere more comfortable because he/she is pleasant to work with. 8. Supports the team and other team members in their work even if he/she would have personally done it differently 9. Interacts with people outside of the team to coordinate the sharing of information, money, ideas, and other resources. 10. Interacts with people outside of the team to present the team and its accomplishments in a favorable light.	1 – Not at all 2 – To a limited extent 3 – To a moderate extent 4 – To a great extent 5 – To a very great extent

Group Development Stage	New The following set of questions asks you about your perceptions of your team and its stage of team development. Please rate the extent to which you agree with the following statements.	
Team Formation	1. Members of our group are working on establishing relationships with each other. 2. Members of our group are focusing on learning about each other's skills, abilities, personalities, and attitudes. 3. Members of our group are getting to know each other. 4. Members of our group seek information about what the group is trying to accomplish. 5. Members of our group are trying to understand what it is like to be a part of this group. 6. Members of our group are focusing on understanding what is acceptable behavior and what is not acceptable behavior. 7. Members of our group are developing an understanding of the group, its purpose, and its requirements.	1 – Strongly Disagree 2 – Disagree 3 – Neutral 4 – Agree 5 – Strongly Agree
Task Compilation	8. Members of our group are focusing on how to perform tasks needed in the group. 9. Members of our group are focusing on how well they are performing their individual responsibilities in the group. 10. Members of our group are trying to demonstrate their individual competencies within the group. 11. Members of our group are focusing on developing the knowledge, skills, and strategies to successfully perform their individual tasks and responsibilities in the group. 12. Members of our group are developing a sense of their individual capabilities. 13. Members of our group are beginning to feel confident in their skills and abilities to perform group tasks. 14. Members of our group are starting to feel secure with their tasks and responsibilities in the group.	1 – Strongly Disagree 2 – Disagree 3 – Neutral 4 – Agree 5 – Strongly Agree

Role Compilation	15. Members of our group are establishing their roles in the group. 16. Members of our group are beginning to understand their boundaries of responsibility in the group. 17. Members of our group are starting to understand their roles and responsibilities in the group. 18. Members of our group are beginning to understand what is required of them. 19. Members of our group are developing an understanding of how their role fits with other roles in the group. 20. Members of our group are starting to understand each other's roles in the group. 21. Members of our group are beginning to coordinate their roles and responsibilities with other members of the group.	1 – Strongly Disagree 2 – Disagree 3 – Neutral 4 – Agree 5 – Strongly Agree
Team Compilation	22. Members of our group understand our capabilities as a group. 23. Members of our group are confident in our group's ability to perform group tasks. 24. Members of our group are secure with each other's tasks and responsibilities in the group. 25. Members of our group clearly understand every group member's role and responsibility within the group. 26. Members of our group coordinate their actions with one another. 27. As members of this group, we clearly understand one another's role in the group. 28. Members of our group understand our group's norms, strategies, and goals.	1 – Strongly Disagree 2 – Disagree 3 – Neutral 4 – Agree 5 – Strongly Agree

APPENDIX B

INSTRUCTIONS FOR SUBJECT MATTER EXPERTS ON CONTENT VALIDITY

The purpose of this questionnaire is to determine what phase of group development is being described by various statements. The model of group development used is the successive stage model theorized by Kozlowski and colleagues (Kozlowski, Gully, Nason, & Smith, 1999; Kozlowski, Watola, Jensen, Kim, & Botero, 2009). Beginning on the next page is a list of statements which can be classified as:

- **Team Formation:** First phase of group development marked by members seeking information about other group members as well as the basic nature of the group, its purpose, and their place in the group. The key process is socialization and key outcomes include developing interpersonal knowledge of other group members and becoming oriented to the group.
- **Task Compilation:** Second phase of group development marked by group members developing knowledge of group tasks, trying to demonstrate their task competencies, and developing a sense of individual capability. The key process is skill acquisition and key outcomes include developing a mastery of the group's tasks and building self-efficacy related to tasks and responsibilities.
- **Role compilation:** Third phase of group development marked by group members developing knowledge of their role in the group and establishing their role in the group. The key process is role negotiation and key outcomes include identifying with their role in the group and routinizing their role in the group.
- **Team compilation:** Fourth phase of group development marked by clear roles in the group and group members developing a sense of group capabilities and self-management. The key process is teamwork and key outcomes include team efficacy, coordination, and shared mental models.

These statements come from descriptions of the group development stages as outlined in the conceptual models (Kozlowski et al., 1999; 2009). I believe that you can help advance knowledge on group development stages by indicating the degree to which each statement is representative of each phase of group development (or unidentifiable).

I have two tasks for you to complete, which combined should take you approximately 20 minutes to complete. The first task is to classify each statement into a phase of group development. The second task is to rate the extent to which the statement reflects the phase of group development.

I appreciate and thank you in advance for your participation.

Instructions for Task 1:

For each of the statements which appear below:

1. Carefully read each statement.
2. Please classify each item below into one of the four phases of group development by marking the appropriate box to the right.
3. Please read and rate all of the statements, being careful not to omit or skip any.
4. If you have any questions, please email me at nahrgang@msu.edu.

Item	Team Formation	Task Compilation	Role Compilation	Team Compilation	Unidentifiable
1. Members of our group are beginning to understand what is required of them.					
2. Members of our group are focusing on how to perform tasks needed in the group.					
3. Members of our group are trying to understand what it is like to be a part of this group.					
4. Members of our group are secure with each other's tasks and responsibilities in the group.					
5. Members of our group are beginning to understand their boundaries of responsibility in the group.					
6. Members of our group are starting to feel secure with their tasks and responsibilities in the group.					
7. Members of our group are working on establishing relationships with each other.					
8. Members of our group are starting to understand each other's roles in the group.					
9. Members of our group are establishing their roles in the group.					
10. Members of our group understand our capabilities as a group.					
11. Members of our group seek information about what the group is trying to accomplish.					
12. Members of our group are developing an understanding of the group, its purpose, and its requirements.					
13. Members of our group are beginning to feel confident in their skills and abilities to perform group tasks.					
14. Members of our group are developing a sense of their individual capabilities.					

15. Members of our group are focusing on developing the knowledge, skills, and strategies to successfully perform their individual tasks and responsibilities in the group.					
16. Members of our group understand our group's norms, strategies, and goals.					
17. Members of our group are starting to understand their roles and responsibilities in the group.					
18. Members of our group are focusing on learning about each other's skills, abilities, personalities, and attitudes.					
19. Members of our group are beginning to coordinate their roles and responsibilities with other members of the group.					
20. Members of our group are developing an understanding of how their role fits with other roles in the group.					
21. Members of our group are confident in our group's ability to perform group tasks.					
22. Members of our group clearly understand every group member's role and responsibility within the group.					
23. Members of our group are focusing on how well they are performing their individual responsibilities in the group.					
24. Members of our group are trying to demonstrate their individual competencies within the group.					
25. Members of our group coordinate their actions with one another.					
26. Members of our group are focusing on understanding what is acceptable behavior and what is not acceptable behavior.					
27. Members of our group are getting to know each other.					
28. As members of this group, we clearly understand one another's role in the group.					

Instructions for Task 2:

For each of the statements which appear below:

1. Carefully read each statement.
2. Decide on the extent to which the statement refers to phase of group development you are being asked to rate. The phases of group development will be at the top of the page along with a definition of the phase of group development.
3. For each statement, indicate the extent to which the statement reflects the phase of group development you are rating.
4. Use the following response scale:

1	2	3	4	5
Not at all	To a limited extent	To a moderate extent	To a large extent	To a very large extent

5. Please read and rate all of the statements, being careful not to omit or skip any.
6. If you have any questions, please email me at nahrgang@msu.edu.

- **Team Formation:** First phase of group development marked by members seeking information about other group members as well as the basic nature of the group, its purpose, and their place in the group. The key process is socialization and key outcomes include developing interpersonal knowledge of other group members and becoming oriented to the group.
- **Task Compilation:** Second phase of group development marked by group members developing knowledge of group tasks, trying to demonstrate their task competencies, and developing a sense of individual capability. The key process is skill acquisition and key outcomes include developing a mastery of the group's tasks and building self-efficacy related to tasks and responsibilities.
- **Role compilation:** Third phase of group development marked by group members developing knowledge of their role in the group and establishing their role in the group. The key process is role negotiation and key outcomes include identifying with their role in the group and routinizing their role in the group.
- **Team compilation:** Fourth phase of group development marked by clear roles in the group and group members developing a sense of group capabilities and self-management. The key process is teamwork and key outcomes include team efficacy, coordination, and shared mental models.

Please rate the extent to which the following items reflect the team formation, task compilation, role compilation, and later phasess of group development....

Item	Team Formation	Task Compilation	Role Compilation	Team Compilation
1. Members of our group are beginning to understand what is required of them.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
2. Members of our group are focusing on how to perform tasks needed in the group.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
3. Members of our group are trying to understand what it is like to be a part of this group.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
4. Members of our group are secure with each other's tasks and responsibilities in the group.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
5. Members of our group are beginning to understand their boundaries of responsibility in the group.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
6. Members of our group are starting to feel secure with their tasks and responsibilities in the group.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
7. Members of our group are working on establishing relationships with each other.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
8. Members of our group are starting to understand each other's roles in the group.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
9. Members of our group are establishing their roles in the group.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
10. Members of our group understand our capabilities as a group.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
11. Members of our group seek information about what the group is trying to accomplish.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
12. Members of our group are developing an understanding of the group, its purpose, and its requirements.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
13. Members of our group are beginning to feel confident in their skills and abilities to perform group tasks.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
14. Members of our group are developing a sense of their individual capabilities.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
15. Members of our group are focusing on developing the knowledge, skills, and strategies to successfully perform their individual tasks and responsibilities in the group.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
16. Members of our group understand our group's norms, strategies, and goals.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
17. Members of our group are starting to understand their roles and responsibilities in the group.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

18. Members of our group are focusing on learning about each other's skills, abilities, personalities, and attitudes.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
19. Members of our group are beginning to coordinate their roles and responsibilities with other members of the group.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
20. Members of our group are developing an understanding of how their role fits with other roles in the group.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
21. Members of our group are confident in our group's ability to perform group tasks.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
22. Members of our group clearly understand every group member's role and responsibility within the group.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
23. Members of our group are focusing on how well they are performing their individual responsibilities in the group.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
24. Members of our group are trying to demonstrate their individual competencies within the group.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
25. Members of our group coordinate their actions with one another.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
26. Members of our group are focusing on understanding what is acceptable behavior and what is not acceptable behavior.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
27. Members of our group are getting to know each other.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
28. As members of this group, we clearly understand one another's role in the group.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

APPENDIX C

INTERCORRELATIONS OF ALL STUDY VARIABLES

Table 11a

Descriptive Statistics and Correlations – Time 0 Variables

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Gender	.78	.41	–											
2. Age	29.55	4.73	0.03	–										
3. Years Work Experience	5.92	4.06	.0.03	0.91	–									
4. International	.31	.46	-0.04	0.04	0.03	–								
5. Verbal GMAT	33.28	5.78	-0.04	-0.07	-0.12	-0.09	–							
6. Took TOEFL	.11	.31	-0.10	-0.12	-0.07	0.51	0.19	–						
7. United States	.69	.46	0.04	-0.04	-0.03	-1.00	0.09	-0.51	–					
8. Non US-English Speaking	.20	.40	0.11	0.02	0.02	0.73	-0.05	0.28	-0.73	–				
9. Non US-Non-English Speaking	.12	.32	-0.19	0.02	0.01	0.54	-0.07	0.39	-0.54	-0.18	–			
10. Intelligence (GMAT)	611.87	73.29	0.06	-0.08	-0.12	0.34	0.68	0.41	-0.34	0.24	0.20	–		
11. C-Orderliness	3.68	.52	-0.02	-0.07	-0.04	0.23	-0.26	0.05	-0.23	0.21	0.07	-0.14	–	
12. C-Achievement Striving	4.37	.41	-0.05	-0.02	-0.01	-0.06	-0.11	-0.01	0.06	-0.06	-0.02	-0.19	0.04	–
13. C-Self-Discipline	3.83	.59	-0.04	-0.09	-0.09	0.05	-0.15	0.07	-0.05	0.07	-0.02	-0.19	0.28	0.56
14. E-Assertiveness	3.79	.56	0.14	-0.13	-0.10	-0.15	-0.05	-0.01	0.15	-0.12	-0.07	-0.10	0.07	0.41
15. E-Friendliness	4.13	.64	0.00	-0.10	-0.10	0.07	-0.10	0.07	-0.07	0.05	0.04	-0.02	0.13	0.30
16. E-Gregariousness	3.66	.67	-0.01	-0.20	-0.18	0.13	-0.12	0.07	-0.13	0.12	0.04	0.03	0.09	0.27
17. O-Intellect	4.04	.60	0.22	0.06	0.04	0.01	0.22	0.02	-0.01	0.05	-0.06	0.20	-0.18	0.24
18. O-Imagination	3.57	.68	0.01	0.01	0.04	-0.08	0.16	-0.06	0.08	-0.02	-0.09	0.07	-0.14	0.07
19. Group Experience	4.18	.41	0.13	0.01	-0.02	0.08	-0.16	0.05	-0.08	0.15	-0.06	-0.07	0.05	0.38

Note: *N* ranges from 197-199. Correlations greater than $r = .14$ significant at $p < .05$. Correlations greater than $r = .19$ significant at $p < .01$.

Table 11a continued

Descriptive Statistics and Correlations – Time 0 Variables

Variable	13	14	15	16	17	18	19
13. C-Self-Discipline	–						
14. E-Assertiveness	0.31	–					
15. E-Friendliness	0.30	0.51	–				
16. E-Gregariousness	0.20	0.49	0.66	–			
17. O-Intellect	0.20	0.30	0.22	0.14	–		
18. O-Imagination	0.05	0.17	0.11	0.07	0.39	–	
19. Group Experience	0.31	0.45	0.42	0.39	0.36	0.15	–

Table 11b

Descriptive Statistics and Correlations – Time 1 Variables

Variable	M	SD	20	21	22	23	24	25	26	27	28	29	30	31
20. Self ILT – Sensitivity (T1)	4.37	.52	–											
21. Self ILT – Intelligence (T1)	4.13	.57	0.55	–										
22. Self ILT – Dedication (T1)	4.49	.57	0.54	0.52	–									
23. Self ILT – Dynamism (T1)	4.06	.63	0.55	0.53	0.54	–								
24. Self ILT – Tyranny (T1)	2.27	.79	-0.24	-0.09	-0.12	0.13	–							
25. Self ILT – Masculinity (T1)	3.54	1.30	0.15	0.17	0.14	0.29	0.20	–						
26. Peer ILT – Sensitivity (T1)	4.40	.31	0.09	0.09	0.08	0.08	-0.03	0.03	–					
27. Peer ILT – Intelligence (T1)	4.27	.31	0.00	0.02	-0.04	0.08	0.05	0.17	0.61	–				
28. Peer ILT – Dedication (T1)	4.44	.35	0.10	0.12	0.17	0.13	0.04	0.09	0.61	0.69	–			
29. Peer ILT – Dynamism (T1)	3.94	.48	0.05	0.10	0.08	0.26	0.15	0.30	0.40	0.48	0.41	–		
30. Peer ILT – Tyranny (T1)	1.99	.45	0.01	0.05	0.09	0.18	0.18	0.22	-0.25	-0.11	-0.07	0.35	–	
31. Peer ILT – Masculinity (T1)	3.46	1.07	0.00	0.03	0.04	0.15	0.16	0.72	0.11	0.24	0.17	0.29	0.23	–
32. Self Task Roles (T1)	4.03	.54	0.55	0.53	0.58	0.57	-0.15	0.19	0.09	0.10	0.12	0.11	0.02	0.06
33. Self Social Roles (T1)	4.17	.61	0.63	0.46	0.54	0.44	-0.19	0.18	0.10	0.02	0.11	0.11	-0.04	0.12
34. Self Boundary Spanning Roles (T1)	3.89	.83	0.38	0.32	0.44	0.43	-0.02	0.05	0.05	-0.08	0.01	0.14	0.02	-0.03
35. Peer Task Roles (T1)	4.03	.34	0.03	0.04	0.07	0.16	-0.02	0.20	0.54	0.61	0.54	0.57	-0.06	0.22
36. Peer Social Roles (T1)	4.20	.36	0.12	0.11	0.08	0.09	-0.04	0.03	0.72	0.59	0.59	0.49	-0.17	0.14
37. Peer Boundary Spanning Roles (T1)	3.91	.44	0.03	-0.02	-0.02	0.13	-0.01	0.12	0.44	0.30	0.26	0.45	0.01	0.19

Note: *N* ranges from 195-199. Correlations greater than $r = .14$ significant at $p < .05$. Correlations greater than $r = .19$ significant at $p < .01$.

Table 11b continued

Descriptive Statistics and Correlations – Time 1 Variables

Variable	32	33	34	35	36	37
32. Self Task Roles (T1)	–					
33. Self Social Roles (T1)	0.65	–				
34. Self Boundary Spanning Roles (T1)	0.54	0.49	–			
35. Peer Task Roles (T1)	0.16	0.01	0.04	–		
36. Peer Social Roles (T1)	0.04	0.07	0.07	0.63	–	
37. Peer Boundary Spanning Roles (T1)	0.07	0.11	0.13	0.52	0.56	–

Table 11b continued

Descriptive Statistics and Correlations – Time 1 Variables

Variable	M	SD	20	21	22	23	24	25	26	27	28	29	30	31
38. Self Leadership Ratings (T1)	3.96	.64	0.37	0.48	0.43	0.59	0.16	0.40	0.05	0.05	0.11	0.27	0.24	0.24
39. Self Task Leadership Rank (T1)	.21	.75	0.08	0.17	0.15	0.20	0.17	0.18	0.11	0.19	0.15	0.17	0.27	0.15
40. Self Social Leadership Rank (T1)	.10	.83	0.19	0.06	0.14	0.15	-0.09	0.07	0.01	-0.03	0.04	0.12	0.19	0.08
41. Self Leadership Rank Composite (T1)	.00	.78	0.18	0.14	0.19	0.23	0.05	0.15	0.08	0.09	0.12	0.19	0.29	0.14
42. Self Leadership Composite Score (T1)	.00	.70	0.30	0.33	0.34	0.45	0.12	0.31	0.08	0.10	0.14	0.26	0.33	0.22
43. Peer Leadership Ratings (T1)	3.88	.49	-0.03	0.05	0.05	0.19	0.09	0.29	0.30	0.44	0.36	0.63	0.27	0.30
44. Peer Task Leadership Rank (T1)	.30	.46	0.07	-0.01	0.12	0.19	0.06	0.21	0.16	0.18	0.18	0.42	0.27	0.15
45. Peer Social Leadership Rank (T1)	.31	.40	0.02	0.04	0.09	0.10	0.06	0.15	0.23	0.07	0.05	0.37	0.16	0.06
46. Peer Leadership Rank Composite (T1)	-.01	.87	0.05	0.02	0.12	0.17	0.07	0.21	0.22	0.14	0.13	0.45	0.25	0.12
47. Peer Leadership Composite Score (T1)	.00	.81	0.02	0.03	0.11	0.19	0.09	0.27	0.28	0.28	0.24	0.58	0.29	0.21
48. Observer Leadership Ratings (T1)	3.38	.90	0.04	0.06	0.15	0.20	0.07	0.18	0.07	0.03	0.03	0.36	0.17	0.13
49. Observer Task Leadership Rank (T1)	.00	.79	-0.03	0.06	0.11	0.12	0.18	0.18	0.09	0.04	0.05	0.33	0.28	0.16
50. Observer Social Leadership Rank (T1)	.00	.78	0.06	0.06	0.11	0.03	0.03	0.02	0.01	-0.07	-0.09	0.29	0.27	-0.05
51. Observer Leadership Rank Composite (T1)	.00	.86	0.01	0.07	0.13	0.09	0.13	0.11	0.06	-0.02	-0.02	0.36	0.32	0.07
52. Observer Leadership Composite Score (T1)	.00	.82	0.02	0.08	0.16	0.14	0.12	0.15	0.07	0.00	0.00	0.40	0.29	0.10
53. Team Formation Stage (T1)	4.64	.49	0.23	0.24	0.25	0.12	-0.28	-0.06	-0.03	-0.10	-0.01	0.03	-0.11	-0.03
54. Task Compilation Stage (T1)	4.23	.62	0.28	0.30	0.31	0.23	-0.19	0.06	0.09	0.05	0.00	0.06	-0.16	0.04
55. Role Compilation Stage (T1)	3.74	.73	0.23	0.25	0.23	0.32	-0.10	0.03	0.03	-0.08	-0.02	-0.05	-0.08	0.00
56. Team Compilation (T1)	3.77	.83	0.27	0.35	0.28	0.31	-0.08	0.04	0.03	-0.10	0.00	-0.05	-0.14	0.03

Table 11b continued

Descriptive Statistics and Correlations – Time 1 Variables

Variable	32	33	34	35	36	37	38	38	40	41	42	43	44	45
38. Self Leadership Ratings (T1)	0.57	0.41	0.40	0.20	0.08	0.21	–							
39. Self Task Leadership Rank (T1)	0.23	-0.04	0.08	0.22	0.17	0.09	0.37	–						
40. Self Social Leadership Rank (T1)	0.21	0.30	0.18	-0.04	0.05	0.05	0.15	0.21	–					
41. Self Leadership Rank Composite (T1)	0.29	0.17	0.17	0.11	0.13	0.09	0.33	0.78	0.78	–				
42. Self Leadership Composite Score (T1)	0.48	0.32	0.31	0.18	0.14	0.17	0.72	0.74	0.65	0.89	–			
43. Peer Leadership Ratings (T1)	0.12	0.01	0.10	0.68	0.43	0.49	0.37	0.28	-0.01	0.17	0.30	–		
44. Peer Task Leadership Rank (T1)	0.12	-0.01	0.14	0.41	0.19	0.18	0.30	0.32	0.09	0.26	0.34	0.56	–	
45. Peer Social Leadership Rank (T1)	0.04	-0.02	0.06	0.30	0.27	0.20	0.22	0.19	0.15	0.22	0.26	0.40	0.51	–
46. Peer Leadership Rank Composite (T1)	0.09	-0.02	0.12	0.41	0.26	0.22	0.30	0.29	0.14	0.27	0.34	0.55	0.87	0.87
47. Peer Leadership Composite Score (T1)	0.11	-0.01	0.12	0.57	0.36	0.36	0.36	0.32	0.10	0.27	0.37	0.80	0.85	0.78
48. Observer Leadership Ratings (T1)	0.13	0.04	0.09	0.27	0.07	0.16	0.29	0.15	0.02	0.11	0.22	0.35	0.34	0.24
49. Observer Task Leadership Rank (T1)	0.09	0.05	0.11	0.23	0.05	0.15	0.31	0.19	-0.02	0.11	0.23	0.33	0.34	0.23
50. Observer Social Leadership Rank (T1)	0.04	0.03	0.10	0.13	0.05	0.09	0.17	0.11	0.08	0.13	0.17	0.23	0.23	0.24
51. Observer Leadership Rank Composite (T1)	0.07	0.04	0.12	0.21	0.06	0.14	0.28	0.18	0.04	0.14	0.23	0.33	0.33	0.28
52. Observer Leadership Composite Score (T1)	0.10	0.05	0.12	0.26	0.07	0.17	0.31	0.19	0.03	0.14	0.25	0.37	0.37	0.29
53. Team Formation Stage (T1)	0.15	0.27	0.16	-0.03	0.05	0.00	0.21	-0.01	0.06	0.03	0.12	0.02	0.07	0.08
54. Task Compilation Stage (T1)	0.30	0.38	0.24	0.08	0.12	0.13	0.35	0.03	0.12	0.09	0.24	0.10	0.06	0.11
55. Role Compilation Stage (T1)	0.27	0.32	0.24	-0.06	0.02	0.11	0.38	-0.05	0.02	-0.02	0.17	-0.13	-0.09	-0.11
56. Team Compilation (T1)	0.32	0.38	0.32	-0.10	0.00	0.06	0.32	-0.08	0.07	-0.01	0.15	-0.17	-0.23	-0.19

Table 11b continued

Descriptive Statistics and Correlations – Time 1 Variables

Variable	46	47	48	49	50	51	52	53	54	55	56
46. Peer Leadership Rank Composite (T1)	–										
47. Peer Leadership Composite Score (T1)	0.94	–									
48. Observer Leadership Ratings (T1)	0.34	0.39	–								
49. Observer Task Leadership Rank (T1)	0.33	0.37	0.67	–							
50. Observer Social Leadership Rank (T1)	0.27	0.29	0.41	0.47	–						
51. Observer Leadership Rank Composite (T1)	0.35	0.38	0.63	0.86	0.86	–					
52. Observer Leadership Composite Score (T1)	0.38	0.42	0.84	0.87	0.76	0.95	–				
53. Team Formation Stage (T1)	0.08	0.07	-0.03	0.04	-0.01	0.02	0.00	–			
54. Task Compilation Stage (T1)	0.10	0.11	0.06	0.08	0.00	0.05	0.06	0.61	–		
55. Role Compilation Stage (T1)	-0.12	-0.13	0.01	0.03	-0.09	-0.03	-0.02	0.47	0.55	–	
56. Team Compilation (T1)	-0.24	-0.24	-0.01	-0.05	-0.11	-0.10	-0.07	0.44	0.53	0.75	–

Table 11c

Descriptive Statistics and Correlations –Time 2 Variables

Variable	M	SD	57	58	59	60	61	62	63	64	65	66	67	68
57. Self ILT – Sensitivity (T2)	4.42	.49	–											
58. Self ILT – Intelligence (T2)	4.32	.49	0.53	–										
59. Self ILT – Dedication (T2)	4.55	.49	0.40	0.37	–									
60. Self ILT – Dynamism (T2)	4.11	.67	0.29	0.40	0.42	–								
61. Self ILT – Tyranny (T2)	2.35	.83	-0.33	-0.11	-0.11	0.27	–							
62. Self ILT – Masculinity (T2)	3.59	1.30	0.03	0.26	0.08	0.35	0.26	–						
63. Peer ILT – Sensitivity (T2)	4.34	.32	0.06	0.02	0.07	0.03	0.00	0.03	–					
64. Peer ILT – Intelligence (T2)	4.31	.28	-0.11	0.08	0.07	0.14	0.16	0.24	0.35	–				
65. Peer ILT – Dedication (T2)	4.40	.40	-0.09	0.03	0.23	0.02	0.09	0.04	0.39	0.47	–			
66. Peer ILT – Dynamism (T2)	3.93	.50	-0.01	0.13	0.25	0.46	0.36	0.29	0.15	0.44	0.34	–		
67. Peer ILT – Tyranny (T2)	2.14	.54	-0.03	0.05	0.11	0.25	0.33	0.17	-0.37	0.02	-0.03	0.48	–	
68. Peer ILT – Masculinity (T2)	3.53	1.02	-0.04	0.10	0.05	0.31	0.21	0.73	0.06	0.33	0.14	0.33	0.20	–
69. Self Task Roles (T2)	3.94	.47	0.31	0.45	0.35	0.50	0.12	0.33	0.08	0.23	0.07	0.29	0.13	0.25
70. Self Social Roles (T2)	3.99	.55	0.51	0.42	0.26	0.30	-0.26	0.13	0.16	0.01	-0.02	0.04	-0.13	0.05
71. Self Boundary Spanning Roles (T2)	3.27	.72	0.16	0.23	0.22	0.36	0.07	0.18	0.08	0.12	0.09	0.08	-0.10	0.09
72. Peer Task Roles (T2)	3.80	.34	-0.05	0.16	0.23	0.24	0.25	0.20	0.27	0.52	0.56	0.64	0.25	0.22
73. Peer Social Roles (T2)	3.93	.31	0.09	0.04	0.10	0.08	-0.04	0.13	0.52	0.24	0.20	0.24	-0.27	0.09
74. Peer Boundary Spanning Roles (T2)	3.26	.40	0.04	0.05	0.24	0.27	0.05	0.05	0.14	0.21	0.30	0.48	0.14	0.10

Note: *N* ranges from 194-199. Correlations greater than $r = .14$ significant at $p < .05$. Correlations greater than $r = .19$ significant at $p < .01$.

Table 11c continued

Descriptive Statistics and Correlations –Time 2 Variables

Variable	69	70	71	72	73	74
69. Self Task Roles (T2)	–					
70. Self Social Roles (T2)	0.63	–				
71. Self Boundary Spanning Roles (T2)	0.51	0.44	–			
72. Peer Task Roles (T2)	0.24	0.00	0.04	–		
73. Peer Social Roles (T2)	0.13	0.19	0.04	0.46	–	
74. Peer Boundary Spanning Roles (T2)	0.16	-0.02	0.09	0.55	0.36	–

Table 11c continued

Descriptive Statistics and Correlations –Time 2 Variables

Variable	M	SD	57	58	59	60	61	62	63	64	65	66	67	68
75. Self Leadership Ratings (T2)	3.74	.73	0.16	0.39	0.36	0.61	0.28	0.45	0.08	0.23	0.19	0.42	0.28	0.34
76. Self Task Leadership Rank (T2)	.28	.71	0.16	0.23	0.24	0.33	0.18	0.24	-0.06	0.10	0.07	0.17	0.28	0.26
77. Self Social Leadership Rank (T2)	.30	.73	0.25	0.10	0.04	0.17	-0.05	0.05	0.06	-0.05	-0.14	0.00	-0.01	0.12
78. Self Leadership Rank Composite (T2)	.00	.82	0.25	0.20	0.17	0.30	0.08	0.18	0.00	0.03	-0.04	0.10	0.16	0.23
79. Self Leadership Composite Score (T2)	.00	.73	0.26	0.33	0.29	0.50	0.19	0.34	0.04	0.12	0.05	0.27	0.25	0.33
80. Peer Leadership Ratings (T2)	3.50	.57	-0.07	0.17	0.22	0.31	0.32	0.30	0.18	0.47	0.50	0.71	0.41	0.36
81. Peer Task Leadership Rank (T2)	.31	.49	-0.11	0.12	0.19	0.16	0.27	0.21	0.23	0.33	0.40	0.36	0.23	0.17
82. Peer Social Leadership Rank (T2)	.31	.44	0.08	0.18	0.23	0.19	0.06	0.21	0.39	0.08	0.17	0.21	-0.03	0.08
83. Peer Leadership Rank Composite (T2)	.00	.86	-0.02	0.17	0.24	0.20	0.19	0.24	0.36	0.24	0.33	0.33	0.12	0.14
84. Peer Leadership Composite Score (T2)	.00	.81	-0.04	0.19	0.26	0.27	0.27	0.29	0.33	0.36	0.44	0.53	0.25	0.25
85. Observer Leadership Ratings (T2)	3.66	.97	-0.05	0.08	0.23	0.20	0.18	0.21	0.00	0.24	0.30	0.40	0.33	0.17
86. Observer Task Leadership Rank (T2)	.00	.78	-0.16	0.03	0.14	0.08	0.20	0.06	-0.01	0.27	0.14	0.24	0.25	0.04
87. Observer Social Leadership Rank (T2)	.00	.79	0.05	0.02	0.06	0.11	0.08	-0.03	-0.04	0.02	0.00	0.10	0.11	-0.11
88. Observer Leadership Rank Composite (T2)	.00	.83	-0.07	0.03	0.12	0.12	0.18	0.02	-0.03	0.18	0.08	0.21	0.22	-0.03
89. Observer Leadership Composite Score (T2)	.00	.78	-0.07	0.06	0.19	0.17	0.20	0.11	-0.02	0.23	0.19	0.32	0.30	0.05
90. Team Formation Stage (T2)	4.26	.58	0.22	0.19	0.26	0.21	-0.10	0.01	0.06	0.10	0.19	0.03	0.02	0.00
91. Task Compilation Stage (T2)	4.17	.61	0.28	0.23	0.30	0.28	-0.09	0.10	0.06	0.04	0.08	0.11	0.00	0.04
92. Role Compilation Stage (T2)	3.99	.66	0.18	0.18	0.24	0.35	-0.05	0.10	0.08	0.06	0.06	0.07	-0.03	0.10
93. Team Compilation (T2)	3.96	.74	0.30	0.28	0.22	0.22	-0.17	0.04	0.15	0.12	0.10	0.00	-0.14	0.06

Table 11c continued

Descriptive Statistics and Correlations –Time 2 Variables

Variable	69	70	71	72	73	74	75	76	77	78	79	80	81	82
75. Self Leadership Ratings (T2)	0.66	0.33	0.39	0.41	0.12	0.24	–							
76. Self Task Leadership Rank (T2)	0.23	-0.02	0.08	0.16	-0.14	0.02	0.45	–						
77. Self Social Leadership Rank (T2)	0.10	0.18	0.06	-0.22	-0.01	-0.12	0.11	0.36	–					
78. Self Leadership Rank Composite (T2)	0.20	0.10	0.08	-0.04	-0.09	-0.06	0.34	0.82	0.83	–				
79. Self Leadership Composite Score (T2)	0.45	0.22	0.24	0.16	-0.01	0.06	0.71	0.82	0.67	0.90	–			
80. Peer Leadership Ratings (T2)	0.24	-0.03	0.02	0.80	0.27	0.49	0.49	0.31	-0.10	0.13	0.32	–		
81. Peer Task Leadership Rank (T2)	0.23	0.02	0.10	0.51	0.10	0.17	0.48	0.41	0.02	0.26	0.41	0.63	–	
82. Peer Social Leadership Rank (T2)	0.25	0.20	0.08	0.24	0.34	0.14	0.32	0.24	0.22	0.28	0.35	0.31	0.50	–
83. Peer Leadership Rank Composite (T2)	0.28	0.13	0.11	0.43	0.25	0.18	0.46	0.37	0.14	0.31	0.44	0.54	0.87	0.86
84. Peer Leadership Composite Score (T2)	0.30	0.08	0.08	0.64	0.29	0.33	0.53	0.39	0.06	0.27	0.45	0.80	0.88	0.74
85. Observer Leadership Ratings (T2)	0.22	0.00	-0.02	0.46	0.22	0.29	0.41	0.17	-0.03	0.08	0.25	0.52	0.36	0.21
86. Observer Task Leadership Rank (T2)	0.15	-0.12	-0.05	0.26	0.02	0.12	0.34	0.19	-0.03	0.09	0.22	0.32	0.37	0.15
87. Observer Social Leadership Rank (T2)	0.03	-0.05	-0.09	0.11	0.03	0.12	0.11	0.03	0.12	0.09	0.12	0.12	0.17	0.21
88. Observer Leadership Rank Composite (T2)	0.12	-0.11	-0.08	0.23	0.03	0.15	0.27	0.14	0.05	0.11	0.21	0.27	0.33	0.22
89. Observer Leadership Composite Score (T2)	0.18	-0.07	-0.07	0.36	0.12	0.23	0.37	0.17	0.02	0.11	0.25	0.41	0.39	0.25
90. Team Formation Stage (T2)	0.31	0.32	0.17	0.07	0.05	0.10	0.17	0.06	-0.12	-0.04	0.05	0.05	0.07	0.04
91. Task Compilation Stage (T2)	0.33	0.38	0.31	0.04	0.12	0.19	0.20	0.08	-0.14	-0.03	0.06	0.05	0.02	0.09
92. Role Compilation Stage (T2)	0.33	0.33	0.37	0.06	0.10	0.16	0.24	0.15	-0.09	0.04	0.14	0.03	0.02	0.03
93. Team Compilation (T2)	0.34	0.37	0.32	0.06	0.15	0.14	0.22	0.05	-0.06	-0.01	0.09	-0.02	-0.09	-0.02

Table 11c continued

Descriptive Statistics and Correlations –Time 2 Variables

Variable	83	84	85	86	87	88	89	90	91	92	93
83. Peer Leadership Rank Composite (T2)	–										
84. Peer Leadership Composite Score (T2)	0.94	–									
85. Observer Leadership Ratings (T2)	0.33	0.45	–								
86. Observer Task Leadership Rank (T2)	0.30	0.35	0.58	–							
87. Observer Social Leadership Rank (T2)	0.22	0.21	0.27	0.38	–						
88. Observer Leadership Rank Composite (T2)	0.32	0.34	0.52	0.83	0.83	–					
89. Observer Leadership Composite Score (T2)	0.37	0.43	0.79	0.84	0.71	0.93	–				
90. Team Formation Stage (T2)	0.06	0.06	0.15	0.05	-0.04	0.01	0.07	–			
91. Task Compilation Stage (T2)	0.06	0.06	0.09	-0.02	-0.01	-0.01	0.03	0.68	–		
92. Role Compilation Stage (T2)	0.03	0.03	0.06	0.00	-0.08	-0.04	0.00	0.58	0.70	–	
93. Team Compilation (T2)	-0.06	-0.05	0.05	0.05	-0.13	-0.04	-0.01	0.60	0.65	0.72	–

Table 11d

Descriptive Statistics and Correlations – Time 3 Variables

Variable	M	SD	94	95	96	97	98	99	100	101	102	103	104	105
94. Self ILT – Sensitivity (T3)	4.42	.49	–											
95. Self ILT – Intelligence (T3)	4.32	.49	0.50	–										
96. Self ILT – Dedication (T3)	4.55	.49	0.42	0.41	–									
97. Self ILT – Dynamism (T3)	4.11	.67	0.33	0.51	0.40	–								
98. Self ILT – Tyranny (T3)	2.35	.83	-0.38	-0.05	-0.14	0.15	–							
99. Self ILT – Masculinity (T3)	3.59	1.30	0.04	0.22	0.01	0.32	0.36	–						
100.Peer ILT – Sensitivity (T3)	4.34	.32	0.14	-0.02	0.08	-0.13	-0.06	0.06	–					
101.Peer ILT – Intelligence (T3)	4.31	.28	-0.04	0.09	0.12	0.00	0.16	0.09	0.58	–				
102.Peer ILT – Dedication (T3)	4.40	.40	-0.02	-0.05	0.18	-0.17	0.11	0.00	0.67	0.62	–			
103.Peer ILT – Dynamism (T3)	3.93	.50	-0.06	0.07	0.15	0.19	0.30	0.13	0.25	0.51	0.46	–		
104.Peer ILT – Tyranny (T3)	2.14	.54	-0.17	0.07	0.00	0.14	0.30	0.04	-0.47	-0.06	-0.09	0.29	–	
105.Peer ILT – Masculinity (T3)	3.53	1.02	-0.09	0.06	-0.04	0.19	0.29	0.66	-0.05	0.16	0.05	0.14	0.21	–
106.Self Task Roles (T3)	3.94	.47	0.37	0.40	0.34	0.50	0.00	0.12	0.14	0.22	0.06	0.16	-0.02	0.12
107.Self Social Roles (T3)	3.99	.55	0.52	0.36	0.24	0.34	-0.26	0.04	0.14	0.02	-0.06	-0.04	-0.23	-0.04
108.Self Boundary Spanning Roles (T3)	3.27	.72	0.29	0.33	0.21	0.46	0.05	0.16	-0.03	-0.04	-0.13	-0.03	-0.12	0.01
109.Peer Task Roles (T3)	3.80	.34	0.00	0.00	0.23	-0.05	0.15	0.04	0.50	0.58	0.71	0.62	0.08	0.05
110.Peer Social Roles (T3)	3.93	.31	0.18	0.02	0.15	0.02	-0.09	0.02	0.66	0.43	0.49	0.36	-0.37	0.01
111.Peer Boundary Spanning Roles (T3)	3.26	.40	-0.05	-0.10	0.16	0.05	0.12	-0.01	0.21	0.34	0.39	0.56	0.19	-0.02

Note: *N* ranges from 178-199. Correlations greater than $r = .14$ significant at $p < .05$. Correlations greater than $r = .19$ significant at $p < .01$.

Table 11d continued

Descriptive Statistics and Correlations – Time 3 Variables

Variable	106	107	108	109	110	111
106.Self Task Roles (T3)	–					
107.Self Social Roles (T3)	0.66	–				
108.Self Boundary Spanning Roles (T3)	0.56	0.49	–			
109.Peer Task Roles (T3)	0.18	0.01	-0.10	–		
110.Peer Social Roles (T3)	0.17	0.25	0.00	0.64	–	
111.Peer Boundary Spanning Roles (T3)	0.11	-0.02	-0.01	0.62	0.37	–

Table 11d continued

Descriptive Statistics and Correlations – Time 3 Variables

Variable	M	SD	94	95	96	97	98	99	100	101	102	103	104	105
112.Self Leadership Ratings (T3)	3.74	.73	0.07	0.37	0.32	0.49	0.32	0.38	0.07	0.21	0.18	0.36	0.12	0.25
113.Self Task Leadership Rank (T3)	.28	.71	-0.01	0.12	0.13	0.02	0.24	0.07	0.16	0.37	0.25	0.18	0.01	0.14
114.Self Social Leadership Rank (T3)	.30	.73	0.40	0.09	0.07	0.16	-0.09	0.01	0.23	0.15	0.02	0.11	-0.12	-0.05
115.Self Leadership Rank Composite (T3)	.00	.82	0.23	0.13	0.12	0.11	0.09	0.04	0.24	0.32	0.16	0.18	-0.06	0.05
116.Self Leadership Composite Score (T3)	.00	.73	0.21	0.27	0.24	0.31	0.22	0.21	0.22	0.34	0.20	0.30	0.01	0.16
117.Peer Leadership Ratings (T3)	3.50	.57	-0.08	0.02	0.19	-0.03	0.23	0.19	0.43	0.51	0.70	0.63	0.10	0.18
118.Peer Task Leadership Rank (T3)	.31	.49	-0.11	-0.02	0.14	-0.09	0.28	0.12	0.41	0.40	0.60	0.40	0.06	0.12
119.Peer Social Leadership Rank (T3)	.31	.44	0.20	0.02	0.15	0.05	0.09	0.13	0.49	0.22	0.41	0.25	-0.17	0.04
120.Peer Leadership Rank Composite (T3)	.00	.86	0.05	0.00	0.16	-0.02	0.20	0.14	0.50	0.34	0.55	0.36	-0.06	0.09
121.Peer Leadership Composite Score (T3)	.00	.81	0.01	0.01	0.19	-0.03	0.23	0.17	0.51	0.44	0.66	0.49	0.00	0.13
122.Observer Leadership Ratings (T3)	3.66	.97	-0.12	0.04	0.23	0.10	0.28	0.22	0.25	0.36	0.38	0.50	0.18	0.19
123.Observer Task Leadership Rank (T3)	.00	.78	-0.22	-0.02	0.12	0.04	0.31	0.16	0.07	0.27	0.22	0.38	0.19	0.13
124.Observer Social Leadership Rank (T3)	.00	.79	-0.06	0.02	0.07	0.06	0.24	0.11	0.12	0.13	0.15	0.29	0.08	0.05
125.Observer Leadership Rank Composite (T3)	.00	.83	-0.15	0.00	0.10	0.05	0.31	0.15	0.11	0.22	0.21	0.38	0.15	0.10
126.Observer Leadership Composite Score (T3)	.00	.78	-0.15	0.01	0.16	0.07	0.32	0.19	0.16	0.29	0.28	0.45	0.18	0.14
127.Team Formation Stage (T3)	4.26	.58	0.18	0.15	0.09	0.16	-0.15	-0.01	0.08	-0.04	-0.03	-0.08	-0.15	-0.07
128.Task Compilation Stage (T3)	4.17	.61	0.42	0.37	0.15	0.22	-0.24	0.04	0.03	-0.06	-0.07	-0.12	-0.17	0.02
129.Role Compilation Stage (T3)	3.99	.66	0.27	0.23	0.10	0.14	-0.13	0.04	0.12	0.00	0.02	-0.07	-0.16	-0.03
130.Team Compilation (T3)	3.96	.74	0.41	0.33	0.17	0.19	-0.20	0.05	0.09	0.04	0.00	-0.11	-0.17	0.04

Table 11d continued

Descriptive Statistics and Correlations – Time 3 Variables

Variable	106	107	108	109	110	111	112	113	114	115	116	117	118	119
112.Self Leadership Ratings (T3)	0.56	0.17	0.36	0.24	0.06	0.17	–							
113.Self Task Leadership Rank (T3)	0.22	0.03	0.11	0.31	0.14	0.14	0.35	–						
114.Self Social Leadership Rank (T3)	0.35	0.38	0.17	0.15	0.30	0.08	0.12	0.36	–					
115.Self Leadership Rank Composite (T3)	0.35	0.25	0.17	0.28	0.26	0.13	0.29	0.82	0.82	–				
116.Self Leadership Composite Score (T3)	0.52	0.27	0.29	0.33	0.23	0.18	0.68	0.79	0.69	0.90	–			
117.Peer Leadership Ratings (T3)	0.11	-0.10	-0.09	0.80	0.42	0.50	0.36	0.30	0.06	0.22	0.33	–		
118.Peer Task Leadership Rank (T3)	0.12	-0.14	-0.09	0.62	0.31	0.35	0.35	0.48	0.16	0.39	0.46	0.74	–	
119.Peer Social Leadership Rank (T3)	0.17	0.12	0.06	0.44	0.43	0.24	0.22	0.35	0.36	0.43	0.43	0.46	0.64	–
120.Peer Leadership Rank Composite (T3)	0.16	-0.01	-0.02	0.58	0.41	0.32	0.31	0.46	0.29	0.45	0.49	0.66	0.91	0.91
121.Peer Leadership Composite Score (T3)	0.16	-0.05	-0.05	0.72	0.45	0.42	0.36	0.44	0.22	0.40	0.47	0.85	0.92	0.81
122.Observer Leadership Ratings (T3)	0.06	-0.15	-0.08	0.47	0.26	0.35	0.33	0.29	0.00	0.17	0.29	0.57	0.43	0.24
123.Observer Task Leadership Rank (T3)	-0.04	-0.26	-0.16	0.34	0.11	0.28	0.25	0.31	-0.04	0.16	0.24	0.42	0.35	0.21
124.Observer Social Leadership Rank (T3)	0.06	-0.04	0.04	0.24	0.12	0.18	0.26	0.29	0.16	0.27	0.33	0.32	0.37	0.26
125.Observer Leadership Rank Composite (T3)	0.01	-0.17	-0.07	0.32	0.13	0.26	0.29	0.33	0.07	0.24	0.32	0.41	0.40	0.26
126.Observer Leadership Composite Score (T3)	0.03	-0.18	-0.08	0.40	0.18	0.31	0.32	0.34	0.05	0.24	0.33	0.50	0.44	0.27
127.Team Formation Stage (T3)	0.19	0.33	0.20	-0.13	0.07	-0.10	0.03	-0.12	0.10	-0.01	0.01	-0.05	-0.09	0.02
128.Task Compilation Stage (T3)	0.26	0.43	0.30	-0.17	0.14	-0.14	0.07	-0.10	0.11	0.01	0.04	-0.18	-0.17	0.01
129.Role Compilation Stage (T3)	0.19	0.32	0.20	-0.08	0.16	-0.05	0.01	-0.05	0.11	0.04	0.04	-0.05	-0.02	0.09
130.Team Compilation (T3)	0.30	0.48	0.32	-0.10	0.13	-0.06	0.09	-0.04	0.05	0.01	0.05	-0.11	-0.14	0.04

Table 11d continued

Descriptive Statistics and Correlations – Time 3 Variables

Variable	120	121	122	123	124	125	126	127	128	129	130
120.Peer Leadership Rank Composite (T3)	–										
121.Peer Leadership Composite Score (T3)	0.96	–									
122.Observer Leadership Ratings (T3)	0.37	0.48	–								
123.Observer Task Leadership Rank (T3)	0.31	0.38	0.74	–							
124.Observer Social Leadership Rank (T3)	0.35	0.37	0.54	0.61	–						
125.Observer Leadership Rank Composite (T3)	0.37	0.42	0.72	0.90	0.90	–					
126.Observer Leadership Composite Score (T3)	0.39	0.47	0.88	0.90	0.82	0.96	–				
127.Team Formation Stage (T3)	-0.04	-0.05	-0.01	-0.20	-0.03	-0.13	-0.09	–			
128.Task Compilation Stage (T3)	-0.09	-0.13	-0.16	-0.27	-0.12	-0.22	-0.21	0.60	–		
129.Role Compilation Stage (T3)	0.04	0.01	-0.11	-0.24	-0.10	-0.19	-0.17	0.65	0.71	–	
130.Team Compilation (T3)	-0.06	-0.08	-0.07	-0.19	-0.07	-0.15	-0.13	0.49	0.72	0.59	–

Table 11e

Correlations – Time 0 Variables with Time 1 Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12
20. Self ILT – Sensitivity (T1)	0.02	-0.05	-0.08	-0.02	-0.09	-0.10	0.02	0.10	-0.16	-0.11	0.00	0.12
21. Self ILT – Intelligence (T1)	0.05	0.04	-0.03	-0.12	0.03	-0.10	0.12	-0.07	-0.09	-0.01	-0.10	0.12
22. Self ILT – Dedication (T1)	-0.01	0.01	-0.04	-0.08	-0.13	-0.16	0.08	0.06	-0.18	-0.19	0.15	0.26
23. Self ILT – Dynamism (T1)	0.15	-0.07	-0.12	-0.04	-0.13	-0.19	0.04	0.07	-0.14	-0.09	0.04	0.18
24. Self ILT – Tyranny (T1)	0.12	-0.06	0.01	0.03	-0.17	-0.02	-0.03	-0.04	0.09	-0.09	0.02	-0.03
25. Self ILT – Masculinity (T1)	0.76	-0.03	-0.04	-0.18	0.03	-0.24	0.18	-0.05	-0.19	0.03	-0.03	-0.03
26. Peer ILT – Sensitivity (T1)	0.02	0.10	0.10	-0.03	-0.13	-0.10	0.03	-0.01	-0.02	-0.14	0.08	0.09
27. Peer ILT – Intelligence (T1)	0.19	0.21	0.15	0.05	-0.04	-0.11	-0.05	0.09	-0.05	0.02	0.05	0.03
28. Peer ILT – Dedication (T1)	0.09	0.00	-0.01	0.03	-0.08	-0.02	-0.03	0.10	-0.08	-0.06	0.14	0.10
29. Peer ILT – Dynamism (T1)	0.20	-0.01	-0.07	-0.35	0.00	-0.41	0.35	-0.23	-0.22	-0.22	-0.04	0.12
30. Peer ILT – Tyranny (T1)	0.15	-0.17	-0.17	-0.31	-0.01	-0.18	0.31	-0.14	-0.27	-0.13	-0.11	0.09
31. Peer ILT – Masculinity (T1)	0.87	-0.01	-0.03	-0.11	-0.09	-0.17	0.11	0.02	-0.19	-0.05	0.01	0.01
32. Self Task Roles (T1)	0.08	0.00	-0.06	0.08	-0.11	-0.17	-0.08	0.15	-0.07	-0.09	0.11	0.19
33. Self Social Roles (T1)	0.13	-0.08	-0.11	0.03	-0.14	-0.10	-0.03	0.03	0.00	-0.13	0.05	0.13
34. Self Boundary Spanning Roles (T1)	-0.03	-0.07	-0.07	0.00	-0.11	-0.12	0.00	0.10	-0.12	-0.15	0.10	0.07
35. Peer Task Roles (T1)	0.14	0.06	0.01	-0.17	0.05	-0.18	0.17	-0.05	-0.19	-0.08	0.05	0.03
36. Peer Social Roles (T1)	0.04	0.06	0.04	-0.07	-0.03	-0.08	0.07	-0.01	-0.10	-0.14	0.06	0.05
37. Peer Boundary Spanning Roles (T1)	0.17	-0.10	-0.15	-0.15	0.14	-0.04	0.15	-0.08	-0.11	-0.02	-0.08	0.00

Note: N ranges 195-199. Correlations greater than $r = .14$ significant at $p < .05$. Correlations greater than $r = .19$ significant at $p < .01$.
See Table 11a for Time 0 variable names.

Table 11e continued

Correlations – Time 0 Variables with Time 1 Variables

Variable	13	14	15	16	17	18	19
20. Self ILT – Sensitivity (T1)	0.09	-0.02	0.26	0.21	0.00	0.12	0.15
21. Self ILT – Intelligence (T1)	0.05	0.05	0.08	0.07	0.18	0.14	0.07
22. Self ILT – Dedication (T1)	0.19	0.08	0.18	0.18	0.03	-0.05	0.22
23. Self ILT – Dynamism (T1)	0.11	0.29	0.30	0.32	0.12	0.16	0.24
24. Self ILT – Tyranny (T1)	0.00	0.32	0.01	0.11	0.07	-0.01	0.04
25. Self ILT – Masculinity (T1)	-0.04	0.14	-0.02	0.02	0.21	0.10	0.08
26. Peer ILT – Sensitivity (T1)	0.00	-0.04	-0.05	-0.02	-0.11	-0.02	0.07
27. Peer ILT – Intelligence (T1)	-0.07	0.03	-0.10	-0.03	-0.02	-0.06	0.10
28. Peer ILT – Dedication (T1)	0.05	0.10	-0.02	0.05	-0.06	-0.05	0.12
29. Peer ILT – Dynamism (T1)	0.03	0.24	0.10	0.17	0.05	0.04	0.12
30. Peer ILT – Tyranny (T1)	0.01	0.26	0.11	0.16	0.07	0.05	0.09
31. Peer ILT – Masculinity (T1)	-0.03	0.13	-0.04	-0.04	0.13	0.02	0.11
32. Self Task Roles (T1)	0.18	0.06	0.30	0.24	0.17	0.06	0.19
33. Self Social Roles (T1)	0.14	-0.01	0.33	0.19	0.10	0.11	0.19
34. Self Boundary Spanning Roles (T1)	0.17	0.19	0.31	0.27	0.06	0.03	0.07
35. Peer Task Roles (T1)	0.01	0.10	-0.08	0.00	0.04	0.02	0.08
36. Peer Social Roles (T1)	0.00	-0.04	-0.06	-0.04	-0.09	0.04	0.04
37. Peer Boundary Spanning Roles (T1)	0.05	0.10	0.10	0.13	-0.02	0.11	0.10

Table 11e continued

Correlations – Time 0 Variables with Time 1 Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12
38. Self Leadership Ratings (T1)	0.26	-0.04	-0.05	-0.25	-0.08	-0.27	0.25	-0.10	-0.23	-0.23	0.05	0.14
39. Self Task Leadership Rank (T1)	0.12	-0.02	-0.03	-0.16	0.01	-0.13	0.16	-0.05	-0.16	-0.10	0.01	0.08
40. Self Social Leadership Rank (T1)	0.02	-0.03	-0.01	-0.06	-0.12	-0.13	0.06	0.10	-0.21	-0.17	-0.03	-0.06
41. Self Leadership Rank Composite (T1)	0.09	-0.04	-0.03	-0.14	-0.07	-0.17	0.14	0.03	-0.24	-0.18	-0.01	0.01
42. Self Leadership Composite Score (T1)	0.19	-0.04	-0.05	-0.22	-0.09	-0.25	0.22	-0.03	-0.29	-0.24	0.01	0.07
43. Peer Leadership Ratings (T1)	0.20	0.10	0.06	-0.38	0.10	-0.35	0.38	-0.17	-0.34	-0.15	-0.06	0.06
44. Peer Task Leadership Rank (T1)	0.13	0.07	0.08	-0.34	0.00	-0.30	0.34	-0.14	-0.32	-0.22	0.04	0.08
45. Peer Social Leadership Rank (T1)	0.00	0.11	0.12	-0.37	0.11	-0.28	0.37	-0.29	-0.18	-0.21	-0.02	0.04
46. Peer Leadership Rank Composite (T1)	0.08	0.10	0.11	-0.41	0.06	-0.33	0.41	-0.25	-0.29	-0.25	0.01	0.07
47. Peer Leadership Composite Score (T1)	0.14	0.12	0.11	-0.45	0.09	-0.38	0.45	-0.25	-0.35	-0.24	-0.01	0.07
48. Observer Leadership Ratings (T1)	0.17	0.02	-0.04	-0.35	0.05	-0.31	0.35	-0.16	-0.30	-0.14	-0.02	0.07
49. Observer Task Leadership Rank (T1)	0.19	0.06	0.05	-0.37	0.03	-0.28	0.37	-0.18	-0.31	-0.14	-0.01	0.04
50. Observer Social Leadership Rank (T1)	-0.10	-0.01	-0.04	-0.43	0.04	-0.30	0.43	-0.31	-0.25	-0.24	-0.13	0.10
51. Observer Leadership Rank Composite (T1)	0.05	0.03	0.01	-0.47	0.04	-0.34	0.47	-0.28	-0.32	-0.23	-0.09	0.08
52. Observer Leadership Composite Score (T1)	0.10	0.03	-0.01	-0.46	0.05	-0.37	0.46	-0.26	-0.35	-0.21	-0.07	0.08
53. Team Formation Stage (T1)	-0.07	0.06	0.05	-0.20	0.01	-0.06	0.20	-0.14	-0.12	-0.15	-0.04	0.23
54. Task Compilation Stage (T1)	-0.02	0.02	-0.02	-0.11	-0.03	-0.12	0.11	-0.10	-0.04	-0.17	-0.08	0.17
55. Role Compilation Stage (T1)	0.02	-0.08	-0.10	0.02	-0.08	0.01	-0.02	0.01	0.01	-0.06	-0.01	0.09
56. Team Compilation (T1)	0.02	-0.16	-0.20	0.12	-0.21	0.04	-0.12	0.11	0.04	-0.12	0.07	0.09

Table 11e continued

Correlations – Time 0 Variables with Time 1 Variables

Variable	13	14	15	16	17	18	19
38. Self Leadership Ratings (T1)	0.13	0.35	0.22	0.12	0.17	0.15	0.21
39. Self Task Leadership Rank (T1)	0.10	0.15	0.01	0.00	0.04	0.01	0.09
40. Self Social Leadership Rank (T1)	0.07	-0.09	0.10	-0.01	0.02	0.08	0.16
41. Self Leadership Rank Composite (T1)	0.12	0.04	0.07	0.00	0.03	0.06	0.15
42. Self Leadership Composite Score (T1)	0.15	0.20	0.16	0.05	0.11	0.12	0.22
43. Peer Leadership Ratings (T1)	-0.01	0.28	0.01	0.05	0.09	0.08	0.08
44. Peer Task Leadership Rank (T1)	0.02	0.21	0.04	0.01	0.07	0.06	0.12
45. Peer Social Leadership Rank (T1)	0.00	0.03	-0.01	-0.02	0.03	0.03	0.09
46. Peer Leadership Rank Composite (T1)	0.01	0.14	0.02	-0.01	0.06	0.05	0.12
47. Peer Leadership Composite Score (T1)	0.00	0.21	0.02	0.02	0.08	0.07	0.12
48. Observer Leadership Ratings (T1)	0.10	0.29	0.19	0.19	0.14	0.10	0.18
49. Observer Task Leadership Rank (T1)	0.03	0.25	0.10	0.11	0.11	0.15	0.07
50. Observer Social Leadership Rank (T1)	-0.06	0.14	0.04	0.02	0.03	0.03	0.01
51. Observer Leadership Rank Composite (T1)	-0.02	0.23	0.08	0.07	0.08	0.10	0.05
52. Observer Leadership Composite Score (T1)	0.03	0.27	0.13	0.13	0.11	0.11	0.11
53. Team Formation Stage (T1)	0.16	0.02	0.14	-0.04	0.04	-0.01	-0.01
54. Task Compilation Stage (T1)	0.17	-0.02	0.10	-0.03	0.07	0.10	0.09
55. Role Compilation Stage (T1)	0.08	0.06	0.20	0.08	-0.02	0.06	0.01
56. Team Compilation (T1)	0.19	0.08	0.23	0.18	-0.04	0.00	0.11

Table 11f

Correlations – Time 0 Variables with Time 2 Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12
57. Self ILT – Sensitivity (T2)	-0.04	0.09	0.06	0.04	0.03	-0.05	-0.04	0.15	-0.12	0.04	-0.06	0.05
58. Self ILT – Intelligence (T2)	0.15	0.12	0.05	0.03	0.13	-0.02	-0.03	0.13	-0.12	0.16	-0.03	0.07
59. Self ILT – Dedication (T2)	0.02	0.02	-0.01	-0.06	-0.01	-0.09	0.06	0.00	-0.08	-0.12	0.07	0.15
60. Self ILT – Dynamism (T2)	0.19	-0.08	-0.11	-0.15	-0.08	-0.20	0.15	-0.01	-0.20	-0.18	0.08	0.17
61. Self ILT – Tyranny (T2)	0.13	-0.16	-0.12	-0.14	-0.01	-0.09	0.14	-0.17	0.00	-0.02	-0.01	0.06
62. Self ILT – Masculinity (T2)	0.76	-0.05	-0.05	-0.19	0.06	-0.13	0.19	-0.06	-0.20	0.01	-0.06	0.01
63. Peer ILT – Sensitivity (T2)	-0.03	0.04	0.09	0.00	-0.05	-0.01	0.00	-0.01	0.02	-0.02	0.05	-0.01
64. Peer ILT – Intelligence (T2)	0.24	0.00	0.04	0.02	0.10	0.12	-0.02	0.05	-0.03	0.15	-0.02	0.06
65. Peer ILT – Dedication (T2)	0.00	0.05	0.12	-0.02	-0.05	0.02	0.02	-0.06	0.04	-0.06	0.15	0.07
66. Peer ILT – Dynamism (T2)	0.15	-0.08	-0.05	-0.32	0.08	-0.15	0.32	-0.22	-0.19	-0.13	0.03	0.16
67. Peer ILT – Tyranny (T2)	0.13	-0.04	-0.07	-0.22	0.02	-0.12	0.22	-0.08	-0.22	-0.04	-0.03	0.12
68. Peer ILT – Masculinity (T2)	0.85	-0.02	-0.02	-0.08	-0.04	-0.14	0.08	0.06	-0.20	0.00	0.02	0.02
69. Self Task Roles (T2)	0.20	-0.08	-0.11	-0.04	-0.01	0.02	0.04	0.03	-0.09	-0.04	0.02	0.17
70. Self Social Roles (T2)	0.03	-0.07	-0.10	0.09	0.01	0.08	-0.09	0.10	0.00	0.00	0.02	0.15
71. Self Boundary Spanning Roles (T2)	0.12	-0.11	-0.10	0.13	-0.06	0.16	-0.13	0.14	0.00	0.02	0.07	0.09
72. Peer Task Roles (T2)	0.08	0.06	0.07	-0.22	0.05	-0.13	0.22	-0.10	-0.20	-0.07	0.02	0.12
73. Peer Social Roles (T2)	0.01	0.03	0.04	-0.14	-0.06	-0.12	0.14	-0.07	-0.11	-0.23	0.03	0.11
74. Peer Boundary Spanning Roles (T2)	-0.03	0.12	0.12	-0.23	-0.07	-0.21	0.23	-0.10	-0.21	-0.26	0.04	0.19

Note: N ranges 194-199. Correlations greater than $r = .4$ significant at $p < .05$. Correlations greater than $r = .19$ significant at $p < .01$. See Table 11a for Time 0 variable names.

Table 11f continued

Correlations – Time 0 Variables with Time 2 Variables

Variable	13	14	15	16	17	18	19
57. Self ILT – Sensitivity (T2)	0.04	-0.05	0.20	0.12	0.17	0.10	0.20
58. Self ILT – Intelligence (T2)	0.03	0.03	0.04	0.00	0.36	0.14	0.17
59. Self ILT – Dedication (T2)	0.09	0.19	0.20	0.20	0.11	-0.12	0.21
60. Self ILT – Dynamism (T2)	0.18	0.38	0.22	0.25	0.16	0.09	0.28
61. Self ILT – Tyranny (T2)	0.06	0.34	0.03	0.20	0.07	0.00	0.03
62. Self ILT – Masculinity (T2)	-0.01	0.20	0.01	0.02	0.28	0.09	0.18
63. Peer ILT – Sensitivity (T2)	0.02	-0.06	0.03	-0.02	0.04	0.07	0.03
64. Peer ILT – Intelligence (T2)	0.12	0.17	0.02	0.01	0.12	-0.05	0.10
65. Peer ILT – Dedication (T2)	0.06	0.09	-0.02	-0.01	-0.06	-0.16	0.03
66. Peer ILT – Dynamism (T2)	0.11	0.40	0.24	0.23	0.08	0.02	0.20
67. Peer ILT – Tyranny (T2)	0.02	0.28	0.06	0.06	0.05	-0.04	0.11
68. Peer ILT – Masculinity (T2)	0.04	0.25	0.05	0.03	0.24	0.05	0.19
69. Self Task Roles (T2)	0.18	0.24	0.14	0.10	0.23	0.15	0.31
70. Self Social Roles (T2)	0.10	0.02	0.20	0.07	0.18	0.15	0.28
71. Self Boundary Spanning Roles (T2)	0.11	0.23	0.24	0.16	0.17	0.02	0.29
72. Peer Task Roles (T2)	0.02	0.24	0.05	0.02	0.04	-0.02	0.17
73. Peer Social Roles (T2)	0.06	0.03	0.04	-0.03	0.06	0.11	0.14
74. Peer Boundary Spanning Roles (T2)	0.12	0.24	0.15	0.14	0.06	-0.01	0.17

Table 11f continued

Correlations – Time 0 Variables with Time 2 Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12
75. Self Leadership Ratings (T2)	0.30	-0.10	-0.08	-0.28	0.02	-0.19	0.28	-0.16	-0.21	-0.12	0.06	0.12
76. Self Task Leadership Rank (T2)	0.25	0.00	-0.02	-0.20	0.02	-0.20	0.20	-0.01	-0.28	-0.04	-0.02	-0.06
77. Self Social Leadership Rank (T2)	0.11	-0.03	0.00	-0.05	0.01	-0.09	0.05	0.03	-0.12	-0.03	0.02	-0.07
78. Self Leadership Rank Composite (T2)	0.22	-0.02	-0.01	-0.15	0.02	-0.17	0.15	0.02	-0.24	-0.04	0.00	-0.08
79. Self Leadership Composite Score (T2)	0.30	-0.06	-0.05	-0.24	0.02	-0.22	0.24	-0.06	-0.28	-0.09	0.03	0.00
80. Peer Leadership Ratings (T2)	0.22	0.06	0.07	-0.37	0.12	-0.22	0.37	-0.19	-0.31	-0.11	0.02	0.16
81. Peer Task Leadership Rank (T2)	0.11	-0.02	0.02	-0.27	0.15	-0.07	0.27	-0.20	-0.14	0.01	0.00	-0.01
82. Peer Social Leadership Rank (T2)	0.06	0.06	0.06	-0.26	0.01	-0.14	0.26	-0.22	-0.10	-0.18	-0.04	-0.01
83. Peer Leadership Rank Composite (T2)	0.10	0.02	0.04	-0.30	0.09	-0.12	0.30	-0.24	-0.14	-0.09	-0.03	-0.02
84. Peer Leadership Composite Score (T2)	0.16	0.04	0.06	-0.37	0.11	-0.18	0.37	-0.25	-0.23	-0.11	-0.01	0.06
85. Observer Leadership Ratings (T2)	0.15	0.16	0.20	-0.36	-0.06	-0.35	0.36	-0.24	-0.22	-0.32	-0.07	0.16
86. Observer Task Leadership Rank (T2)	0.07	0.03	0.06	-0.16	0.08	-0.07	0.16	-0.12	-0.08	-0.07	-0.02	0.08
87. Observer Social Leadership Rank (T2)	-0.14	-0.01	0.02	-0.18	-0.10	-0.12	0.18	-0.15	-0.07	-0.27	-0.05	0.12
88. Observer Leadership Rank Composite (T2)	-0.04	0.01	0.05	-0.21	0.00	-0.12	0.21	-0.17	-0.10	-0.20	-0.04	0.12
89. Observer Leadership Composite Score (T2)	0.03	0.08	0.12	-0.30	-0.03	-0.24	0.30	-0.22	-0.16	-0.28	-0.06	0.16
90. Team Formation Stage (T2)	-0.05	0.07	0.06	0.08	-0.05	0.02	-0.08	0.13	-0.04	-0.06	0.01	0.10
91. Task Compilation Stage (T2)	-0.01	0.03	0.02	0.00	-0.10	-0.01	0.00	0.11	-0.14	-0.15	-0.03	0.19
92. Role Compilation Stage (T2)	0.05	0.05	0.03	0.09	-0.12	-0.04	-0.09	0.14	-0.05	-0.11	0.09	0.08
93. Team Compilation (T2)	0.04	0.03	0.04	0.11	-0.10	0.09	-0.11	0.15	-0.03	-0.05	0.04	0.15

Table 11f continued

Correlations – Time 0 Variables with Time 2 Variables

Variable	13	14	15	16	17	18	19
75. Self Leadership Ratings (T2)	0.08	0.34	0.11	0.06	0.20	0.08	0.21
76. Self Task Leadership Rank (T2)	0.07	0.13	-0.04	-0.04	0.01	-0.08	0.08
77. Self Social Leadership Rank (T2)	0.03	-0.05	0.11	0.00	0.00	0.09	0.05
78. Self Leadership Rank Composite (T2)	0.06	0.05	0.04	-0.02	0.00	0.00	0.08
79. Self Leadership Composite Score (T2)	0.08	0.19	0.08	0.01	0.09	0.04	0.15
80. Peer Leadership Ratings (T2)	0.07	0.34	0.05	0.05	0.10	0.04	0.18
81. Peer Task Leadership Rank (T2)	-0.07	0.11	-0.02	-0.04	0.03	-0.08	0.01
82. Peer Social Leadership Rank (T2)	-0.06	0.04	0.04	-0.05	0.02	0.06	0.16
83. Peer Leadership Rank Composite (T2)	-0.08	0.09	0.01	-0.05	0.03	-0.01	0.10
84. Peer Leadership Composite Score (T2)	-0.03	0.20	0.03	-0.01	0.06	0.00	0.15
85. Observer Leadership Ratings (T2)	0.02	0.24	-0.01	-0.09	0.10	-0.03	0.13
86. Observer Task Leadership Rank (T2)	0.14	0.10	0.01	0.00	0.05	-0.04	0.00
87. Observer Social Leadership Rank (T2)	0.00	-0.03	0.04	0.10	-0.08	0.01	0.11
88. Observer Leadership Rank Composite (T2)	0.09	0.04	0.02	0.06	-0.01	-0.01	0.07
89. Observer Leadership Composite Score (T2)	0.07	0.13	0.01	0.01	0.03	-0.02	0.10
90. Team Formation Stage (T2)	0.10	0.01	0.03	-0.01	0.06	-0.08	0.12
91. Task Compilation Stage (T2)	0.19	0.09	0.05	0.03	0.11	0.02	0.26
92. Role Compilation Stage (T2)	0.16	0.11	-0.02	0.01	0.07	0.01	0.18
93. Team Compilation (T2)	0.23	0.09	0.09	0.01	0.10	0.07	0.15

Table 11g

Correlations – Time 0 Variables with Time 3 Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12
94. Self ILT – Sensitivity (T3)	-0.01	0.03	0.01	-0.05	0.12	0.01	0.05	0.06	-0.15	0.04	-0.06	-0.01
95. Self ILT – Intelligence (T3)	0.12	0.04	-0.04	-0.10	0.18	0.02	0.10	-0.06	-0.07	0.11	-0.04	0.02
96. Self ILT – Dedication (T3)	0.01	0.01	0.02	-0.20	0.07	0.07	0.20	-0.14	-0.12	-0.14	0.15	0.23
97. Self ILT – Dynamism (T3)	0.24	-0.17	-0.18	-0.10	0.09	0.08	0.10	-0.03	-0.11	0.00	0.06	0.13
98. Self ILT – Tyranny (T3)	0.18	-0.08	-0.05	-0.13	-0.13	-0.12	0.13	-0.09	-0.08	-0.13	-0.03	0.06
99. Self ILT – Masculinity (T3)	0.73	-0.02	0.00	-0.21	0.02	-0.20	0.21	-0.09	-0.19	-0.03	-0.17	-0.03
100.Peer ILT – Sensitivity (T3)	-0.02	0.06	0.08	-0.04	0.03	-0.02	0.04	-0.04	-0.01	0.00	0.03	-0.13
101.Peer ILT – Intelligence (T3)	0.11	0.04	0.04	-0.08	0.07	0.02	0.08	-0.06	-0.04	0.12	-0.01	0.02
102.Peer ILT – Dedication (T3)	-0.05	0.05	0.07	-0.16	0.01	-0.08	0.16	-0.17	-0.03	-0.05	0.10	0.05
103.Peer ILT – Dynamism (T3)	0.06	-0.13	-0.10	-0.35	0.04	-0.20	0.35	-0.25	-0.20	-0.14	-0.05	0.16
104.Peer ILT – Tyranny (T3)	-0.02	-0.04	-0.07	-0.22	-0.05	-0.14	0.22	-0.19	-0.09	-0.09	-0.05	0.17
105.Peer ILT – Masculinity (T3)	0.80	0.04	0.02	-0.08	-0.12	-0.12	0.08	0.04	-0.16	-0.06	0.00	-0.01
106.Self Task Roles (T3)	0.19	-0.17	-0.24	0.07	0.07	0.17	-0.07	0.11	-0.04	0.13	0.07	0.19
107.Self Social Roles (T3)	0.08	-0.07	-0.08	0.12	-0.04	0.17	-0.12	0.13	0.01	0.06	0.06	0.14
108.Self Boundary Spanning Roles (T3)	0.13	-0.07	-0.08	0.16	-0.03	0.23	-0.16	0.20	-0.01	0.08	0.08	0.04
109.Peer Task Roles (T3)	-0.02	-0.08	-0.07	-0.29	0.05	-0.20	0.29	-0.20	-0.17	-0.04	0.02	0.06
110.Peer Social Roles (T3)	0.01	-0.03	0.00	-0.11	-0.01	-0.09	0.11	-0.03	-0.12	-0.09	0.03	-0.02
111.Peer Boundary Spanning Roles (T3)	-0.03	-0.10	-0.06	-0.14	0.03	-0.03	0.14	-0.09	-0.09	-0.05	0.04	0.09

Note: *N* ranges 178-199. Correlations greater than $r = .14$ significant at $p < .05$. Correlations greater than $r = .19$ significant at $p < .01$.
See Table 11a for Time 0 variable names.

Table 11g continued

Correlations – Time 0 Variables with Time 3 Variables

Variable	13	14	15	16	17	18	19
94. Self ILT – Sensitivity (T3)	0.00	-0.04	0.08	0.01	0.05	0.23	0.10
95. Self ILT – Intelligence (T3)	-0.05	0.10	0.04	0.00	0.26	0.21	0.16
96. Self ILT – Dedication (T3)	0.12	0.01	0.05	-0.02	-0.03	0.03	0.10
97. Self ILT – Dynamism (T3)	0.14	0.41	0.30	0.28	0.25	0.14	0.32
98. Self ILT – Tyranny (T3)	0.11	0.28	-0.01	0.11	0.07	-0.11	0.08
99. Self ILT – Masculinity (T3)	-0.07	0.16	-0.06	0.00	0.26	-0.01	0.14
100.Peer ILT – Sensitivity (T3)	-0.04	-0.18	-0.08	-0.15	-0.08	-0.08	-0.14
101.Peer ILT – Intelligence (T3)	0.02	0.00	-0.05	-0.07	0.03	-0.10	-0.01
102.Peer ILT – Dedication (T3)	0.01	-0.07	-0.04	-0.11	-0.08	-0.15	-0.11
103.Peer ILT – Dynamism (T3)	0.11	0.23	0.15	0.13	0.08	0.01	0.05
104.Peer ILT – Tyranny (T3)	0.05	0.20	0.03	0.07	0.06	-0.03	0.11
105.Peer ILT – Masculinity (T3)	-0.03	0.16	-0.06	-0.05	0.15	-0.02	0.11
106.Self Task Roles (T3)	0.20	0.18	0.26	0.20	0.16	0.13	0.36
107.Self Social Roles (T3)	0.10	0.02	0.25	0.19	0.10	0.15	0.30
108.Self Boundary Spanning Roles (T3)	0.08	0.20	0.25	0.23	0.03	0.02	0.36
109.Peer Task Roles (T3)	-0.02	-0.04	-0.04	-0.01	-0.12	-0.08	-0.07
110.Peer Social Roles (T3)	0.00	-0.10	0.01	-0.01	-0.12	0.03	-0.02
111.Peer Boundary Spanning Roles (T3)	0.04	0.02	0.09	0.14	-0.05	-0.03	-0.02

Table 11g continued

Correlations – Time 0 Variables with Time 3 Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12
112.Self Leadership Ratings (T3)	0.24	-0.16	-0.14	-0.27	0.14	-0.07	0.27	-0.13	-0.23	-0.05	0.10	0.07
113.Self Task Leadership Rank (T3)	0.04	-0.01	0.00	-0.01	0.07	0.09	0.01	0.05	-0.08	0.11	0.13	0.01
114.Self Social Leadership Rank (T3)	-0.05	-0.14	-0.11	0.01	0.01	0.03	-0.01	0.08	-0.10	0.00	0.00	-0.03
115.Self Leadership Rank Composite (T3)	0.00	-0.10	-0.06	0.00	0.05	0.08	0.00	0.08	-0.10	0.07	0.08	-0.02
116.Self Leadership Composite Score (T3)	0.11	-0.15	-0.11	-0.12	0.10	0.02	0.12	0.01	-0.18	0.03	0.11	0.02
117.Peer Leadership Ratings (T3)	0.10	0.00	0.02	-0.40	0.10	-0.25	0.40	-0.27	-0.24	-0.07	-0.01	0.06
118.Peer Task Leadership Rank (T3)	0.05	-0.04	-0.01	-0.27	0.10	-0.16	0.27	-0.20	-0.15	-0.04	0.04	-0.04
119.Peer Social Leadership Rank (T3)	0.03	0.01	0.03	-0.19	0.06	-0.09	0.19	-0.17	-0.06	-0.09	0.04	-0.08
120.Peer Leadership Rank Composite (T3)	0.04	-0.02	0.01	-0.25	0.09	-0.14	0.25	-0.20	-0.12	-0.07	0.05	-0.06
121.Peer Leadership Composite Score (T3)	0.07	-0.01	0.02	-0.34	0.10	-0.20	0.34	-0.25	-0.18	-0.08	0.03	-0.02
122.Observer Leadership Ratings (T3)	0.10	0.00	0.02	-0.39	0.05	-0.20	0.39	-0.20	-0.31	-0.19	-0.02	0.08
123.Observer Task Leadership Rank (T3)	0.03	-0.01	0.02	-0.33	0.06	-0.16	0.33	-0.21	-0.22	-0.11	-0.12	0.03
124.Observer Social Leadership Rank (T3)	-0.01	-0.04	-0.02	-0.37	0.05	-0.16	0.37	-0.21	-0.27	-0.13	-0.03	0.01
125.Observer Leadership Rank Composite (T3)	0.02	-0.03	0.00	-0.39	0.06	-0.18	0.39	-0.24	-0.27	-0.13	-0.08	0.02
126.Observer Leadership Composite Score (T3)	0.05	-0.02	0.01	-0.41	0.06	-0.20	0.41	-0.24	-0.30	-0.16	-0.06	0.05
127.Team Formation Stage (T3)	-0.04	0.07	0.07	0.05	-0.03	0.16	-0.05	0.03	0.04	-0.05	0.09	0.16
128.Task Compilation Stage (T3)	0.06	0.01	-0.01	0.15	0.03	0.21	-0.15	0.13	0.06	0.07	0.02	0.09
129.Role Compilation Stage (T3)	0.03	0.04	0.03	0.15	-0.01	0.19	-0.15	0.10	0.09	0.02	0.02	0.14
130.Team Compilation (T3)	0.06	0.08	0.07	0.11	0.01	0.18	-0.11	0.10	0.02	0.06	0.00	0.15

Table 11g continued

Correlations – Time 0 Variables with Time 3 Variables

Variable	13	14	15	16	17	18	19
112.Self Leadership Ratings (T3)	0.08	0.33	0.14	0.10	0.17	-0.02	0.21
113.Self Task Leadership Rank (T3)	0.15	0.03	-0.06	0.00	-0.04	-0.10	0.01
114.Self Social Leadership Rank (T3)	0.13	-0.09	0.05	0.03	-0.08	0.10	0.06
115.Self Leadership Rank Composite (T3)	0.17	-0.04	-0.01	0.02	-0.07	0.00	0.04
116.Self Leadership Composite Score (T3)	0.16	0.12	0.06	0.06	0.02	-0.01	0.13
117.Peer Leadership Ratings (T3)	0.00	0.11	-0.03	-0.02	-0.03	-0.09	-0.03
118.Peer Task Leadership Rank (T3)	-0.05	-0.01	-0.08	-0.03	-0.12	-0.12	-0.01
119.Peer Social Leadership Rank (T3)	-0.08	-0.04	-0.02	-0.01	-0.12	-0.03	-0.01
120.Peer Leadership Rank Composite (T3)	-0.07	-0.03	-0.05	-0.02	-0.13	-0.08	-0.01
121.Peer Leadership Composite Score (T3)	-0.05	0.02	-0.05	-0.02	-0.10	-0.09	-0.02
122.Observer Leadership Ratings (T3)	0.06	0.13	-0.03	-0.03	-0.03	-0.13	0.00
123.Observer Task Leadership Rank (T3)	0.04	0.13	0.02	0.02	0.05	0.02	-0.01
124.Observer Social Leadership Rank (T3)	0.06	0.14	0.00	0.03	-0.04	0.01	0.02
125.Observer Leadership Rank Composite (T3)	0.05	0.15	0.01	0.03	0.00	0.01	0.01
126.Observer Leadership Composite Score (T3)	0.06	0.15	-0.01	0.01	-0.02	-0.04	0.00
127.Team Formation Stage (T3)	0.11	0.15	0.16	0.17	-0.07	-0.06	0.25
128.Task Compilation Stage (T3)	0.01	0.05	0.09	0.10	0.02	0.05	0.19
129.Role Compilation Stage (T3)	0.07	0.10	0.07	0.08	0.04	-0.04	0.24
130.Team Compilation (T3)	0.09	0.07	0.16	0.14	0.09	0.05	0.21

Table 11h

Correlations – Time 1 Variables with Time 2 Variables

Variable	20	21	22	23	24	25	26	27	28	29	30	31
57. Self ILT – Sensitivity (T2)	0.50	0.29	0.32	0.26	-0.19	0.00	-0.04	-0.05	-0.03	-0.02	-0.10	-0.11
58. Self ILT – Intelligence (T2)	0.25	0.45	0.20	0.20	-0.12	0.16	0.01	0.00	0.00	0.05	0.02	0.05
59. Self ILT – Dedication (T2)	0.21	0.21	0.39	0.22	-0.05	0.05	0.06	-0.04	0.10	0.16	0.12	0.00
60. Self ILT – Dynamism (T2)	0.14	0.24	0.23	0.53	0.27	0.31	0.07	0.05	0.07	0.40	0.26	0.26
61. Self ILT – Tyranny (T2)	-0.15	-0.07	-0.14	0.14	0.62	0.24	-0.08	0.01	-0.03	0.27	0.33	0.17
62. Self ILT – Masculinity (T2)	0.03	0.09	0.10	0.22	0.19	0.83	-0.03	0.10	0.04	0.26	0.23	0.72
63. Peer ILT – Sensitivity (T2)	0.04	-0.01	-0.02	0.02	0.02	0.03	0.24	0.06	0.17	0.04	-0.18	0.00
64. Peer ILT – Intelligence (T2)	-0.08	-0.01	-0.09	-0.01	0.03	0.22	0.04	0.31	0.23	0.11	-0.01	0.23
65. Peer ILT – Dedication (T2)	-0.05	-0.08	0.04	-0.04	0.11	-0.01	0.16	0.21	0.38	0.13	0.01	0.07
66. Peer ILT – Dynamism (T2)	0.02	0.03	0.09	0.22	0.17	0.24	0.07	0.13	0.14	0.55	0.35	0.20
67. Peer ILT – Tyranny (T2)	0.01	0.08	0.08	0.16	0.19	0.20	-0.07	0.04	0.04	0.33	0.55	0.19
68. Peer ILT – Masculinity (T2)	-0.02	0.05	0.07	0.20	0.18	0.72	0.07	0.20	0.17	0.29	0.21	0.88
69. Self Task Roles (T2)	0.22	0.32	0.23	0.30	0.05	0.24	-0.04	0.01	0.03	0.11	0.12	0.17
70. Self Social Roles (T2)	0.33	0.30	0.28	0.26	-0.19	0.08	-0.01	-0.10	0.00	-0.05	-0.08	-0.01
71. Self Boundary Spanning Roles (T2)	-0.01	0.03	0.05	0.18	0.11	0.10	-0.08	-0.08	-0.08	0.00	0.04	0.09
72. Peer Task Roles (T2)	-0.02	-0.03	0.07	0.04	0.14	0.13	0.11	0.23	0.22	0.34	0.20	0.12
73. Peer Social Roles (T2)	0.07	-0.05	0.08	0.02	-0.03	0.07	0.13	0.05	0.11	0.10	-0.14	0.04
74. Peer Boundary Spanning Roles (T2)	0.04	0.02	0.16	0.15	0.09	0.05	-0.04	0.04	0.01	0.20	0.22	0.04

Note: N ranges 194-199. Correlations greater than $r = .14$ significant at $p < .05$. Correlations greater than $r = .19$ significant at $p < .01$. See Table 11b for Time 1 variable names.

Table 11h continued

Correlations – Time 1 Variables with Time 2 Variables

Variable	32	33	34	35	36	37	38	39	40	41	42	43	44	45
57. Self ILT – Sensitivity (T2)	0.40	0.38	0.21	-0.03	0.03	0.00	0.14	0.00	0.18	0.11	0.15	-0.05	-0.04	0.02
58. Self ILT – Intelligence (T2)	0.30	0.19	0.11	0.09	0.07	0.09	0.29	0.16	0.06	0.14	0.24	0.14	0.05	0.10
59. Self ILT – Dedication (T2)	0.26	0.13	0.17	0.13	0.10	0.06	0.28	0.10	0.01	0.07	0.18	0.12	0.17	0.19
60. Self ILT – Dynamism (T2)	0.26	0.14	0.22	0.22	0.08	0.16	0.43	0.20	0.12	0.21	0.36	0.33	0.30	0.24
61. Self ILT – Tyranny (T2)	-0.19	-0.20	-0.04	0.06	-0.07	0.01	0.16	0.17	-0.10	0.04	0.11	0.18	0.15	0.16
62. Self ILT – Masculinity (T2)	0.10	0.13	0.01	0.18	0.04	0.20	0.38	0.20	0.03	0.14	0.29	0.30	0.18	0.14
63. Peer ILT – Sensitivity (T2)	-0.02	0.03	0.00	0.08	0.11	-0.07	-0.06	-0.10	0.08	-0.01	-0.04	0.01	0.02	0.17
64. Peer ILT – Intelligence (T2)	-0.02	-0.11	-0.12	0.20	0.06	0.03	0.08	0.07	-0.08	-0.01	0.03	0.25	0.06	-0.01
65. Peer ILT – Dedication (T2)	-0.03	-0.09	-0.04	0.22	0.15	-0.03	-0.01	0.03	-0.10	-0.04	-0.04	0.20	0.08	0.14
66. Peer ILT – Dynamism (T2)	0.02	-0.03	0.07	0.32	0.17	0.21	0.24	0.14	0.03	0.11	0.19	0.47	0.32	0.31
67. Peer ILT – Tyranny (T2)	-0.05	-0.12	-0.04	0.08	0.01	0.06	0.14	0.19	0.11	0.19	0.21	0.26	0.27	0.13
68. Peer ILT – Masculinity (T2)	0.10	0.11	-0.01	0.19	0.07	0.16	0.27	0.11	0.07	0.12	0.22	0.26	0.13	0.09
69. Self Task Roles (T2)	0.30	0.26	0.14	0.06	0.00	0.04	0.37	0.15	0.07	0.13	0.28	0.13	0.15	0.07
70. Self Social Roles (T2)	0.33	0.48	0.18	-0.04	-0.02	-0.02	0.23	-0.09	0.18	0.06	0.16	-0.04	-0.01	-0.04
71. Self Boundary Spanning Roles (T2)	0.12	0.11	0.13	-0.07	-0.13	-0.02	0.18	0.06	0.00	0.04	0.12	-0.01	-0.01	-0.02
72. Peer Task Roles (T2)	-0.03	-0.14	-0.05	0.38	0.19	0.13	0.21	0.14	-0.12	0.02	0.11	0.43	0.24	0.23
73. Peer Social Roles (T2)	0.00	0.02	-0.05	0.12	0.13	0.04	0.06	-0.02	-0.05	-0.05	-0.01	0.15	0.09	0.17
74. Peer Boundary Spanning Roles (T2)	0.08	-0.06	0.05	0.13	0.02	-0.03	0.19	0.08	-0.03	0.03	0.11	0.29	0.17	0.20

Table 11h continued

Correlations – Time 1 Variables with Time 2 Variables

Variable	46	47	58	49	50	51	52	53	54	55	56
57. Self ILT – Sensitivity (T2)	-0.01	-0.03	0.08	-0.01	0.05	0.02	0.05	0.15	0.25	0.21	0.20
58. Self ILT – Intelligence (T2)	0.09	0.12	0.05	0.08	0.03	0.07	0.07	0.14	0.23	0.15	0.12
59. Self ILT – Dedication (T2)	0.21	0.19	0.24	0.14	0.09	0.14	0.19	0.19	0.16	0.21	0.19
60. Self ILT – Dynamism (T2)	0.31	0.36	0.33	0.26	0.17	0.25	0.31	0.07	0.21	0.22	0.18
61. Self ILT – Tyranny (T2)	0.18	0.20	0.08	0.21	0.11	0.18	0.16	-0.15	-0.14	-0.15	-0.17
62. Self ILT – Masculinity (T2)	0.19	0.26	0.16	0.18	0.04	0.13	0.15	-0.03	0.06	0.03	0.00
63. Peer ILT – Sensitivity (T2)	0.11	0.08	-0.12	-0.17	-0.13	-0.17	-0.17	-0.01	-0.08	-0.08	-0.10
64. Peer ILT – Intelligence (T2)	0.02	0.12	-0.11	-0.07	-0.15	-0.13	-0.13	-0.01	0.00	-0.07	-0.08
65. Peer ILT – Dedication (T2)	0.12	0.17	-0.03	-0.07	-0.11	-0.10	-0.09	0.05	-0.12	-0.13	-0.11
66. Peer ILT – Dynamism (T2)	0.36	0.45	0.27	0.22	0.17	0.23	0.27	-0.06	-0.01	-0.04	-0.08
67. Peer ILT – Tyranny (T2)	0.23	0.27	0.23	0.27	0.21	0.28	0.29	-0.12	-0.13	-0.10	-0.11
68. Peer ILT – Masculinity (T2)	0.13	0.20	0.17	0.15	-0.09	0.04	0.09	-0.06	-0.02	0.00	0.01
69. Self Task Roles (T2)	0.12	0.14	0.11	0.11	0.00	0.07	0.09	0.20	0.25	0.17	0.19
70. Self Social Roles (T2)	-0.03	-0.04	0.06	-0.06	-0.03	-0.05	-0.01	0.18	0.22	0.22	0.27
71. Self Boundary Spanning Roles (T2)	-0.02	-0.02	0.02	-0.02	-0.06	-0.05	-0.03	0.15	0.19	0.18	0.22
72. Peer Task Roles (T2)	0.27	0.37	0.10	0.08	0.13	0.12	0.13	-0.04	-0.03	-0.11	-0.15
73. Peer Social Roles (T2)	0.15	0.17	0.05	-0.04	0.00	-0.03	0.00	0.05	0.10	0.04	0.00
74. Peer Boundary Spanning Roles (T2)	0.21	0.27	0.18	0.12	0.12	0.14	0.17	0.04	0.02	0.02	-0.02

Table 11h continued

Correlations – Time 1 Variables with Time 2 Variables

Variable	20	21	22	23	24	25	26	27	28	29	30	31
75. Self Leadership Ratings (T2)	0.12	0.26	0.19	0.34	0.22	0.38	0.06	0.07	0.08	0.31	0.27	0.27
76. Self Task Leadership Rank (T2)	0.08	0.18	0.11	0.21	0.14	0.27	0.15	0.18	0.18	0.22	0.24	0.25
77. Self Social Leadership Rank (T2)	0.19	0.11	0.07	0.21	0.00	0.12	0.09	0.06	0.01	0.10	0.12	0.12
78. Self Leadership Rank Composite (T2)	0.17	0.17	0.11	0.26	0.08	0.23	0.15	0.15	0.11	0.19	0.22	0.23
79. Self Leadership Composite Score (T2)	0.18	0.25	0.17	0.35	0.16	0.35	0.14	0.14	0.12	0.29	0.29	0.30
80. Peer Leadership Ratings (T2)	0.01	0.02	0.09	0.12	0.15	0.24	0.16	0.25	0.24	0.43	0.27	0.27
81. Peer Task Leadership Rank (T2)	-0.05	-0.02	0.00	0.02	0.06	0.16	0.14	0.17	0.16	0.24	0.20	0.14
82. Peer Social Leadership Rank (T2)	0.12	0.07	0.07	0.07	0.03	0.17	0.16	0.00	0.04	0.15	0.02	0.10
83. Peer Leadership Rank Composite (T2)	0.04	0.03	0.04	0.05	0.05	0.19	0.17	0.10	0.11	0.22	0.12	0.14
84. Peer Leadership Composite Score (T2)	0.04	0.03	0.07	0.09	0.10	0.24	0.19	0.17	0.18	0.34	0.20	0.21
85. Observer Leadership Ratings (T2)	-0.02	0.03	0.09	0.08	0.12	0.15	0.05	0.13	0.14	0.35	0.23	0.15
86. Observer Task Leadership Rank (T2)	-0.13	-0.07	-0.05	-0.06	0.02	0.03	0.05	0.11	0.04	0.23	0.19	0.04
87. Observer Social Leadership Rank (T2)	0.05	-0.02	0.03	0.03	0.04	-0.09	0.08	-0.01	0.01	0.21	0.15	-0.07
88. Observer Leadership Rank Composite (T2)	-0.06	-0.05	-0.02	-0.03	0.04	-0.03	0.08	0.07	0.03	0.27	0.21	-0.01
89. Observer Leadership Composite Score (T2)	-0.05	-0.02	0.03	0.02	0.08	0.04	0.08	0.10	0.09	0.34	0.24	0.05
90. Team Formation Stage (T2)	0.09	0.12	0.05	0.04	-0.04	-0.05	-0.12	-0.06	0.02	-0.15	-0.04	-0.05
91. Task Compilation Stage (T2)	0.17	0.15	0.16	0.14	-0.02	0.03	-0.04	-0.07	0.05	-0.05	0.03	0.01
92. Role Compilation Stage (T2)	-0.03	0.05	0.07	0.12	0.09	0.03	-0.04	-0.01	0.02	-0.03	-0.05	0.07
93. Team Compilation (T2)	0.08	0.10	0.04	0.04	-0.03	-0.02	-0.11	-0.09	0.00	-0.14	-0.10	0.02

Table 11h continued

Correlations – Time 1 Variables with Time 2 Variables

Variable	32	33	34	35	36	37	38	39	40	41	42	43	44	45
75. Self Leadership Ratings (T2)	0.25	0.16	0.18	0.21	0.07	0.18	0.57	0.25	0.05	0.18	0.41	0.34	0.37	0.25
76. Self Task Leadership Rank (T2)	0.21	0.08	0.16	0.22	0.18	0.15	0.35	0.46	0.31	0.50	0.53	0.27	0.32	0.30
77. Self Social Leadership Rank (T2)	0.22	0.24	0.15	-0.02	0.11	0.03	0.17	0.30	0.45	0.48	0.44	0.04	0.13	0.20
78. Self Leadership Rank Composite (T2)	0.26	0.20	0.19	0.12	0.18	0.11	0.32	0.47	0.46	0.59	0.59	0.19	0.27	0.30
79. Self Leadership Composite Score (T2)	0.31	0.22	0.22	0.19	0.16	0.16	0.49	0.46	0.37	0.53	0.63	0.30	0.37	0.34
80. Peer Leadership Ratings (T2)	-0.01	-0.09	0.00	0.42	0.25	0.19	0.26	0.18	-0.06	0.08	0.18	0.59	0.41	0.38
81. Peer Task Leadership Rank (T2)	-0.03	-0.07	0.03	0.31	0.18	0.11	0.15	0.19	0.06	0.16	0.18	0.35	0.43	0.40
82. Peer Social Leadership Rank (T2)	0.02	0.08	0.01	0.14	0.18	0.09	0.13	0.14	0.22	0.24	0.23	0.17	0.26	0.49
83. Peer Leadership Rank Composite (T2)	-0.01	0.01	0.02	0.26	0.21	0.12	0.16	0.19	0.16	0.23	0.24	0.30	0.40	0.52
84. Peer Leadership Composite Score (T2)	-0.01	-0.03	0.02	0.36	0.25	0.16	0.22	0.21	0.09	0.19	0.25	0.46	0.46	0.53
85. Observer Leadership Ratings (T2)	-0.06	-0.05	-0.02	0.18	0.12	0.02	0.21	0.14	0.06	0.13	0.20	0.35	0.31	0.21
86. Observer Task Leadership Rank (T2)	-0.13	-0.12	-0.04	0.15	0.07	0.12	0.06	0.11	0.07	0.11	0.11	0.20	0.25	0.14
87. Observer Social Leadership Rank (T2)	0.00	-0.03	-0.08	0.09	0.10	0.17	0.02	0.07	0.16	0.15	0.11	0.13	0.06	0.19
88. Observer Leadership Rank Composite (T2)	-0.09	-0.10	-0.07	0.15	0.11	0.18	0.04	0.11	0.12	0.15	0.13	0.20	0.19	0.20
89. Observer Leadership Composite Score (T2)	-0.09	-0.09	-0.06	0.18	0.13	0.14	0.12	0.14	0.11	0.16	0.18	0.29	0.27	0.23
90. Team Formation Stage (T2)	0.00	0.01	-0.04	-0.10	-0.10	-0.18	0.05	-0.06	0.06	0.00	0.03	-0.04	-0.11	-0.09
91. Task Compilation Stage (T2)	0.11	0.11	0.00	-0.01	-0.07	-0.03	0.17	0.02	0.05	0.04	0.11	0.05	0.01	-0.04
92. Role Compilation Stage (T2)	0.09	0.01	-0.03	0.00	-0.09	-0.04	0.13	0.05	-0.01	0.02	0.08	0.01	-0.04	-0.13
93. Team Compilation (T2)	0.05	0.11	0.03	-0.12	-0.13	-0.07	0.10	-0.11	-0.04	-0.10	-0.02	-0.09	-0.15	-0.22

Table 11h continued

Correlations – Time 1 Variables with Time 2 Variables

Variable	46	47	48	49	50	51	52	53	54	55	56
75. Self Leadership Ratings (T2)	0.36	0.39	0.25	0.25	0.14	0.23	0.26	0.14	0.15	0.13	0.09
76. Self Task Leadership Rank (T2)	0.35	0.36	0.14	0.20	0.02	0.13	0.15	0.05	0.07	0.03	-0.01
77. Self Social Leadership Rank (T2)	0.19	0.15	0.19	0.13	0.10	0.14	0.17	0.09	0.13	0.10	0.07
78. Self Leadership Rank Composite (T2)	0.33	0.31	0.20	0.20	0.07	0.16	0.19	0.09	0.12	0.08	0.04
79. Self Leadership Composite Score (T2)	0.41	0.41	0.27	0.27	0.12	0.22	0.26	0.13	0.16	0.12	0.07
80. Peer Leadership Ratings (T2)	0.46	0.57	0.21	0.26	0.16	0.24	0.25	0.02	-0.01	-0.18	-0.22
81. Peer Task Leadership Rank (T2)	0.48	0.49	0.10	0.11	0.06	0.10	0.11	0.05	-0.04	-0.17	-0.29
82. Peer Social Leadership Rank (T2)	0.43	0.38	0.14	0.08	0.13	0.12	0.14	0.16	0.06	0.00	-0.07
83. Peer Leadership Rank Composite (T2)	0.53	0.50	0.14	0.11	0.11	0.13	0.14	0.12	0.01	-0.10	-0.21
84. Peer Leadership Composite Score (T2)	0.56	0.59	0.19	0.18	0.14	0.19	0.21	0.10	0.00	-0.15	-0.24
85. Observer Leadership Ratings (T2)	0.30	0.36	0.24	0.21	0.17	0.22	0.25	0.11	0.08	-0.08	-0.11
86. Observer Task Leadership Rank (T2)	0.23	0.24	0.08	0.11	0.07	0.10	0.10	0.04	-0.04	-0.10	-0.18
87. Observer Social Leadership Rank (T2)	0.15	0.16	0.15	0.11	0.31	0.25	0.23	0.05	0.05	-0.09	-0.10
88. Observer Leadership Rank Composite (T2)	0.23	0.24	0.14	0.13	0.23	0.21	0.20	0.06	0.00	-0.12	-0.17
89. Observer Leadership Composite Score (T2)	0.29	0.33	0.20	0.18	0.24	0.24	0.25	0.09	0.04	-0.12	-0.17
90. Team Formation Stage (T2)	-0.11	-0.10	0.02	-0.16	-0.18	-0.20	-0.13	0.20	0.14	0.13	0.23
91. Task Compilation Stage (T2)	-0.02	0.01	0.03	-0.05	-0.15	-0.12	-0.07	0.18	0.22	0.19	0.19
92. Role Compilation Stage (T2)	-0.10	-0.06	0.05	-0.05	-0.22	-0.16	-0.09	0.10	0.17	0.20	0.21
93. Team Compilation (T2)	-0.21	-0.19	-0.05	-0.13	-0.20	-0.19	-0.15	0.25	0.24	0.27	0.36

Table 11i

Correlations – Time 1 Variables with Time 3 Variables

Variable	20	21	22	23	24	25	26	27	28	29	30	31
94. Self ILT – Sensitivity (T3)	0.46	0.23	0.24	0.22	-0.28	0.06	-0.11	-0.11	0.00	-0.07	-0.04	-0.06
95. Self ILT – Intelligence (T3)	0.25	0.43	0.15	0.24	-0.04	0.18	-0.03	0.06	0.02	0.12	0.04	0.09
96. Self ILT – Dedication (T3)	0.23	0.20	0.27	0.12	-0.22	-0.02	0.03	0.02	0.09	0.04	-0.01	0.01
97. Self ILT – Dynamism (T3)	0.20	0.23	0.16	0.48	0.10	0.26	-0.15	-0.06	-0.02	0.22	0.15	0.23
98. Self ILT – Tyranny (T3)	-0.18	-0.16	-0.07	0.14	0.57	0.20	-0.03	0.08	0.02	0.24	0.22	0.22
99. Self ILT – Masculinity (T3)	0.07	0.08	0.08	0.21	0.27	0.79	-0.08	0.07	-0.01	0.25	0.26	0.71
100.Peer ILT – Sensitivity (T3)	-0.01	-0.03	-0.02	-0.15	-0.08	-0.06	0.09	0.09	0.16	-0.07	-0.14	-0.05
101.Peer ILT – Intelligence (T3)	-0.03	0.09	-0.02	-0.05	0.01	0.08	0.13	0.37	0.30	0.15	0.03	0.07
102.Peer ILT – Dedication (T3)	-0.05	0.00	0.02	-0.14	-0.03	-0.06	0.09	0.16	0.29	0.08	0.00	-0.03
103.Peer ILT – Dynamism (T3)	-0.08	0.06	0.02	0.08	0.13	0.15	0.02	0.14	0.08	0.46	0.27	0.10
104.Peer ILT – Tyranny (T3)	-0.03	0.10	0.08	0.15	0.15	0.10	-0.05	0.04	0.04	0.33	0.45	0.05
105.Peer ILT – Masculinity (T3)	0.00	0.05	0.05	0.17	0.22	0.69	0.08	0.24	0.17	0.27	0.28	0.85
106.Self Task Roles (T3)	0.29	0.21	0.12	0.35	-0.09	0.12	0.01	0.10	0.08	0.08	0.05	0.13
107.Self Social Roles (T3)	0.37	0.17	0.19	0.25	-0.17	0.07	-0.01	-0.02	0.01	-0.08	-0.12	0.04
108.Self Boundary Spanning Roles (T3)	0.14	0.01	0.11	0.25	0.09	0.06	-0.02	0.05	0.00	0.03	-0.05	0.10
109.Peer Task Roles (T3)	0.00	-0.02	0.02	-0.08	-0.06	0.06	0.13	0.18	0.16	0.24	0.16	0.00
110.Peer Social Roles (T3)	0.09	0.00	0.01	-0.06	-0.12	0.03	0.14	0.12	0.14	0.06	-0.04	0.02
111.Peer Boundary Spanning Roles (T3)	0.02	-0.01	0.10	0.05	-0.02	0.04	0.00	0.07	0.07	0.18	0.15	-0.04

Note: *N* ranges 178-199. Correlations greater than $r = .14$ significant at $p < .05$. Correlations greater than $r = .19$ significant at $p < .01$. See Table 11b for Time 1 variable names.

Table 11i continued

Descriptive Statistics and Correlations – Time 1 Variables with Time 3 Variables

Variable	32	33	34	35	36	37	38	39	40	41	42	43	44	45
94. Self ILT – Sensitivity (T3)	0.25	0.31	0.15	-0.07	-0.06	-0.06	0.04	-0.03	0.23	0.13	0.12	-0.05	-0.10	-0.03
95. Self ILT – Intelligence (T3)	0.17	0.15	0.08	0.09	0.07	0.04	0.23	0.23	0.00	0.14	0.22	0.10	0.02	0.04
96. Self ILT – Dedication (T3)	0.14	0.14	0.04	0.09	0.12	0.08	0.18	0.08	-0.04	0.03	0.11	0.06	0.07	0.14
97. Self ILT – Dynamism (T3)	0.18	0.14	0.21	0.15	0.02	0.13	0.32	0.14	0.09	0.15	0.27	0.19	0.15	0.10
98. Self ILT – Tyranny (T3)	-0.11	-0.20	-0.03	0.15	0.03	0.06	0.14	0.18	-0.04	0.09	0.14	0.18	0.22	0.18
99. Self ILT – Masculinity (T3)	0.08	0.07	0.04	0.13	-0.01	0.13	0.32	0.21	0.04	0.16	0.28	0.29	0.21	0.15
100.Peer ILT – Sensitivity (T3)	-0.08	0.05	-0.06	0.03	0.06	-0.05	-0.08	0.02	0.05	0.05	0.00	0.06	0.00	0.13
101.Peer ILT – Intelligence (T3)	-0.01	-0.03	-0.11	0.17	0.18	0.03	0.06	0.20	0.01	0.13	0.13	0.18	0.04	0.08
102.Peer ILT – Dedication (T3)	-0.06	-0.05	-0.13	0.15	0.17	-0.01	-0.01	0.07	-0.03	0.02	0.01	0.18	0.09	0.16
103.Peer ILT – Dynamism (T3)	-0.07	-0.11	0.04	0.26	0.19	0.14	0.20	0.24	0.06	0.19	0.23	0.41	0.27	0.33
104.Peer ILT – Tyranny (T3)	-0.03	-0.18	-0.10	0.15	0.02	-0.03	0.08	0.14	0.03	0.10	0.12	0.15	0.19	0.13
105.Peer ILT – Masculinity (T3)	0.07	0.06	-0.08	0.20	0.08	0.09	0.24	0.16	0.12	0.18	0.25	0.26	0.14	0.08
106.Self Task Roles (T3)	0.25	0.29	0.10	0.08	0.11	0.16	0.26	0.17	0.21	0.24	0.31	0.06	0.05	0.07
107.Self Social Roles (T3)	0.24	0.38	0.14	-0.01	0.04	-0.01	0.14	-0.02	0.26	0.16	0.19	-0.03	-0.14	-0.12
108.Self Boundary Spanning Roles (T3)	0.17	0.11	0.19	0.01	0.04	0.10	0.15	0.11	0.10	0.13	0.17	-0.01	0.02	-0.02
109.Peer Task Roles (T3)	-0.15	-0.10	-0.12	0.18	0.23	0.04	-0.01	0.13	0.01	0.09	0.06	0.28	0.21	0.27
110.Peer Social Roles (T3)	-0.05	0.11	-0.04	0.07	0.16	-0.02	-0.01	0.11	0.15	0.17	0.12	0.16	0.09	0.16
111.Peer Boundary Spanning Roles (T3)	-0.05	-0.07	0.02	0.16	0.13	0.08	0.04	0.08	0.00	0.05	0.06	0.20	0.17	0.20

Table 11i continued

Descriptive Statistics and Correlations – Time 1 Variables with Time 3 Variables

Variable	46	47	48	49	50	51	52	53	54	55	56
94. Self ILT – Sensitivity (T3)	-0.08	-0.08	0.00	-0.06	0.12	0.04	0.03	0.11	0.08	0.04	0.03
95. Self ILT – Intelligence (T3)	0.03	0.07	0.02	0.00	0.09	0.05	0.04	0.13	0.07	0.06	0.04
96. Self ILT – Dedication (T3)	0.12	0.11	0.11	0.10	0.21	0.18	0.18	0.22	0.20	0.09	0.07
97. Self ILT – Dynamism (T3)	0.14	0.18	0.25	0.13	0.11	0.14	0.20	0.06	0.15	0.13	0.15
98. Self ILT – Tyranny (T3)	0.23	0.24	0.22	0.21	0.07	0.16	0.20	-0.14	-0.13	-0.13	-0.17
99. Self ILT – Masculinity (T3)	0.21	0.27	0.22	0.22	0.05	0.16	0.20	0.00	0.05	0.02	-0.06
100.Peer ILT – Sensitivity (T3)	0.07	0.08	-0.03	-0.08	-0.06	-0.08	-0.07	0.14	0.07	-0.03	-0.04
101.Peer ILT – Intelligence (T3)	0.07	0.12	0.00	-0.01	-0.14	-0.08	-0.06	0.14	0.04	-0.06	-0.04
102.Peer ILT – Dedication (T3)	0.14	0.18	0.03	0.03	0.02	0.03	0.04	0.20	-0.05	-0.06	-0.09
103.Peer ILT – Dynamism (T3)	0.34	0.41	0.31	0.24	0.23	0.27	0.31	0.10	0.08	-0.02	0.00
104.Peer ILT – Tyranny (T3)	0.18	0.19	0.17	0.18	0.19	0.22	0.22	-0.13	-0.14	-0.14	-0.13
105.Peer ILT – Masculinity (T3)	0.13	0.20	0.16	0.14	-0.07	0.04	0.09	-0.09	-0.08	-0.04	-0.03
106.Self Task Roles (T3)	0.07	0.08	0.17	0.01	-0.01	0.00	0.07	0.11	0.19	0.21	0.18
107.Self Social Roles (T3)	-0.15	-0.12	0.00	-0.05	0.01	-0.03	-0.02	0.13	0.19	0.11	0.18
108.Self Boundary Spanning Roles (T3)	0.00	0.00	0.11	0.01	-0.09	-0.04	0.01	0.09	0.22	0.22	0.21
109.Peer Task Roles (T3)	0.28	0.31	0.20	0.13	0.19	0.19	0.21	0.02	-0.08	-0.12	-0.18
110.Peer Social Roles (T3)	0.14	0.17	0.08	-0.05	-0.01	-0.04	0.00	0.07	0.05	-0.03	-0.01
111.Peer Boundary Spanning Roles (T3)	0.22	0.24	0.22	0.06	0.13	0.11	0.17	0.01	-0.04	-0.07	-0.08

Table 11i continued

Descriptive Statistics and Correlations – Time 1 Variables with Time 3 Variables

Variable	20	21	22	23	24	25	26	27	28	29	30	31
112.Self Leadership Ratings (T3)	0.09	0.16	0.13	0.31	0.21	0.28	0.06	0.07	0.08	0.28	0.18	0.24
113.Self Task Leadership Rank (T3)	0.02	-0.03	0.03	0.01	0.06	0.05	0.17	0.17	0.17	0.06	0.09	0.05
114.Self Social Leadership Rank (T3)	0.23	0.06	0.07	0.14	-0.07	0.02	0.06	0.04	0.10	0.07	0.02	0.01
115.Self Leadership Rank Composite (T3)	0.16	0.02	0.06	0.09	-0.01	0.04	0.14	0.13	0.16	0.08	0.06	0.04
116.Self Leadership Composite Score (T3)	0.16	0.08	0.11	0.22	0.09	0.16	0.14	0.13	0.16	0.19	0.13	0.14
117.Peer Leadership Ratings (T3)	-0.03	0.00	0.00	-0.06	0.00	0.15	0.03	0.11	0.12	0.25	0.22	0.15
118.Peer Task Leadership Rank (T3)	-0.02	-0.06	0.01	-0.07	-0.04	0.06	0.15	0.17	0.16	0.19	0.14	0.08
119.Peer Social Leadership Rank (T3)	0.17	-0.01	0.06	0.03	-0.10	0.03	0.13	0.03	0.06	0.08	0.04	0.05
120.Peer Leadership Rank Composite (T3)	0.08	-0.03	0.04	-0.02	-0.08	0.05	0.15	0.11	0.13	0.15	0.10	0.07
121.Peer Leadership Composite Score (T3)	0.04	-0.02	0.03	-0.04	-0.05	0.09	0.12	0.12	0.14	0.20	0.16	0.11
122.Observer Leadership Ratings (T3)	-0.07	-0.01	-0.01	-0.05	0.05	0.13	0.03	0.11	0.07	0.27	0.18	0.11
123.Observer Task Leadership Rank (T3)	-0.01	0.00	-0.06	-0.04	0.10	0.09	0.08	0.13	0.03	0.23	0.16	0.04
124.Observer Social Leadership Rank (T3)	0.00	-0.05	-0.05	-0.07	0.14	0.06	0.03	0.09	0.00	0.21	0.18	0.01
125.Observer Leadership Rank Composite (T3)	-0.01	-0.02	-0.06	-0.06	0.14	0.09	0.06	0.12	0.02	0.24	0.19	0.02
126.Observer Leadership Composite Score (T3)	-0.03	-0.02	-0.04	-0.06	0.12	0.11	0.05	0.12	0.04	0.27	0.20	0.07
127.Team Formation Stage (T3)	0.02	0.00	0.05	0.02	-0.06	-0.08	0.00	-0.06	0.06	-0.06	0.00	-0.01
128.Task Compilation Stage (T3)	0.16	0.07	0.06	0.10	-0.10	0.02	-0.01	0.01	0.11	-0.07	-0.08	0.07
129.Role Compilation Stage (T3)	0.05	0.00	0.09	0.04	-0.07	-0.03	-0.01	-0.03	0.08	-0.05	-0.03	0.05
130.Team Compilation (T3)	0.22	0.14	0.20	0.16	-0.09	0.07	-0.07	-0.06	0.04	-0.10	-0.02	0.07

Table 11i continued

Descriptive Statistics and Correlations – Time 1 Variables with Time 3 Variables

Variable	32	33	34	35	36	37	38	39	40	41	42	43	44	45
112.Self Leadership Ratings (T3)	0.16	0.07	0.12	0.20	0.15	0.23	0.45	0.33	0.05	0.24	0.40	0.32	0.36	0.32
113.Self Task Leadership Rank (T3)	0.04	-0.10	0.00	0.19	0.23	0.11	0.06	0.46	0.16	0.40	0.32	0.10	0.23	0.17
114.Self Social Leadership Rank (T3)	0.10	0.22	0.11	0.06	0.22	0.06	-0.03	0.22	0.45	0.44	0.31	0.05	0.08	0.17
115.Self Leadership Rank Composite (T3)	0.09	0.08	0.07	0.15	0.27	0.10	0.02	0.42	0.37	0.51	0.38	0.09	0.19	0.21
116.Self Leadership Composite Score (T3)	0.14	0.09	0.11	0.21	0.28	0.19	0.22	0.47	0.31	0.51	0.48	0.22	0.31	0.31
117.Peer Leadership Ratings (T3)	-0.15	-0.14	-0.07	0.21	0.18	0.09	0.11	0.14	-0.02	0.08	0.11	0.42	0.32	0.36
118.Peer Task Leadership Rank (T3)	-0.11	-0.10	-0.09	0.26	0.22	0.11	0.05	0.20	0.05	0.16	0.14	0.29	0.33	0.37
119.Peer Social Leadership Rank (T3)	-0.07	0.06	0.00	0.16	0.15	0.05	-0.01	0.11	0.14	0.16	0.11	0.19	0.24	0.35
120.Peer Leadership Rank Composite (T3)	-0.10	-0.02	-0.05	0.23	0.20	0.09	0.02	0.17	0.10	0.17	0.14	0.26	0.31	0.40
121.Peer Leadership Composite Score (T3)	-0.13	-0.07	-0.06	0.24	0.21	0.09	0.05	0.18	0.06	0.15	0.14	0.35	0.34	0.42
122.Observer Leadership Ratings (T3)	-0.11	-0.18	-0.01	0.19	0.15	0.17	0.12	0.11	0.00	0.07	0.10	0.31	0.28	0.28
123.Observer Task Leadership Rank (T3)	-0.08	-0.15	0.01	0.21	0.12	0.25	0.11	0.18	-0.02	0.10	0.13	0.30	0.34	0.27
124.Observer Social Leadership Rank (T3)	-0.05	-0.09	0.08	0.16	0.14	0.16	0.10	0.17	0.05	0.14	0.15	0.26	0.30	0.25
125.Observer Leadership Rank Composite (T3)	-0.07	-0.14	0.05	0.21	0.15	0.22	0.12	0.20	0.01	0.14	0.15	0.31	0.36	0.29
126.Observer Leadership Composite Score (T3)	-0.09	-0.16	0.03	0.21	0.16	0.22	0.12	0.18	0.01	0.12	0.15	0.33	0.35	0.30
127.Team Formation Stage (T3)	-0.02	0.11	0.00	-0.04	-0.02	-0.03	0.02	-0.08	0.16	0.05	0.05	-0.04	-0.08	0.01
128.Task Compilation Stage (T3)	0.07	0.21	-0.06	-0.02	-0.05	-0.08	0.02	-0.07	0.08	0.00	0.01	-0.04	-0.14	-0.16
129.Role Compilation Stage (T3)	0.00	0.12	-0.04	0.03	0.01	-0.03	0.03	0.00	0.09	0.06	0.06	0.02	-0.05	-0.06
130.Team Compilation (T3)	0.19	0.25	0.10	-0.15	-0.13	-0.13	0.12	-0.03	0.11	0.05	0.10	-0.08	-0.11	-0.15

Table 11i continued

Descriptive Statistics and Correlations – Time 1 Variables with Time 3 Variables

Variable	45	47	48	49	50	51	52	53	54	55	56
112.Self Leadership Ratings (T3)	0.40	0.41	0.27	0.18	0.18	0.21	0.26	0.11	0.13	0.12	0.00
113.Self Task Leadership Rank (T3)	0.24	0.21	0.07	0.02	0.03	0.03	0.05	-0.03	-0.11	-0.11	-0.12
114.Self Social Leadership Rank (T3)	0.14	0.12	-0.07	-0.14	0.04	-0.05	-0.07	0.02	0.05	-0.10	-0.07
115.Self Leadership Rank Composite (T3)	0.23	0.20	0.00	-0.07	0.05	-0.02	-0.01	-0.01	-0.03	-0.12	-0.12
116.Self Leadership Composite Score (T3)	0.36	0.34	0.13	0.03	0.11	0.08	0.11	0.04	0.03	-0.04	-0.09
117.Peer Leadership Ratings (T3)	0.39	0.45	0.19	0.18	0.15	0.19	0.21	0.09	-0.05	-0.16	-0.20
118.Peer Task Leadership Rank (T3)	0.40	0.41	0.17	0.16	0.17	0.19	0.20	0.06	-0.09	-0.18	-0.25
119.Peer Social Leadership Rank (T3)	0.34	0.32	0.08	0.04	0.15	0.11	0.11	0.10	0.04	-0.05	-0.13
120.Peer Leadership Rank Composite (T3)	0.41	0.40	0.14	0.11	0.18	0.17	0.17	0.09	-0.03	-0.13	-0.21
121.Peer Leadership Composite Score (T3)	0.44	0.45	0.17	0.15	0.18	0.19	0.20	0.10	-0.04	-0.15	-0.22
122.Observer Leadership Ratings (T3)	0.32	0.35	0.33	0.21	0.16	0.21	0.28	0.07	-0.01	-0.06	-0.06
123.Observer Task Leadership Rank (T3)	0.35	0.37	0.18	0.20	0.12	0.18	0.20	0.03	0.02	-0.06	-0.11
124.Observer Social Leadership Rank (T3)	0.32	0.33	0.15	0.17	0.24	0.24	0.22	0.05	-0.06	-0.04	-0.10
125.Observer Leadership Rank Composite (T3)	0.37	0.39	0.18	0.21	0.20	0.24	0.24	0.04	-0.02	-0.06	-0.12
126.Observer Leadership Composite Score (T3)	0.38	0.40	0.24	0.22	0.19	0.24	0.27	0.05	-0.02	-0.06	-0.11
127.Team Formation Stage (T3)	-0.04	-0.05	-0.08	-0.07	0.01	-0.04	-0.06	0.11	0.11	0.05	0.17
128.Task Compilation Stage (T3)	-0.17	-0.14	-0.09	-0.15	-0.05	-0.12	-0.12	0.11	0.09	0.08	0.16
129.Role Compilation Stage (T3)	-0.07	-0.04	-0.09	-0.10	-0.03	-0.07	-0.09	0.10	0.05	-0.05	-0.04
130.Team Compilation (T3)	-0.15	-0.14	-0.05	-0.10	-0.13	-0.14	-0.12	0.18	0.12	0.10	0.18

Table 11j

Descriptive Statistics and Correlations – Time 2 Variables with Time 3 Variables

Variable	57	58	59	60	61	62	63	64	65	66	67	68
94. Self ILT – Sensitivity (T3)	0.48	0.29	0.07	0.11	-0.38	0.03	0.18	-0.05	-0.04	-0.04	-0.13	-0.03
95. Self ILT – Intelligence (T3)	0.36	0.55	0.16	0.34	-0.04	0.23	0.10	0.15	0.00	0.11	0.07	0.11
96. Self ILT – Dedication (T3)	0.23	0.24	0.32	0.19	-0.19	0.05	0.02	0.06	0.11	0.12	0.03	-0.01
97. Self ILT – Dynamism (T3)	0.20	0.29	0.22	0.62	0.16	0.34	-0.01	0.17	-0.04	0.32	0.13	0.27
98. Self ILT – Tyranny (T3)	-0.15	-0.09	0.09	0.33	0.68	0.23	0.00	0.15	0.17	0.34	0.35	0.23
99. Self ILT – Masculinity (T3)	0.05	0.20	0.08	0.35	0.28	0.86	0.04	0.22	0.07	0.19	0.12	0.68
100.Peer ILT – Sensitivity (T3)	0.08	0.06	0.03	-0.13	-0.09	0.03	0.40	0.18	0.31	-0.02	-0.35	-0.05
101.Peer ILT – Intelligence (T3)	-0.05	0.10	0.04	-0.06	0.10	0.10	0.17	0.46	0.33	0.20	-0.01	0.12
102.Peer ILT – Dedication (T3)	-0.02	0.04	0.17	-0.09	0.03	-0.01	0.28	0.24	0.60	0.17	-0.09	0.00
103.Peer ILT – Dynamism (T3)	-0.03	0.12	0.21	0.28	0.28	0.17	0.03	0.33	0.25	0.67	0.34	0.15
104.Peer ILT – Tyranny (T3)	-0.08	0.01	0.08	0.22	0.33	0.07	-0.24	0.01	0.02	0.39	0.66	0.09
105.Peer ILT – Masculinity (T3)	-0.06	0.07	0.09	0.27	0.22	0.67	0.00	0.23	0.12	0.24	0.25	0.87
106.Self Task Roles (T3)	0.32	0.38	0.16	0.40	-0.02	0.22	0.07	0.16	-0.06	0.18	0.05	0.20
107.Self Social Roles (T3)	0.39	0.27	0.01	0.20	-0.21	0.11	0.14	0.05	-0.15	0.01	-0.21	0.05
108.Self Boundary Spanning Roles (T3)	0.19	0.21	0.16	0.40	-0.01	0.15	-0.02	0.08	-0.02	0.06	-0.06	0.10
109.Peer Task Roles (T3)	-0.02	0.01	0.06	-0.02	0.11	0.04	0.18	0.24	0.30	0.33	0.14	0.02
110.Peer Social Roles (T3)	0.07	0.00	0.00	-0.05	-0.14	0.04	0.32	0.14	0.15	0.10	-0.24	0.01
111.Peer Boundary Spanning Roles (T3)	-0.06	0.00	0.09	0.07	0.02	0.00	0.07	0.18	0.23	0.39	0.13	-0.05

Note: N ranges 178-199. Correlations greater than $r = .14$ significant at $p < .05$. Correlations greater than $r = .19$ significant at $p < .01$.
See Table 11c for Time 2 variable names.

Table 11j continued

Descriptive Statistics and Correlations – Time 2 Variables with Time 3 Variables

Variable	69	70	71	72	73	74	75	76	77	78	79	80	81	82
94. Self ILT – Sensitivity (T3)	0.19	0.39	0.05	-0.02	0.15	0.04	-0.03	-0.05	0.23	0.11	0.06	-0.05	-0.09	0.16
95. Self ILT – Intelligence (T3)	0.40	0.31	0.20	0.20	0.10	0.03	0.32	0.22	0.07	0.18	0.28	0.18	0.16	0.12
96. Self ILT – Dedication (T3)	0.24	0.24	0.06	0.23	0.14	0.18	0.17	0.03	0.03	0.03	0.10	0.20	0.11	0.10
97. Self ILT – Dynamism (T3)	0.36	0.28	0.25	0.18	0.09	0.16	0.34	0.17	0.16	0.20	0.30	0.22	0.12	0.10
98. Self ILT – Tyranny (T3)	0.22	-0.17	0.06	0.26	-0.02	0.12	0.36	0.28	-0.02	0.16	0.28	0.33	0.33	0.15
99. Self ILT – Masculinity (T3)	0.30	0.09	0.18	0.17	0.12	0.10	0.38	0.27	0.15	0.25	0.36	0.27	0.20	0.26
100.Peer ILT – Sensitivity (T3)	0.19	0.17	0.06	0.20	0.34	0.01	0.08	0.07	0.14	0.12	0.13	0.07	0.23	0.34
101.Peer ILT – Intelligence (T3)	0.24	0.03	0.08	0.37	0.15	0.11	0.25	0.30	0.08	0.23	0.29	0.28	0.34	0.18
102.Peer ILT – Dedication (T3)	0.17	0.06	0.00	0.41	0.18	0.19	0.19	0.13	-0.06	0.04	0.12	0.33	0.42	0.31
103.Peer ILT – Dynamism (T3)	0.28	0.00	0.04	0.50	0.18	0.40	0.35	0.25	0.07	0.19	0.30	0.52	0.37	0.27
104.Peer ILT – Tyranny (T3)	-0.04	-0.16	-0.16	0.25	-0.18	0.21	0.10	0.12	-0.13	-0.01	0.04	0.31	0.17	-0.07
105.Peer ILT – Masculinity (T3)	0.20	0.00	0.03	0.16	-0.01	0.08	0.30	0.32	0.11	0.26	0.34	0.30	0.18	0.12
106.Self Task Roles (T3)	0.62	0.51	0.35	0.12	0.06	0.04	0.40	0.14	0.27	0.25	0.37	0.14	0.14	0.19
107.Self Social Roles (T3)	0.35	0.54	0.26	-0.08	0.12	-0.06	0.09	-0.03	0.29	0.16	0.16	-0.07	-0.13	0.06
108.Self Boundary Spanning Roles (T3)	0.32	0.26	0.51	0.03	0.03	0.02	0.16	0.11	0.16	0.17	0.20	0.02	0.01	0.07
109.Peer Task Roles (T3)	0.14	0.02	-0.05	0.49	0.28	0.25	0.21	0.14	-0.02	0.08	0.15	0.43	0.47	0.34
110.Peer Social Roles (T3)	0.10	0.15	0.00	0.19	0.43	0.11	0.06	0.05	0.16	0.13	0.12	0.12	0.18	0.34
111.Peer Boundary Spanning Roles (T3)	0.06	-0.01	0.05	0.39	0.18	0.52	0.15	-0.01	-0.08	-0.06	0.03	0.32	0.27	0.17

Table 11j continued

Descriptive Statistics and Correlations – Time 2 Variables with Time 3 Variables

Variable	83	84	85	86	87	88	89	90	91	92	93
94. Self ILT – Sensitivity (T3)	0.04	0.01	-0.12	-0.24	0.05	-0.13	-0.14	0.08	0.18	0.08	0.19
95. Self ILT – Intelligence (T3)	0.16	0.19	0.06	-0.03	0.00	-0.01	0.02	0.22	0.21	0.19	0.29
96. Self ILT – Dedication (T3)	0.12	0.17	0.13	-0.02	0.09	0.04	0.08	0.05	0.10	0.08	0.18
97. Self ILT – Dynamism (T3)	0.13	0.19	0.16	0.04	0.06	0.05	0.11	0.12	0.12	0.15	0.15
98. Self ILT – Tyranny (T3)	0.28	0.33	0.28	0.22	0.07	0.18	0.25	0.04	0.01	0.11	-0.05
99. Self ILT – Masculinity (T3)	0.26	0.30	0.25	0.06	-0.01	0.03	0.13	0.05	0.08	0.09	0.02
100.Peer ILT – Sensitivity (T3)	0.33	0.27	0.18	0.10	-0.02	0.05	0.11	0.14	0.03	0.02	0.15
101.Peer ILT – Intelligence (T3)	0.30	0.33	0.32	0.26	0.03	0.17	0.26	0.07	0.01	0.02	0.10
102.Peer ILT – Dedication (T3)	0.43	0.44	0.27	0.18	0.08	0.15	0.23	0.18	0.10	0.04	0.10
103.Peer ILT – Dynamism (T3)	0.37	0.48	0.39	0.28	0.17	0.27	0.36	0.06	0.02	0.00	-0.03
104.Peer ILT – Tyranny (T3)	0.06	0.17	0.22	0.16	0.12	0.17	0.22	0.00	0.02	-0.01	-0.14
105.Peer ILT – Masculinity (T3)	0.17	0.24	0.20	0.11	-0.04	0.05	0.12	0.02	0.04	0.07	0.04
106.Self Task Roles (T3)	0.19	0.20	0.03	0.11	0.06	0.10	0.08	0.20	0.19	0.19	0.27
107.Self Social Roles (T3)	-0.04	-0.05	-0.14	-0.13	0.06	-0.05	-0.10	0.21	0.24	0.14	0.23
108.Self Boundary Spanning Roles (T3)	0.04	0.04	-0.12	-0.18	-0.05	-0.14	-0.15	0.10	0.17	0.26	0.20
109.Peer Task Roles (T3)	0.47	0.51	0.31	0.26	0.16	0.25	0.31	-0.02	-0.06	-0.11	-0.09
110.Peer Social Roles (T3)	0.31	0.27	0.16	0.10	0.01	0.07	0.12	0.05	0.04	-0.04	0.06
111.Peer Boundary Spanning Roles (T3)	0.25	0.31	0.22	0.24	0.14	0.23	0.26	-0.05	0.00	-0.06	-0.07

Table 11j continued

Descriptive Statistics and Correlations – Time 2 Variables with Time 3 Variables

Variable	57	58	59	60	61	62	63	64	65	66	67	68
112.Self Leadership Ratings (T3)	0.17	0.36	0.30	0.59	0.29	0.43	0.02	0.20	0.11	0.39	0.24	0.30
113.Self Task Leadership Rank (T3)	0.09	0.13	0.12	0.06	0.12	0.02	-0.04	0.10	0.14	0.06	0.16	0.06
114.Self Social Leadership Rank (T3)	0.23	0.10	-0.07	0.11	-0.12	0.01	0.17	0.02	-0.12	-0.01	-0.06	-0.05
115.Self Leadership Rank Composite (T3)	0.19	0.14	0.03	0.11	0.00	0.02	0.08	0.07	0.01	0.03	0.06	0.00
116.Self Leadership Composite Score (T3)	0.22	0.27	0.16	0.35	0.13	0.21	0.07	0.15	0.06	0.20	0.16	0.14
117.Peer Leadership Ratings (T3)	-0.10	0.07	0.12	0.03	0.21	0.17	0.16	0.33	0.45	0.47	0.25	0.18
118.Peer Task Leadership Rank (T3)	-0.17	0.00	0.09	-0.03	0.23	0.09	0.17	0.22	0.36	0.25	0.14	0.08
119.Peer Social Leadership Rank (T3)	0.02	0.06	0.07	0.03	0.05	0.08	0.31	0.06	0.21	0.15	-0.09	0.01
120.Peer Leadership Rank Composite (T3)	-0.08	0.03	0.09	0.00	0.15	0.09	0.26	0.16	0.31	0.22	0.03	0.05
121.Peer Leadership Composite Score (T3)	-0.09	0.05	0.11	0.01	0.19	0.13	0.25	0.24	0.39	0.34	0.12	0.10
122.Observer Leadership Ratings (T3)	-0.07	0.03	0.17	0.15	0.12	0.18	0.01	0.21	0.25	0.35	0.27	0.15
123.Observer Task Leadership Rank (T3)	-0.07	0.01	0.06	0.10	0.21	0.11	-0.07	0.13	0.10	0.27	0.26	0.07
124.Observer Social Leadership Rank (T3)	-0.02	0.04	0.02	0.15	0.20	0.08	0.00	0.05	-0.01	0.23	0.18	0.02
125.Observer Leadership Rank Composite (T3)	-0.05	0.02	0.04	0.14	0.23	0.11	-0.04	0.10	0.05	0.28	0.25	0.05
126.Observer Leadership Composite Score (T3)	-0.06	0.03	0.09	0.15	0.21	0.14	-0.03	0.15	0.13	0.32	0.28	0.09
127.Team Formation Stage (T3)	0.09	0.07	0.08	0.15	-0.13	0.01	0.21	0.11	0.14	0.08	-0.11	-0.01
128.Task Compilation Stage (T3)	0.23	0.18	0.07	0.17	-0.21	0.06	0.18	0.07	-0.02	-0.03	-0.13	0.04
129.Role Compilation Stage (T3)	0.09	0.10	0.05	0.07	-0.14	0.06	0.19	0.07	0.08	-0.03	-0.08	0.02
130.Team Compilation (T3)	0.20	0.17	0.05	0.10	-0.22	0.06	0.20	0.05	0.04	-0.06	-0.16	0.07

Table 11j continued

Descriptive Statistics and Correlations – Time 2 Variables with Time 3 Variables

Variable	69	70	71	72	73	74	75	76	77	78	79	80	81	82
112.Self Leadership Ratings (T3)	0.53	0.21	0.34	0.35	0.06	0.22	0.70	0.42	0.17	0.36	0.59	0.45	0.45	0.34
113.Self Task Leadership Rank (T3)	0.15	-0.07	0.04	0.11	-0.08	-0.01	0.23	0.57	0.43	0.61	0.55	0.16	0.36	0.24
114.Self Social Leadership Rank (T3)	0.15	0.20	0.04	-0.13	0.09	-0.13	0.02	0.24	0.54	0.48	0.36	-0.09	0.09	0.29
115.Self Leadership Rank Composite (T3)	0.18	0.08	0.05	-0.01	0.01	-0.09	0.15	0.49	0.59	0.66	0.55	0.05	0.27	0.32
116.Self Leadership Composite Score (T3)	0.38	0.16	0.20	0.15	0.03	0.04	0.44	0.57	0.53	0.67	0.70	0.24	0.42	0.40
117.Peer Leadership Ratings (T3)	0.20	-0.05	0.00	0.56	0.20	0.36	0.34	0.24	-0.05	0.11	0.24	0.66	0.59	0.38
118.Peer Task Leadership Rank (T3)	0.16	-0.06	-0.03	0.38	0.13	0.17	0.27	0.27	0.13	0.24	0.30	0.47	0.68	0.50
119.Peer Social Leadership Rank (T3)	0.18	0.13	0.01	0.20	0.29	0.13	0.16	0.15	0.25	0.24	0.25	0.27	0.43	0.68
120.Peer Leadership Rank Composite (T3)	0.19	0.04	-0.01	0.32	0.23	0.17	0.24	0.23	0.21	0.27	0.31	0.41	0.61	0.65
121.Peer Leadership Composite Score (T3)	0.21	0.01	-0.01	0.44	0.24	0.26	0.30	0.25	0.13	0.23	0.31	0.54	0.66	0.60
122.Observer Leadership Ratings (T3)	0.11	-0.09	-0.06	0.34	0.15	0.23	0.33	0.25	0.02	0.16	0.27	0.40	0.41	0.29
123.Observer Task Leadership Rank (T3)	0.06	-0.20	-0.13	0.24	0.03	0.15	0.24	0.26	0.04	0.18	0.24	0.30	0.33	0.22
124.Observer Social Leadership Rank (T3)	0.13	-0.08	-0.02	0.16	0.10	0.16	0.27	0.23	0.11	0.21	0.28	0.26	0.31	0.24
125.Observer Leadership Rank Composite (T3)	0.10	-0.16	-0.08	0.22	0.07	0.17	0.29	0.27	0.08	0.22	0.29	0.31	0.36	0.26
126.Observer Leadership Composite Score (T3)	0.11	-0.15	-0.08	0.28	0.10	0.21	0.32	0.29	0.06	0.21	0.30	0.37	0.40	0.28
127.Team Formation Stage (T3)	0.09	0.19	0.16	0.02	0.05	0.06	0.09	-0.01	0.00	-0.01	0.04	0.05	-0.04	0.00
128.Task Compilation Stage (T3)	0.15	0.32	0.22	-0.06	0.13	-0.01	0.07	-0.07	0.06	-0.01	0.03	-0.06	-0.10	-0.02
129.Role Compilation Stage (T3)	0.11	0.21	0.16	0.03	0.11	0.00	0.08	-0.05	-0.01	-0.03	0.01	0.04	0.02	0.04
130.Team Compilation (T3)	0.17	0.32	0.18	-0.02	0.15	0.07	0.07	-0.02	0.03	0.00	0.03	-0.03	-0.07	0.03

Table 11j continued

Descriptive Statistics and Correlations – Time 2 Variables with Time 3 Variables

Variable	83	84	85	86	87	88	89	90	91	92	93
112.Self Leadership Ratings (T3)	0.46	0.52	0.29	0.24	0.13	0.23	0.29	0.09	0.11	0.16	0.12
113.Self Task Leadership Rank (T3)	0.35	0.32	0.10	0.24	0.09	0.21	0.19	-0.08	-0.07	-0.01	0.02
114.Self Social Leadership Rank (T3)	0.22	0.12	-0.02	0.07	0.20	0.15	0.10	-0.08	-0.07	-0.05	-0.05
115.Self Leadership Rank Composite (T3)	0.34	0.26	0.05	0.19	0.18	0.22	0.17	-0.10	-0.08	-0.04	-0.01
116.Self Leadership Composite Score (T3)	0.48	0.44	0.17	0.26	0.19	0.27	0.27	-0.03	-0.01	0.05	0.04
117.Peer Leadership Ratings (T3)	0.56	0.68	0.44	0.31	0.13	0.27	0.38	0.05	0.01	-0.06	-0.03
118.Peer Task Leadership Rank (T3)	0.68	0.68	0.27	0.32	0.24	0.34	0.36	0.02	-0.03	-0.08	-0.10
119.Peer Social Leadership Rank (T3)	0.64	0.57	0.18	0.17	0.14	0.19	0.21	0.02	0.03	-0.05	-0.01
120.Peer Leadership Rank Composite (T3)	0.73	0.69	0.25	0.27	0.21	0.29	0.31	0.02	0.00	-0.07	-0.06
121.Peer Leadership Composite Score (T3)	0.73	0.74	0.34	0.31	0.19	0.31	0.36	0.03	0.00	-0.07	-0.06
122.Observer Leadership Ratings (T3)	0.40	0.45	0.48	0.37	0.24	0.37	0.47	0.16	0.05	0.01	0.04
123.Observer Task Leadership Rank (T3)	0.32	0.35	0.29	0.35	0.22	0.35	0.37	-0.05	-0.05	-0.10	-0.09
124.Observer Social Leadership Rank (T3)	0.32	0.33	0.19	0.23	0.25	0.29	0.29	-0.01	0.01	-0.03	-0.07
125.Observer Leadership Rank Composite (T3)	0.36	0.38	0.27	0.32	0.26	0.35	0.37	-0.03	-0.03	-0.08	-0.09
126.Observer Leadership Composite Score (T3)	0.40	0.44	0.36	0.36	0.27	0.38	0.43	0.03	0.00	-0.05	-0.05
127.Team Formation Stage (T3)	-0.02	0.00	0.03	-0.04	0.05	0.01	0.02	0.32	0.19	0.10	0.19
128.Task Compilation Stage (T3)	-0.07	-0.08	-0.09	-0.18	-0.01	-0.12	-0.13	0.30	0.28	0.16	0.27
129.Role Compilation Stage (T3)	0.04	0.04	0.07	-0.02	-0.03	-0.04	0.00	0.23	0.24	0.16	0.21
130.Team Compilation (T3)	-0.02	-0.03	-0.06	-0.12	-0.05	-0.11	-0.10	0.30	0.34	0.22	0.34

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