EXAMINING THE INFLUENCE OF LEADERSHIP ON TEAMS: LEADER CHARACTERISTICS, CONTEXTUAL FACTORS, TEAM PROCESSES AND TEAM EFFECTIVENESS

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To my family.

Your unwavering patience and encouragement
have taught me the greatest lesson of all. I love you.

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ABSTRACT

EXAMINING THE INFLUENCE OF LEADERSHIP ON TEAMS:
LEADER CHARACTERISTICS, CONTEXTUAL FACTORS,
TEAM PROCESSES AND TEAM EFFECTIVENESS

by Joseph R. Dettmann

Work teams are ubiquitous in organizations across the globe. Not only are organizations championing team-based work arrangements as effective, but empirical research supports work team effectiveness. Many team inputs and processes have been researched as necessary antecedents of team effectiveness. Sound leadership has been posited as a necessary team input, yet to date there is no well-accepted model of how leaders can influence teams in order to ultimately impact performance. The current study examines how leadership both directly and indirectly, through effecting team processes, influences team effectiveness. Over 300 employees at a global chemical company participated in a survey about leadership and teams. 94 leaders provided data as well as 81 teams (each with an average of four members). Descriptive and inferential analytics are used to evaluate 25 hypotheses about relationships in a proposed organizing framework. That framework aims to further our understanding of how leaders impact teams.

Some support is found for the notion that leader personality characteristics (Conscientiousness, Extraversion, and Agreeableness) are antecedent characteristics of distinct leadership styles. Limited support is found for the hypotheses that

Transformational Leadership, Initiating Structure and Consideration as leadership styles (input) directly impact team-effectiveness outcomes (output). Limited support is also found for the notion that these leadership styles more indirectly impact team effectiveness through three important team-level processes: team-level competencies, cohesion and potency (process).

The relationship between leadership styles and team processes may not be entirely direct. Process fostering is posited but not supported as an important moderator of the influence that leader behaviors have on team processes. Other moderators may exist and should be explored in the future. Further, in line with substantial empirical research, interdependence is found to be a contextual factor that influences whether or not team processes manifest and result in team performance.

This research will have implications for the leadership literature as well as for the team literature, and will be practically valuable to practitioners in understanding how to manage and develop effective teams.

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INTRODUCTION

The nature of work and conventional hierarchical organizational structures has changed (Mohrman & Cohen, 1995). Flatter, leaner organizations require a workforce that is empowered to make and act on decisions in order to substantially influence results (Lawler, 1992). Further, organizations require employees who are flexibly effective in adapting to different roles and tackling a multitude of diverse tasks. Employing team-based structures is a primary means by which organizations in the 21st century accomplish employee empowerment and workforce flexibility. Indeed the use of teams in organizations has become a very popular work design in many types of organizations. In an attempt to illuminate the prevalence of team use in the United States, Gordon (1992) reported that 82% of companies surveyed used teams. The ubiquity of teams in organizations is perhaps only overshadowed by the pervasiveness of writings on the subject. Although the study of teams and work groups has a long and continuous history in organizational studies, there is yet much we do not know about critical issues related to the management of work teams (Stevens and Campion, 1999).

The Effectiveness of Teams in Organizations

Practitioner enthusiasm for teams is almost fad-like. The manifestation of that enthusiasm (i.e., rapid movement to team use) results in a situation in which practice often comes before sound research. In other words, something is done without a good understanding of its effects and without knowing how to manage and support it. Teams apparently work well enough for organizations; their use would not be as longstanding if

they did not. Organizations report that the use of teams is effective in meeting desired outcomes (Devine, Clayton, Philips, Dunford, & Melner, 1999).

Rapid team-based organizational reconfigurations have made it difficult for researchers to keep up in providing empirical support for team practices. Although organizations report success in using teams, empirical evidence of that success is not often established. Fortunately, however, some empirically-based team research does support the notion of work team effectiveness. Cohen and Bailey (1997) reviewed the literature on teams and groups[1] in various organizational settings and on several dimensions of effectiveness. The authors conclude that many different group types (e.g., natural work groups, project-based teams) are effective in a multitude of organizational settings. Their conclusion is qualified with the caveat that across studies, certain group process variables, such as cohesion, were necessarily present for groups to be effective. Campion, Medsker, and Higgs (1993) conclude from the group literature in several different disciplines (i.e., social psychology, socio-technical theory, industrial engineering and organizational psychology) that teams can simultaneously increase both productivity and employee satisfaction–two common effectiveness criteria.

Although many positive outcomes of teams are documented, negative effects have been noted as well. In particular, teams can sometimes result in poor decision-making (Janis, 1972), conflict (Alderfer, 1977) and low productivity (Whyte, 1955). Much consideration has been given to the determinants of team effectiveness in the literature, yet more work is needed to determine what and how team inputs and processes influence team performance. Most approaches that examine factors contributing to team

[1] Although sometimes considered conceptually distinct, the terms 'team' and 'group' are often used interchangeably to describe related entities. These terms will be used interchangeably herein as well.

effectiveness follow McGrath's (1964) *input-process-output* model (Stewart & Barrick, 2000). Basically stated, the model indicates which group inputs (e.g., compositional factors) and processes (e.g., group cohesion) lead to desired outputs (e.g., productivity). Campion et al. (1993) identified several input and process variable categories that influence team effectiveness, including job design characteristics, process and goal interdependence, group compositional factors, contextual factors and internal team processes. It is beyond the scope of this work to review each of the variables subsumed under these categories. What is important is that team input and process variables are necessarily considered antecedents of team effectiveness. Although many process variables have been extensively studied, antecedents of most have yet to be empirically established.

It is not often clear in the literature which group inputs influence group processes that ultimately determine group effectiveness. Said another way, group processes are normally not explicitly examined as full or partial mediators of the relationship between group inputs and outputs. The nature of the simple model, *input-process-output*, assumes process mediation. As will be posited herein, a partially mediated model might best explain how certain inputs both directly and indirectly (through team processes) result in team outcomes. A primary purpose of the present study is to examine the relationship that leadership (a key input variable) has with team-level competencies, cohesion and potency (processes variables), and with team effectiveness (output).

A Model for Understanding Leadership, Team Processes and Team Effectiveness

There are few organizing frameworks that illustrate how leadership impacts team effectiveness (Zaccaro & Marks, 1999). Further, the effects of team-level competencies on team performance have not yet been explicitly explored. The current study addresses both of those issues. Based on an *input-process-output* design, the proposed research model (Figure 1) depicts the potential mediating role of team processes in the relationship between leadership style and team effectiveness. Also included in the model are leader traits that precede or underlie leadership styles as input variables. Finally, the research model also depicts the critical moderating roles of a leader characteristic (process fostering) in the link between leadership style and team process variables, and contextual factors in the link between team process variables and team effectiveness. Again, the proposed framework offers a test of the venerable *input-process-output* model and broadens it to include potentially important antecedent and moderating variables. Figure 1 illustrates each of the hypothesized relationships in the current study and generally provides a framework for understanding how leaders get results through their teams.

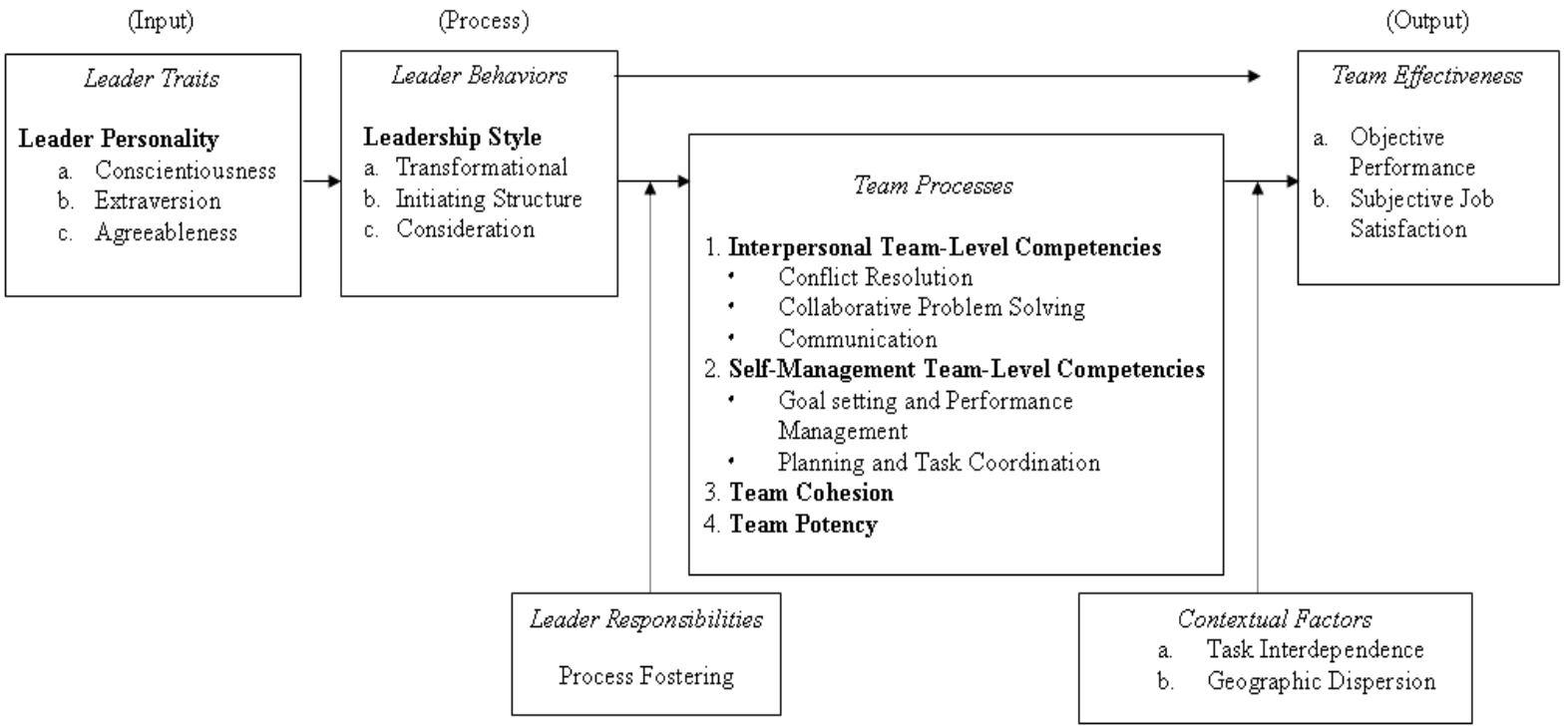

Figure 1. *The Influence of Leadership on Team Effectiveness through Team Process Variables*

Leadership and Team Effectiveness

Effective teams call for effective leadership (Zaccaro & Marks, 1999). Just as leadership is critical at the organizational level, so is it at the team level–although traditional organizational leadership and team leadership can differ. The team leader role (especially in autonomous and semi-autonomous work teams) can be doubly difficult as the leader is faced with the often-ambiguous task of balancing direction with team member autonomy and discretion. Team leaders often serve as facilitators, coordinators and coaches. In the present study, formally appointed team leadership will be examined. Stewart and Manz (1995) also examined formal team leadership, defining it as "…guidance and direction provided to a team by someone functioning in a role constituting formal authority to influence the team." This definition of team leadership is suitable for the present study, particularly because of its emphasis on leaders having the *authority* to *influence* the team.

Research has supported the notion that leadership can substantially impact team effectiveness both directly and indirectly. McIntyre and Salas (1995) provide evidence that team leaders serve as role models for team members. If a leader openly engages in teamwork (e.g., provides and accepts feedback), other team members are likely to do the same. This suggests that leaders can influence teamwork by modeling appropriate behaviors. Burpitt and Bigoness (1997) investigated and found a significant relationship between leaders' empowering behavior and perceptions of team innovation. Zaccaro and Marks (1995) reported qualitative analyses in which effective leadership of teams at different levels within an organization led to a successful organizational culture shift and improved processes at all levels. Certain leadership styles have also been found to be

particularly important in influencing team performance. Sosik, Avolio, Kahai, and Jung (1998) found that as Transformational Leadership increased, group effectiveness increased–primarily as a result of a greater exchange of ideas, consideration of more points of view, encouragement to challenge assumptions, and the cultivation of cooperation and efficacy (i.e., group process variables).

The positive direct effects of leadership on team effectiveness are notable. As suggested by an *input-process-output* model of team functioning, however, leadership as an input variable may also have an indirect effect on team effectiveness (partially mediated by process variables). The research model proposed in the current study suggests such a partially mediated relationship between leadership styles and team effectiveness.

Leader Characteristics

Three general leader characteristics are herein considered central in influencing teams. Leader personality traits, leadership style, and process fostering are all hypothesized to influence how leaders get performance through their teams. Leadership theories often take either a trait-based (innate) or behaviorally-based (learned) approach to describing the underpinnings of leadership effectiveness. As will be evident forthcoming, in the current study both traits and behaviors of leaders are considered fundamental in understanding leadership. Leader personality traits are hypothesized to relate specifically and differentially to leadership styles. This is hypothesized based on the notion that leader behaviors (leadership styles are collections of behaviors) are in part the manifestation of underlying traits. Further, empirical research has found certain

personality characteristics to be strong correlates of certain leadership styles (e.g., Judge & Bono, 2000; Lim & Ployhart, 2004). A discussion of how personality characteristics relate to leadership styles will be undertaken first.

Leader Personality

A meta-analysis of personality and leadership by Lord, De Vader and Alliger (1986) supported the notion that traits play a key role in leader effectiveness, and it highlighted the importance of considering personality in understanding leadership and the influence that leaders exert. Despite this support for trait theory, there has been dissention among leadership theorists regarding the idea that leadership effectiveness depends on the personality of leaders. In fact, House and Aditya (1997) stated that leadership scholars have conceded that "It appeared…that there were few, if any, universally accepted traits associated with leader effectiveness. Consequently…the search for universal traits was futile" (p. 410). Despite this dissention, several studies have demonstrated the importance of considering personality traits in understanding leader effectiveness. Notably, Judge, Bono, Ilies, and Gerhardt (2002) reported in their meta-analysis that the five-factor model has a multiple correlation of .48 with leadership effectiveness, and that Conscientiousness, Extraversion and Agreeableness lend particularly strong support to the trait perspective of leadership. The five-factor model of personality is a useful framework from which to estimate the relationship between personality and leadership.

Conscientiousness. Conscientiousness includes facets such as achievement, dependability, responsibility, self-discipline and attention to detail, and has been found to be important for several functions of leadership, such as goal setting and motivating

others (Kirkpatrick & Locke, 1991). Leaders must be persistent in what they do in order to get follow-through in their initiatives. Conscientious individuals are persistent and therefore expected to be more effective leaders. Judge et al. (2002) found Conscientiousness to correlate .28 with leadership (effectiveness and emergence) across 73 samples. Because conscientious individuals have a propensity for structure and rule following and are highly attentive to detail, it makes sense that such a characteristic might relate to a leadership style such as Initiating Structure. As will be discussed later, those who lead by Initiating Structure engage in activities such as structuring roles and setting up processes and procedures to be followed. A high degree of attention to detail by conscientious leaders might also relate to a preference for task-oriented behaviors by initiating leaders. Although the link between Conscientiousness and Initiating Structure fits theoretically, to date there has not been empirical work that examines this link. The aforesaid reasoning led to the following hypothesis:

> Hypothesis 1: *Leader Conscientiousness will be positively related to Initiating Structure.*

Surprisingly, no research could be found that examines the relationship between Conscientiousness and the leadership style Consideration. It is hard to make a theoretical case why the two might be either positively or negatively related, and what loosely-associated research that exists does not help to clarify this relationship. As such, a relationship between Conscientiousness and Consideration will not be hypothesized, but will be explored post-hoc.

Further, research fails to indicate that a meaningful relationship between Conscientiousness and Transformational Leadership exists (e.g., Judge & Bono, 2000).

This is somewhat perplexing as Conscientiousness is one of the more consistent personality correlates of leadership effectiveness (Judge et al., 2002), and Transformational Leadership has consistently been found to be a most effective leadership style. Yet, empirical research does not support what might seem to be an intuitive connection. For example, Lim and Ployhart (2004) found a non-significant negative relationship between follower-rated Transformational Leadership and leader self-report Conscientiousness. As such, a relationship between Conscientiousness and Transformational Leadership will not be hypothesized, but will be explored post-hoc.

Extraversion. Extraverts are sociable, assertive, have a positive affect, and are normally highly active. As pointed out by Taggar et al. (1999), the social confidence that extraverts possess may be important for leadership contexts that require much social interaction (as in team settings). Further, their tendency to be active and socially effective may be important in modeling team-working behaviors. Costa and McCrae (1988) reported that Extraversion is strongly related to social leadership. Judge et al. (2002), report Extraversion to be the most positive and consistent personality correlate of leadership across leadership criteria and settings. Because Extraversion seems to be the personality trait most closely relates to leadership, it is herein hypothesized that it will have a positive relationship with all three leadership styles.

This researcher could not locate empirical research linking Extraversion to Initiating Structure or Consideration, yet it is posited that to be effective in a leadership position one must be at least somewhat extraverted (i.e., to lead by an effective style). As such the following are hypothesized:

> Hypothesis 2: *Leader Extraversion will be positively related to Initiating Structure.*

Hypothesis 3: *Leader Extraversion will be positively related to Consideration.*

Hypothesis 4: *Leader Extraversion will be positively related to Transformational Leadership.*

The strength of the relationships between Extraversions and leadership styles could very well differ. As Costa and McCrae (1988) allude, Extraversion is a particularly important trait for person-oriented leadership styles. Because Initiating Structure is a more task-oriented leadership style, the relationship between it and Extraversion will likely be weaker than between the more social styles of Consideration and Transformational Leadership. The existing research on Extraversion and Transformational Leadership suggests that their link might be strongest of all. Judge and Bono (2000) found a significant corrected correlation of .28, while Lim and Ployhart (2004) found a significant correlation of .39. These are strong relationships considering the relative complexity of Transformational Leadership (i.e., having four distinctive factors). As such, the following is hypothesized:

Hypothesis 5: *Extraversion will differentially relate to leadership styles, such that Extraversion will have the strongest relationship with Transformational Leadership, the second strongest relationship with Consideration, and the weakest relationship with Initiating Structure.*

Agreeableness. Agreeableness is the tendency to be compliant and to trust and express genuine care for others. Zaccaro, Foti, and Kenny (1991) found interpersonal sensitivity to be related to leadership effectiveness. Because leaders high in Agreeableness are likely to be interpersonally sensitive, they are more likely to understand team members and form meaningful relationships with them. Some authors (e.g., Judge et al., 2002) have reasoned that the link between Agreeableness and

leadership is unclear, citing research that supports both positive and negative relationships. In their meta-analysis the authors found a correlation of just .08 between Agreeableness and leadership effectiveness. In terms of research examining the link between leadership styles and Agreeableness, the literature is either absent or inconsistent. Empirical work examining a relationship between Agreeableness and Consideration and Initiating Structure could not be found. It does make sense, however, that agreeable leaders might be perceived as more considerate than initiating because of their focus on interpersonal relationships and how they express genuine concern for others. There is not a readily apparent rationale for why initiating leaders might be high on Agreeableness. In fact, it could be argued that because they are less concerned with personal relationships and more task-oriented, they might be less agreeable (i.e., a negative relationship between Initiating Structure and Agreeableness). As such, the following relationships are hypothesized:

Hypothesis 6: *Leader Agreeableness will be negatively related to Initiating Structure.*

Hypothesis 7: *Leader Agreeableness will be positively related to Consideration.*

Interestingly, Judge and Bono (2000) found Agreeableness to be the strongest correlate of Transformational Leadership (corrected $r = .32$), while Lim and Ployhart (2004) found it to be significantly negatively correlated ($r = -.29$). Lim and Ployhart (2004) attributed this substantial difference to the nature of the samples used, and called for more research that examines the Agreeableness-Transformational Leadership relationship. This research answers that call and predicts a strong positive relationship between Agreeableness and Transformational Leadership.

Hypothesis 8: *Leader Agreeableness will be positively related to Transformational Leadership.*

The following is offered as a summary hypothesis for the relationships between personality characteristics and leadership styles:

Hypothesis 9: *Conscientiousness will have the strongest relationship with Initiating Structure, Agreeableness will have the strongest relationship with Consideration, and Extraversion will have the strongest relationship with Transformational Leadership.*

Leadership Styles

Leaders direct and communicate with followers and/or teams in different ways. Different leaders have different personal styles –some being more effective than others. Researchers have identified taxonomies of leadership behaviors that typify leaders. Stewart and Manz (1995) present a typology of leadership styles in which certain leader behaviors directly impact team members, which eventually either facilitate or hinder team effectiveness. Three leadership styles have been chosen for inspection in the current study. Transformational Leadership is contemporarily the most popular theory of leadership. The writings on Transformational Leadership over the past two decades are copious. Consideration and Initiating Structure are among the most venerable of leadership behavioral categories, but they have fallen from vogue in recent research. For reasons forthcoming, these three styles will be examined in the current study. Before an explanation of why, it is important to note that these styles are not likely mutually exclusive. It has generally been accepted that Transformational Leadership augments Consideration and Initiating Structure. It is also argued, however, that factors of Transformational Leadership need to be distinguished from Consideration (e.g., Bass,

1999), as there is evidence that overlap exists. For example, Seltzer and Bass (1990) reported moderate correlations between factors of Transformational Leadership and Consideration and Initiating Structure. It is herein expected that these styles do overlap to an extent and therefore hypothesized that:

> Hypothesis 10: *Transformational Leadership, Consideration, and Initiating Structure will be moderately positively related leadership styles.*

Consideration and Initiating Structure. Although Consideration and Initiating Structure are currently recognized as important to the history of what we know of leadership, Judge, Piccolo, and Ilies (2004) note that they have recently been described to be of limited validity and to have little utility in contemporary research and thinking. According to Judge et al. (2004), research on them has nearly completely fallen away, as only a handful of empirical journal articles have been published since 1980. Despite the modern-day belief that Consideration and Initiating Structure are outmoded, in their recent meta-analysis Judge et al. (2004) reported that Consideration (.48) and Initiating Structure (.29) do have moderately strong relations with outcomes. According to the authors, "It is striking how the validities for each behavior generalized across criteria, measures, and even over time and across sources" (p. 44). Their findings indicate, contrary to popular opinion, that these styles are in fact valid and quite robust in helping us to understand leadership effectiveness. For this reason the current study continues the revitalization of research on Consideration and Initiating Structure as they evidently continue to be important in our understanding of modern leadership.

Consideration is the degree to which leaders are concerned for, respect, and express appreciation and support for those whom they lead. Initiating Structure is the

degree to which leaders define and structure roles, are concerned with attaining goals, and define clear communication channels. It has been drawn from a considerable amount of research that Consideration correlates more strongly with follower satisfaction, whereas Initiating Structure correlates more strongly with performance-related outcomes due to a focus on meeting role expectations and an orientation towards tasks (Bass, 1990; Judge et al., 2004). As such, although team members may be more satisfied with considerate leaders, leaders who lead by a predominantly initiating style will likely be more effective in fostering team level processes and getting team results.

Transformational Leadership. A substantial amount of research has been done on different leadership styles as conceptualized by Bass (1985). Decades of research have supported Transformational Leadership as effective in enhancing the performance of a number of different entities, including groups (see Bass, 1997). Transformational Leadership is herein considered to be the most effective leadership style as well (i.e., more effective than Consideration and Initiating Structure in fostering important group processes and in getting results).

Transformational leaders engage primarily in four behavioral categories (factors): idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. Such leaders employ one or more of these four behavioral categories of Transformational Leadership in order to promote superior results in those whom they lead. The more of these behaviors leaders engage in (and the greater degree to which they do), the more transformational and effective they are.

Leaders exemplifying idealized influence serve as charismatic role models to followers (Judge & Bono, 2000). These leaders arouse devotion and involvement through

personal dynamics such as ideological stance, emotional appeals, and self-confidence (Kirby, Paradise, & King, 1992). They are willing to take stands on difficult issues and emphasize the ethical consequences of decisions. Further, they elevate the needs of group members to motivate and align them around a shared purpose (Sosik et al., 1998). Leaders who lead by inspirational motivation have a "gift" for seeing what is really important, and they transmit a sense of mission (Bass, 1985). They challenge followers with high standards, speak optimistically and with enthusiasm, and offer meaning and encouragement for what needs to be accomplished. Collectively, idealized influence and inspirational motivation comprise what has been more traditionally labeled charisma. Recent empirical research indicates that charisma plays an important role in promoting key process variables within teams, such as cooperation, due in large part to its appeal to relational concerns (e.g., Cremer & Knippenberg, 2002).

Intellectually stimulating leaders encourage followers to challenge assumptions of the mainstream and to take more risks (Kirby et al., 1992). They emphasize problem solving and the use of reasoning before taking action (Hater & Bass, 1988). They also enable followers to rethink the ways they do things, promote consideration of different viewpoints, and inspire collective action to promote group effectiveness (Bass, 1985). Promoting consideration of different viewpoints among followers is akin to fostering such process variables as cooperation, collaboration and communication. Further, inspiring collective action has been shown to result in increased team potency (Sosik et al., 1998).

Individualized consideration has been defined as appreciating and integrating the different needs and viewpoints of members within a group (Sosik et al., 1998), involving

providing a high degree of attention and support to individual followers. The transformational leader who leads by individualized consideration delegates projects to stimulate learning, provides coaching and teaching, and treats each follower as an important individual. Just as the individual followers of leaders who engage in individual consideration are more likely to set goals and manage their performance, so should teams be. Integrating different viewpoints should also promote processes such as cooperation and aid in resolving conflicts.

A Transformational Leadership style seems particularly well-suited in promoting team process variables because of its focus on getting followers to transcend self-interests for the common interests of a collective. The assumption that leadership efforts that restrict the self-interests of followers results in increases in important team processes has previously been made (e.g., Messick, Wilke, Brewer, Kramer, Zemke, & Lui, 1983). Transformational Leadership has also been empirically found to be consistently linked with positive outcomes and to have a strong positive effect on group norms, group cohesiveness, empowerment, and collective efficacy (Jung, 2001). The following are predicted based on this reasoning regarding leadership styles:

> Hypothesis 11: *Leader Consideration, Initiating Structure, and Transformational Leadership will all significantly positively predict team process variables (team-level competencies, team cohesion, and team potency).*
>
> Hypothesis 12: *Leader Consideration, Initiating Structure, and Transformational Leadership will all significantly positively predict team effectiveness criteria.*

Consistent with Bass's (1985) hypothesis, the following are also hypothesized:

> Hypothesis 13: *Leadership styles will differentially predict team processes (team-level competencies, team cohesion and team potency), such that Transformational Leadership will be the strongest predictor, Initiating Structure will be the second strongest, and Consideration the third strongest.*

Hypothesis 14: *Leadership styles will differentially predict effectiveness criteria, such that Transformational Leadership will be the strongest predictor, Initiating Structure will be the second strongest, and Consideration the third strongest.*

Process Fostering

Leaders have different views regarding their roles in leading teams. Whether or not leaders deem it their duty to develop and maintain team processes will be a determinant of the impact that leadership styles have on fostering processes. Process fostering is herein defined as the degree to which leaders perceive it to be their responsibility to develop and maintain processes in their teams. If leaders recognize developing and maintaining team processes as central responsibilities they will be more likely to foster processes than if they do not. This notion of process fostering is rooted in the leadership literature, in what Mumford and Connelly (1991) identified as leaders' 'monitoring personnel resources'. Process fostering is also conceptually related to what Marks and Panzer (2004) termed team monitoring. These authors found that monitoring teammates' behaviors benefited performance by enhancing facilitative processes such as coordination and feedback. Their sample comprised teams without formal leadership, but, as they alluded to, monitoring team processes is an important activity of leaders when formal leadership exists as well.

If leaders see developing and maintaining team processes as responsibilities extraneous to their role, they will exert less influence over them and teams will be less likely to engage in them. Leadership styles may have little impact on team processes if leaders don't appreciate the importance of helping to build and preserve such processes.

It follows that process fostering will be an important moderator of leadership style-team process relationships:

> Hypothesis 15: *Process fostering will moderate the relationships between leadership styles (Initiating Structure, Consideration and Transformational Leadership) and team processes (team-level competencies, team cohesion and team potency), such that the posited relationships will be stronger when leaders are high on process fostering than when they are low on process fostering.*

Team Process Variables

Klimoski and Jones (1995) have noted that it is not enough for team members to possess individual-task competencies alone to ensure team effectiveness. Effective teams also depend upon group and member characteristics that make possible smooth team functioning (Muchinsky, 2000). Team processes have been extensively studied. Recent meta-analyses capture the legacy of research that has been done on variables such as cohesion (e.g., Beal & Cohen, 2003; Gully, DeVine, & Whitney, 1995). Consideration must be given to factors that account for good interpersonal relations. In the current study, particular attention will be given to understanding one new category of team processes and two conventionally important processes.

Team-Level Competencies. Cannon-Bowers, Tannenbaum, Salas and Volpe (1995) described the importance of considering team-level competencies above and beyond individual-level competencies in impacting team effectiveness. In a review of literature from many different domains (i.e., socio-technical systems theory, organizational behavior, industrial engineering and social psychology), Stevens and Campion (1994) examined theories and findings relevant to team-level competencies. In considering underlying similarities, they condensed and classified pertinent information into a taxonomy of the knowledge, skill, and ability (KSA) requirements of teamwork.

The taxonomy includes two general competencies, with five sub-competencies and 14 specific KSAs. Table 1 is the taxonomy as it appears in Stevens and Campion (1994).

Although Stevens and Campion (1994) did not overtly recognize team-level KSAs as process variables, they are fitting in that capacity. Indeed they overlap with some traditionally researched team process variables. Focusing on competencies is important because KSAs are presumed to be somewhat stable characteristics that can be influenced. The current study is the first to look at team-level competencies, as described by Stevens and Campion (1994), as team-process variables that can be influenced by leadership.

Cohesion. Group cohesion is recognized as being composed of member interpersonal attraction, group pride, and task commitment- each of which has been tied to various domains of effectiveness (e.g., Beal & Cohen, 2003). Cohesive teams presumably perform effectively because members are highly motivated to perform well and are better able to coordinate activities. Group cohesion has been a central variable in literally hundreds of empirical and theoretical pieces (see meta-analyses by Beal & Cohen, 2003; Evans & Dion, 1991; Gully et al., 1995; Mullen & Cooper, 1994). Generally it can be concluded that cohesive teams are more effective teams, although the link between cohesion and effectiveness is stronger under certain conditions (e.g., when tasks are highly interdependent; see Gully et al., 1995).

Although much work has been done to link cohesion to outcomes, less research has examined the possible antecedents of team cohesion. Factors such as leadership (e.g., Jung, 2001), however, have been posited to be important. Clarifying the antecedents of cohesion is important because of its well-established link to group effectiveness.

Table 1. *Knowledge, Skill, and Ability (KSA) Requirements for Teamwork*

I. INTERPERSONAL KSAs

A. Conflict Resolution

1. The KSA to recognize and encourage desirable, but discourage undesirable, team conflict.
2. The KSA to recognize the type and source of conflict confronting the team and to implement an appropriate conflict resolution strategy.
3. The KSA to employ and integrate (win-win) negotiation strategy rather than the traditional distributive (win-lose) strategy.

B. Collaborative Problem Solving

4. The KSA to identify situations requiring participative group problem solving and to utilize the proper degree and type of participation.
5. The KSA to recognize the obstacles to collaborative group problem solving and implement appropriate corrective action.

C. Communication

6. The KSA to understand communication networks, and to utilize decentralized networks to enhance communication where possible.
7. The KSA to communicate openly and supportively, that is, to send messages which are: (1) behavior- or event-oriented; (2) congruent; (3) validating; (4) conjunctive; and (5) owned.
8. The KSA to listen non-evaluatively and to appropriately use active listening techniques.
9. The KSA to maximize consonance between nonverbal and verbal messages, and to recognize and interpret the nonverbal messages of others.
10. The KSA to engage in ritual greetings and small talk, and the recognition of their importance.

II. SELF-MANAGEMENT KSAs

D. Goal Setting and Performance Management

11. The KSA to help establish specific, challenging, and accepted team goals.
12. The KSA to monitor, evaluate, and provide feedback on both overall team performance and individual team member performance.

E. Planning and Task Coordination

13. The KSA to coordinate and synchronize activities, information, and task interdependencies between team members.
14. The KSA to help establish task and role expectations of individual team members, and to ensure proper balancing of workload in the team.

Note. From Stevens and Campion (1994).

Recently, Pillai and Williams (2004) reported that Transformational Leadership builds team member commitment and high performing work groups via enhancing group

cohesion. In other words, cohesion was a mediating variable that was influenced by leadership and that resulted in specific outcomes. Effective leadership might be a necessary input in achieving cohesion among group members.

Potency. Team potency and collective efficacy are extensions of Bandura's (1986) self-efficacy construct, which refers to individual-level confidence in abilities. Team potency is the collective belief of group members that they can be communally effective (Guzzo, Yost, Campbell, & Shea, 1993). Team potency and collective efficacy are related, yet discernible concepts that both regard confidence at the group level. When a group collectively believes that it can be effective at completing a specific task or in a specific context or situation, it is said to convey collective efficacy. Team potency is that collective confidence generalized across tasks, contexts and situations. A team that conveys potency generally believes that it can be effective no matter what it might encounter.

Potency's relationship with team effectiveness criteria is fairly well researched. Substantial empirical evidence demonstrates potency to be both an antecedent (cause) and a consequence (effect) of team effectiveness- i.e., it has a reciprocal and longitudinal relationship with team effectiveness (Pearce, Gallagher, & Ensley, 2002). In other words, teams that are more potent are as a result more effective, and teams that are more effective are as a result more potent. Potency has been established as a significant positive predictor of team effectiveness (e.g., Larson & LaFasto, 1989; Sosik, Aviolio, & Kahai, 1997).

Just as is the case with cohesion, research has focused less on the potential antecedents of team potency than on its outcomes, although potency has been shown to

be influenced by such input variables as communication, cooperation (Lester, Meglino, & Korsgaard, 2002) and leadership (e.g., Guzzo & Dickson, 1996). Empirical findings support leadership as a key antecedent of the development of team potency. Guzzo et al. (1993) suggested that Transformational Leadership enhances group potency, and others have produced empirical work to confirm this (e.g., Bass & Avolio, 1994; Sosik et al., 1997). Charismatic leadership (see Lester et al., 2002) and Transformational Leadership (see Sivasubramaniam, Murry, Avolio, & Jung, 2002) have been found to be key influences on the development of group potency over time. This is further support that leadership plays a central role in fostering potency.

Further clarifying the antecedent variables of team potency is important because of its strong relationship with team effectiveness. Potent groups are also likely to develop self-fulfilling prophecies regarding successfully changing their workplaces for the better (Hackman, 1990), and they have been shown to better adapt in the face of adversity (Larson & LaFasto, 1989).

Team Processes and Team Effectiveness

The competencies developed by Stevens and Campion (1994) have not yet been tested as team process variables that directly impact team effectiveness. Stevens and Campion (1999) have, however, examined their team-level KSAs as individual characteristics that predict effectiveness. Based on their taxonomy of team KSAs, the authors created a selection test to be used in team settings. The authors found criterion-related validity of the measure with supervisory and peer ratings of teamwork and overall job performance. Important to note, Stevens and Campion (1999) looked at the team competencies at the individual level (i.e., to what extent do individuals possess those

KSAs), whereas the current study will be examining the KSAs at the team level (i.e., to what extent do team members believe that their team collectively possesses the KSAs). Although the levels of analyses differ, findings by Stevens and Campion (1999) can be considered initial evidence of the validity of team KSAs predicting team-level performance. The following three hypotheses regard the relationship between team process and team effectiveness:

Hypothesis 16: *Team-level competencies will be positively predictive of team effectiveness.*

Hypothesis 17: *Team cohesion will be positively predictive of team effectiveness.*

Hypothesis 18: *Team potency will be positively predictive of team effectiveness.*

As the *input-process-output* model suggests, process variables have also been tested and found to be mediators of input and outcome variable relationships (e.g., Stewart & Barrick, 2000). Recently, Pillai and Williams (2004) found support for a partially mediated model in which one leadership style (Transformational Leadership) had both direct and indirect (through the development of self-efficacy and the team process group cohesiveness) effects on group outcomes. The authors found support for the model when looking at an affective outcome (commitment) and subjectively-rated unit performance. The current research extends Pillai and Williams' (2004) partially mediated model by examining additional leadership styles, antecedents of those styles, and potentially important moderators of *input-process-output* relationships. Further, the current research builds on their work by examining the model with a more objective measure of team performance. As the proposed research model suggests, a partially mediated model best describes the intervening nature of team processes in the impact that

leadership has on team effectiveness. The following partial mediation hypothesis is posed:

> Hypothesis 19: *The relationship between leadership styles and team effectiveness will be partially mediated by team processes (team-level competencies, potency and cohesion). As such, leadership styles will have both direct and indirect effects through team processes in predicting team outcomes.*

The Moderating Effects of Contextual Factors

The importance of understanding the contexts in which teams operate sometimes goes overlooked. The relationships between team processes and outcomes are likely influenced by characteristics in the workplace. Two team contextual factors will be examined as important dynamics in which teams function: how interdependent teams are in completing tasks and the geographic dispersion of team members.

Team Interdependence. Interdependence is a defining characteristic of teams. Task interdependence largely promotes team-member interaction, as interdependent tasks require group members to work together often (McGrath, 1984). Research suggests that in order for groups to develop homogeneous beliefs (e.g., in their potency), substantial group-member interaction is required (Jung & Sosik, 2003). Empirical findings indicate that team process variables such as cooperation (Wageman & Baker, 1997), helping behavior (Allen, Sargent & Bradley, 2003), cohesiveness and the development of group norms (Shanley & Langfred, 1998), group control over decision making (Liden, Wayne, & Bradway, 1998), and group autonomy (Langfred, 2000) depend on the level of task interdependence within a team–in all cases important process variables being more common in teams that are more interdependent than in those that are less interdependent.

Team-level competencies, cohesion and potency may be less relevant in teams if team members do not often interact in order to complete their work. Because teams by nature require task interdependence, and because task interdependence has been established as an important moderator of team processes and outcomes, the following moderation hypotheses are proposed:

> Hypothesis 20a: *The relationship between team-level competencies and team effectiveness will be stronger when teams are more interdependent than when they are less interdependent.*
>
> Hypothesis 20b: *The relationship between team cohesion and team effectiveness will be stronger when teams are more interdependent than when they are less interdependent.*
>
> Hypothesis 20c: *The relationship between team potency and team effectiveness will be stronger when teams are more interdependent than when they are less interdependent.*

Geographic Dispersion. Technology and geographic dispersion have fundamentally changed the way people relate at work. Organizations now more than ever have multiple geographically dispersed locations, yet organizational members must still communicate and coordinate effectively in order to be successful. Technological communication mediums such as e-mail and video- and tele-conferencing connect people virtually. Ample research shows that such communication channels do not provide the same important qualities of face-to-face communication, particularly when there are high levels of ambiguity and complexity in messages (Armstrong & Cole, 1995). Many of the important subtleties of face-to-face communication are lost, such as body language and intonation. Further, due primarily to the absence of others' social presences, individuals who communicate virtually react to each other with less politeness, empathy and inhibition (Short, Williams, & Christie, 1976). In geographically dispersed groups such

impoliteness and lack of inhibition has been shown to lead to less awareness of other group members' needs (e.g., McGrath, 1990), more conflict and less consensus among group members (e.g., Hiltz, Johnson, & Turoff, 1986). Also, Armstrong and Cole (1995) discussed how conflict is expressed, recognized and addressed much more slowly in remotely-operating groups. Such research suggests that the communication and coordination challenges that result from distance between team members can lead to group dysfunction and inhibit the development of group processes (e.g., cooperation and conflict management) and the effect those processes have on team effectiveness. For these reasons the following are hypothesized:

> Hypothesis 21a: *The relationship between team-level competencies and team effectiveness will be stronger when teams are less geographically dispersed than when they are more geographically dispersed.*
>
> Hypothesis 21b: *The relationship between team cohesion and team effectiveness will be stronger when teams are less geographically dispersed than when they are more geographically dispersed.*
>
> Hypothesis 21c: *The relationship between team potency and team effectiveness will be stronger when teams are less geographically dispersed than when they are more geographically dispersed.*

CHAPTER II

METHOD

To promote the external validity (i.e., generalizability) of findings in teams research, it is important to identify and report the context in which a team operates and the particular type of team being studied. Further, it has been argued and empirically demonstrated that leadership is largely dependent upon the context in which one is expected to lead. Zaccaro and Marks (1999) maintain that leadership is very much contextual-that team type and a leader's position within the organization are important considerations in assessing the influence leadership has on teams. Although all contextual variables could not be empirically assessed in the current framework, many additional leadership and team factors are recognized as important herein. For this reason the organizational environment in which the current sample of leaders and teams operates are reviewed.

Setting and Participants

The participating organization is a wholly-owned subsidiary of a Fortune 500 multinational corporation whose primary business is chemicals and plastics. The company's corporate headquarters is in the United States, yet it has several locations throughout the world. The large majority of its growth in the past few decades has been outside of the U.S. This results in a great amount of remote teamwork. Geographic dispersion is managed by heavy investment in web- and tele-conferencing technologies. Structure-wise, the company has traditionally been hierarchical in nature, yet it now operates largely as a matrix organization. Cross-functional teams are a basic structure at all levels in the organization. The participating organization also has a long history of

investing in the identification and continuous development of its leadership talent, particularly top management and those on their way to top management.

The Participating Subsidiary and Teams. A subsidiary of the larger organization was chosen in the current study for a number of reasons. First, it is a self-contained global business, which will allow for a sampling of leaders across geographies and functions within one organization. Generalization of study results can thus be maximized as inferences across contexts can better be made. Second, the subsidiary has a strong leadership- and teams-focused culture. Third, the study fit well with the subsidiary's existing principles of performance management (e.g., enabling extraordinary team performance). Finally, the subsidiary has an established performance metric that served as an objective outcome.

Ninety-four of the subsidiaries' top leaders, up to and including its Chief Executive Officer, and their management teams participated in the current study. These teams ranged in size from 3-6 members. Although all teams were composed of management personnel, team members ranged in educational level (high school education to advanced degrees) and area of expertise. Most of the teams were intact (i.e., permanent or semi-permanent in nature) and while some were cross functional in nature, the majority operated within functions and had function-specific responsibilities. Each team had specific goals as defined by the organization and as shared and driven by team leaders.

Measures

Leader personality, leadership style, cohesion, potency, team interdependence, and job satisfaction were all measured using metrics that have been previously reported

in the literature. Team-level competencies were assessed via a measure directly adapted from Stevens and Campion's (1994) selection tool. The measures for process fostering and geographic dispersion were designed specifically for this study. Finally, objective team performance was measured via an objective criterion obtained from the participating organization. A more detailed description of each measure follows.

As is common in teams research, a statistical check is necessary in order to justify aggregating data collected at the individual level to the team level. The Intra-class Correlation Coefficient (ICC) is often used as a measure of association when studying the reliability of raters. Such study is appropriate for a number of variables in the present study. Shrout and Fliess (1979) published guidelines on selecting the proper coefficient by which to assess inter-rater reliability. It is common practice today to report both ICC(1) (one-way random-effects ANOVA model) and ICC(2) (provides an estimate of the reliability of group means) and that is done in the present study. In evaluating adequate agreement, James (1982) suggests an ICC(1) coefficient of at least .12 and Glick (1985) suggests a coefficient of at least .60 for ICC(2). These inter-rater agreement statistics are reported for all relevant aggregated variables in Table 2.

Personality. Leaders were asked to provide self-ratings of their personality characteristics. Conscientiousness, Extraversion and Agreeableness were measured via scales from the International Personality Item Pool (IPIP). Leaders provided self-ratings on a five-point scale, ranging from 1 = 'strongly disagree' to 5 = 'strongly agree'. The scale for each of the personality traits of interest has 10 items. Each scale demonstrated solid reliability estimates (Conscientiousness, alpha: .79; Extraversion, alpha: .87; Agreeableness, alpha: .82; see Goldberg, 1999).

Consideration, Initiating Structure, and Transformational Leadership. Leaders were asked to provide self-ratings on the behaviors that compose Consideration, Initiating Structure and Transformational Leadership. Also, all team members were asked to rate their leaders' leadership styles. Research on multi-source feedback indicates that direct-reports' ratings of leadership are more accurate (i.e., more closely related to ratings by other sources and more closely linked to actual performance) than leaders' self-ratings (e.g., Atkins & Wood, 2002). Self-ratings often tend to be inflated (Podsakoff & Organ, 1986). For this reason, an average of all complete direct-report ratings was considered a leader's leadership style and used in analyses. The *Leadership Behavior Description Questionnaire* (*LBDQ*, Form XII) was used to measure Consideration and Initiating Structure. Leaders and team members provided ratings on the 20-item LBDQ on the frequency of the leaders' engagement in behaviors, ranging from 1 = 'never' to 5 = 'always'. A mean for each item and across all items for each rater was produced. The *LBDQ* is the best available and most frequently cited measure of Consideration and Initiating Structure (Schreisheim & Kerr, 1974). Transformational Leadership was measured by items from the *Multifactor Leadership Questionnaire* (*MLQ*)-Form 5x-Short (Bass & Avolio, 2000). The *MLQ* also has sound psychometric properties and measures five distinct leadership styles, including Transformational Leadership (most effective), contingent reward leadership, active management-by-exception leadership, passive management-by-exception leadership and laissez-faire leadership (least effective). Only the four factors of Transformational Leadership (idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration) are of interest in the current study, as they collectively compose Transformational Leadership; and

therefore only the 20 items from the *MLQ* that measure those factors were used. Leaders and team members provided ratings on the frequency of the leaders' engagement in the behaviors, ranging from 0 = "not at all" to 4 = "frequently, if not always". When looking at ratings provided by team members, inter-rater agreement was examined and ICC(1) and ICC(2) for each leadership style are reported in Table 2. The results of the ICC(1) analysis for each leadership style exceeded the minimum threshold of agreement (.12), supporting aggregation of the data. The results of the ICC(2) analysis for Consideration also exceeded the minimum threshold of agreement (.60), while the results for Transformational Leadership and Initiating Structure were slightly below threshold. The researcher took these findings as support for aggregating the leadership style measures to the group level.

Process Fostering. On a 7-point scale, ranging from 1= "strongly disagree" to 7 = "strongly agree", leaders were asked to rate the degree to which they feel that it is their responsibility to develop and maintain conflict resolution, communication, collaborative problem solving, goal setting and performance management, planning and task coordination, cohesion and potency. An example item is as follows: "As team leader, it is my responsibility to develop and maintain collaborative problem solving among members." A mean of the ratings across all processes formed the degree to which a leader perceived fostering team processes as his or her responsibility.

Team-Level Competencies. The fourteen specific KSAs that were proposed by Stevens and Campion (1994) were slightly rephrased to assess the degree to which team members believed their team possessed those competencies. Team members were asked to rate each item on a 7-point agreement scale, ranging from 1 = "strongly disagree" to 7

= “strongly agree.” A mean for each item and across items for the different competencies for each rater was produced. An example item is as follows: “This team recognizes and encourages desirable, but discourages undesirable, team conflict.” As displayed in Table 1, specific KSAs 1-10 make up interpersonal team-level competencies, while KSAs 11-14 compose self-management team-level competencies. While the researcher examined results for all of team-level competencies (i.e., Total Team-Level Competencies) rolled together, the two more specific yet still exhaustive constructs of interpersonal team-level competencies self-management team-level competencies were examined and used to evaluate the study hypotheses. The ICC(1) and ICC(2) of each competency were examined before aggregating team member ratings, and the results are shared in Table 2. The results of the ICC(1) analysis for each competency exceeded the minimum threshold of agreement, supporting data aggregation. The results of the ICC(2) analysis for the competencies approximated but did not exceed the minimum threshold of agreement. The researcher took these findings as moderate support for aggregating the team competency measures to the group level.

Potency. Guzzo et al. (1993) developed an eight-item measure of team potency that has demonstrated sound psychometric properties (e.g., internal consistency), and that has been used recently by a number of researchers (e.g., Jung & Sosik, 2003; Pearce, Gallagher, & Ensley, 1992). This measure was used in the current study. Team members provided ratings on a 5-point scale (1= “strongly disagree” to 5= “strongly agree”); an example item being: “No task is too tough for our group.” A mean for each item and across all items for each rater was produced. Before aggregating team member potency ratings, ICC(1) and ICC(2) results were examined. The results of the ICC(1) analysis

exceeded the minimum threshold of agreement, supporting data aggregation, but the results of the ICC(2) analysis did not. The researcher took these findings as moderate support for aggregating the potency measure to the group level.

Team Cohesion. Cohesion is a measure of attraction to the group that is a result of the relationships that group members form with each other (Zaccaro, 1991). Cohesion was measured by combining scales from Cook (1981) and O'Reilly, Caldwell, and Barnett (1989). Balthazard, Waldman, Howell, and Atwater (2002) and Bauer (2002) recently employed this combined 9-item scale, reporting reliability estimates (coefficient alpha) of .85. This scale was chosen for use in the current study in part because items focus on the group-level phenomena, rather than the individual level. Level of analysis is an important consideration when conducting group-level research. After an assessment of level of analysis effects on the cohesion-performance relationship, Gully et al. (1995) suggest that group-level measurements are most appropriate when concerned with group-level constructs. Team members provided ratings on a five-point scale, ranging from 1 = "strongly disagree" to 5 = "strongly agree." A mean for each item and across all items for each rater was produced. An example item from the scale is: "On our team, members appear to feel that they are really part of the group." Before aggregating team cohesion ratings, ICC(1) and ICC(2) results were examined. The results of the ICC(1) analysis exceeded the minimum threshold of agreement, supporting data aggregation, but the results of the ICC(2) analysis did not. While the ICC(2) did not exceed the threshold it did approximate it, and the researcher took these findings as support for aggregating cohesion to the group level.

Geographic Dispersion. A measure of geographic dispersion was created for the current study. Team members were asked to choose which of five response options best describes their team in terms of geographic proximity. Response options for team members are as follows: (1) "We operate VERY proximally: Our Leader and ALL or MOST of my teammates are based at the same location.", (2) "We operate MOSTLY proximally: Our leader and SOME of my teammates are based at the same location.", (3) "We operate SOMEWHAT proximally and remotely: I'm in a different location, but our leader and SOME of the team is based at the same location.", (4) "We operate MOSTLY remotely: I'm in a different location, and our leader and MOST of the team is based at different locations.", or (5) "We operate VERY remotely: I and all of my team members (including our leader) are based at different locations." Team members' responses were combined to get an overall index (mean rating) of geographic dispersion for each team.

Team Interdependence. A highly interdependent team consists of members who regularly share information and materials in the completion of group tasks. An adaptation of a task interdependence scale reported in and used by Ven der Vegt, Emans, and Van de Vliert (2000, 2001), and Ven der Vegt and Janssen (2003) was used in the current study. The 5-item scale has demonstrated adequate reliability. The items and their responses options were modified slightly for the current study. As the items have been used in the past they assess task interdependence at the individual level (e.g., "I need information and advice from my colleagues to perform my job well"). The items were rephrased to assess interdependence focused at the group level (e.g., "On our team, members need information and advice from each other to perform their jobs well"). Team members were asked to provide ratings on a 7-point scale, ranging from 1 = "strongly disagree" to 7 =

"strongly agree." A mean for each item and across all items for each rater was produced. Given the reorientation of this scale it was more appropriately labeled Team Interdependence in the current study. Before aggregating team interdependence ratings, ICC(1) and ICC(2) results were examined. The results of both analyses exceeded the minimum thresholds of agreement and the researcher therefore concluded support for aggregating the team interdependence measure to the group level.

Team Effectiveness. Two measures of team effectiveness were assessed in the current study: (1) Leader Consensus Rankings and (2) Team Member Job Satisfaction. Senior management at the participating organization brings to bear several 'hard' performance indicators, including financial performance for the leaders' groups, performance against function-specific established goals (e.g., in R&D, number of new product developments), in a consensus ranking process. In an extended forum, performance on these indicators is considered and each leader is discussed relative to his/her peers. Each leader is ranked into a performance classification: (*falls below expectations*, *meets expectations*, or *exceeds expectations*). The classifications are intended to be normally distributed, such that the majority of leaders fall into the *meets expectations* classification. The performance classification of each leader is communicated and decisions regarding promotions and/or developmental action are made based upon them. Although seemingly an individual assessment, leaders' classifications are considered by the organization as direct reflections of the performance of leaders' teams. In other words, a leader is considered as good as the team that he/she leads. In this study, these data are considered a somewhat objective measure of team effectiveness and labeled Leader Consensus Rankings.

Theories (e.g., Gladstein, 1984) and empirical evidence (e.g., Campion et al., 1993) indicate that work group or team effectiveness is defined not only in terms of productivity but also employee satisfaction. Much of the research on team effectiveness has relied on affective outcomes. Campion et al. (1993) found potency, communication/cooperation, social support, and workload sharing to be team processes predictive of group productivity as well as satisfaction. Obtaining employee satisfaction data from a source other than the study survey (e.g., from an established organizational survey) or from team members at another point in time would have been ideal in order to minimize the effects of common method variance. Unfortunately, due to organizational constraints this was not possible in the current study. Appreciating that common method variance may inflate correlations between team processes and subjective effectiveness criteria, they were still deemed important to examine. Using a single source (i.e., team members) for ratings of both team characteristics and satisfaction has been done in previous research (e.g., Van der Vegt, Emans, & Van de Vliert, 2001).

Team Member Job Satisfaction was examined as the subjective outcome in the current study. A three item measure of overall job satisfaction from the Michigan Assessment Questionnaire was used. Cook (1981) and Seashore, Lawler, Mirvis and Camman (1982) all reported on this measure. The items are as follows: "All in all, I am satisfied with my job," "In general, I don't like my job" (reverse coded), and "In general, I like working here." Team members will be asked to provide ratings on a 7-point scale, ranging from 1 = "strongly disagree" to 7 = "strongly agree". A mean for each item and across all items for each rater was produced. Individual ratings of job satisfaction were aggregated to the group level. Aggregate job satisfaction has been used as a criterion in

recent teams research (e.g., Campion, Papper, & Medsker, 1996; Van Der Vegt at al., 2001), in which adequate reliability estimates are reported. Before aggregating job satisfaction ratings, ICC(1) and ICC(2) results were examined. The result of neither analysis exceeded the minimum thresholds of agreement and the researcher therefore concluded no support for aggregating the job satisfaction measure to the group level.

CHAPTER III

RESULTS

Descriptive statistics and correlations for the variables included in the current study are included in Tables 2 and 3. Depicted are coefficient alpha reliability estimates, inter-rater agreement estimates, means, standard deviations, and variable intercorrelations. The measures' reliabilities ranged from .58 (leader self-rated Initiating Structure) to .84 (leader self-rated Extraversion and Transformational Leadership). While leaders' ratings of their own Consideration and Initiating Structure were relatively low (.60 and .58, respectively), they were deemed to be adequate for the current study.

The relationships among the study variables were also observed. It is worth noting that in all cases relationships were stronger between variables rated by the same source, suggesting that some effects may be artificially inflated due to common method variance. With that observed, in evaluating each hypothesis the researcher reports and evaluates all possible sources of data as to draw conclusions that are as accurate as possible.

As for leader personality variables, Agreeableness correlated positively with both Extraversion and Conscientiousness. The relationship between Agreeableness and Extraversion was positive and statistically significant, whereas the correlation between Extraversion and Conscientiousness was not significant. The new variable, Process Fostering, correlated significantly and positively with Conscientiousness, suggesting that conscientious leaders are likely to perceive it to be their responsibility to develop and maintain effective processes in their teams.

Conscientiousness, Extraversion, Agreeableness and Process Fostering all correlated positively (most being statistically significant) with Transformational

Leadership, Initiating Structure, and Consideration, when the leadership styles were self-rated by leaders. When using direct report ratings of the leadership styles, the relationship between personality variables and the leadership styles were not significant. One interpretation is that common method variance may account for the relationship between leaders' personality variables and their self-rated behaviors.

Leader personality variables were not related to team processes and/or either measure of team effectiveness. Strong positive correlations between leaders' traits and team processes and outcome criteria were not expected, as personality has a more indirect influence, through their expression as leaders' own behaviors.

As for leadership styles, Transformational Leadership, Initiating Structure, and Consideration were all highly correlated (statistically significantly) when rated within-source. That is, all styles overlap when rated by leaders themselves, or when rated by direct reports. Said another way, leaders who see themselves leading by one style also see themselves leading by the others. And direct reports who see their leaders leading by one style also see them leading by the others. This suggests some overlap in the leadership style constructs, and the influence of common method variance is also likely. Regarding the correlations between each leadership style as self-rated by leaders and as rated by their direct reports, only Transformational Leadership demonstrated any convergent validity and it was modest, with a correlation of .27 ($p < .05$) between leader self- and direct report-rated styles. The other correlations were not significant. Leaders who perceive themselves to be transformational are also generally seen by their direct reports to be so.

Table 2. *Scale Reliabilities, Inter-Rater Agreement, Means, and Standard Deviations of Study Measures*

Measures	a	ICC(1)	ICC(2)	M	SD
Leader Personality & Process Fostering					
1. Conscientiousness	.74	n/a	n/a	4.15	.46
2. Extraversion	.84	n/a	n/a	3.58	.58
3. Agreeableness	.68	n/a	n/a	4.19	.40
4. Process Fostering*	n/a	n/a	n/a	6.27	.48
Leadership Styles					
5. Transformational Leadership	.84	n/a	n/a	4.14	.36
6. Initiating Structure	.58	n/a	n/a	3.87	.34
7. Consideration	.60	n/a	n/a	4.12	.33
Direct Report Ratings					
8. Transformational Leadership	n/a	.22	.52	3.86	.39
9. Initiating Structure	n/a	.24	.56	3.75	.30
10. Consideration	n/a	.30	.63	3.90	.37
Team Processes					
11. Interpersonal Team Competencies	n/a	.16	.43	5.40	.52
12. Self-Management Team Competencies	n/a	.18	.47	5.31	.69
13. Total Team-Level Competencies	n/a	.19	.49	5.36	.58
14. Team Cohesion	n/a	.14	.40	4.11	.27
15. Team Potency	n/a	.24	.55	4.06	.35
Contextual Factors					
16. Team Interdependence	n/a	.29	.63	5.48	.74
17. Geographic Dispersion*	n/a	n/a	n/a	3.67	1.24
Effectiveness Criteria					
18. Job Satisfaction	n/a	.08	.26	6.04	.46
19. Leader Consensus Rankings*	n/a	n/a	n/a	119.99	2.36

Note. N = 94 for measures 1-7, N = 81 measures 8-18, and N = 74 for measure 19. a = reliability coefficient. ICC = Intraclass Correlation Coefficient. M = Mean. SD = Standard Deviation. * Process Fostering, Geographic Dispersion and Leader Consensus Rankings are single-item measures, so no reliability estimate.

Table 3. *Correlations for Study Variables*

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Leader Personality and Process Fostering																			
1. Conscientiousness	--																		
2. Extraversion	-.09	--																	
3. Agreeableness	.19	.20*	--																
4. Process Fostering	.25*	.03	.08	--															
Leadership Styles																			
Leader Self Ratings																			
5. Transformational Leadership	.16	.27**	.26*	.25*	--														
6. Initiating Structure	.29**	.12	.26*	.34**	.52**	--													
7. Consideration	.31**	.31**	.40**	.23*	.56**	.54**	--												
Direct Report Ratings																			
8. Transformational Leadership	.02	.07	.06	.08	.27*	.04	.15	--											
9. Initiating Structure	.14	-.10	.13	.12	.05	.11	.18	.73**	--										
10. Consideration	.02	.06	.20	.03	.09	-.02	.21	.83**	.68**	--									
Team Processes																			
11. Interpersonal Team Competencies	.15	.07	.18	.12	.19	.17	.35**	.63**	.72**	.63**	--								
12. Self-Management Team Competencies	.14	.01	.15	.14	.18	.23*	.30**	.66**	73**	.60**	.84**	--							
13. Total Team-Level Competencies	.15	.04	.17	.14	.20	.22	.34**	.67**	.76**	.64**	.95**	.97**	--						
14. Team Cohesion	.02	.10	.14	-.08	.25*	.18	.23*	.40**	.41**	.28*	.29**	.42**	.38**	--					
15. Team Potency	.06	.17	.15	.04	.26*	.14	.22*	.66**	.54**	.61**	.64**	.59**	.63**	.36**	--				
Contextual Factors																			
16. Team Interdependence	-.06	.12	.18	.17	.25*	.24*	.34**	.41**	.41**	.34**	.42**	.54**	.51**	.39**	.41**	--			
17. Geographic Dispersion	.25*	.08	.13	-.31**	.06	-.17	-.08	.11	.10	.16	.09	.11	.10	.16	.22*	.11	--		
Effectiveness Criteria																			
18. Job Satisfaction	.03	-.06	.01	.07	.30**	-.04	.09	.50**	.36**	.39**	.40**	.43**	.43**	.22*	.51**	.35**	.12	--	
19. Leader Consensus Rankings	.10	.08	.09	.18	.20	.03	.06	.25*	.25*	.24*	.22	.22	.23	.08	.19	.09	.01	.21	--

Note. N = 94 for variables 1-7, N = 81 variables 8-18, and N = 74 for variable 19. ** = statistical significance at the .01 level, * = statistical significance at the .05 level.

The relationship between leader self-reported leadership styles and team process variables (again, as rated by direct reports) were all positive, some significantly so. Consideration was the most consistent correlate, being significantly related to all team processes. The relationship between leadership styles as rated by direct reports and team process variables were all positive, statistically significant, and much stronger than the when using leaders self-report data. Again, the fact that these correlations were stronger suggests some influence of common method variance.

Looking at the relationship between leadership styles and team effectiveness criteria, when using leader self-report data, Transformational Leadership correlated significantly and positively with team member Job Satisfaction ($r = .30$, $p < .01$), but not with Leader Consensus Rankings. The other leadership styles, as self-rated by leaders, did not correlate significantly with team effectiveness criteria. When using direct report data, all three leadership styles correlated significantly and positively with both team member Job Satisfaction and Leader Consensus Rankings. The relationship between direct report rated leadership styles and Leader Consensus Rankings is especially notable, as the consensus rankings were a metric captured independently of both leaders and direct reports. In other words, it is the most objective measure available in the study.

Team process variables were all highly correlated with one another. This suggests that employees perceive their teams to be holistically effective or not effective, having effective interpersonal processes, self-managing well, and being both cohesive and potent.

All team process variables were significantly and positively correlated with Job Satisfaction. While Total Team-Level Competencies were also significantly correlated

with Leader Consensus Rankings, the individual facets of Interpersonal and Self-Management Team Competencies were not. Neither team Cohesion nor Potency was significantly correlated with Leader Consensus Rankings.

To test Hypothesis 1, that leader Conscientiousness is positively related to Initiating Structure, two separate zero-order correlations were observed. As can be seen in Table 3, when looking at leader self-ratings of Initiating Structure, the correlation was significant and positive ($r = .29$, $p < .01$) as hypothesized. When ratings by direct reports of Initiating Structure were used in the correlationsal analysis, the relationship was also positive, yet not statistically significant ($r = .14$, $p = ns$). In sum, only partial support for Hypothesis 1 can be concluded. Of note, leader Conscientiousness was also significantly positively correlated with leader self-reported Consideration ($r = .31$, $p < .01$), but was not significantly related to Consideration as rated by direct reports. Conscientiousness was also not significantly positively related with Transformational Leadership as self-reported by leaders or as reported by direct reports.

In order to test Hypotheses 2-4, that leader Extraversion is related to each of Initiating Structure, Consideration, and Transformational Leadership, correlations between leader Extraversion and each of the leadership styles were observed. As can be seen in Table 3, for both leaders' self-rated and direct reports' rated Initiating Structure, the resulting correlations were not significant. No support was found for Hypothesis 2, as Extraversion does not have a significantly positive relationship with Initiating Structure.

Some support was found, however, for both Hypotheses 3 and 4. Leader Extraversion was significantly and positively related to leader self-reported Consideration ($r = .31$, $p < .01$), but non-significantly related to direct report rated Consideration ($r =$

.06, *p* = *ns*). Similarly, leader Extraversion was significantly and positively related to the leader self-report measure of Transformational Leadership (r = .28, *p* < .01), but non-significantly related to the direct reports measure of Transformational Leadership (r = .07, *p* = *ns*). Therefore there was partial support for Hypotheses 3 and 4.

The bivariate correlations were also considered in order to test the hypothesis that Extraversion differentially relates to leadership styles. Support for this hypothesis would be concluded if Extraversion did in fact have the strongest correlation with Transformational Leadership, the second strongest with Consideration, and the weakest correlation with Initiating Structure. As predicted and as shown in Table 3, correlations between Extraversion and Initiating Structure were weakest (and non-significant). This was the case when using both self-report and direct-report measures of Initiating Structure. Although Extraversion was posited to have the strongest relationship with Transformational Leadership, its correlation with Consideration was slightly stronger when using the self-report measure of the leadership styles and about the same when using the direct report measures. These relationships are very close in strength (and when tested not significantly different), indicating that Extraversion is equally if not more strongly correlated with Consideration than with Transformational Leadership. Extraversion was not meaningfully related to any of the leadership styles when they were rated by direct reports. Given this lack of relationship and lack of support for the ordering of the magnitude of relationship when using leader self-report data, Hypothesis 5 was not supported.

In order to test Hypotheses 6-8, correlations between leader Agreeableness and each of the leadership styles were observed. Support for Hypothesis 6 would be

concluded if a significantly negative correlation exists between Agreeableness and Initiating Structure. This was not the case, as when the leader self-report measure of Initiating Structure was used in the analysis the resulting correlation was positive and significant (r = .26, $p < .05$). Further, when the direct report measure of Initiating Structure was used the correlation was also positive, yet non-significant (r = .13, $p = ns$). Support was thus not found for Hypothesis 6, as Agreeableness likely has more of a positive than a negative relationship with Initiating Structure.

Some support was found, however, for Hypotheses 7 and 8. Leader Agreeableness was positively and significantly related to the leader self-report measure of Consideration (r = .40, $p < .01$), and positively but not significantly to the direct report measure of Consideration (r = .20, $p = ns$). Similarly, Agreeableness was positively and significantly related to leader self-report measure of Transformational Leadership (r = .26, $p < .05$), but not to the direct report measure of Transformational Leadership (r = .06, p = ns). Thus only partial support for Hypotheses 7 and 8 are concluded.

To test summary Hypothesis 9, that Conscientiousness will have the strongest relationship with Initiating Structure, Agreeableness will have the strongest relationship with Consideration, and Extraversion will have the strongest relationship with Transformational Leadership, the correlations in Table 3 were again examined. The relevant correlations are depicted in Table 4.

When using leader self-ratings of their leadership styles, Conscientiousness has the strongest relationship with Initiating Structure (.29). The relationship between Conscientiousness and Consideration was also positive and significant (.22).

Table 4. *Correlations between Leadership Styles and Personality Traits*

Leadership Styles	*Personality Traits*		
	Agreeableness	Conscientiousness	Extraversion
Consideration	.40* (.20)	[a].22* (.02)	.31* (.06)
Initiating Structure	.26* (.13)	.29* (.14)	.12 (-.10)
Transformational Leadership	.28* (.06)	[a].16 (.02)	.27* (.07)

Note. N = 94 for correlations including leader self-rated leadership styles, and N = 81 for correlations including direct report rated leadership styles. Values given in ( ) are correlations when using direct report data for the leadership style measures. * = statistical significance at the .05 level. Correlations using direct report leadership style ratings are provided in parentheses. [a] indicates that the given relationship was not hypothesized.

The difference between these two correlations was tested and was not statistically significant ($t = .64$, $p = ns$) however, weakening the argument that Conscientiousness clearly ties most closely to Initiating Structure. The correlational difference between Conscientiousness and Initiating Structure (.29) and Conscientiousness and Transformational Leadership (.16) was also tested and was not significant ($t = 1.11$, $p = ns$). While at face value Conscientiousness and Initiating Structure have the strongest relationship, the differences between the correlations are not large enough to evidence clear differentiation.

While when using direct report ratings of the leadership styles the correlation between Conscientiousness and Initiating Structure is strongest (.14), none of the correlations are statistically significant or meaningful. As such a test of the correlational differences was not necessary. Taking this with the conclusion that the relationship between Conscientiousness and Initiating Structure is not significantly stronger than the relationships between Conscientiousness and the other leadership styles when using leader self-report data, clear support is not found for the first part of Hypothesis 9.

To test the second part of Hypothesis 9, that Agreeableness will have the strongest relationship with Consideration, the correlations from Table 4 were again examined and tested. When using leader self-ratings of their leadership styles Agreeableness does have the strongest relationship with Consideration (.40). The relationship between Agreeableness and Initiating Structure (.26) and Agreeableness and Transformational Leadership (.28), however, are also positive and significant. The differences among these correlations were tested for significance. The correlation between Agreeableness and Consideration was not significantly stronger than the relationship between Agreeableness and Initiating Structure ($t = 1.41$, $p = ns$) or Agreeableness and Transformational Leadership ($t = 1.23$, $p = ns$).

When using direct report ratings of the leadership styles the correlation between Agreeableness and Consideration is again strongest (.20), but none of the correlations are statistically significant or meaningful, and as such a test of the correlational differences was not necessary. Taking this with the conclusion that the relationship between Agreeableness and Consideration is not significantly stronger than the relationships between Agreeableness and the other leadership styles when using leader self-report data, clear support is not found for the second part of Hypothesis 9.

To test the final part of Hypothesis 9, that Extraversion will have the strongest relationship with Transformational Leadership, the correlations from Table 4 were examined for a final time. When using leader self-ratings of their leadership styles, Extraversion does not have the strongest relationship with Transformational Leadership (.27), but rather with Consideration (.31). The relationship between Extraversion and Initiating Structure is also positive, but non-significant (.12). While there is a significant

positive correlation between Extraversion and leaders' self-reported Transformational Leadership, that relationship is not notably different from the relationship between Extraversion and the other styles.

While when using direct report ratings of the leadership styles the correlation between Extraversion and the styles are again non-significant. Support is not found for the final part of Hypothesis 9. Examining the evidence from the three parts of Hypothesis 9 together, overall support for the hypothesis cannot be concluded. There was some evidence that the direction of the relationships hypothesized is there, however, and the researcher believes at least partial support for Hypothesis 9 would be concluded with a larger sample size (strengthening statistical power).

To test Hypothesis 10, that Transformational Leadership, Consideration, and Initiating Structure will be moderately positively related leadership styles, correlations between leadership styles (as rated by direct reports as well as by leaders themselves) were examined. As can be seen in Table 5, when using leader self-ratings of leadership styles, correlations across the three styles are in the moderately positive range (i.e., .52 to .56). Further, when using direct reports' ratings of the leadership styles, the correlations are positive and moderate to high (.68 to .83). These correlational ranges lend support to Hypothesis 10.

The relationships between leadership styles when using direct reports as the rating source are slightly stronger than anticipated, particularly between Transformational Leadership and Consideration (i.e., $r = .83$, $p < .05$). This is not entirely surprising given the overlap in these styles found by other researchers (e.g., Seltzer and Bass, 1990). Important to note as well is the fact that correlations between leaders' self-rated and

Table 5. *Correlations among Leadership Styles*

	Leader Self Ratings Data			Direct Report Data		
	Consideration	Initiating Structure	Transformational Leadership	Consideration	Initiating Structure	Transformational Leadership
Leader Self-Ratings Data						
Consideration	1.00					
Initiating Structure	.54*	1.00				
Transformational Leadership	.56*	.52*	1.00			
Direct Report Data						
Consideration	.21	-.02	.09	1.00		
Initiating Structure	.18	.11	.05	.68*	1.00	
Transformational Leadership	.15	.04	.27*	.83*	.73*	1.00

Note. N = 94 for correlations using only leader self-rated data, and N = 81 for correlations including direct report rated data. * = statistical significance at the .05 level.

direct-report rated Consideration and Initiating Structure were fairly small and non-significant. This suggests that leaders who perceive themselves as leading by Consideration or Initiating Structure aren't necessarily perceived by their direct reports to lead by that same style. This was not true for Transformational Leadership, however. The significant positive relationship between leaders' self-ratings of Transformational Leadership and direct reports' ratings of Transformational Leadership (i.e., $r = .27$, $p < .05$) indicates that leaders who believe they are transformational are also generally perceived that way by their direct reports (and vice versa, when direct reports perceive their leader to be transformational, the leader perceives himself/herself to lead that way as well).

In order to test Hypothesis 11, that leader Consideration, Initiating Structure, and Transformational Leadership will all significantly positively predict team process variables, two forms of evidence were sought. First, correlations from Table 3 were examined. As can be seen in Table 3, there is a positive correlation between

Consideration and all team process variables when using both leader self-report and direct report Consideration data. There is also a positive correlation between Initiating Structure and all team process variables; the positive correlations being statistically significant in five of eight cases. When using direct report ratings of Initiating Structure the correlations between that style and all team process variables are significant. When using leader self-report data, only the correlation between Initiating Structure and Self-Management Team Competencies is significant. Finally, there is also a positive correlation between Transformational Leadership and all team process variables; the positive correlations being statistically significant in six of eight cases. The two positive but non-significant correlations are between Transformational Leadership and Interpersonal Team Competencies and Transformational Leadership and Self-Management Team Competencies when using leader self-report data. All of this is taken together as a first form of generally supportive evidence for Hypothesis 11.

As a second form of supporting evidence, the researcher sought to understand the ability of each leadership style to uniquely predict team processes. To test this, each team process variable was regressed onto the three leadership styles simultaneously. The overall R^2 was examined to understand the strength of the prediction of the set of leadership styles. Then the standardized regression coefficient for each leadership style was observed in order to understand the unique predictive contribution each leadership style makes. This process was repeated twice, once using leader self-report leadership style data and once using direct report ratings of leadership styles.

The results of the analyses can be found in Table 6. When using either leader self-report data or direct report data, Consideration, Initiating Structure, and Transformational

Leadership were collectively predictive of the two types of team-level competencies. This suggests that more effective leaders foster interpersonal and self-management competencies among their teams. When looking at the unique effects of the leadership styles on Interpersonal Team Competencies, only Consideration explained unique variance when using leader self-report data, with Initiating Structure and Transformational Leadership offering no significant incremental predictive contribution. Conversely, when using direct report data, only Initiating Structure explained unique variance, with Consideration and Transformational Leadership not having significant unique effects.

Looking at the unique predictive contribution of the self-reported leadership styles for Self-Management Team Competencies, no single leadership style had a significant unique effect, even though as a set the three leadership styles predicted a significant 10% of the variance. When using direct report data, the leadership styles were collectively predictive, and Initiating Structure had a unique effect. Consideration and Transformational Leadership had no significant unique predictive contribution.

Table 6 also shows that when using leader self-report data, the three leadership styles did not collectively significantly predict team Cohesion or team Potency, and no single style had a significant unique effect. When using direct report data, however, the three styles did collectively significantly predict Cohesion ($R^2 = .21$, $p < .01$) and Potency ($R^2 = .45$, $p < .01$). In both cases Transformational leadership had the only significant unique effect, with a standardized regression coefficient of .41 ($p < .05$) in predicting Cohesion and a coefficient of .47 ($p < .05$) in predicting Potency.

Table 6. *Regression Statistics for Combined and Unique Influence of Leadership Styles on Team Processes*

	Interpersonal Team Competencies			Self-Management Team Competencies			Team Cohesion			Team Potency		
	R^2	β	r	R^2	β	R	R^2	β	R	R^2	β	r
Leader Data												
Step	.13*			.10*			.07			.08		
Consideration		.37**	.35**		.24	.30**		.12	.23*		.13	.22*
Initiating Structure		-.05	.17		.09	.23*		.02	.18		-.04	.14
Transformational Leadership		.02	.19		.01	.18		.17	.25*		.21	.26*
Direct Report Data												
Step	.56**			.57**			.21**			.45**		
Consideration		.22	.63**		.03	.60**		-.27	.28*		.15	.61**
Initiating Structure		.53**	.72**		.52**	.73**		.29	.41**		.09	.54**
Transformational Leadership		.06	.63**		.26	.66**		.41*	.40**		.47**	.66**

Note. N = 81 (leader-team connections). ** = statistical significance at the .01 level, * = statistical significance at the .05 level. R^2 = multiple regression coefficient (collective variance explained). β = standardized regression coefficient with all variables included in the model. r = zero-order correlation coefficient.

Taken together as a second way to evaluate Hypothesis 11, these results lend additional support to Hypothesis 11. Generally, these leadership styles are collectively predictive of effective team processes, suggesting leaders exhibiting these behaviors lead teams with these group processes. The leadership styles contribute differently in their prediction, depending on the data source (using either leader self ratings or direct report ratings) and on the team process variable being examined. Consideration and Initiating Structure were generally more predictive of Interpersonal and Self-Management Team Competencies, whereas Transformational Leadership was generally more predictive of team Cohesion and team Potency. In short, different leadership behaviors may impact teams differently. Taking the correlational and regression data together, support is concluded for Hypothesis 11.

The same approach used to evaluate Hypothesis 11 was used to evaluate Hypothesis 12. Hypothesis 12 states that Leader Consideration, Initiating Structure, and Transformational Leadership will significantly positively predict team effectiveness

criteria. The relevant correlations from Table 3 are again depicted in Table 7. Leadership styles, when using leader self-report data, correlated significantly with direct-reports' Job Satisfaction but not with Leader Consensus Rankings. When using data from direct reports, Consideration, Initiating Structure and Transformational Leadership all correlated significantly and positively with both effectiveness criteria. As a first point of evaluation, correlations partially support Hypothesis 12.

As a second form of evidence, Job Satisfaction and then Leader Consensus Rankings were regressed onto the three leadership styles simultaneously. The overall R^2 was again examined to understand the strength of the prediction of the set of leadership styles. The standardized regression coefficient for each leadership style was again observed in order to understand each style's unique predictive contribution. This process was repeated using each of leader self-report data and direct report ratings. The results of the regression analyses can also be found in Table 7.

Table 7. *Regression Statistics for Combined and Unique Influence of Leadership Styles on Team Effectiveness*

	Job Satisfaction			Leader Consensus Rankings		
	R^2	β	r	R^2	β	r
Leader Data						
Step	.14**			.05		
Consideration		.01	.09		-.04	.06
Initiating Structure		-.26	-.04		-.07	.03
Transformational Leadership		.42**	.30**		.26	.20
Direct Report Data						
Step	.25**			.07		
Consideration		-.08	.39**		.07	.24*
Initiating Structure		.02	.36**		.13	.25*
Transformational Leadership		.55**	.50**		.10	.25*

Note. N = 81 for Job Satisfaction Analyses and N = 74 for Leader Consensus Ranking Analyses. ** = statistical significance at the .01 level, * = statistical significance at the .05 level. R^2 = multiple regression coefficient (collective variance explained). β = standardized regression coefficient with all variables included in the model. r = zero-order correlation coefficient.

The leadership styles, as self-rated by leaders and as rated by their direct reports, were collectively predictive of team member Job Satisfaction. Examining the relationships using leader self-report data, while the leadership styles were collectively predictive ($R^2 = .14$, $p < .01$), only Transformational Leadership uniquely predicted team member Job Satisfaction ($\beta = .42$, $p < .01$). The same is true when looking at the relationships using direct report data. Again the leadership styles were collectively predictive ($R^2 = .25$, $p < .01$), but only Transformational Leadership uniquely predicted team member Job Satisfaction ($\beta = .55$, $p < .01$).

The leadership styles, as self-rated by leaders and as rated by their direct reports, were neither collectively nor uniquely predictive of the second effectiveness criterion, Leader Consensus Rankings. These regression results, paired with some supportive evidence from the correlational analyses, lead to a conclusion of partial support for Hypothesis 12.

In order to test Hypothesis 13, that leadership styles will be differentially predictive of team processes, two assessment steps were again taken. As a first step, the zero-order correlations between the styles and team processes were again observed, noting the strength and order of the correlations. The relevant correlations are again shared in Table 8. While the leadership styles are differentially predictive of team processes, their strength of prediction is not in the order posited. Transformational Leadership is not consistently the strongest correlate, in fact it has the strongest correlation in only three of eight cases: with Cohesion ($r = .25$, $p < .05$) when using leader self-report data and with Potency when using both leader self-report ($r = .26$, $p < .05$) and direct report ($r = .66$, $p < .05$) data. Even in these cases, where Transformational

Leadership is the strongest correlate, the difference between its correlation with the given team process variable is not significantly larger than the correlation between the second strongest style and the given team process variable. Further, Initiating Structure is not consistently the second strongest correlate, as in some cases it is the strongest correlate, some cases the second strongest, and in other cases it is the weakest. Finally, the same pattern is true for Consideration, as it is not consistently the weakest correlate. In some cases it is, but in others it is strongest or the middle correlate. Based on the correlations alone, Hypothesis 13 is not supported.

As a second assessment step, the researcher sought to understand the predictive power of the leadership styles together and independently, while holding team interdependence constant. Team interdependence was significantly correlated with all variables in question, and so it was appropriate to run the modeling with it entered as a control variable in step one of hierarchical multiple regression analyses. Entering this variable as the first step in each analysis holds constant the degree of interdependence across teams. In step two of each analysis, Interpersonal Team Competencies, Self-Management Team Competencies, Cohesion and Potency were regressed onto the three leadership styles. These hierarchical regression analyses were performed twice for each team process variable, once using leader self-report data and again using direct report data.

The results of these analyses can be found in Table 8. As can be seen in the table, when using leader self-report data, the leadership styles collectively do not explain significantly more variance than what is already explained by the control variable, team interdependence. The ΔR^2 is not significant in any case. Further, with the exception of

Consideration having a significant unique effect on Interpersonal Team Competencies (β = .28, $p < .05$), none of the leadership styles have independent significant effects.

When using direct report data in the analyses, the leadership styles collectively do explain significantly more variance than team interdependence, with the ΔR^2 being significant in all cases. While the different leadership styles have significant unique effects on team process variables, they are not in the order hypothesized. Taking the correlational and regression results in evaluation of Hypothesis 13 together, the hypothesis is not supported.

Rankings, when all leadership styles are The same approach to testing Hypothesis 13 was taken to test Hypothesis 14, which states that leadership styles will be differentially predictive of team effectiveness criteria, with Transformational Leadership being the strongest predictor, Initiating Structure being second strongest, and Consideration being third strongest. Table 7 includes the statistics needed to evaluate Hypothesis 14.

As can be seen in Table 7, in three of four cases Transformational Leadership is the strongest correlate and unique predictor (examining the Betas when all leadership styles are entered into the model) of team effectiveness criteria, the exception being the relationship between direct-report rated styles and Leader Consensus about equally related to that outcome (based on simple correlations). While this is notable, Initiating Structure is not consistently the second strongest correlate or unique predictor, and Consideration is not consistently the third strongest correlate or unique predictor, as the hypothesis suggested. Hypothesis 14, therefore, is unsupported.

Table 8. *Regression Statistics for the Ability of Leadership Styles to Predict Team Process Variables with Team Interdependence held Constant*

	Dependent Variables															
	Interpersonal Team Competencies				Self-Management Team Competencies				Team Cohesion				Team Potency			
	R^2	ΔR^2	β	r	R^2	ΔR^2	B	r	R^2	ΔR^2	β	r	R^2	ΔR^2	β	r
Leader Data																
Step One	.18**				.29**				.15**				.17**			
Team Interdependence			.34**	.42**			.50**	.54**			.34**	.38**			.37**	.41**
Step Two	.23**	.05			.31**	.02			.18	.03			.20**	.03		
Consideration			.28*	.35**			.11	.30**			.03	.23*			.03	.22*
Initiating Structure			-.07	.17			.07	.23**			.01	.18			-.05	.14
Transformational Leadership			-.01	.19			-.03	.18			.14	.25*			.18	.26*
Direct Report Data																
Step One	.18**				.29**				.15**				17**			
Team Interdependence			.13	.42**			.26**	.54**			.24*	.38**			.16*	.41**
Step Two	.57**	.40**			.63**	.33**			.25**	.10*			.47**	.30**		
Consideration			.23*	.63**			.05	.60**			-.25	.28*			.16	.61**
Initiating Structure			.50**	.72**			.46**	.73**			.23	.41**			.05	.54**
Transformational Leadership			.03	.63**			.18	.66**			.35*	.40**			.43**	.66**

Note. N = 81 (leader-team connections). ** = statistical significance at the .01 level, * = statistical significance at the .05 level. R^2 = multiple regression coefficient (collective variance explained). ΔR^2 = change in multiple regression coefficient (added collective variance explained). β = standardized regression coefficient with all variables included in the model. r = zero-order correlation coefficients.

In order to test Hypothesis 15, that relationships between leadership styles and team processes will be stronger when leaders are high in process fostering, hierarchical moderated regression analysis was employed. As Cohen and Cohen (1975) have pointed out, hierarchical moderated regression is advantageous in that it can be used even when a moderate correlation between an independent variable and moderator variable exists, or between these variables and their cross product.

Team interdependence was again significantly correlated with all variables in these analyses and was therefore held constant by entering it on the first step of each analysis. In step two of each analysis, Consideration, Initiating Structure, or Transformational Leadership and Process Fostering were entered (one leadership style and Process Fostering for each analysis). A cross product term for each leadership style and Process Fostering was then created and entered on the third and final step of each analysis. Thus each team process variable (Interpersonal Team Competencies, Self-Management Team Competencies, Cohesion, and Potency) was regressed onto each leadership style and Process Fostering in step two and their cross-product term in step three. This resulted in twelve analyses, with each of the twelve replicated twice, once using leaders' self-report leadership style and once using leadership styles as rated by leaders' direct reports. The final tally was twenty four analyses, the results of which can be found in Tables 9 and 10 on the previous pages.

As can be seen in the tables, there is nearly no supporting evidence for the notion that Process Fostering moderates the relationships between leadership styles and team processes. In only one of the twenty-four analyses did the cross product of a leadership style and Process Fostering contribute significantly after factoring out the variance

Table 9. *Moderating Effects of Process Fostering on the Relationship between Leadership Styles and Team Process Variables with Team Interdependence held Constant (Using Leader Self-Report Data)*

	Dependent Variables															
	Interpersonal Team Competencies				Self-Management Team Competencies				Team Cohesion				Team Potency			
Leader Data	R^2	ΔR^2	β	r	R^2	ΔR^2	β	r	R^2	ΔR^2	β	r	R^2	ΔR^2	β	R
Step One	.18**				.29**				.15**				.17**			
Team Interdependence			.35**	.42**			.50**	.54**			.37**	.39**			.39**	.41**
Step Two	.23**	.05			.31	.02			.19	.04			.18**	.01		
Consideration			-1.41	.35**			-.43	.30**			.23	.23*			-.10	.22*
Process Fostering			.00	.12			.02	.14			-.18	-.08			-.50	.09
Step Three	.24**	.02			.31	.00			.19	.00			.18**	.00		
Consideration *X* Process Fostering			1.65	.36**			.56	.30**			-.09	.22*			.20	.22
Step One	.18**				.29**				.15**				.17**			
Team Interdependence			.40**	.42**			.51**	.54**			.38**	.39**			.40**	.41**
Step Two	.18**	.00			.31**	.02			.19**	.04			.17**	.00		
Initiating Structure			-.17	.17			.87				.70	.18			-.10	.14
Process Fostering			.03	.12			.03	.14			-.19	-.08			-.04	.09
Step Three	.18**	.00			.31**	.00			.19**	.00			.17**	.00		
Initiating Stru. *X* Process Fostering			.23	.17			-.77	.23*			-.56	.17			.16	.14
Step One	.18**				.29**				.15**				.17**			
Team Interdependence			.40**	.42**			.54**	.54**			.38**	.39**			.39**	.41**
Step Two	.18**	.01			.30**	.01			.21**	.06*			.20**	.03		
Transformational Leadership			1.09	.19			1.58	.18			1.05	.25*			1.11	.26*
Process Fostering			.03	.12			.04	.14			-.20	-.08			-.07	.09
Step Three	.19**	.01			.31**	.01			.21**	.00			.20**	.00		
Transform. Lead *X* Process Fostering			-1.00	.19			-1.55	.18			-.61	.25*			-.93	.26*

Note. N = 81 (leader-team connections). ** = statistical significance at the .01 level, * = statistical significance at the .05 level. R^2 = multiple regression coefficient (collective variance explained). ΔR^2 = change in multiple regression coefficient (added collective variance explained). β = standardized regression coefficient with all variables included in the model. r = zero-order correlation coefficients.

Table 10. *Moderating Effects of Process Fostering on the Relationship between Leadership Styles and Team Process Variables with Team Interdependence held Constant (Using Direct Report Data)*

	Depenent Variables															
	Interpersonal Team Competencies				Self-Management Team Competencies				Team Cohesion				Team Potency			
Direct Report Data	R^2	ΔR^2	β	r	R^2	ΔR^2	β	R	R^2	ΔR^2	β	r	R^2	ΔR^2	β	R
Step One	.18**				.29**				.15**				.17**			
Team Interdependence			.22*	.42**			.37**	.54**			36**	.39**			.23*	.41**
Step Two	.45**	.27**			.50**	.20**			.19**	.04			.41**	.25**		
Consideration			1.45	.63**			.69	.60**			-2.03	.28**			.97	.61**
Process Fostering			.06	.12			.06	.14			-.12	-.08			-.01	.09
Step Three	.45**	.00			.50**	.00			.22**	.03			.41**	.00		
Consideration *X* Process Fostering			-.90	.62**			-.21	.60**			2.19	.29**			.44	.60**
Step One	.18**				.29**				.15**				.17**			
Team Interdependence			.14	.42**			.29**	.54**			.29**	.39**			.24**	.41**
Step Two	.54**	.36**			.60**	.31**			.25**	.10**			.33**	.16**		
Initiating Structure			1.34	.72**			.80	.73**			-.72	.41**			1.50	.54**
Process Fostering			.01	.12			.02	.14			-.16	-.08			-.06	.09
Step Three	.54**	.00			.60**	.00			.25**	.01			.34**	.01		
Initiating Stru. *X* Process Fostering			-.68	.72**			-.19	.73**			1.03	.41**			-.84	.53**
Step One	.18**				.29**				.15**				.17**			
Team Interdependence			.19**	.42**			.31**	.54**			.27**	.39**			.17	.41**
Step Two	.43**	.25**			.51**	.24**			.24**	.09**			.46**	.30**		
Transformational Leadership			.91	.63**			-.10	.66**			-2.70*	.40**			.32	.66**
Process Fostering			.04	.12			.05	.14			-.13	-.08			-.03	.09
Step Three	.43**	.00			.51**	.00			.29**	.05*			.46**	.00		
Transform. Lead *X* Process Fostering			-.36	.62**			.64	.67**			3.01*	.42**			.28	.67**

Note. N = 81 (leader-team connections). ** = statistical significance at the .01 level, * = statistical significance at the .05 level. R^2 = multiple regression coefficient (collective variance explained). ΔR^2 = change in multiple regression coefficient (added collective variance explained). β = standardized regression coefficient with all variables included in the model. r = zero-order correlation coefficients.

accounted for Team Interdependence (as a control) and a leadership style and Process Fostering independently. This single case was a significant effect that the cross-product term between Transformational Leadership and Process Fostering had on team Cohesion ($\Delta R^2 = .05$, $p < .05$). Hypothesis 15 is therefore not supported. The one significant interaction is plotted in Figure 2 below.

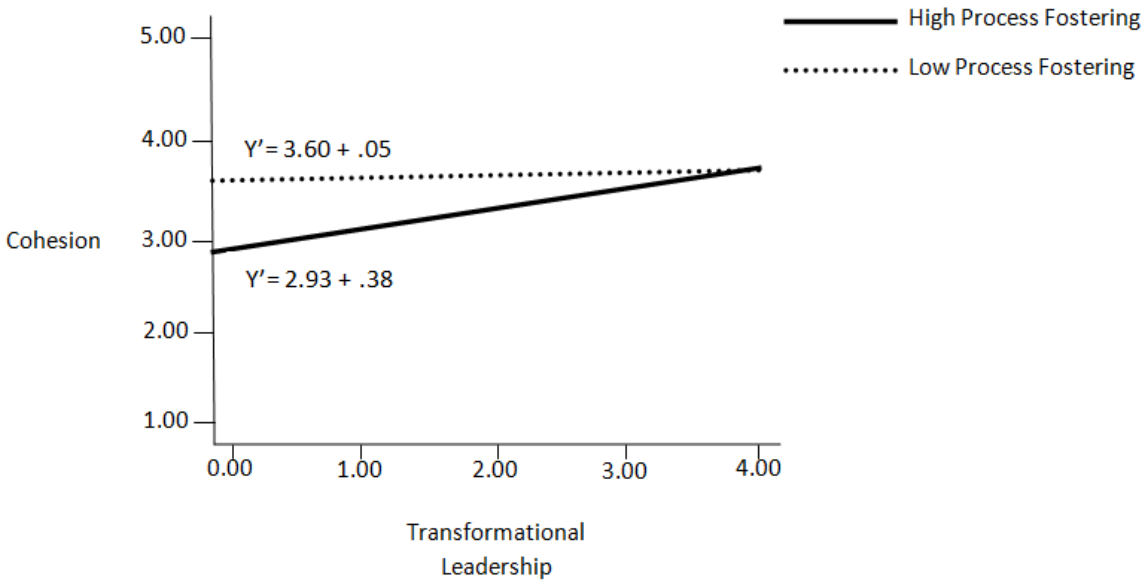

Figure 2. *Moderating Effect of Process Fostering on the Relationship between Transformational Leadership and Cohesion*

To test Hypotheses 16, 17 and 18, that Team-Level Competencies, Cohesion, and Potency will be positively predictive of team effectiveness, respectively, two assessments were performed. First, the zero-order correlation between each team process variable and outcome variable was observed. The relevant correlations are found in Table 11. As can be seen in the table, all of the correlations between team processes and team member Job Satisfaction were positive and statistically significant. On the other hand, none of the correlations between team processes and Leader Consensus Rankings were significant.

Table 11. *Correlations and Hierarchical Regression Statistics for Hypotheses 16, 17, and 18.*

	Dependent Variables							
	Job Satisfaction				Consensus Rankings			
	R^2	ΔR^2	β	r	R^2	ΔR^2	β	r
Hypothesis 16								
Step One	.12**				.01			
Team Interdependence			.22*	.35**			-.02	.09
Step Two	.20**	.08*			.05*	.04		
Interpersonal Team Competencies			.31**	.40**			.23	.22
Step One	.12**				.01			
Team Interdependence			.17	.35**			-.07	.09
Step Two	.20**	.08*			.05*	.04		
Self-Management Team Competencies			.34**	.43**			.23	.22
Hypothesis 17								
Step One	.12**				.01			
Team Interdependence			.31**	.35**			.06	.09
Step Two	.13*	.01			.01	.00		
Team Cohesion			.10	.22*			.06	.08
Hypothesis 18								
Step One	.12**				.01			
Team Interdependence			.17	.35**			.01	.09
Step Two	.28**	.16**			.04	.03		
Team Potency			.43**	.51**			.19	.19

Note. N = 81 for Job Satisfaction Analyses and N = 74 for Leader Consensus Ranking Analyses. ** = statistical significance at the .01 level, * = statistical significance at the .05 level. R^2 = multiple regression coefficient (collective variance explained). ΔR^2 = change in multiple regression coefficient (added collective variance explained). β = standardized regression coefficient with all variables included in the model. r = zero-order correlation coefficients.

As a second step, hierarchical regression was again employed with Team Interdependence held as a constant due to its significant relationship with a number of the variables in the analysis. Given the strong correlation Team Interdependence had with team process variables and with Job Satisfaction, the researcher wanted to be clear on the variance explained uniquely by each team process variable above and beyond any explained by the interdependence of the teams. In testing Hypothesis 16, four separate stepwise analyses were conducted. In step two of each analysis, Job Satisfaction or Leader Consensus Rankings were each regressed onto each of Interpersonal Team Competencies, Self-Management Team Competencies.

As can be seen in the table, each team competency variable significantly predicted Job Satisfaction above and beyond the effects of Team Interdependence (i.e., ΔR^2 was significant from step one to step two in each case), but neither was incrementally predictive of Leader Consensus Rankings. In summary, both team competencies are significantly correlated with and positively predictive of Job Satisfaction. Neither team competency was predictive, however, of Leader Consensus Rankings. This is taken as partial support for Hypothesis 16.

To test Hypothesis 17, two separate hierarchical regression analyses were conducted. In step two of each analysis, Job Satisfaction or Leader Consensus Rankings were each regressed onto team Cohesion. As can be seen in Table 11, Cohesion did not significantly predicted Job Satisfaction beyond what was already explained by Team Interdependence (i.e., ΔR^2 was not significant from step one to step two), and it also was not predictive of Leader Consensus Rankings. While positive and significant zero-order correlations between Cohesion and Job Satisfaction were observed, the regression results suggest that team cohesiveness does not have a significant unique influence on team effectiveness. No support for Hypothesis 17 is therefore concluded.

Finally, to test Hypothesis 18, two separate hierarchical analyses were again conducted. In step two of each analysis, Job Satisfaction or Leader Consensus Rankings were each regressed onto team Potency. Potency significantly predicted Job Satisfaction above and beyond the effects of Team Interdependence ($\Delta R^2 = .16$, $p < .01$), but it was not incrementally predictive of Leader Consensus Rankings. These results, paired with a positive and significant zero-order correlations between Potency and Job Satisfaction are taken as partial support for Hypothesis 18.

In order to test Hypothesis 19, that team process variables will mediate the impact leadership styles have on team effectiveness, mediation analysis as suggested by Baron and Kenney (1986) was performed. To follow their prescribed methodology, as a first step significant correlations must be established between leadership styles and team effectiveness criteria, leadership styles and team processes, and team processes and effectiveness criteria. As depicted in Table 3, these relationships are all significant in the current study when using team member Job Satisfaction as an effectiveness criterion, but not when using Leader Consensus data as the criterion. Because there is no significant relationship between team process variables and Leader Consensus Rankings, checking mediation with that criterion is unnecessary. Further, because neither of Initiating Structure or Consideration, as self-rated by leaders, are significantly correlated with either of the effectiveness criteria, mediation analyses with for those leadership style variables is not necessary.

Transformational Leadership (both as self-rated by leaders and as rated by direct reports), and Initiating Structure and Consideration (as rated by direct reports only) all correlate significantly with team process variables and with Job Satisfaction. Those team process variables also correlate significantly with Job satisfaction. Because of these meaningful relationships mediation tests of the *input-process-output* model are possible.

The researcher followed a methodology prescribed by Baron and Kenney (1986), regressing Job Satisfaction onto each leadership style in step one of a hierarchical regression analysis, then regressing Job Satisfaction onto each leadership style and each team process variable in step two. What the researcher was looking for in step two was whether or not the standardized regression coefficient (Beta) for a given leadership style

was no longer significant, but the Beta for a given team process was significant. This would indicate full mediation, meaning that a given team process variable mediates the relationship between a given leadership style and Job Satisfaction. Both Betas being significant would indicate partial mediation, suggesting some influence of team processes on the relationship. If the Beta for a team process were not to be significant, no mediation would be concluded.

The potential mediation of team process variables on the relationship between Transformational Leadership (as self-rated by leaders) and Job Satisfaction was tested first. Transformational Leadership (as self-rated) correlated significantly only with Cohesion and Potency as process variables, so those variables are the focus of the analyses. The results of two separate hierarchical regression analyses are depicted in Table 12. When regressing Job Satisfaction on Transformational Leadership and Cohesion, the Beta for Transformational Leadership remained significant while Cohesion did not have a significant Beta. This suggests that Cohesion does not mediate the relationship between Transformational Leadership and Job Satisfaction. When regressing Job Satisfaction on Transformational Leadership and Potency, on the other hand, the Beta for Transformational Leadership was no longer significant, and Potency had a significant Beta. This suggests that Potency may in fact mediate the relationship between Transformational Leadership and Job Satisfaction.

The potential mediation of team process variables on the relationship between Transformational Leadership (as rated by direct reports) and Job Satisfaction was tested next. Transformational Leadership (again, as rated by direct reports) correlated

significantly with all team process variables, so all were tested. The results of four hierarchical regression analyses are depicted in Table 13.

Table 12. *Correlations and Hierarchical Regression Statistics for Leader Self-Rated Transformational Leadership in Testing Hypothesis 19*

	Job Satisfaction			
	R^2	ΔR^2	β	r
Step One	.09**			
Transformational Leadership (self report)			.30**	.30**
Step Two	.11**	.02		
Transformational Leadership (self report)			.26*	.30**
Cohesion			.15	.22*
Step One	.09**			
Transformational Leadership (self report)			.30**	.30**
Step Two	.29**	.20**		
Transformational Leadership (self report)			.18	.30**
Potency			.46**	.51**

Note. N = 81. ** = statistical significance at the .01 level, * = statistical significance at the .05 level. R^2 = multiple regression coefficient (collective variance explained). ΔR^2 = change in multiple regression coefficient (added collective variance explained). β = standardized regression coefficient with all variables included in the model. r = zero-order correlation coefficients.

When regressing Job Satisfaction on Transformational Leadership and Interpersonal Team Competencies, Self-Management Team Competencies, and Cohesion, the Beta for Transformational Leadership remained significant while none of the process variables yielded a significant Beta. This suggests that none of these team process variables mediate the relationship between Transformational Leadership and Job Satisfaction. When regressing Job Satisfaction on Transformational Leadership and Potency, however, the Betas for both Transformational Leadership and Potency were significant. This suggests that Potency partially mediates the relationship between Transformational Leadership and Job Satisfaction.

Table 13. *Correlations and Hierarchical Regression Statistics for Transformational Leadership (Direct Reports) in Testing Hypothesis 19*

	Job Satisfaction			
	R^2	ΔR^2	β	r
Step One	.25**			
Transformational Leadership (direct reports)			.50**	.50**
Step Two	.26**	.01		
Transformational Leadership (direct reports)			.40**	.50**
Interpersonal Team Competencies			.15	.40**
Step One	.25**			
Transformational Leadership (direct reports)			.50**	.50**
Step Two	.27**	.02		
Transformational Leadership (direct reports)			.38**	.50**
Self Management Team Competencies			.18	.43**
Step One	.25**			
Transformational Leadership (direct reports)			.50**	.50**
Step Two	.25**	.00		
Transformational Leadership (direct reports)			.49**	.50**
Cohesion			.02	.22*
Step One	.25**			
Transformational Leadership (direct reports)			.50**	.50**
Step Two	.30**	.05*		
Transformational Leadership (direct reports)			.29*	.50**
Potency			.31*	.51**

Note. N = 81. ** = statistical significance at the .01 level, * = statistical significance at the .05 level. R^2 = multiple regression coefficient (collective variance explained). ΔR^2 = change in multiple regression coefficient (added collective variance explained). β = standardized regression coefficient with all variables included in the model. r = zero-order correlation coefficients.

The potential mediation of team process variables on the relationship between Initiating Structure (as rated by direct reports) and Job Satisfaction was tested next. Initiating Structure (again, as rated by direct reports) correlated significantly with all team process variables, and so all were tested. The results of four hierarchical regression analyses are depicted in Table 14.

When regressing Job Satisfaction on Initiating Structure and Cohesion, the Beta for Initiating Structure remained significant while Cohesion did not yield a significant Beta. This suggests that Cohesiveness does not mediate the relationship between Initiating Structure and Job Satisfaction. When regressing Job Satisfaction on Initiating Structure and Interpersonal Team Competencies, Self-Management Team Competencies, and Potency, however, the Beta for Initiating Structure was no longer significant, yet the Beta for each of the team process variables was significant. This suggests that each of Interpersonal Team Competencies, Self-Management Team Competencies, and Potency may play a role in mediating the relationship between Initiating Structure and Job Satisfaction.

Finally, the potential mediation of team process variables on the relationship between Consideration (as rated by direct reports) and Job Satisfaction was tested. Consideration (again, as rated by direct reports) correlated significantly with all team process variables, so all were tested. The results of four hierarchical regression analyses are depicted in Table 15.

When regressing Job Satisfaction on Consideration and Cohesion, the Beta for Consideration remained significant while Cohesion did not yield a significant Beta. This suggests that Cohesion does not mediate the relationship between Consideration and Job Satisfaction. When regressing Job Satisfaction on Consideration and Interpersonal Team Competencies, Self-Management Team Competencies, and Potency, however, the Beta for Consideration was no longer significant, yet the Beta for each of the team process variables was significant. This suggests that each of Interpersonal Team Competencies, Self-Management Team Competencies, and Potency play a role in mediating the

Table 14. *Correlations and Hierarchical Regression Statistics for Initiating Structure (Direct Reports) in Testing Hypothesis 19*

	Job Satisfaction			
	R^2	ΔR^2	β	r
Step One	.13**			
Initiating Structure (direct reports)			.36**	.36**
Step Two	.17**	.04*		
Initiating Structure (direct reports)			.15	.36**
Interpersonal Team Competencies			.29*	.40**
Step One	.13**			
Initiating Structure (direct reports)			.36**	.36**
Step Two	.19**	.06*		
Initiating Structure (direct reports)			.10	.36**
Self Management Team Competencies			.36**	.43**
Step One	.13**			
Initiating Structure (direct reports)			.36**	.36**
Step Two	.14**	.01		
Initiating Structure (direct reports)			.33**	.36**
Cohesion			.09	.22*
Step One	.13**			
Initiating Structure (direct reports)			.36**	.36**
Step Two	.27**	.14**		
Initiating Structure (direct reports)			.13	.36**
Potency			.44**	.51**

Note. N = 81. ** = statistical significance at the .01 level, * = statistical significance at the .05 level. R^2 = multiple regression coefficient (collective variance explained). ΔR^2 = change in multiple regression coefficient (added collective variance explained). β = standardized regression coefficient with all variables included in the model. r = zero-order correlation coefficients.

relationship between Consideration and Job Satisfaction. Looking across the results used to evaluate Hypothesis 19, Cohesion clearly does not partially or fully mediate the relationship between leadership styles and team member Job Satisfaction. Team Potency, on the other hand, consistently does mediate such relationships. There is also evidence that team-level competencies also mediate the relationships between some leadership styles (Initiating Structure and Consideration) and Job Satisfaction. Taken together with

the findings that some styles, processes, and outcomes do not have strong enough relationships to even test mediation, Hypothesis 19 is partially supported.

Table 15. *Correlations and Hierarchical Regression Statistics for Consideration (Direct Reports) in Testing Hypothesis 19*

	Job Satisfaction			
	R^2	ΔR^2	β	r
Step One	.15**			
Consideration (direct reports)			.39**	.39**
Step Two	.19**	.04*		
Consideration (direct reports)			.23	.39**
Interpersonal Team Competencies			.26*	.40**
Step One	.15**			
Consideration (direct reports)			.39**	.39**
Step Two	.21**	.06*		
Consideration (direct reports)			.21	.39**
Self Management Team Competencies			.31*	.43**
Step One	.15**			
Consideration (direct reports)			.39**	.39**
Step Two	.17**	.02		
Consideration (direct reports)			.36**	.39**
Cohesion			.12	.22*
Step One	.15**			
Consideration (direct reports)			.39**	.39**
Step Two	.27**	.12**		
Consideration (direct reports)			.13	.39**
Potency			.42**	.51**

Note. N = 81. ** = statistical significance at the .01 level, * = statistical significance at the .05 level. R^2 = multiple regression coefficient (collective variance explained). ΔR^2 = change in multiple regression coefficient (added collective variance explained). β = standardized regression coefficient with all variables included in the model. r = zero-order correlation coefficients.

In order to test Hypotheses 20a-20c, that relationships between team processes and effectiveness criteria will be stronger when teams are highly interdependent than when they are less interdependent, eight separate hierarchical moderated regression analyses were performed.

In testing Hypothesis 20a, each of Interpersonal Team Competencies and Self-Management Team Competencies along with Team Interdependence was entered at step one of each analysis. A cross product term for each team competency variable and Interdependence was then created and entered on the second and final step of each analysis. Job Satisfaction or Leader Consensus Rankings as dependent variables were then regressed onto each team competency variable and Interdependence in step one, and their respective cross-product term in step two. The final tally was four independent analyses, the results of which can be found in Table 16. As can be seen in the table, there is no supporting evidence for the notion that team interdependence moderates the relationships between team competencies and team effectiveness. In none of the four analyses did the cross product term contribute significantly beyond the independent terms. Hypothesis 20a is therefore not supported.

To test Hypothesis 20b, Cohesion and Interdependence were entered in step one of the analysis. A cross product term for Cohesion and Interdependence was created and entered on the second and final step of the analysis. Each of Job Satisfaction and Leader Consensus Rankings as dependent variables were regressed onto Cohesion and Interdependence in step one, and their cross-product term in step two. As can be seen in Table 16, there is no supporting evidence for the notion that team interdependence moderates the relationships between Cohesion and team effectiveness. The cross product term did not contribute significantly beyond the independent terms. Hypothesis 20b is therefore not supported.

To test Hypothesis 20c, Potency and Interdependence were entered in step one of the analysis. A cross product term for Potency and Interdependence was created and

entered on the second and final step of the analysis. Each of Job Satisfaction and Leader Consensus Rankings as dependent variables were regressed onto Potency and Interdependence in step one, and their cross-product term in step two. As can be seen in Table 16, there is no supporting evidence for the notion that team interdependence moderates the relationships between Potency and team effectiveness. The cross product term did not contribute significantly beyond the independent terms. Hypothesis 20c is therefore not supported.

Table 16. *Correlations and Stepwise Regression Statistics for Hypotheses 20a, 20b, and 20c*

	Dependent Variables							
	Job Satisfaction				Consensus Rankings			
	R^2	ΔR^2	β	r	R^2	ΔR^2	β	r
Hypothesis 20a								
Step One	.20**				.05			
Interpersonal Team Competencies			1.02	.40**			.04	.22
Interdependence			.21	.35**			-.01	.09
Step Two	.21**	.01			.05	.00		
Interpersonal Team Cmp *X* Interdependence			-.71	.38**			.19	.22
Step One	.21**				.05			
Self-Management Team Competencies			1.43*	.43**			.86	.22
Interdependence			.13	.35**			-.11	.09
Step Two	.23**	.02			.06	.01		
Self-Mgmt Team Cmp *X* Interdependence			-1.08	.40**			-.59	.21
Hypothesis 20b								
Step One	.13**				.01			
Cohesion			1.42	.22*			.22	.08
Interdependence			.20	.35**			.05	.09
Step Two	.16**	.03			.01	.00		
Cohesion *X* Team Interdependence			-1.29	.17			-.16	.08
Hypothesis 20c								
Step One	.28**				.04			
Potency			.85	.51**			.23	.19
Interdependence			.15	.35**			.01	.09
Step Two	.28**	.00			.04	.00		
Potency *X* Team Interdependence			-.41	.48**			-.04	.19

Note. N = 81 for Job Satisfaction Analyses and N = 74 for Leader Consensus Ranking Analyses. ** = statistical significance at the .01 level, * = statistical significance at the .05 level. R^2 = multiple regression coefficient (collective variance explained). ΔR^2 = change in multiple regression coefficient (added collective variance explained). β = standardized regression coefficient with all variables included in the model. r = zero-order correlation coefficients.

In order to test Hypotheses 21a-21c, that relationships between team processes and effectiveness criteria will be stronger when teams are less geographically dispersed than when they are more dispersed, eight separate hierarchical moderated regression analyses were performed.

To test Hypothesis 21a, each of Interpersonal Team Competencies or Self-Management Team Competencies along with Geographic Dispersion were entered at step one of each analysis. A cross product term for each team competency variable and Geographic Dispersion was then created and entered on the second and final step of each analysis. Each of Job Satisfaction or Leader Consensus Rankings as dependent variables was regressed onto each team competency variable and Geographic Dispersion in step one, and their respective cross-product term in step two. This resulted in four independent analyses, the results of which can be found in Table 13. As can be seen in the table, there is no supporting evidence for the notion that how geographically dispersed a team is moderates the relationships between team competencies and team effectiveness. In none of the four analyses did the cross product term contribute significantly beyond the independent terms. Hypothesis 21a is therefore not supported.

To test Hypothesis 21b, Cohesion and Geographic Dispersion were entered in step one of the analysis. A cross product term for Cohesion and Geographic Dispersion was created and entered on the second and final step of the analysis. Each of Job Satisfaction or Leader Consensus Rankings as dependent variables was regressed onto Cohesion and Team Dispersion in step one, and their cross-product term in step two. As can be seen in Table 17, there is no supporting evidence for the notion that team dispersion moderates the relationships between Cohesion and team effectiveness. The cross product term did

not contribute significantly beyond the independent terms. Hypothesis 21b is therefore not supported.

To test Hypothesis 21c, Potency and Geographic Dispersion were entered in step one of the analysis. A cross product term for Potency and Geographic Dispersion was created and entered on the second and final step of the analysis. Each of Job Satisfaction or Leader Consensus Rankings as dependent variables was regressed onto Potency and Team Dispersion in step one, and their cross-product term in step two. As can be seen in Table 17, there is no supporting evidence for the notion that team dispersion moderates the relationships between Potency and team effectiveness. The cross product term did not contribute significantly beyond the independent terms. Hypothesis 21c is therefore not supported.

Table 17. *Correlations and Stepwise Regression Statistics for Hypotheses 21a, 21b, and 21c*

	Dependent Variables							
	Job Satisfaction				Consensus Rankings			
	R^2	ΔR^2	β	r	R^2	ΔR^2	B	r
Hypothesis 21a								
Step One	.17**				.05			
Interpersonal Team Competencies			-.13	.40**			.06	.22
Team Dispersion			.10	.12			-.01	.01
Step Two	.20**	.03			.05	.00		
Interpersonal Team Cmp *X* Team Dispersion			.56	.44**			.17	.22
Step One	.19**				.05			
Self-Management Team Competencies			-.06	.43**			.26	.22
Team Dispersion			.10	.12			-.03	.01
Step Two	.22*	.03			.05	.00		
Self-Mgmt Team Cmp *X* Team Dispersion			.51	.46**			-.10	.20
Hypothesis 21b								
Step One	.06				.01			
Cohesion			-.01	.22*			-.22	.08
Team Dispersion			.10	.12			.00	.01
Step Two	.06	.00			.02	.01		
Cohesion *X* Team Team Dispersion			.22	.23*			.32	.11
Hypothesis 21c								
Step One	.26**				.04			
Potency			.59	.51**			.05	.19
Team Dispersion			.01	.12			-.04	.01
Step Two	.26**	.00			.04	.00		
Potency *X* Team Team Dispersion			-.09	.48**			.15	.20

Note. N = 81 for Job Satisfaction Analyses and N = 74 for Leader Consensus Ranking Analyses. ** = statistical significance at the .01 level, * = statistical significance at the .05 level. R^2 = multiple regression coefficient (collective variance explained). ΔR^2 = change in multiple regression coefficient (added collective variance explained). β = standardized regression coefficient with all variables included in the model. r = zero-order correlation coefficients.

CHAPTER IV

DISCUSSION

Organizations are highly dynamic places, where the interplay among many converging variables yields complex relationships and affects many outcomes. In research we look to isolate variables of interest and understand how they operate in multifaceted environments. This research set out to establish the fit of a number of puzzle pieces in what is posited as an organizing framework for understanding the influence that leadership has on teams. Given their importance and ubiquity, leadership and teams are centerpieces for nearly any organizational puzzle. The posited leadership and teams organizing framework brings to bear venerable constructs, resurfaces too-long dormant variables, and introduces new factors of interest, all in the spirit of deepening our empirical understanding of the dynamic interplay that happens in everyday work life.

Table 18 summarizes support found and not found for the hypotheses in this study. Of the twenty-five hypotheses, two were clearly supported, nine were partially supported, and fourteen were unsupported. As will be discussed in the pages that follow, the lack of support in some cases was surprising, and in other cases perhaps support would have been stronger with greater power in the analyses (i.e., with a larger sample size).

Leader Personality and Leadership Styles

The initial set of hypotheses set out to establish relationships between characteristics of leaders' personalities and their behaviors (i.e., their leadership styles). There are two ways to assess leaders' behaviors – by their own account and through the eyes of others. In this research both self-report and direct report data sources were

utilized. In most cases while the effect sizes are different when using different data sources (typically more significant when using a common measurement method), the results patterns are generally the same. Differences in measurement sources could contribute to the conflicting research results that exist as to the role personality characteristics play in effective leadership.

Table 18. *Evaluation of Hypotheses Table*

	Full Support	Partial Support	No Support
Hypothesis 1		X	
Hypothesis 2			X
Hypothesis 3		X	
Hypothesis 4		X	
Hypothesis 5			X
Hypothesis 6			X
Hypothesis 7		X	
Hypothesis 8		X	
Hypothesis 9			X
Hypothesis 10	X		
Hypothesis 11	X		
Hypothesis 12		X	
Hypothesis 13			X
Hypothesis 14			X
Hypothesis 15			X
Hypothesis 16		X	
Hypothesis 17			X
Hypothesis 18		X	
Hypothesis 19		X	
Hypothesis 20a			X
Hypothesis 20b			X
Hypothesis 20c			X
Hypothesis 21a			X
Hypothesis 21b			X
Hypothesis 21c			X

This research was influenced by the review published by Judge et al. (2002), which concluded support for the five-factor model of personality as a useful framework from which to estimate the relationship between personality and leadership effectiveness. When using leaders' self-report data for both personality and leadership styles, the current research found positive and mostly significant relationships among Agreeableness, Conscientiousness, and Extraversion and the leadership styles Consideration, Initiating Structure and Transformational Leadership. When using direct report ratings of their leaders' styles (and leaders' self-report personality) correlations were also mostly positive, but none of the correlations were significant. A larger sample size would likely have yielded at least some significant positive correlations among leader personality characteristics and direct-report rated leadership styles. The median correlation between direct report ratings of leaders' styles and leaders' self-rated personality characteristics was only .065 ($p > .05$), however, so even if these correlations were significant, the effects sizes were weak. Future research using multi-rater feedback (arguably the most reliable of leadership behavioral ratings) on leadership styles in the analysis would further our understanding of the relationship between personality factors and leadership. Overall, (1) the relationships between leader personality and leader behaviors were only significant when leader behaviors were reported by the leaders themselves and may be accounted for by common methods variance, (2) the relationships between leader personality and leader behaviors were not significant when leader behaviors were reported by direct reports (which is the more common and accepted source in leadership research and probably more accurate; Atkins & Wood, 2002), and (3) even if the correlations of leader personality with direct report ratings were found

significant in a study with a larger sample size the effects sizes indicate little importance of the relationship ($r = .065$; $r^2 = .004$). This is consistent with House and Aditya's (1997) conclusion that there appear to be no leader personality traits that are clearly related to leader effectiveness.

Overall, leaders' personality characteristics likely relate differently to leadership styles, at least when leaders describe their own behaviors, though not always as predicted in this research. The following discussion of the relationships between leaders' personalities and behaviors is based on the leaders' self-report data only, and must be taken as tentative because it was not replicated by the direct-reports' data.

Conscientiousness. This research posited and found that there is a positive relationship between leader Conscientiousness and Initiating Structure (Hypothesis 1). This relationship is significant when using leader self-report leadership style data and directionally (though not significantly) positive when using direct report data. Further, Conscientiousness is more strongly related to Initiating Structure than to either Consideration or Transformational Leadership. Highly conscientious individuals have a natural propensity for structure and rule following and are highly attentive to detail, all central characteristics of the Initiating Structure style of leading.

Relationships between Conscientiousness and each of Consideration and Transformational Leadership were not hypothesized but were explored post-hoc. The relationship between Conscientiousness and Consideration is significant when using leader self ratings for both as the data source in the analysis, but drops to zero when using direct report data for Consideration. Further, Conscientiousness did not correlate significantly with Transformational Leadership behaviors when using either leadership

style rating source. It makes sense that Conscientiousness is more highly correlated with Initiating Structure than with the other two leadership styles because both Conscientiousness and Initiating Structure are more about process than people relationships. Research with additional leadership style rating sources is needed to fully understand the connections.

Extraversion. This research hypothesized that Extraversion would be positively related to each of Initiating Structure, Consideration, and Transformational Leadership (Hypotheses 2-4). While no research could be found linking Extraversion to Initiating Structure or Consideration, this researcher posited that the more socially effective one is the more generally effective one would be as a leader. When using leader self ratings of both Extraversion and the leadership styles, Extraversion was positively and significantly correlated with Consideration and Transformational Leadership. When using direct report data those relationships were no longer significant, yet still positive. This suggests, as hypothesized, that extraverted leaders are seen to be more considerate and transformational. Their inclination towards people predisposes them to lead by more people-focused leadership styles. As it turns out, however, Extraversion does not significantly correlate with Initiating Structure. Given that extraverts are typically highly socially active and that Initiating Structure is predicated on process and role structure rather than on being social, this non-existent or perhaps even negative relationship makes sense. By nature extraverts lead interpersonally, likely typically focusing more on people and less on process and structure.

It was also hypothesized that Extraversion would most strongly correlate with Transformational Leadership, second most strongly with Consideration, and weakest with

Initiating Structure (Hypothesis 5). Again, Extraversion related strongly with both Transformational Leadership and Consideration –the more people-oriented styles. There was little difference in the strength of correlations with these two styles, although the relationship between Extraversion and Consideration appears slightly stronger. The argument could be made that while Transformational Leadership is in part people oriented, it is also more broadly focused on things like vision and strategy. Consideration is fairly purely people oriented. Extraversion has an important role in both Transformational Leadership and Consideration. As mentioned, Extraversion did clearly have the weakest relationship with Initiating Structure.

Agreeableness. Past research on relationships between Agreeableness and the three leadership styles is fairly sparse –with almost all of it being about the relationship between Agreeableness and Transformational Leadership. This research posited that because Initiating Structure is more task-oriented than people-oriented, Agreeableness (which of course is a high people-orientation) and Initiating Structure might actually be negatively related (Hypothesis 6). This does not turn out to be the case. In fact, Agreeableness is the personality factor most consistently positively correlated with all three leadership styles, including a strong significantly positive correlation with Initiating Structure. The positive relationship between Agreeableness and Consideration (Hypothesis 7) is a new research finding and the positive relationship between Agreeableness and Transformational Leadership (Hypothesis 8) confirms findings from Judge and Bono (2000), Lim and Ployhart (2004) and others. Being agreeable, that is being socially compliant and building mutual trust and showing genuine concern for

others, is a trait that seems to contribute to all three of the leadership styles, and most notably to Consideration.

To summarize which personality factors might most strongly relate to each of the leadership styles, Hypothesis 9 posited that Conscientiousness would have the strongest relationship with Initiating Structure, that Agreeableness would have the strongest relationship with Consideration and that Extraversion would have the strongest relationship with Transformational Leadership. While when using leader self-ratings as the data source there seemed to be some evidence in support of Hypothesis 9, none of the correlations were different enough to suggest that certain personality traits tie more closely with certain leadership styles. Further, when using direct report leadership style ratings, none of the correlations were statistically significant. While it may be the case that personality predispositions lend themselves to the development of certain leadership styles, this study did not provide strong evidence in support of that notion.

Relationships among the Three Leader Styles

We should acknowledge that Consideration, Initiating Structure and Transformational Leadership are not likely mutually exclusive leadership styles. In other words, there is likely a good deal of overlap in the behaviors and underlying constructs that we are measuring. Previous research (e.g., Seltzer and Bass, 1990) has cited overlaps among these styles and this study found significant correlations among them as well (supporting Hypothesis 10). Consistent with other research (e.g., Bass, 1999), this research found that leaders who perceived themselves to be effective in one style also saw themselves as effective in the others. The same was true, to an even greater extent,

for direct reports –direct reports perceived their leaders to be effective in multiple styles simultaneously.

This suggests at least three things. First, the underlying leadership constructs that we are measuring are not clearly distinct, but overlapping in nature. In short, we lack discriminant validity in our multifaceted leadership constructs. Second, in practice leaders do not fit neatly in to one specific leadership style, but express behaviors of many different styles. While a leader might be more like one style and less like another, it is hard to imagine any leader being purely transformational, purely considerate, or purely initiating. Finally, it is likely the case that effectively leaders are generally rated (and rate themselves) as relatively high on most leader behaviors that are thought to be effective, irrespective of the behavior in question. People in leadership positions might have sought the position, been selected for it, been trained and socialized on how to do it, and learned through experience how to be effective. Therefore we might expect few leaders to actually lack the behaviors that are characteristic of any positive leadership style. This all said, while support for differentiation in the relationships among specific leader personality traits and leadership styles could not be concluded in the present study, this researcher has two suggestions for making future research more precise. First, use more narrowly defined leadership styles (i.e., very specific behaviors), which would clarify the behavioral constructs. The researcher could test specific behaviors that fit within one style, then generalize a conclusion about the style overall. Second, use multi-source feedback as a more complete and reliable measure of the specific leadership behaviors. Again, multi-source feedback is often cited as the most accurate source of data in leadership behavior research (e.g., Atkins & Wood, 2002).

Before moving on, it is also interesting to look at the specific correlations among the leadership styles and across leaders' self-report and direct-report data. While most of the correlations between leader self and direct report ratings of leadership styles are not significant, there is one exception. Leaders who see themselves as mostly transformational are also mostly seen by their direct reports as transformational. Perhaps transformational leaders more accurately self-assess, or perhaps their behaviors are more readily recognizable to direct reports. There is clearly less congruence between leaders and direct reports when it comes to appraising Consideration and Initiating Structure.

Leadership Styles and Team Processes

This study also sought to understand the degree to which the three leadership styles are predictive of team processes and team performance. Hypothesis 11 makes a very broad prediction, that leader Consideration, Initiating Structure, and Transformational Leadership will all significantly positively predict team process variables (team-level competencies, team cohesion, and team potency). Support was concluded for this, as meaningful zero-order correlations were found between the different styles and team process variables, and the leadership styles were collectively predictive of effective team processes. Generally this suggests that more effective leaders (i.e., those who exhibit the behaviors characteristic of the three leadership styles studied) lead more effective teams.

Importantly, it was also found that the leadership styles contribute differently in their prediction, depending on the data source (using either leader self ratings or direct report ratings) and on the team process variable being examined. In short, different leadership behaviors likely impact teams differently. Leaders' Consideration and

Initiating Structure were generally more predictive of Interpersonal and Self-Management Team Competencies, whereas Transformational Leadership was generally more predictive of team Cohesion and team Potency. The relationship between Consideration and team competencies suggests that when leaders show genuine respect, concern and appreciation for their teams, those teams are more likely to be interpersonally effective and well self-managed. The relationship between Initiating Structure and team competencies suggests that that when leaders define and structure roles, focus their teams on goals, and define clear communication channels, their teams are better equipped with the knowledge, skills, and abilities needed to effectively interact and self manage. Given that team-level competencies are focused on processes (e.g., conflict resolution, communication channeling) and tasks (e.g., setting goals, planning and task coordination), it makes sense that leaders strong in initiating behaviors would help to foster such activities. The relationship between Transformational Leadership and team Cohesion and team Potency suggests that when leaders serve as charismatic role models, inspire motivation, stimulate intellectually, and consider the needs of their individual team members, their teams work better together and are more positive in their belief in their collective abilities.

Hypothesis 13 builds on Hypothesis 11, positing more specifically that Transformational Leadership would be the strongest, Initiating Structure would be the second strongest, and Consideration the third strongest predictor of team process variables. Again, meaningful zero-order correlations were found among the different leadership styles and team process variables, and the leadership styles were collectively predictive of effective team processes. The order of prediction by the leadership styles as

posited in Hypothesis 13 was, however, not consistently supported. Just as in Hypothesis 9, attempting to order predictive ability with constructs that are highly correlated is challenging. All of the correlations among the leadership styles and between the leadership styles and team process variables were positive, and nearly all were significantly so. None of the relationships were consistently different enough to conclude that certain leadership styles tie more closely with certain team process variables. That the leadership styles were collectively predictive of team processes suggests that a leader exhibiting the best of any of these styles would likely influence their team to be effective in a multitude of ways. But, if the goal is to foster a specific team process within a team, then the present results do not provide clear direction as to how a leader can go about it. Such knowledge and direction awaits future studies.

Leadership Styles and Team Effectiveness

Hypothesis 12 also makes a fairly broad prediction, that leader Consideration, Initiating Structure, and Transformational Leadership will all significantly positively predict team effectiveness criteria. Some support was found for this. Again, results varied depending on the outcome variable used in the analysis and the source of data used for leadership styles. Generally, correlational and predictive support was found for the influence of leadership styles on team member Job Satisfaction when using either leadership style data source. The styles all correlated significantly and positively with Job Satisfaction. The styles were also collectively predictive of Job Satisfaction, yet only Transformational Leadership was uniquely predictive. This suggests that while team members are generally more satisfied with leaders who are considerate, initiating, and

transformational, they are clearly most satisfied when leaders demonstrate transformational leadership behaviors.

Unfortunately, uniform support was not found when examining Leader Consensus Rankings as the effectiveness criterion. When using leader self-reported leadership style data, none of the styles correlated meaningfully with Leader Consensus Rankings, though when using direct-report data positive and significant correlations were observed. Also, the leadership styles, as self-rated by leaders and as rated by their direct reports, were neither collectively nor uniquely predictive of Leader Consensus Rankings.

Although the direct influence of leadership styles on a more subjective effectiveness criterion (i.e., Job Satisfaction) is solidified by the current study, a direct connection between leadership styles and a more objective criterion could not be established. This has been the case in previous research and suggests one of at least three things, all of which call for further testing. First, perhaps a direct relationship between leadership styles and objective team performance criteria simply doesn't exist. Perhaps objective team performance is directly dependent on factors other than team leadership. This may not be the case given the strong connection between the leadership styles and team member Job Satisfaction (i.e., the subjective team performance criterion). Second, perhaps the relationship between leadership styles and objective team performance criteria is in fact indirect (mediated or moderated by other variables). The researcher tested this in later hypotheses. Third, perhaps the objective criterion used in the current study could have been more relevant or better measured. While the organization used in the current study brings to bear several 'hard' performance indicators in the consensus ranking process and considers a leaders' ranking to be a fairly direct assessment of team

performance, perhaps the criterion is not as valid as believed. There is still some subjectivity to the ranking process, which could diminish the accuracy of the outcome measure (leaving room for subjective biases to influence the performance ranking). Also, perhaps Leader Consensus Rankings are actually a better gage of individual leader performance, and not of team performance.

Hypothesis 14 builds on Hypothesis 12, positing more specifically that Transformational Leadership would be the strongest, Initiating Structure would be the second strongest, and Consideration the third strongest predictor of team effectiveness criteria. Hypothesis 14, like some of the other hypotheses in this study is a broad statement and one difficult to support given the overlap (or lack of further discriminate validity) of many of the variables in question. Notably, Transformational Leadership was in all but one case the strongest correlate and a unique predictor of team effectiveness criteria, but it was not a signficantly stronger predictor than the other leadership behaviors. Nor was Initiating Structure consistently the second strongest correlate or unique predictor, and Consideration was not consistently the third strongest correlate or unique predictor. Again, further research with well-constructed objective criteria is needed.

Leaders' Beliefs in Process Fostering

This study introduced Process Fostering as a new variable, positing it to be a potential moderator of the relationships between leadership styles and team processes. Of note, the Process Fostering variable had a very high mean and low standard deviation, indicating that nearly all leaders in the current study felt it was their responsibility to develop and maintain processes in their teams. This restriction of range may contribute to

lack of support for Hypothesis 15. While it was hypothesized that relationships between leadership styles and team processes would be stronger when leaders are high in process fostering, that was not the case. In only one of the twenty four possible analyses was a meaningful cross-product term found. Future research should refine the measure used in the current study such that it yields greater variance and has a better opportunity to moderate relationships. It would also be interesting to test the relationships between leadership styles and team processes across teams where fostering team processes is formally part of leaders' roles versus formally not part of leaders' roles (i.e., sampling teams with leaders who have different formal role descriptions). Also, while the current study focused on Process Fostering as one potential moderator of the relationships between leadership styles and team process variables, others should be explored. The relationships between leadership styles and team process variables ranged from weak ($r = .14$, $p = ns$) to strong ($r = .76$, $p < .01$). The strength in relationship varies as a function of the measurement method (i.e., common or different rating sources for the variables) and the true correlation between two constructs in question, but also may vary by the influence of other intervening variables. Especially where there are weak correlations between leadership styles and team processes it is likely that other variables intercede and should be measured and understood.

Team Processes and Team Effectiveness

In Hypotheses 16, 17 and 18, this study tested whether or not team processes (each of Team-Level Competencies, Cohesion, and Potency) were positively predictive of team effectiveness (each of Job Satisfaction and Leader Consensus Rankings). All of

the team process variables were positively and significantly correlated with team member Job Satisfaction, but none were related to Leaders Consensus Rankings.

Team competencies were also predictive of team member Job Satisfaction beyond the effect of team interdependence, which was used as a control variable given its strong relationship with many of the variables in the current study. This suggests that teams who function well together, that is who are interpersonally effective and well self-managed, have satisfied members. It is unfortunate that support was not found for the more objective team effectiveness criterion, Leader Consensus Rankings, as it mixes the message a bit. Only when the team effectiveness criterion was measured from the same source as the team processes (i.e., from team members themselves) was a meaningful relationship found. The researcher again suggests this hypothesis be re-tested with other objective team effectiveness criteria.

Surprisingly, team Cohesion was not predictive of team member Job Satisfaction beyond the effect of team interdependence. While intuitively it makes sense that cohesive teams have more satisfied members, this study could not strongly support that as the significant positive zero-order relationship essentially disappears when the variance explained by team interdependence is taken into account. This suggests that while team member Job Satisfaction may be influenced by how cohesive working relationships are, it may be even more dependent upon how interdependently a team works.

Team Potency was also predictive of team member Job Satisfaction beyond the effect of team interdependence. This suggests that teams who collectively believe that they can be effective have satisfied members. It is again unfortunate that support was not found for the more objective team effectiveness criterion, Leader Consensus Rankings, as

it muddies the Potency-effectiveness picture. The researcher again suggests this hypothesis be re-tested with other objective team effectiveness criteria.

Taken together, these results provide some empirical support for the notion that how teams work together might influence their effectiveness. This is some support for the *process-output* portion of the organizing framework proposed in this study. Team Potency had the strongest relationship with team effectiveness criteria, reinforcing previous research findings (e.g., Larson & LaFasto, 1989; Sosik, Aviolio, & Kahai, 1997). The varied relationships between team processes and effectiveness criteria could in part be due to the context in which teams operated.

The Input-Process-Output Model

Hypothesis 19 was a test of the *input-process-output* model, positing that team process variables would mediate the impact leadership styles have on team effectiveness. To test for mediation significant correlations had to be established among leadership styles and team effectiveness criteria, leadership styles and team processes, and team processes and effectiveness criteria. All relationships were significant when using team member Job Satisfaction as an effectiveness criterion, but not when using Leader Consensus Rankings. As such, the *input-process-output* model was not tested in the current study with the objective team effectiveness criterion. Also, because neither of Initiating Structure nor Consideration, as self-rated by leaders, was significantly correlated with either of the effectiveness criteria, mediation analyses with for those leadership style variables was not tested.

Overall, few of the results supported the *input-process-output* model. Team Potency was the most consistent mediator, mediating the relationships between each of

the three leadership styles and team member Job Satisfaction. This suggests that the impact that leaders have on the effectiveness of their teams is channeled through a sense of team potency or collective efficacy that they foster. Leaders may exhibit positive behaviors (described by any leadership style), but if they cannot inspire a belief in their teams that they can and will be successful, that success (or at least satisfaction) will be unlikely to happen. On the hand, positive leadership styles may influence team results (again, at least satisfaction) when the leaders get their teams to collectively believe they can be effective.

While this study finds that relationship between Transformational Leadership and team member Job Satisfaction is dependent upon the presence of Team Potency, it also finds that the relationship between Consideration and Initiating Structure and Job Satisfaction is dependent upon Team Potency and Interpersonal and Self-Management Team Competencies. Considerate and initiating leaders must not only foster a sense of collective efficacy in their teams, but they must also ensure that their teams function well interpersonally and know how to self manage.

Cohesion did not mediate the relationship between any leadership style and team member Job Satisfaction. While Cohesion correlated significantly with Job Satisfaction, it was not uniquely predictive of it (beyond the effects of Team Interdependence). While having a cohesive group may be important for teams, other factors are clearly more important in getting results, and the impact that leaders have on team performance is not dependent upon the cohesiveness of the team.

The Context in Which Teams Operate

The present study examined two context variables, team interdependence and team dispersion, as potential moderators of the relationships between team processes and outcomes. The results did not support the idea that context moderates this relationship, however. Research (e.g., Jung & Sosik, 2003) has suggested that in order for groups to develop homogeneous beliefs substantial group-member interaction is required. The current study did find strong correlations between Team Interdependence and each team process variable, supporting the notion that being interdependent goes hand-in-hand with engaging in effective team processes. In fact, Team Interdependence was found to be a strong correlate of all leadership styles, team process variables, and team member Job Satisfaction. Relationships were so strong in some cases that Team Interdependence was often held as a constant in testing other relationships in the current study. No evidence was found, however, for moderation, that is the notion that how interdependent a team is changes the influence of team processes on the satisfaction of team members, as posited in Hypotheses 20a-20c. Effective team processes are just as important to team member Job Satisfaction in teams that interact less often as in teams that interact more often. Because it was related to many of the team-level variables, future research could examine Team Interdependence as a predictor, mediator or moderator of other relationships in the organizing framework proposed in the current study.

In Hypotheses 21a-21c, the current study also posited that relationships between team processes and effectiveness criteria would be stronger when teams were less geographically dispersed than when they were more dispersed. This notion was unsupported, as Geographic Dispersion did not moderate the relationship between any of

the team process variables and team effectiveness criteria. Interestingly, on average teams in the current study reported that they operated between somewhat and mostly remotely, having their leader and team members in different locations. The standard deviation on the Geographic Dispersion scale was high, indicating a good range in how dispersed teams were. With this said, how geographically dispersed a team was did not correlate meaningfully with any team processes, suggesting that such processes are not dependent upon how co-located teams were. Perhaps this is due to significant advancements in communication technologies in the last few years, or maybe people are increasingly more comfortable in working in virtual team situations. As mentioned, the participating organization in this study invested heavily in technology in order to foster good team communication. Future research could explore the potential effects of Geographic Dispersion on teams where communication mediums are sub-par, making effective communication more challenging. It is tentatively concluded that it is nearly irrelevant whether teams operate near each other (e.g., face-to-face) or geographically dispersed.

Conclusion

The current research sought to further our understanding of how leaders impact their teams and ultimately performance. Relationships were hypothesized in the context of an *input-process-output* model, and a broader organizing framework was proposed to encompass other variables posited to play into the relationship between leaders and teams. While over half of the twenty-five hypotheses in the current study were unsupported, fully and partially supported hypotheses lend some support to the importance of effective leadership styles, team processes, and the contextual variable of team interdependence in the modern workplace.

The *input-process-output* model by nature suggests process mediation, and it has a long a popular history in group research (e.g., Zaccaro & Marks, 1999). Nevertheless, little support was found for mediation in the current study. Team Interdependence was found to be a strong correlate of all team process variables and team member Job Satisfaction, suggesting that it may play an important role in team functioning and team effectiveness, though that role is not to moderate the *process-output* relationship as posited. Future research focusing on team interdependence is recommended. It may be one of the most important variables regarding teams in organizations.

Overall, while many of the tested hypotheses went unsupported, there is at least some modest evidence to conclude that leaders influence how their teams work together and the results that they achieve. While a number of the hypotheses in this research were about simple correlational relationships, with twenty five total hypotheses and multiple data sources this research was ambitious in design. The hope here is that a framework is brought to life, and that the fully supported, partially supported, and unsupported relationships uncovered in this research contribute to more focused testing. The further hope is that the proposed organizing framework, through critique, refinement, and expansion, serves as a roadmap for future research. Each piece of the proposed framework deserves further careful research attention.

Limitations and Future Research

This study was not without limitations. First, the size of the sample made it difficult to detect effect sizes. While the researcher had data for 94 leaders, sufficient data was obtained for only 81 teams. So, analyses using leader and team data only had an N of 81. Further, Leader Consensus Rankings were only obtained for 74 of the teams, so

analyses involving that outcome variable had an N of 74. Greater statistical power would have permitted better evaluation of some of the hypotheses in the current study. While N = 81 in teams research is typically acceptable, future research that tests hypotheses in the proposed organizing framework should look to include more teams. Considering that each team is composed of multiple people, it is more difficult to obtain a large sample of teams than of individuals. For example in the present study the number of individuals was well over 300; analyzing data with an N of 300 would provide substantially more power than analyzing about 80 groups.

Second, stronger evidence for the aggregation of some of the measures to group level would have provided a better basis for some of the analytics. While the researcher manipulated item wording in some of the measures so that references were at the team level, in some cases aggregation of measures was unsupported. Using measures with the best possible reliability at the group level is recommended for future studies.

Third, discriminate validity among the leadership styles was not good, as the leadership style ratings overlapped greatly, especially when rated by direct reports (e.g., Transformational Leadership and Consideration were correlated at .83). While previous research has recognized some overlap in these styles, and the most common measures of these styles were employed in the current study, further research and measurement improvement is needed to distinguish them. The lack of discriminate validity in these styles made the hypotheses that attempted to order the strength of relationships between these styles and other variables nearly impossible to support.

Fourth, while both leader self-ratings and direct-report ratings of leadership styles were examined in the current study, research has shown multi-source feedback can often

be especially reliable and valid. Using multi-source feedback for more of the variables in the present study might have alleviated the effect of common method variance, a measurement issue that plagues much social science research. Future research could improve upon this study and retest the organizing framework by using multi-source feedback.

Fifth, the Process Fostering variable introduced in the current study had a very high mean and low standard deviation, indicating that nearly all leaders in the current study felt it was their responsibility to develop and maintain processes in their teams. This restriction of range likely contributed to a lack of support for Hypothesis 15. Future research should refine the measure such that it yields greater variance. Future research could also test the relationships between leadership styles and team processes across teams where fostering team processes is formally part of leaders' roles versus formally not part of leaders' roles. Also, while the current study focused on Process Fostering as one potential moderator of the relationships between leadership styles and team process variables, given relationships between leadership styles and team process variables ranged from weak to strong, others should be explored. Especially where there are weak correlations between leadership styles and team processes, it is likely that other variables intercede and should be measured and understood.

Finally, the objective team effectiveness criterion used in the current study could have been better. While the participating organization brought to bear several 'hard' performance indicators in the consensus ranking process and considers a leaders' ranking to be a fairly direct assessment of team performance, the criterion may not be as valid as believed. There is still some subjectivity to the ranking process, which could diminish the

validity of the outcome (leaving room for subjective biases to influence the performance ranking). Also, perhaps Leader Consensus Rankings are actually a better gauge of individual leader performance, and not of team performance. The variable Leader Consensus Rankings was correlated with few other variables in the study, perhaps most importantly its correlation with the other team effectiveness criterion (team member job Satisfaction) was non-significant. Obtaining a reliable and valid objective performance criterion is often a challenge in social science research, and the lack of a strong criterion in this study weakened conclusions about the impact of leaders and team processes on team effectiveness. Future research should include a better objective measure of team performance.

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