ABSTRACT

Title of dissertation: THE RELATIONSHIP BETWEEN LEADER CORE SELF-EVALUATIONS, TEAM FEEDBACK, LEADER EFFICACY, TRANSFORMATIONAL LEADERSHIP, TEAM EFFICACY, TEAM GOALS, TEAM ACTION AND TRANSITION PROCESSES, AND TEAM PERFORMANCE

Narda Roxanne Quigley, Doctor of Philosophy, 2003

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This research attempts to explain how internal team leaders can help teams perform in high stress, dynamic environments. Specifically, the aim of the research was to examine a chain of relationships beginning with team leaders' core self-evaluations and ending in team performance. Several core research questions were examined, including: "Do leaders' core self-evaluations and self-efficacy serve as important antecedents of transformational leadership? Is transformational leadership an important antecedent of team efficacy? How does team efficacy lead to higher levels of team performance?" First, I reviewed the extant relevant literature. Second, I derived from this review a theoretical model, which proposes that both leader core self-evaluations and team feedback may influence leader self-efficacy and transformational leadership. Transformational leadership may then influence team efficacy, which in turn may influence performance through its impact on team goals and team action and transition processes. Third, using data collected from a sample of teams composed of first-year

MBA students involved in a week-long business simulation, I tested the model and demonstrated support for a number of hypothesized relationships. Fourth, I revised the model based on modification indices provided by covariance structure analysis. I found that leaders' core self-evaluations do influence their self-efficacy; this efficacy exhibited positive and significant direct relationships with team efficacy and with team processes. In addition, I found support for a chain of relationships linking team efficacy to team goals to team processes to team performance.

THE RELATIONSHIP BETWEEN LEADER CORE SELF-EVALUATIONS, TEAM FEEDBACK, LEADER EFFICACY, TRANSFORMATIONAL LEADERSHIP, TEAM EFFICACY, TEAM GOALS, TEAM ACTION AND TRANSITION PROCESSES, AND TEAM PERFORMANCE

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Chapter 1

Introduction

Consider the following situation: a team of 28 men at the start of World War I attempt to make the first historic crossing of Antarctica, from the Weddell Sea to the Ross Sea, on the ship *Endurance*. As they sail south for their destination, they find that the pack ice in the Weddell Sea is unusually thick. Just a day away from their destination, their boat becomes hopelessly trapped in the ice; instead of achieving honor, recognition, and glory, the team now faces a grueling trial of survival. For 10 months the team drifts north with the ice, living on the boat, eating penguins and seals, and camping on ice floes when their ship eventually sinks. What possible chance could this team have to survive?

As it happened, the explorer in charge of the expedition was Ernest Henry Shackleton, a man renowned for his good humor, charm, and energy. Described as an "obstinate boy" by his first sea captain, Shackleton grew up to be described by Thomas Orde-Lees (one of his 28 team members) as never "anything but the acme of good humor and hopefulness." Shackleton's positive view of even the most adverse of conditions allowed him to keep the team together; at one point, for example, he asked his crew to train all 60-odd sled dogs they had brought with them so as to keep up morale. All 28 members of Shackleton's team eventually survived the ordeal; this amazing feat has been attributed to Shackleton's legendary positive leadership during a time of intense adversity. Sir Raymon Preistley, a British geologist and explorer who was part of the *Endurance* team, said, "For scientific leadership, give me [British explorer] Scott, for swift and efficient travel, give me [Norwegian explorer] Amundsen; but when you are in

a hopeless situation, when there seems to be no way out, get on your knees and pray for Shackleton."

A number of issues surface in regard to the above situation. First, for example, what was Shackleton's response (both emotional and intellectual) as he faced extreme adversity and seemingly hopeless conditions with his team, and why? Second, how did Shackleton's response to the situation influence the confidence his team members had in their ability to overcome the challenge at hand, the team processes they experienced, and their ability to come up with a viable approach to the situation? Finally, did the team's confidence in its own abilities and the team's processes have any impact on whether it successfully navigated the challenges it faced in the frozen Weddell Sea; what exactly was it that allowed the entire team's survival?

A relevant theoretical perspective to begin thinking about the above questions associated with leadership is core self-evaluations theory (Judge, Locke, & Durham, 1997). This theory is rooted in appraisal theory (e.g., Arnold, 1960; Lazarus, 1991; Locke, 1969, 1976; Packer, 1985/1986), which broadly asserts that individuals subconsciously appraise objects, people, or events in relation to their perceived needs, values, and commitments—and that emotions are the form by which individuals experience these subconscious appraisals (Judge et al., 1997). Using an appraisal theory perspective, therefore, Shackleton encountered a particular situation, and then was faced with his own emotional response to the situation—which then had an impact on his team's confidence, interactions, and outcomes. Judge et al. (1997), based on Packer (1985/1986), suggested that appraisals occur on many different levels. At the deepest level, appraisals of specific situations are affected by "core evaluations," or the basic

conclusions we hold subconsciously about ourselves, other people, and the external environment. Judge et al. (1997) argued that these core evaluations could be considered to be traits, which they define as “stable and consistent ways of thinking, feeling, or acting exhibited by individuals” (p.155). Judge, Locke, Durham, and Kluger (1998) found that core evaluations of the self were associated with core evaluations of the world and others. Four indicator traits have been used to measure these core self-evaluations: self-esteem, generalized self-efficacy, locus of control, and emotional stability/ neuroticism.

While core self-evaluations theory has never been applied in a leadership context, the broader consideration of personality factors such as the four indicator traits and their impact on leadership is nothing new. “Great man” theories of leadership, which asserted that leadership qualities were inherited (this last unnecessarily, since they conceivably could be acquired as well), were popular in the nineteenth and early twentieth centuries (Kirkpatrick & Locke, 1991) only to lose their popularity by the mid-twentieth century. In the late twentieth century, trait theories experienced a resurgence of interest; this may have been partly due to the understanding that leadership success was not merely a matter of possessing some trait or combination of traits. Rather, as Kirkpatrick and Locke (1991) theorized, it may be the combination of those traits with certain actions that give rise to more effective leadership.

It is here where core self-evaluations may prove to be of interest to modern leadership theory. Transformational and charismatic leadership theories (e.g., Bass, 1985; Burns, 1978; Conger & Kanungo, 1987) have never been particularly clear about the respective contributions of traits and behaviors to those types of leadership. They seem to

acknowledge both the importance of specific leadership behaviors and specific traits. The first component of transformational leadership as defined by Bass's (1985) theory, for example, is charisma; the original Greek meaning of the word means "gift," which suggests a trait. However, a different component of Bass's transformational leadership—individual consideration—is very similar to the consideration dimension from the Ohio State—Michigan studies, which were clearly studies about leadership behavior. The incorporation of core self-evaluations as an antecedent to transformational leadership may be an interesting way to examine whether a theoretically relevant trait contributes to transformational leadership behaviors; if so, the relationship between leadership traits and behaviors (in the context of transformational leadership) may be somewhat clarified. Core self-evaluations may also be particularly relevant to examine in the context of transformational leadership, as both concepts have been linked to higher performance through motivational pathways.

This leads me to my first research question:

RQ1: Do leader core self-evaluations serve as an antecedent to transformational leadership?

Regardless of whether core self-evaluations serve as an important antecedent to transformational leadership, transformational leadership in team settings has been widely overlooked both by those studying transformational leadership and those studying teams (Zaccaro & Klimoski, 2002). Indeed, the majority of leadership research has centered on organizational leadership—leadership at a much higher level than team leadership. As a

result, there is a dearth of knowledge about what the effects of transformational leadership in a small team setting might be. In this dissertation, I seek to begin addressing this issue. It is likely that transformational leadership helps teams transcend the immediate issues and problems they face, helping team members stay focused and motivated. Part of this may be due to the ability of the transformational leader to generate team member confidence in the team's ability to handle the task at hand (team/collective efficacy—e.g., Gibson, 1999; Lindsley, Brass, & Thomas, 1995) and achieve its goals, which may in turn positively influence team processes and team effectiveness.

This leads me to my second research question:

RQ2: Does transformational leadership in a team setting influence how teams respond when faced with challenging tasks?

Team efficacy is another critical variable examined in this dissertation (Bandura, 1997). Pescosolido (2001) reviewed the extant work on team efficacy and noted that though much work has demonstrated links between team efficacy and performance, little work exists that has attempted to determine how this type of efficacy is built and what can be done to increase a group's efficacy levels. It seems reasonable, as noted above, to consider team efficacy in tandem with both team leader core self-evaluations and transformational leadership due to their conceptual links. In this dissertation, I also consider whether the team leader's self-efficacy plays a role in linking the leader's core self-evaluations, transformational leadership, and team efficacy. Although some research has found leader efficacy to be an immediate antecedent of team efficacy (Pescosolido,

2001), no prior research has examined whether transformational leadership may play a mediating role in that relationship. My third research question, therefore, is as follows:

> RQ3: What are the critical antecedents of team efficacy; how important is the role of transformational leadership as a pathway through which the leader may influence team efficacy?

Although a fair amount of research has found team efficacy to be directly related to team performance (e.g., Gully, Beaubien, Incalaterra, & Joshi, in press; Prussia & Kinicki, 1996; Shea & Guzzo, 1987; Silver & Bufiano, 1996; Spink, 1990), questions still remain regarding how exactly team efficacy is translated into performance. Previous research has supported the mediating role of team goals (e.g., Durham, Knight, & Locke, 1997); substantial theoretical support also exists for the mediating role of team action and transition processes (Marks, Mathieu, & Zaccaro, 2001). However, no study to my knowledge has considered how team efficacy may influence performance through its impact on both team goals and team action and transition processes. This leads me to my fourth research question:

> RQ4: What are the specific mechanisms through which team efficacy influences performance; do team goals and team action and transition processes play mediating roles?

This research contributes to the existing literature on leadership, teams, and core self-evaluations in a number of ways. First, as noted above, few empirical studies have examined the impact of leaders in small team settings in particular. As Zaccaro and Klimoski (2002, p. 5) noted, "although there exist[s] a large theoretical and empirical literature on… leadership… we still know relatively little about how leaders create and direct team processes to achieve collective success." This is especially interesting given the clear importance of work teams in modern organizations; it seems that more attention should be devoted to understanding the interactions of leaders with other team members. Given the paucity of our knowledge in this area, the research in this dissertation has potential to contribute to the field.

A second contribution of this research is in examining how core self-evaluations may influence transformational leadership. Judge and Colbert (2002) noted that existing research on leadership traits has not explored the "black box" between personality traits and leadership itself; the processes by which traits affect leadership have gone virtually unstudied. The model proposed in Chapter 3 begins to address this issue by hypothesizing a potential motivational pathway—leader efficacy—through which a leader's core self-evaluations may influence transformational leadership. Therefore, another contribution of this study is in how it illuminates the connection between leader traits and transformational leadership.

A third contribution of this research is in delineating a set of potentially major antecedents of team efficacy. As noted above, little work exists that has attempted to determine how this type of efficacy is built and what can be done to increase a group's efficacy levels (Pescosolido, 2001). This research sheds further light on potential

antecedents of team efficacy; no prior research has examined team leader core self-evaluations, team leader efficacy, or transformational leadership as antecedents of team efficacy.

A fourth contribution of this research is in the potential implications of the findings for selection and staffing purposes in organizations. If core self-evaluations do indeed impact the way leaders respond in the face of challenges to motivate team members and facilitate effective team processes, organizations with teams in difficult situations may want to specifically choose leaders on the basis of their core self-evaluations (which may be related to their ability to effectively handle the situation). It may be that leaders who are above average on core self-evaluations should be selected for teams assigned especially arduous tasks, if the trait helps them to cope with adversity and still be both high performers and satisfied with their jobs.

Therefore, the purpose of this investigation is to examine core self-evaluations of leaders and the effects of this dispositional concept on leader efficacy, transformational leadership, team efficacy, team goals, team processes, and team performance. To this end, in Chapter 2, I review the relevant literature. In Chapter 3, I derive the theoretical model that is tested in this dissertation and provide support for the various hypotheses considered. In Chapter 4, I discuss the research methodology I utilized to test the hypotheses. In Chapter 5, I report the results of the study. In Chapter 6, I discuss theoretical, methodological, and practical implications, limitations, and future research directions.

Chapter 2

Literature Review

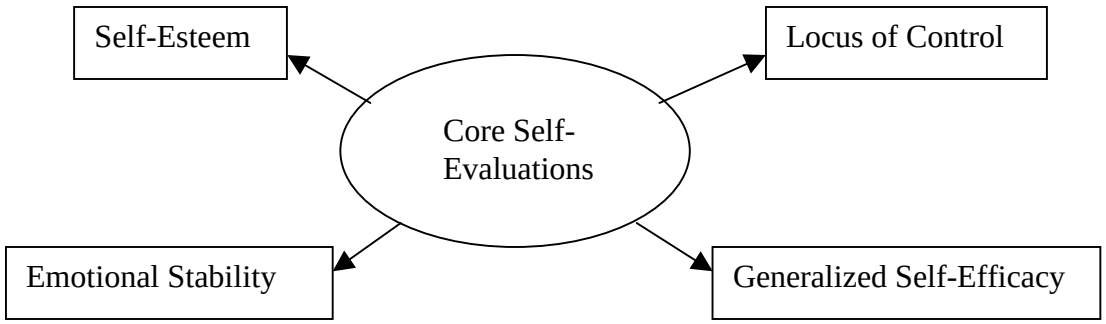
In this chapter, I establish the groundwork for the model proposed in Chapter 3. A review of the literature on core self-evaluations is followed by a discussion of leadership traits, transformational leadership, and emergent leadership. I then discuss team efficacy, team goals, and team processes. I close the chapter with a discussion of the scope of the research.

Core Self-Evaluations

In the following review of the existing material on core self-evaluations, I first define core self-evaluations and discuss the significance of the four indicator traits and the connections between them. I then conclude with a review and summary of the findings in this area to date.

Definition of core self-evaluations. As Judge, Bono, Erez, and Thoresen (2002) wrote, "Core self-evaluations is a higher order concept representing the fundamental evaluations people make about themselves, their environments, and the relationship between themselves and their environment" (p. 58), but in this dissertation I am only concerned with core evaluations of the self. As noted in the first chapter, the concept is manifested by four indicator traits as shown in Figure 1: self-esteem, emotional stability/neuroticism, locus of control, and generalized self-efficacy. These traits met three criteria that made them appropriate indicator traits for the core self-evaluations

Figure 1. The Four Trait Indicators of Core Self-Evaluations.



concept (Judge et al., 1997; Judge & Bono, 2001): evaluation-focus (the degree to which a trait represents evaluation, as opposed to description); fundamentality (as in Cattell's (1965) personality theory, fundamental traits underlie surface traits); and breadth or scope (Allport, 1961, noted that cardinal traits are broader in scope than secondary traits).

The four core traits are conceptually related, as their definitions meet the above three criteria. Self-esteem is typically defined as the overall value that one places on oneself as a person (e.g., Harter, 1990). Neuroticism (emotional stability) represents the tendency to exhibit poor emotional adjustment and experience negative feelings such as fear, self-doubt, and depression (Judge et al., 1998; Barrick & Mount, 1991). Generalized self-efficacy is the most general type of self-efficacy, as it "encompasses individuals' judgments of their capacity to mobilize the motivation, cognitive resources, and courses of action needed to exercise general control over… their lives and deal successfully with life's challenges" (Judge et al., 1997). The last of the indicator traits, locus of control (Rotter, 1966), represents the perceived degree of control over the outcomes of one's actions (Judge et al. 1998). Rotter (1966) divided individuals into two camps based on their locus of control: individuals with an internal locus of control believe they control their own lives, while individuals with an external locus of control believe that they are controlled by luck, chance, fate, or powerful others.

Empirical and theoretical links between traits. Judge et al. (2002) noted that though the indicator traits seem to be extremely prominent in the literature, few empirical investigations have included more than a single core trait. Indeed, even when two or more of the traits are included in the same study, they are usually treated as unrelated variables (e.g., Abouserie, 1994; Hesketh, 1984; Hojat, 1983; Horner, 1996; Tiggeman &

Winefield, 1984). Sometimes the traits are modeled as influences on each other, divorced from any theoretical framework. For example, Wambach and Panackal (1979) claimed an effect of neuroticism on locus of control, whereas Morelli, Krotinger, and Moore (1979) viewed locus of control as a cause of neuroticism.

Judge et al. (1998) conducted a meta-analysis among 12 samples of roughly 15,000 individuals to investigate the relationship between the four core traits. Their results are summarized in Table 1. Note that the estimated true score correlations among the traits are substantial—when Judge et al. (1998) completed a factor analysis, they found that the core traits loaded strongly on a single underlying factor. Erez and Judge (2001) confirmed these results and found evidence that core self-evaluations is a higher-order factor that integrates the association among the four lower-level traits.

Findings associated with core self-evaluations. Since Judge et al.'s (1997) theoretical piece discussing the nature of the proposed concept of core evaluations, a number of studies have advanced our understanding of the concept. The original concept they proposed included core evaluations of the self, other people, and the world in general (with trust vs. cynicism and just vs. unjust world as examples of two core evaluations in the domains of other people and the world). The individual studies that have been conducted to date examining core self-evaluations are reviewed below.

Judge, Locke, et al. (1998) evaluated core evaluations of the self, the world, and other people and also considered the effects of these core evaluations on job and life satisfaction. They found that external core evaluations (those of the world and other people) did not explain further variance in job and life satisfaction than did core self-

Table 1.

Judge, Erez, & Bono's (1998) Meta-Analysis Findings with Respect to the Correlations Between the Four Core Traits.

Trait	1	2	3	4
Self-Esteem	1.00	.70	.44	-.51
Generalized Self-Efficacy	.86	1.00	.45	-.45
Locus of Control	.58	.59	1.00	-.36
Neuroticism	-.62	-.54	-.47	1.00

Notes.

K = 12 and n = 15,888 for locus of control—self-esteem, locus of control—neuroticism, and self-esteem—neuroticism correlations.

K = 11 and n = 14,777 for correlations involving generalized self-efficacy.

Correlations below the diagonal are corrected for measurement and sampling error; correlations above the diagonal are uncorrected.

A 95% confidence interval for each correlation excluded zero.

evaluations and concluded that how individuals view the external world might, in fact, be a function of how they view themselves. They also found that core self-evaluations were both directly and indirectly related to job and life satisfaction. Positive core self-evaluations were found to have consistent effects on job satisfaction through their effects on job perceptions and also independently of the attributes of the job itself.

Judge, Erez, et al. (1998) also investigated the theoretical relationship between core self-evaluations and job performance. They conducted a meta-analysis for correlations among the four core traits over 12 samples of roughly 15,000 individuals. In support of their previous work, as noted above, they found that the traits are highly correlated and comprise a common factor. They also presented a logical argument linking positive core self- evaluations to performance through the impact core self-evaluations have on motivation. In addition, they discussed the implications for selection of core self-evaluations research, covering legal, measurement, applicant reaction, and faking issues.

Judge et al. (2000) returned to the consideration of job satisfaction as the primary dependent variable. They expanded upon Judge, Locke, et al., (1998), however, in that they considered both perceived job characteristics and objective job complexity in a procedure that included two studies. The first study found direct relationships between core self-evaluations and perceived job characteristics, between core self-evaluations and job complexity, and between core self-evaluations and job satisfaction. Furthermore, core self-evaluations had an indirect effect on perceived job characteristics through actual job complexity. The authors suggested that individuals with high core self-evaluations may seek out and attempt more complex jobs; they may be more likely to exert greater effort with respect to goal-setting activities and higher task involvement; they may be less

likely to withdraw from complex jobs when failure is experienced; and they may have better coping mechanisms, all of which may lead to increased attempts to attain and keep more complex jobs. In the second study covered in Judge et al. (2000), the constancy of the core-self evaluations concept and its relation to job complexity and job satisfaction over time was examined. Core self-evaluations as assessed in childhood and adolescence was related to job complexity and job satisfaction later in life, suggesting that core self-evaluations are indeed dispositional in nature.

Erez and Judge (2001) examined the relationship between core self-evaluations, goal-setting, motivation, and performance in three studies. The first of these was to confirm that the four indicator traits loaded on one higher order factor; confirmatory factor analysis supported this hypothesis. The second study demonstrated that more positive core self-evaluations were related to higher levels of task motivation and performance. In addition, motivation (which was measured through amount of time spent on attempting to solve anagrams and also by three direct questions assessing motivation) was found to partially mediate the relationship between core self-evaluations and performance. The final study replicated the above findings in a sample of insurance agents; also, in this study, the effect of core self-evaluations on performance (as measured both by objective number of sales and rated performance) was found to be mediated by both goal-setting and job behavior (activity level—how active the agents were in making sales). The studies also answered several questions regarding the validity of the overall concept. Core self-evaluations appeared to have incremental validity above and beyond conscientiousness in this study, suggesting that core self-evaluations may be an important dispositional predictor of job performance. In addition, when the four core

traits were investigated as “one nomological network, the overall construct [concept] proved to be a more consistent predictor of job behaviors than when the individual traits were used in isolation.” (Judge & Erez, 2000, p. 1277). Therefore, Judge and Erez (2000) provided some support for Judge, Erez, et al. (1998) in that core self-evaluations may influence performance through having an effect on motivation.

Srivastava, Locke, & Judge (2002) revisited the question of why individuals with more positive levels of core self-evaluations exhibit higher levels of satisfaction in a lab setting. They found that core self-evaluations affect the level of task complexity that individuals choose, which was in turn related to perceptions of task characteristics and task satisfaction. Srivastava et al. (2002) also suggested that core self-evaluations might be related to a constellation of behaviors on actual jobs (for example, showing initiative, asking for more responsibility, seeking opportunities for learning, assuming leadership positions, etc.) that would lead to increased satisfaction.

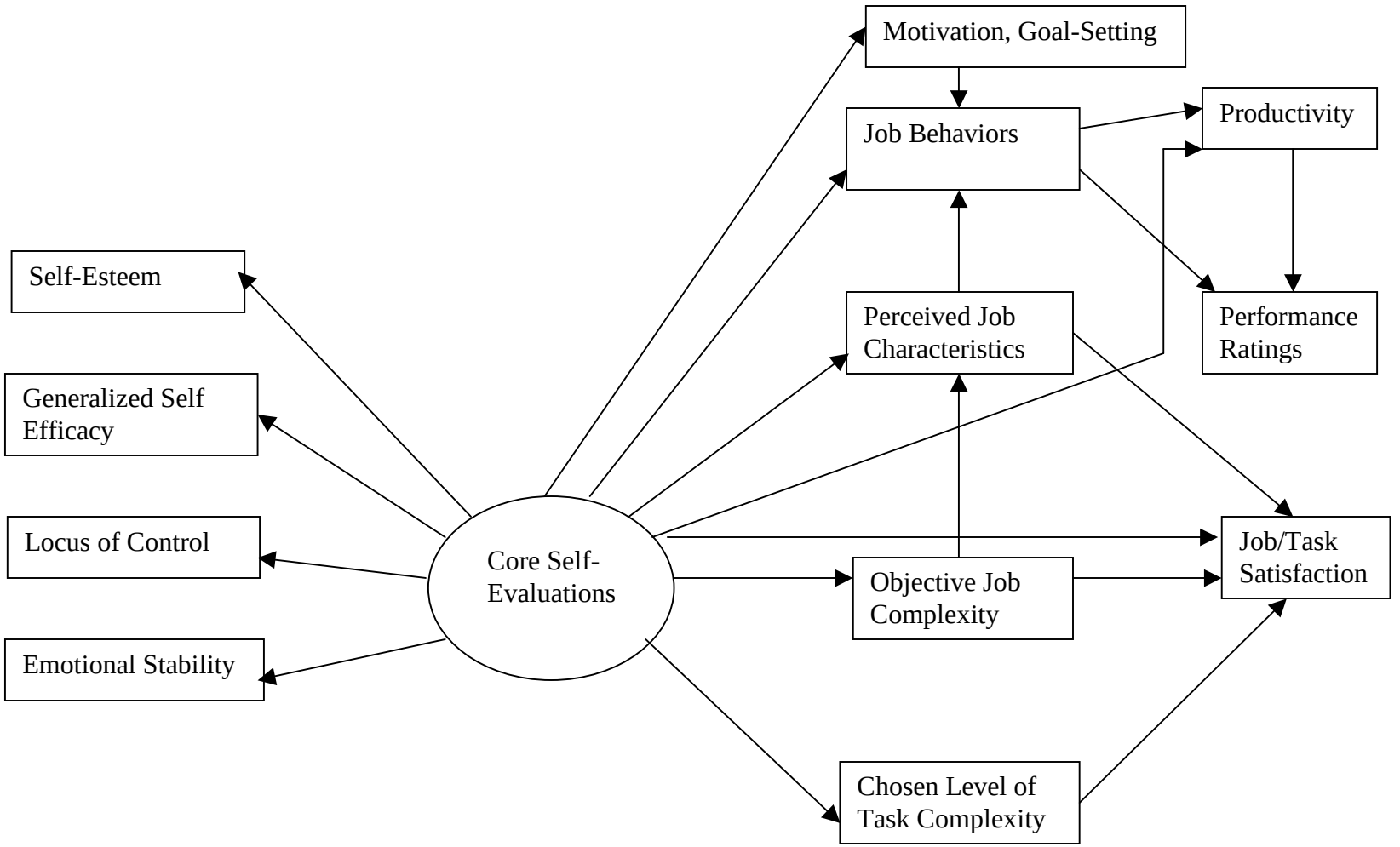
Durham, Locke, and Judge (2002), picking up on this last point and on Erez and Judge (2001), examined the relationship of core evaluations to behavior on the job. The authors hypothesized that core self-evaluations would influence job behaviors both directly and indirectly through perceptions of job characteristics. More positive core self-evaluations were found to influence self-reported job behaviors such as seeking greater job challenge; showing persistence in the face of setbacks; using independent judgment; seeking raises and promotions by asking managers how to get them; and motivating subordinates. However, core self-evaluations were not directly related to job behaviors when managers assessed the behaviors. The authors suggested that this last finding may have been due to the fact that managers were not able to monitor employees at all times;

therefore, employees may be more aware of their own behaviors than managers are. In addition, all managers probably did not use the same standards in evaluating employee behavior, which may have influenced results.

Durham et al. (2002) noted that consideration of their results and the results of Erez and Judge (2001) in tandem yields some interesting conclusions, as each study considered different mediators between core self-evaluations and job behaviors. The conclusion that can be reached is that core self-evaluations may affect behavior on the job indirectly by a variety of paths and possibly directly as well. In addition, core self-evaluations affect both performance and satisfaction directly and indirectly, suggesting that this dispositional trait is worthy of more exploration in different realms. Figure 2 summarizes the findings regarding core self-evaluations to date.

The research that has involved core self-evaluations to date provides some compelling evidence of the viability and utility of the theory in predicting motivation, satisfaction, and performance. Another potentially fruitful realm in which to examine core self-evaluations may be in their relationship to leadership. Two streams of leadership theory are particularly relevant: trait theories of leadership and transformational leadership theories. In the next section I discuss the findings and relationship between these two sets of theories; I close the section with a brief discussion of emergent leadership and its relevance in the context of work teams.

Figure 2. Summary Diagram of All Empirical Findings Involving Core Self-Evaluations to Date.



Trait and Transformational Theories of Leadership

Various theories of leadership abound, of course, ranging from trait theories (e.g., Stogdill, 1948) to behavioral theories (e.g., the Ohio State and University of Michigan leadership studies of the 1940s-50s: e.g., Fleishman, 1953; Halpin & Winer, 1957; Hemphill & Coons, 1957; Katz & Kahn, 1952; Katz, Maccoby, & Morse, 1950; etc.) to contingency theories (e.g., Fiedler, 1964, 1967) to theories of transformational leadership (e.g., Bass, 1985; Conger & Kanungo, 1987) to theories of shared leadership (e.g., Seers, 1996). As a clarifying point, the primary type of leadership upon which I focus in this dissertation is transformational leadership, due to this type of leadership's widely acknowledged impact on follower motivation. Theories of both charismatic and transformational leadership (e.g., Bass, 1985; Burns, 1978; Conger & Kanungo, 1987; House, 1977) have all specifically emphasized the motivating influence these types of leaders may have on followers, suggesting that characteristics, rhetoric, and behaviors of the leader may motivate followers to do extraordinary things.

A secondary theoretical approach to leadership used in this dissertation is trait theory. In Chapter 3, I will argue that a team leader's core self-evaluations are an important individual antecedent related to the rise of transformational leadership. As noted in Chapter 1, the approach I will take is consistent with that taken by Kirkpatrick and Locke (1991), who suggested that traits might be a precondition for effective business leadership; effective leaders must take certain actions, however, in order to have a true impact (e.g., role modeling, setting goals, coaching subordinates, etc.). Therefore, in the next few paragraphs, I focus on trait and transformational theories of leadership.

Trait Theories of Leadership. As noted in the introduction, trait theories of leadership have been among the oldest and most widely discussed theories of leadership in the twentieth century (cf., Kirkpatrick & Locke, 1991; Stogdill, 1948). Prior to 1948 (the date of a seminal review by Stogdill) trait theories were popular, but often failed to show results. Stogdill's review pointed out these many inconsistencies, and the field of leadership as a whole took a new direction as theorists began to focus more on leadership behaviors and, eventually, leadership styles. Recently, however, trait theories have again become part of the leadership literature, as scholars have been considering the possibility that some individuals may have traits that raise the likelihood of certain effective leadership behaviors (Kirkpatrick and Locke, 1991).

Many traits have been hypothesized to influence leader effectiveness, some of which are conceptually related to core self-evaluations. Kirkpatrick and Locke (1991), for example, suggested that traits such as drive, leadership motivation, honesty and integrity, cognitive ability, and knowledge of the business, among others, may be linked to leadership effectiveness. They also suggest that self-confidence and emotional stability are critical traits. For example, managers who are confident in their abilities may be more likely to inspire commitment among and be trusted by their employees. In addition, emotional stability is critical—especially when resolving interpersonal conflicts or facing stressful events and challenges. These two traits are closely related to core self-evaluations—an individual with positive core-self-evaluations is probably more likely to be more confident in his/her abilities, and emotional stability is one of the four indicator traits. A number of trait theorists have identified self-confidence, internal locus of control, and emotional stability as potentially important traits for leaders to have; many of

these are reviewed in more detail in Chapter 3. Existing empirical evidence does indicate that examining core self-evaluations in a leadership context is a logical direction to take.

Transformational Leadership Theory. While trait theories of leadership experienced a resurgence of interest in the last decade, research on transformational leadership has increased exponentially. Three seminal works are widely credited with initially advancing theories of charismatic and transformational leadership: Burns (1978), House (1977), and Bass (1985). The stream of literature that grew surrounding this new area would eventually overtake research considering all other major theories of organizational leadership combined; as Judge and Bono (2000) noted, out of all articles in the decade between 1990 and 2000 available on the PsycINFO database, 207 articles cited transformational or charismatic leadership theory, and 190 cited other once popular leadership theories (least-preferred coworker theory, situational leadership theory, leader-member exchange/vertical dyad linkage theory, normative decision/Vroom-Yetton theory, behavioral theories, path-goal theory, implicit leadership theory, and romance of leadership). Theories of transformational leadership have certainly captured the attention of researchers in the field of organizational behavior.

The approach highlighted in this dissertation emerges from Bass's (1985) theory of transformational leadership. In this theory, there are four dimensions of transformational leadership: idealized influence, inspirational motivation, intellectual stimulation, and individual consideration. *Idealized influence* comprises both the charismatic and the role-modeling aspect of transformational leadership. This is often considered the most prototypic and single most important dimension of transformational leadership (Judge & Bono, 2000). *Inspirational motivation* involves the articulation of a

clear, inspiring, and appealing vision to followers; *intellectual stimulation* involves the stimulation of follower creativity and thought by the questioning of assumptions and of the status quo. Finally, *individual consideration* involves attending to and supporting the individual needs of followers, much like the consideration dimension from the Ohio State—Michigan studies. Unlike the consideration dimension, however, individual consideration is more related to follower development than participative decision-making (Bass, 1995). In the original Bass (1985) piece, both transformational leadership and transactional leadership were discussed. In this research, however, I focus only on transformational leadership; I am most concerned with leaders who are able to motivate followers to pursue a common, inspiring goal and/or vision, rather than with leaders who establish exchange relationships with followers and seek to monitor that exchange (Burns's 1978 and Bass's 1985 transactional leadership type).

A substantial amount of evidence has accumulated in support of the effectiveness of transformational leadership. A meta-analysis by Lowe, Kroeck, and Sivasubramaniam (1996) suggested that transformational leadership behaviors are related to subjective (ρ = .73) and objective (ρ = .30) measures of leadership effectiveness. Fuller, Patterson, Hester, and Stringer (1996) found similar results, with a correlation of .34 between transformational leadership and leadership effectiveness. Finally, transformational leadership seems to be effective in a variety of cultures using a variety of methods (Bass, 1997). Given this information, examining transformational leadership more closely in work team settings may be a potentially fruitful endeavor.

Before ending this section on leadership, I review one final topic: the issue of emergent leadership. This particular type of leadership is particularly important in a variety of organizational situations; I review these in more detail below.

Emergent leadership and team development. An underlying assumption in much of the literature reviewed above is that teams operate with a designated individual who begins his/her life with the team as the appointed leader. Many teams in organizational contexts, however, begin existence without the designation of a formal leader. The phenomenon of emergent leadership may be observed in these teams. Schneider and Goktepe (1983) defined emergent leaders as group members who exert significant influence over other members of the group although no formal authority has been vested in them; these leaders, as Taggar et al. (1999, p. 901) noted, "may be just as important to the facilitation of team task completion as are designated leaders." Indeed, the manner in which a leader comes to power (either formally or through an emergent process) may be "unimportant in comparison to the behaviors of the leader" (Firestone, Lichtman, & Colamonosca, 1983).

The literature on emergent leadership, much like the literature reviewed above, has therefore placed emphasis on the appropriateness of specific leadership behaviors in certain situations. Evidence suggests that those individuals who behave in different leader-like ways to help the group achieve its goals, given different situations, will be perceived by peers as being more leader-like. For example, Zaccaro, Foti, and Kenny (1991) found that emergent team leaders (who were rated highest on a measure of perceived leadership by their peers) were more adept than other team members at perceiving team requirements and selecting appropriate behavior to these demands

(Taggar et al., 1999). In addition, Pescosolido (2001) suggested that different behaviors of an emergent leader may be important during different phases of a group's development; emergent leaders may have more of an impact on certain aspects of group functioning earlier rather than later in a group's development.

Seers and colleagues (Seers, 1989; Seers, Petty, & Cashman, 1995) postulated another related approach to how leaders emerge in team situations. They suggest that the process of leadership emergence in teams is that of negotiating roles and relationships between team members. The role an individual assumes on a team, then, depends on his/her abilities, the needs of other group members, and the team task to be completed. Some group members may possess inherent characteristics and exhibit certain behaviors that are perceived by other group members as indicative of leadership (Taggar et al., 1999). From this perspective, different people may emerge as leaders, depending on what roles are perceived as important leadership roles given the specifics of the situation.

In this dissertation, I focus on teams that, at their inception, are initially leaderless. Furthermore, the perspective I assume is that certain individuals will surface as emergent, transformational leaders. I suggest in chapter 3 that these individuals will have an impact on team efficacy, team goals, and team processes.

Team Efficacy

In the above section, I reviewed findings with respect to trait, transformational, and emergent leadership theories. In Chapter 3, I hypothesize connections between these areas and the development of a team emergent state (Marks, Mathieu, & Zaccaro, 2001)—team efficacy—and team processes. In this section, I focus on team efficacy. I

define it, discuss how it is different from the concept of self-efficacy, and then review some of the major findings associated with the concept.

The concept of team efficacy has been considered for the last two decades, though research exploring the topic has increased considerably in the last decade. In the framework of social cognitive theory (cf., Bandura, 1991; Bandura, 1997), efficacy beliefs play a key role at all levels of analysis. At the individual level of analysis, self-efficacy is defined as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3). It has been described as task-specific self-confidence (Locke & Latham, 1990); a wide range of studies have confirmed a strong relationship between self-efficacy and performance (e.g., Gist & Mitchell, 1992; Stajkovic & Luthans, 1998). These definitions and findings clearly pertain to the individual level of analysis. However, efficacy beliefs can exist at higher levels of analysis; as early as 1982, Bandura called for a "broad a comprehensive research effort" and the development of suitable tools for measuring team efficacy, which he referred to at that point as "groups' perceptions of their efficacy to achieve varying levels of results" (p. 14). Since that time, a number of studies have assessed the impact of group efficacy on group performance (e.g., Shea & Guzzo, 1987; Silver & Bufiano, 1996; Spink, 1990; etc.) and Bandura has defined team efficacy as the "group's shared belief in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainment" (Bandura, 1997, p. 477).

The critical difference between self-efficacy and team efficacy is the level of analysis. This distinction is important to make, as both self-efficacy and team efficacy are a part of the model presented in Chapter 3. Self-efficacy, as noted above, is used to

describe a single individual's assessment of his/her capabilities, acting alone as a single unit. Team efficacy is an analogous concept defined at the team level of analysis (Bandura, 1997; Lindsley et al., 1995). The assumption is that teams can be treated (metaphorically) as social entities that are capable of acting together as a unit (Lindsley et al., 1995). Individuals are typically used as "informants to estimate the group's or organization's collective efficacy" (Lindsley et al., 1995, p. 648); of course, cognitions reside only in the individual, so groups and organizations may possess beliefs only in the sense of shared cognitions. Lindsley et al. (1995) pointed out that the individual-level cognitions of group or organization members are quite distinguishable from their beliefs regarding the group's capabilities. These group-based beliefs fundamentally develop from an individual's ability to cognitively assess the capabilities of other group members and their ability to work together based on observation and experience.

Therefore, team efficacy is distinguishable from individual-level self-efficacy in that it is an emergent property of groups. It is also distinguishable from the average level of team member self-efficacy within a group. This concept would refer to the average overall extent to which different team members felt confident about their own *individual* capabilities to achieve a given level of task performance, rather than the extent to which group members felt confident about the ability of the *group as a whole*.

As noted above, there is an emerging literature on team efficacy. This work has focused on a number of different issues, including the most appropriate way to measure the concept (e.g., Gibson, Randel, & Earley, 1999), the most appropriate way to conceptualize and distinguish it separately from related concepts such as team potency (e.g., Guzzo et al., 1993), and its influences on a variety of organizational phenomenon.

Research has demonstrated a strong link between group efficacy and group motivation and performance (e.g., Bandura, 1997; Durham, Knight, & Locke, 1999; Gully, Beaubien, Incalaterra, & Joshi, in press; Prussia & Kinicki, 1996), and Jex and Bliese (1999) found that team efficacy acts as a buffer of stressor-strain relationships. There is a good deal of promise associated with the continued incorporation of group efficacy into models of team performance. Given the promising results so far, I include group efficacy in Chapter 3 as a major aspect of the model to be presented. In the next section, I review the literature on team goals.

Team Goals

Much research has been conducted in the last three decades regarding the operation of goals at the individual level. Specific, difficult goals—if accepted—lead to higher levels of performance than easy goals or no goals (Locke & Latham, 1990). Although the majority of goal-setting research has been conducted at the individual level, goal-setting at the team level has been receiving more attention as of late (cf. Locke & Latham, 1990; O'Leary-Kelly, Martocchio, & Frink, 1994; Weldon & Weingart, 1993). Basic relationships between goal level and performance at the individual level have been replicated at the team level (cf. Locke, Durham, Poon, & Weldon, 1997; O'Leary et al., 1994). A number of studies have shown that specific, difficult group goals result in higher levels of performance than when there are no goals or easy goals present (e.g., Becker, 1978; Buller & Bell, 1986; Ivancevich, 1974; Klein & Mulvey, 1989, 1995; Latham & Locke, 1975; Latham & Yukl, 1975; Lawrence & Smith, 1955; Pearson, 1987; Weingart, 1992; Weingart & Weldon, 1991; Welden, Jehn, & Pradhan, 1991).

Research examining goals at the team level has been increasingly focused on discovering the mediators and moderators of the goal effect (Durham, Knight, & Locke, 1997; Guzzo & Dickson, 1996; Weldon & Weingart, 1993). As Durham, Locke, Poon, and McLeod (2000) noted, a puzzling theoretical issue in the goal-setting literature currently exists. Research to date has indicated that goals may influence performance in a number of different ways: through direct effects, through both direct effects and effects moderated by strategy or tactics (i.e., interaction effects; Chesney & Locke, 1991; Durham et al., 1997), and through effects mediated by strategy (DeShon & Alexander, 1996; Durham et al., 2000). The approach taken in this dissertation, which will be discussed more in Chapter 3, focuses on the direct effect team goals have on performance. In the next section, I review the literature on team process and denote what processes may potentially be influenced by leadership and team efficacy.

Team Processes

Team process research has historically been characterized by the use of a wide and inconsistent array of process variables (Marks, Mathieu, & Zaccaro, 2001); different scholars have varied widely in the extent to which they have used and ways in which they have operationalized different types of variables to represent team process (Weingart, 1997). In the last few decades, however, team processes have occupied a critical role in many theoretical models of team effectiveness (e.g., Gist, Locke, & Taylor, 1987; Guzzo & Shea, 1992; Hackman, 1987, etc.). A number of taxonomies of group process have been proposed (e.g., Argote & McGrath, 1993; Fleishman & Zaccaro, 1992; Neiva, Fleishman, & Rieck, 1978; Prince & Salas, 1993). Many of these models described

processes as being the critical mediating mechanisms through which member and organizational characteristics are related to effectiveness criteria (Marks et al., 2001). Despite this proliferation of research on process, however, few approaches to the topic included a temporal dimension with task completion as the centerpiece (the few that exist are Kozlowski, Gully, Nason, & Smith, 1999; Marks et al., 2001; McGrath, 1991); this type of approach is central to the work teams accomplish in organizations.

Marks and colleagues (2001) proposed a temporally based framework and taxonomy of team processes to clarify the "process muddle." I use this particular model as the foundation for the hypotheses involving team process presented in Chapter 3. Marks et al. defined team process "as members interdependent acts that convert inputs to outcomes through cognitive, verbal, and behavioral activities directed toward organizing taskwork to achieve collective goals" (p. 357). In their taxonomy, team processes are divided into three categories. Transition processes are those that involve mission analysis, formulation, and planning; action processes involve monitoring progress toward goals, systems monitoring, team monitoring and backup behavior, and team coordination; and interpersonal processes involve conflict management, motivation and confidence building, and affect management. Teams use these different processes simultaneously, though some processes happen more frequently in different phases of a team's work on a task. The two types of phases in each performance episode that Marks et al. (2001) considered were action phases and transition phases. During action phases, teams are engaged in acts that contribute directly to goal accomplishment (e.g., taskwork), while during transition phases, teams focus primarily on evaluation and/or planning activities to guide their accomplishment of a team goal or objective. Marks et al. (2001) posited that

while interpersonal processes occur through both phases of the episodic framework, action processes most often occur in the action phase, while transition processes most often occur in the transition phase. In Chapter 3, I focus on these action and transition processes that occur in newly formed teams. Though interpersonal processes are surely related to team viability and member satisfaction, it is beyond the scope of this dissertation to include interpersonal processes and those aspects of team effectiveness.

The final section in this chapter will cover the scope of this research. This section is intended to bridge the material I reviewed in this chapter and the theoretical model to be discussed in Chapter 3.

Scope of the Research

This section specifies the exact scope of the research for this dissertation. First, I discuss the types of teams and tasks for which this research is most relevant; I then discuss the specific role of leadership; and I close the chapter with a discussion of the levels of analysis examined.

Team and task type. Scholars have identified many different types of teams in organizational settings (e.g., Sundstrom et al., 1990—identified advice and involvement teams, production and service teams, project and development teams, and action and negotiation teams; Cohen & Bailey, 1997—identified work teams, parallel teams, project teams, and management teams, etc.). The model discussed in Chapter 3 is intended to generalize to newly formed, autonomous work teams (whose members have no shared history of working together) who are working on an unfamiliar, complex task that must be completed during a specific time period. Moreover, the teams I focus on have just

undergone a critical midpoint transition period, wherein they received important feedback regarding past progress and future plans for task completion.

The nature of the task itself is an important aspect of group functioning; a number of authors incorporate task structure into theoretical models of group functioning (e.g., Hackman, 1987; Campion, Medsker, & Higgs, 1993). Hyatt and Ruddy (1997) noted that tasks are especially critical to consider in group contexts as they determine what the nature of team effectiveness is for any given situation and can affect the importance of many work group characteristics. The general task type to be examined in this dissertation is a complex information processing and problem-solving task that requires a high level of interaction between team members. This type of task is most congruent with Tesluk, Mathieu, Zaccaro, and Marks's (1997) description of tasks that produce an "intensive" work arrangement, where team members must "work together closely to diagnose and solve problems in performing the task" (p. 203). In addition, these types of dynamic and complex tasks require well-orchestrated teamwork, which may be best spearheaded by a transformational leader.

Role of leadership. As noted above, the type of leader examined in this dissertation is not a designated leader, but rather an emergent one. As reviewed in the section in this chapter on emergent leadership, these types of leaders often have a great deal of influence over group members. Emergent leaders of this type of team may fill a wide variety of roles—from being a structure initiator/direction setter to being a facilitator of team process to being a team motivator (e.g., Hackman & Walton, 1986; Zaccaro & Marks, 1999). The focus in this dissertation, however, is on emergent, transformational leaders. This type of leadership and its relationship to the development

of team efficacy and team processes will be highlighted more in Chapter 3; the dissertation focuses on the role of emergent leaders due to the fact that they have been linked to the development of team efficacy and subsequent team performance (e.g., DeSouza & Klein, 1996; Pescosolido, 2001; Zaccaro et al., 2001).

Levels of analysis. I focus on concepts at two levels of analysis in this dissertation: the individual leader level and the team level. The concepts in the pathway from leader core self-evaluations to transformational leadership (described in detail in Chapter 3) are at the individual leader level. Team efficacy, team goal, team action and transition processes, and team performance are at the team level. Issues of aggregation (e.g., Bliese, 2000; Chan, 1998; Kozlowski & Klein, 2000) arise only with respect to team processes, as the other team-level variables were either assessed through consensus methods or—in the case of team performance—assessed with objective task feedback. I consider team action and transition processes to be an emergent property of groups that arises out of individual-level perceptions—in other words, individuals' combined perceptions and their agreement regarding these perceptions define the group-level characteristic. Therefore, I will be considering both individual leader level and team level variables in the model to be presented in Chapter 3.

It is important to note that although I am focusing on two levels of analysis (leader and team level), typical methodological issues associated with cross-level hypotheses (e.g., Klein, Bliese, Kozlowski, Dansereau, Gavin, Griffin, Hofmann, James, Yammarino, & Bligh, 2000) do not present the usual statistical challenges in this dissertation. Although I do consider the effect of leader-level variables on team-level variables—and vice versa—due to the fact that there is only one leader per team, typical

cross-level issues such as non-independence in the individual-level data (Bliese, 2000; Bliese & Hanges, 2001) are not as critical.

Chapter 3

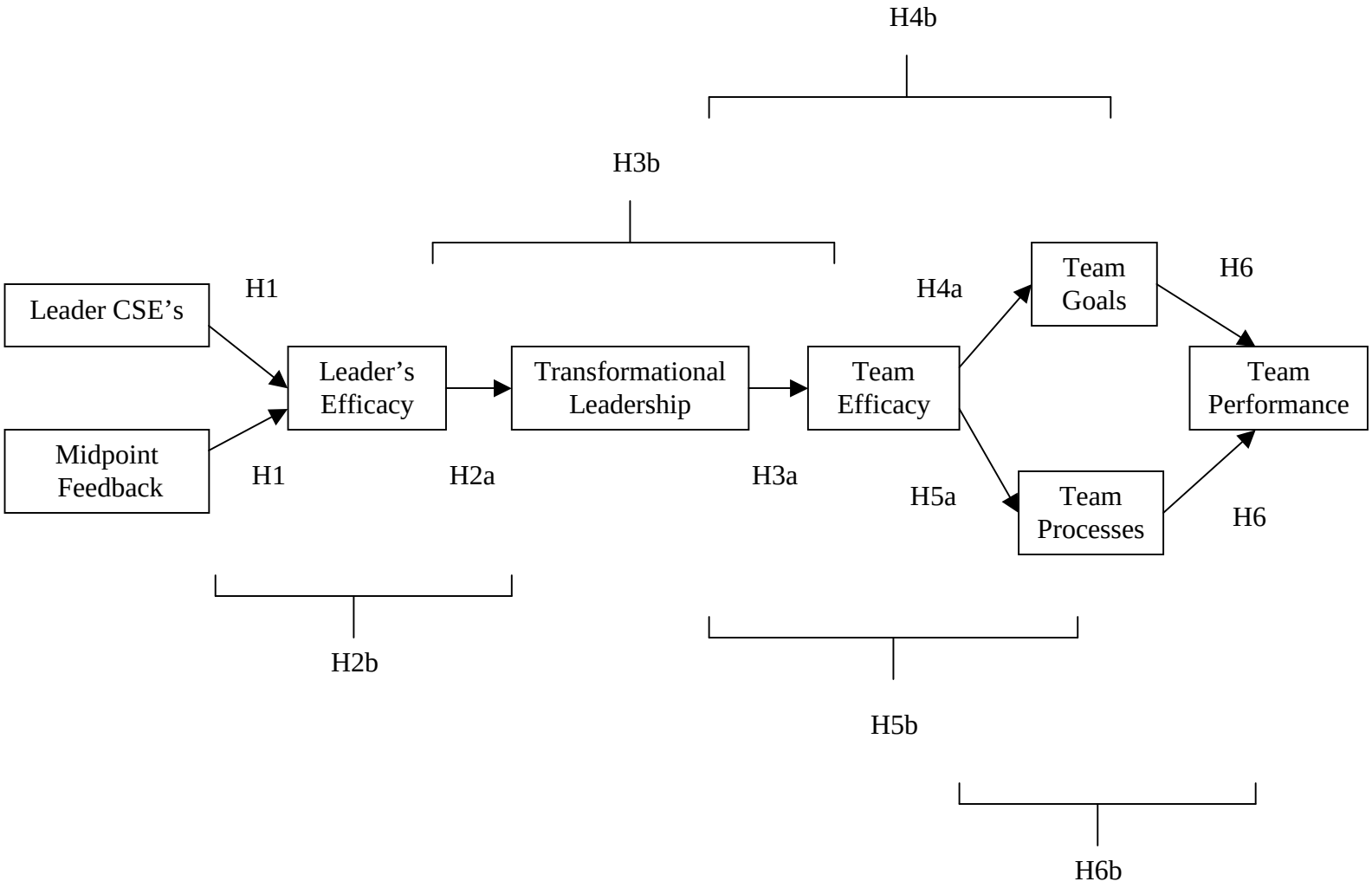
Model and Hypotheses

In Chapter 2, I developed the groundwork for the model that is tested in this dissertation. I reviewed a number of different theories and findings relating to core self-evaluations, leadership, team efficacy, and team processes, and closed the chapter with a discussion of the scope of the research. In this chapter, I build on that foundation by presenting an overview of the model, followed by the underlying theory and support for each of the specific hypotheses in the model.

Model Overview

The model to be presented in this chapter, depicted in Figure 3, incorporates elements of core self-evaluations theory, transformational leadership theory, social cognitive theory, team process theory, and goal setting theory. As noted in Chapter 2, the model is intended to generalize to a common situation found in organizations: that of newly formed work teams, lacking a shared history, that nonetheless face one overarching complex task (which may incorporate a number of subtasks and which may require different inputs at different points in time from leaders and team members—e.g., Kozlowski et al., 1996; Marks et al., 2001) and that have received critical midpoint feedback. Work teams in similar situations have received some recent attention in the literature (e.g., Lester, Meglino, & Korsgaard, 2002); these situations may be particularly conducive to the examination of the effects of team leader core self-evaluations due to the high stress levels involved.

Figure 3. Hypothesized Model



In the model, leader core self-evaluations and critical midpoint feedback are hypothesized to impact team efficacy through their effects on leader self-efficacy and transformational leadership, which in turn is hypothesized to have a direct impact on team efficacy. Team efficacy, in turn, is expected to indirectly influence team performance through influencing team goals and processes. In the next sections, each set of relationships in the model will be discussed.

Team Leader Core Self-Evaluations and Midpoint Feedback→ Leadership Efficacy

In the following paragraphs, I first discuss the connection between core self-evaluations and leadership efficacy. Then, I discuss the role feedback may play in the specific situation on which this dissertation focuses: teams operating in a dynamic environment that have reached a critical midpoint in their existence.

There is both theoretical and empirical reason to believe that a team leader's core self-evaluations should be related to his/her subsequent self-efficacy for leading the team to successful completion of the task. Theoretically, Bandura (1997) suggested that self-efficacy (which is defined as task-specific self-confidence; here, it is defined as the confidence individuals have in their ability to meet the role requirements expected of a leader) primarily arises from four sources of information: enactive mastery experiences, vicarious experiences, verbal persuasion and other types of social influences, and "physiological and affective states from which people partly judge their capableness, strength, and vulnerability to dysfunction" (Bandura, 1997, p. 79). This last source may be one logical link to the team leader's core self-evaluations. When a team faces a complex situation, the team leader is likely to formulate a sense of his/her efficacy from

his/her own initial cognitive and affective reactions to the task, as he/she has had no prior experience with the task (either personal or vicarious).

The basis for these reactions would be the leader's appraisal of the situation, which in turn is rooted in the leader's appraisal of him or herself. As noted in Chapters 1 and 2, core self-evaluations theory has its roots in appraisal theory (e.g., Arnold, 1960; Lazarus, 1991; Locke, 1969, 1976; Packer, 1985/1986), which suggests that appraisals of specific situations are affected by deeper and more fundamental evaluations of oneself (Judge et al., 1997). Judge et al. (1998, p. 30-31) suggested that individuals "who consider themselves worthy and able to cope with life's exigencies bring a 'positive frame' to the events and situations they encounter, whereas people who do not see themselves as worthy and able bring a negative frame to the same situations." By this logic, leaders of newly formed teams who face a complex task will be likely to perceive the situation at least partly through the lens of their own core self-evaluations.

Another logical link between the team leader's core self-evaluations and his/her efficacy may be through generalized self-efficacy. Generalized self-efficacy, as noted in Chapter 2, is the belief an individual has in his/her ability to successfully manage life and the challenges he/she encounters; it is one of the four core traits included in the core self-evaluations concept. As Bandura (1997) noted, judgments of task-based efficacy are likely to be related to more general assessments of efficacy. Therefore, it is likely that more positive core self-evaluations will be related to more positive assessments of task-based efficacy.

In addition, there is some empirical evidence to support the existence of a relationship between a leader's core self-evaluations and his/her leadership efficacy.

Recent studies have suggested that managers with more positive core self-evaluations may perform better when facing challenges, which may arise out of a heightened sense of efficacy. Both Judge, Thoresen, and Pucik (1999) and Wanberg and Banas (1997) found that managers with a more positive view of themselves were more likely to cope effectively with changes induced by organizational transformations. In the case of Judge et al. (1999), coping with change mediated the relationship between positive self-concept and job performance, suggesting that core self-evaluations motivate leaders to take task relevant actions. Another stream of literature has examined the relationships between the core indicator traits and self-efficacy, providing further empirical evidence linking the concepts. Chen, Gully, Whiteman, and Kilcullen (2000) found support for a relationship between generalized self-efficacy and task-oriented self-efficacy.

Therefore, leadership efficacy may arise out of the team leader's core self-evaluations (Judge et al., 1997). A leader who is more likely to perceive him or herself in a positive manner may be more likely to put a positive frame on the challenging task (Judge et al., 1998), thus leading to higher levels of self-efficacy (Bandura, 1997).

A leader's efficacy is not simply an outgrowth of more global personality factors, however. Some of the leader's estimation of his/her efficacy as a leader is most likely related to the feedback that the team has received. As noted above, both enactive mastery experience and verbal persuasion (both of which can be considered as forms of feedback) are also important antecedents of self-efficacy (Bandura, 1997). Teams that have reached critical midpoints have typically received some type of performance feedback, be it associated with the objective quality of task completion or verbal feedback from an external manager. To the extent that the leader identifies with his/her team and feels

responsible for the successes and failures of the team during the first half of task completion, the leader is likely to view these successes and failures as reflections of the effectiveness of his/her leadership.

Moreover, any feedback that is received at the critical midpoint is likely to be particularly linked to a leader's assessment of his/her effectiveness. Often verbal feedback received at the midpoint is specifically directed toward team leaders, as they may be the liaison with external managers. Additionally, as Gersick (1988) noted, feedback received at the midpoint may be a particularly salient indication of whether the team's trajectory is on track. Teams—and their leaders—tend to be in an evaluative mode during this phase of their existence and, as such, may be more influenced by the feedback they receive. Leaders of teams that receive very positive feedback at the midpoint, then, should experience both reinforcement and an increase in their existing levels of self-efficacy, while leaders of teams that receive more negative feedback at the midpoint should experience a decrease in their existing levels of efficacy.

To conclude, a team leader's efficacy shortly after his/her team receives midpoint feedback on a complex task is likely to be related to two main antecedents: his/her own core self-evaluations and the feedback the team has received on its performance.

Hypothesis 1: Team leader core self-evaluations and positive midpoint team feedback are positively related to leadership efficacy.

Leader Efficacy→ Transformational Leadership

Existing theory provides support for the idea that the team leader's efficacy may be related to behaviors indicative of transformational leadership. Though there is little (if

any) research on the link between leadership efficacy and transformational leadership, support for this relationship follows from social cognitive theory. Research has shown that high levels of efficacy seem to be associated with higher levels of performance on all types of tasks in many different realms (cf., Bandura, 1997). Part of this effect is associated with the influence that self-efficacy has on personal choice. Individuals who feel highly efficacious regarding a particular task will be more likely to choose to perform that particular task, set high performance goals, and in turn exhibit higher performance (Bandura, 1997; Locke & Latham, 1990). Transformational leadership is traditionally associated with challenging the status quo and instilling confidence in followers that they can achieve higher levels of performance (Eden, 1990; House & Howell, 1992; Kirkpatrick & Locke, 1991). It follows that the leader's own efficacy may be an important antecedent of transformational leadership, as individuals with low levels of efficacy are not likely to take the initiative in challenging situations and persuade others to do the same.

More support for this relationship can be found in examining Bandura's (1997) discussion of the important role of efficacy in social processes. He wrote:

> …those who have a firm belief in their efficacy, through ingenuity and perseverance, figure out ways to exercise some measure of control over social systems containing limited opportunities and many constraints. Given a social environment with surmountable barriers, people who have a high sense of efficacy will be able to exercise more control over it, and will view it as more changeable, than will self-doubters who give up in the face of difficulty. (p. 483)

Though Bandura was not writing in reference to transformational leadership specifically, certain elements of the statement above point to a potential connection between leadership efficacy and transformational leadership. At its core, leadership is a social influence process (e.g., Yukl & Van Fleet, 1992), and transformational leadership has been identified as being particularly effective in times of crisis and change in organizations. Therefore, though there has been little literature linking self-efficacy to transformational leadership, one can draw the conclusion that higher levels of efficacy may lead to higher levels of leadership performance.

Therefore, though there is no existing literature to my knowledge that draws the specific connection between leadership efficacy and transformational leadership, I hypothesize that there should be a strong, positive relationship between the two.

Hypothesis 2a: The team leader's efficacy is positively related to the extent to which the leader exhibits transformational leadership.

The Mediating Role of Leader Efficacy

Though research on transformational leadership has considered personality traits closely related to core self-evaluations—such as self-confidence—as antecedents of transformational behaviors (e.g., Bass, 1990; House, 1977) and research on trait theories of leadership share conceptual links with research on transformational leadership (e.g., Lord, De Vader, & Alliger, 1986), more process-oriented models of how traits and behaviors are linked are rare in either body of work. Judge, Bono, Ilies, and Gerhardt (2002) noted that trait theories of leadership would greatly benefit from "process models that illuminate the dispositional source of leadership" (p. 36). Judge and Colbert (2002)

also noted a "lack of research on the processes by which personality traits affect leadership" (p.4). Though Judge and Colbert (2002) focused primarily on the mediating role of process behaviors such as idea generation, integration of others' ideas, amount of talking, and expressive communication style, a leader's efficacy at leading the group task in question may also be an important mediator between his/her traits and the expression of transformational leadership.

Hypothesis 2b: The team leader's efficacy mediates the relationship between core self-evaluations and the extent to which the leader exhibits transformational leadership.

Transformational Leadership → Team Efficacy

As noted in Chapter 2, team efficacy can be defined as a "group's shared ability in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainment" (Bandura, 1997, p. 477). Though Chen and Bliese (2002) and Pescosolido (2001) have both noted the lack of research on the antecedents of team efficacy, in previous research leadership has been cited as a potential source of team efficacy. Zaccaro, Blair, Peterson, and Zazanis (1995, p. 315), for example, wrote that leadership functions "are directed at fusing a capable team from disparate individuals, and… building perceptions among individual members of their combined and collective abilities." In addition, Chen and Bliese (2002), Dusig (2000), and Sosik, Avolio, and Kahai (1997) found that leadership is, in fact, an important antecedent of team efficacy. As Lindsley et al. (1995) noted, team efficacy typically arises from common exposures of members to objective stimuli (such as the objective constraints of the situation) and the processes of social influence and comparison. It is this latter category that leader

behaviors come into play, as leaders play a special part in the social influence process in groups. By definition, leaders are individuals who exert influence over other group members, in addition to exerting influence over task objectives and strategies (Yukl & Van Fleet, 1992).

Transformational leadership in particular may be an especially relevant source of team efficacy. Transformational leadership theorists have highlighted how transformational leaders develop, intellectually stimulate, and inspire followers to achieve their purpose, mission, or vision (Bass, 1985; Howell & Avolio, 1992). One of the ways in which these activities are accomplished is through coaching followers, which often involves verbal persuasion to convince them that they are capable of accomplishing goals. Indeed, Pescosolido (2001) suggested that verbal persuasion (an activity often associated with transformational and charismatic leaders) may be the key way leaders with high efficacy may raise team efficacy. Empowering leadership (often considered to be part of transformational leadership—Bass, 1985) may also be related to higher levels of team efficacy, as Kumpfer, Turner, Hopkins, and Librett (1993) found.

Some research has begun to examine the connection between transformational leadership and team potency, a term closely related to team efficacy. Though there is a difference between the two terms (potency is more a general sense of confidence that the group can accomplish its goals, while efficacy is more related to the specific task at hand; Guzzo, Yost, Campbell, & Shea, 1993), the findings with respect to potency can easily be applied in an efficacy context. Guzzo et al. (1993) argued that transformational leadership directly influences group potency by boosting the confidence of team members and developing their belief in the ability of the team to succeed. In addition,

Sivasubramaniam, Murry, Avolio, and Jung (2002) suggested that transformational leadership

> …may enhance the potency of groups or teams by making participation in a group's efforts more meaningful and tied to the collective identity of the group (Shamir, House, & Arthur, 1993)…to the degree that transformational leadership builds personal identification with a group, along with a sense of confidence, a group's level of potency and performance is expected to be higher. (p. 72)

In an empirical test, Sivasubramaniam et al. (2002) indeed found transformational leadership to be significantly related to group potency.

Therefore, there is a fair amount of evidence in support of the idea that transformational leadership would assist in the development of team efficacy and that it would be significantly and positively related to the concept.

Hypothesis 3a: Transformational leadership is positively related to team efficacy.

The Mediating Role of Transformational Leadership

Although Pescosolido (2001) found that leadership efficacy directly influenced team efficacy, the potential mediating effects of transformational leadership were not considered. While there is good reason to believe that a leader's efficacy would be positively related to team efficacy, leaders are likely to convey their efficacy to their fellow team members through their behaviors. To the extent that these behaviors help motivate followers and are indicative of the confidence the leader has, they may be the

way in which the level of a leader's efficacy is made clear to the rest of the team—which then is likely to result in higher levels of team efficacy.

Hypothesis 3b: Transformational leadership mediates the relationship between team leader efficacy and team efficacy.

Team Efficacy → Team Goals

The above few sections have dealt with a chain of antecedents leading to team efficacy, beginning with the team leader's core self-evaluations. In the next few sections, I discuss how higher levels of team efficacy may translate into performance. First, I discuss the influence team efficacy may have on goals; I will discuss other team processes that may be influenced by team efficacy in the following section. I will close the chapter with a discussion of hypothesized connections between team performance, team goals, and team processes.

A number of research teams have found team efficacy to be related to one major team process: goal-setting (e.g., Durham, Knight, & Locke, 1997; Silver & Bufiano, 1996; Weldon & Weingart, 1993). Gist (1987) argued that group perceptions of team efficacy should be related to group performance, and Prussia and Kinicki (1996) and Whitney (1994) both found support for this relationship. Scholars have found this efficacy-performance relationship to be mediated by goals, both at the individual and group levels (Mulvey & Klein, 1998; Prussia and Kinicki, 1996). Additionally, there is good theoretical reason to believe that team efficacy is related to team goal-setting; both Bandura's social cognitive theory (1986, 1998) and Locke and Latham's (1991) goal-setting theory support this connection. Bandura (1982) argued that "perceived collective

efficacy will influence what people choose to do as a group, how much effort they put into it, and their staying power when the group efforts fail to produce results" (p. 143). As Mulvey and Klein (1998) noted, the logical conclusion of this statement is that team efficacy should influence team goals and the team's commitment to those goals. Therefore,

Hypothesis 4a: Team efficacy is positively related to team goals.

The Mediating Role of Team Efficacy in the Transformational Leadership→ Team Goals Relationship

Although a critical characteristic of the transformational leader is having a vision and effectively communicating that vision to his/her followers, directive leadership (wherein leaders are involved on a more micro level with their employees) is usually the type of leadership that is associated with the setting of specific team goals (Yukl, 1998). In the case of transformational leaders, it is more likely that team members be inspired by the vision, motivation, and ideas put forth by the transformational leader, and as such take more of an active role in setting their team's own immediate performance goals. Because team members are the individuals setting those team goals, it is likely that goal levels will be dependent on team efficacy, and that transformational leadership will only indirectly influence team goals through influencing team efficacy.

Hypothesis 4b. The relationship between transformational leadership and team goals is mediated by team efficacy.

Team Efficacy→Team Processes

As reviewed in Chapter 2, there is an emerging literature regarding both the antecedents and consequences of team efficacy. I postulate here that higher levels of team efficacy will be positively related to both action and transition team processes (Marks et al., 2001). Theoretically, as members feel more confident in their team's capabilities, "they are more motivated to work hard for the team, persist in the face of… obstacles, and are willing to accept more difficult challenges" (Zaccaro et al., 2001, p. 467). Despite the potential to interweave literature on team efficacy and group processes that Zaccaro and colleagues' words suggest, Marks (1999) noted that the majority of the literature on team efficacy has focused on establishing links to performance, rather than considering team efficacy as a potential determinant of team processes.

Connections between processes other than goal-setting that a team might use to productively approach task work (e.g., information collection, strategy formulation, etc.) are notably absent in the literature linking team efficacy to performance. Marks (1999) did find that highly efficacious teams seemed to change their strategies more than less efficacious teams when faced with a challenging situation. Other team processes, however, may also be important to consider. Marks et al. (2001) suggested that teams progress through transition phases, wherein "teams focus primarily on evaluation and/or planning activities to guide their accomplishment of a team goal or objective" (p. 364). During this time, processes such as mission analysis, goal specification, and strategy formulation and planning typically occur. Marks et al. (2001) categorize a second important set of processes as action processes, which consist of activities leading directly to team goal accomplishment. These activities typically include monitoring progress

toward goals, systems monitoring, team monitoring and backup responses, and coordination activities. Though no study to my knowledge has ever directly examined the relationship between team efficacy and action or transition processes, Edmondson (1999) found that team efficacy was related to team learning behavior, which consisted of processes such as feedback seeking, experimentation, and discussion of errors. It may be that teams with higher levels of efficacy are more likely to scrutinize their own actions in an attempt to improve in the future. Similarly, teams with higher levels of efficacy may be more likely to formulate strategy and plan for the future; additionally, they may be more likely to carefully examine their progress towards their goals and monitor themselves.

Given the empirical evidence that does exist on the relationship between team efficacy and team processes, and given the logical reasoning that teams that are more confident in their own ability to achieve certain performance levels will be more likely to take action to achieve those performance levels, it is likely that team efficacy is positively related to important team processes. Therefore,

Hypothesis 5a: Team efficacy is positively related to team action and transition processes that are geared towards helping the team reach its goals.

The Mediating Role of Team Efficacy in the Transformational Leadership→ Team Processes Relationship

Transformational leaders motivate team members to be inspired through effectively presenting a vision for the future; however, as noted above, transformational leaders are typically not directly involved on a micro level enforcing specific goal-setting

or micro-managing exactly what processes teams utilize. Moreover, transformational leaders inspire team members to identify with and care more about the team itself; transformational leaders also typically build the team's confidence through verbal persuasion and encouragement. As team members become more engaged in the activities of the team and as their team efficacy reaches new heights due to the efforts of the transformational leader, it is likely that teams will exhibit subsequent upswings in the extent to which constructive team action and transition processes are utilized. Therefore, transformational leadership is likely to indirectly influence team action and transition processes through influencing team efficacy.

Hypothesis 5b. The relationship between transformational leadership and team action and transition processes is mediated by team efficacy.

Team Goals and Team Action and Transition Processes → Performance

As Durham, Knight, and Locke (1997) noted, goal-setting is a well-established motivational technique for individuals and, to a certain extent, for groups as well (Locke & Latham, 1990; O'Leary-Kelley et al., 1994; Weldon & Weingert, 1993). Both individuals and teams that set higher goals exhibit higher levels of performance attainment; additionally, goals have been found to mediate the relationship between efficacy and performance, both at the individual and group level (Durham et al., 1997; Locke & Latham, 1990). Therefore, it is likely that higher team goals will be related to higher levels of team performance.

Action and transition processes may also influence performance, though there is no direct empirical evidence to date to support this contention. However, some of the

literature on goal-setting has alluded to the importance of other team processes in predicting performance. Durham et al. (1997, p. 206), for example, wrote that the effects of goal-setting are "most reliable when the goals are specific and difficult, when there is commitment to the goals, when feedback is available regarding the goal process, high self-efficacy, and knowledge regarding how the goals can be achieved." According to Durham et al. (1997), this knowledge really consists of the knowledge of the strategies needed to perform the task so as to attain the goal, which supports the idea that effective strategy formulation (a transition process) is a critical group process to examine. For newly formed teams that are operating in highly turbulent and unfamiliar environments, or on an unknown and complex task, the importance of developing and using a strategy to cope effectively with the demands of the situation given the team's constraints is doubly critical.

The team processes of information collection, analysis, strategy development, and strategy implementation should all also be positively related to objective team performance. It is necessary for teams to have knowledge of critical information in order to be effective; to the extent that teams make an effort to collect this information, the more positive the resulting performance should be. Similarly, teams that actively analyze, develop strategies for approaching the task, and implement those strategies accordingly should experience more positive performance than teams that do not actively engage in these processes. It is theoretically possible, of course, for a group that does not exhibit any of the above processes to do well; however, it is highly unlikely, as work teams that do not engage in these types of activities on complex tasks would be relying on a great

deal of luck. These processes, then, are hypothesized to have a positive impact on team performance.

Hypothesis 6a: Team goals and team action and transition processes are positively related to team performance.

The Mediating Roles of Team Goals and Team Process in the Team Efficacy → Performance Relationship

The relationship between team efficacy and objective team performance has been solidly established by a number of authors, though this relationship is not quite as strong as the relationship between individual-level self-efficacy and individual performance (Collins & Parker, 2002). Gist and Mitchell (1992), Peterson, Mitchell, Thompson, and Burr (2000), Silver and Bufiano (1996), and Zander and Medow (1964), among others, have all found evidence that suggests that higher levels of group efficacy are related to higher levels of performance. In addition, Bandura (1997) and Lindsley et al. (1995) suggested that efficacy may exhibit a direct relationship with performance.

The team efficacy-performance relationship, however, may be partly an indirect one. It is likely that team efficacy impacts performance partially through its influence on team goals, as goals provide an immediate focal point on which to concentrate motivation (Locke & Latham, 1990). It is also likely that team efficacy impacts performance partially through its influence on team action and transition processes. Teams that are more confident in their ability to successfully complete the task should be more likely to focus effort on how to do it; they should be more involved in analyzing feedback results, seeking further information, and adjusting team strategy, which are all critical processes

necessary to achieve high levels performance when dealing with complex tasks in dynamic environments.

Hypothesis 6b: The relationship between team efficacy and team performance is mediated by team goals and team action and transition processes.

Conclusion

In this chapter, I presented a model that suggested that a team leader's core self-evaluations and midpoint feedback the team receives influence team efficacy, goals, processes, and performance through influencing leadership efficacy and transformational leadership. Team leader core self evaluations and midpoint feedback the team receives were hypothesized to be related to leader efficacy, which in turn was hypothesized to be related to transformational leadership. Transformational leadership, in turn, was hypothesized to be an antecedent of team efficacy. Finally, team efficacy was proposed to be an antecedent of both team action and transition processes and team goal level; the latter two variables were predicted to have a direct impact on team performance. This general conceptualization of the effects of leader core self-evaluations is consistent with the findings suggesting that core self-evaluations may have an impact on job performance through their impact on individual motivation. In Chapter 4, I discuss the research methods, including sample, experimental task, procedure, and aggregation and analytic strategy.

Chapter 4

Research Methods

This chapter presents data collection and analysis methods for this research. In the first section, I describe research design, including a description of the task; in the second section, I describe the sample, in addition to discussing the schedule of the collection of measures; and in the third section, I describe analytic procedures.

Research Design

In order to test the hypotheses proposed in Chapter 3, a number of methodological issues had to be addressed. It was important for the study to feature a task as its centerpiece that was complex, engaging, provided objective performance assessments, and involved both ongoing and critical midpoint feedback. Additionally, the research required access to an appropriate sample of individuals whose results would be generalizeable. This study was developed with these design issues in mind.

As a broad overview of when and how the data were collected, team members' core self-evaluations were assessed prior to the start of the simulation. Objective performance data was provided by the task itself, which was a business simulation that translated teams' decisions into performance. Survey data regarding leader efficacy, transformational leadership, team efficacy, team goals, and team action and transition processes were gathered from participants immediately following the critical midpoint of the task. Examining survey data collected at this point in time was particularly useful for several reasons. First, collecting data after teams had worked together during the first half

of task completion allowed for development of team level constructs through shared history of interaction and task feedback. Second, central concepts and relationships in the model hypothesized in Chapter 3 involved the response to critical midpoint feedback; it was therefore important to assess variables of interest after critical midpoint feedback had been received. Third, due to the fact that leaders were emergent rather than formally designated, it was important to allow team members time to gravitate toward roles in which they felt comfortable; assessing variables after the critical midpoint allowed team members the entire first half of task completion to do exactly that.

Also, for the purposes of this study, individuals were placed on teams such that team composition in terms of gender and race/ethnicity was balanced across groups (demographic information had been provided to the individual who split the participants up into teams; the project director ensured that there were at least two women and two racial or ethnic minorities—but not more than three of either—in each group of five participations). Core self-evaluations, however, were allowed to randomly vary. Individuals were required to participate as part of the University of Maryland's MBA program's orientation activities for first-year students. Additionally, participants were given one incentive for participating: a summary of the findings tailored to their specific team and implications of those findings.

Description of the task. MARKETPLACE (Cadotte, 2003), the task that was used in this study, is a complex, computer-based interactive team decision-making business simulation. The simulation is based on the history of the personal computer industry. During the course of the simulation, participating teams worked to build an entrepreneurial firm, experiment with strategies, make decisions regarding the major

business functions (e.g., marketing, manufacturing, logistics, human resources, finance, and accounting), and compete with other teams in an extremely realistic and detailed virtual business world.

The simulation required each participant to imagine being a member of the top management team of a start-up computer firm. In their role as top management team members, participants made a series of strategic decisions over a period of eight "quarters" (each quarter representing a single decision cycle). Teams received performance feedback at the end of each quarter following Quarter 3 (the first quarter that teams actually sold products).

Teams were pitted against each other in four "universes" of 10 teams each; teams within universes were directly competing for the same customers, though each team could choose to capture any number of five market segments of business users. These five segments ranged from the "Cost Cutter" segment (a large segment that looked for very easy-to-use computers for basic office applications) to the "Mercedes" segment (the smallest segment overall that looked for a high-performance computer to use in sophisticated engineering and manufacturing applications).

Each quarter of play in MARKETPLACE involved new information and a set of decisions that built upon each other. The simulation unfolded to follow the normal life-cycle of a start-up business, though there was a natural break-point halfway through the simulation where more performance feedback and extra funding from "venture capitalists" was received. Quarters 1 and 2 essentially involved "setting up shop." In Quarter 1, team members got organized, assigned corporate responsibilities, named the company, and purchased market research. Team members also sold stock to themselves

during this period as owners in order to raise capital for initial operation. In Quarter 2, market research arrived, and teams analyzed the data and decided on an overall business strategy, including corporate and performance goals, target markets, and strategic direction. Several tactical decisions also had to be made during this period, which focused on brand design, plant location, production capacity, and sales office location. Teams finished Quarter 2 by answering the first survey I distributed, which included team efficacy and team goal measures (used in my analysis to derive an ability measure as a control; specifics are discussed in the below section regarding the measures).

Quarter 3 involved testing the market, as fledgling firms tried out marketing strategies (including brands, prices, ad copy, media campaigns, and sales staffing). In addition, teams decided on hiring policies and production processes for the quarter, then scheduling production for the quarter. Once again, teams purchased market research in order to discover customer reactions to marketing decisions and to find out what the competition has done. Lastly, in this quarter, teams forecasted market demand and simulated their production operations given the supply chain decisions teams had made prior to that point. At the end of this quarter, MARKETPLACE made available cash flow and income statements and balance sheets in order for teams to evaluate the potential financial impact of the firm's first quarter of total business operation.

In Quarter 4, team members received the market data they purchased in Quarter 3 regarding the test market and received manufacturing and accounting data from the first quarter of sales. Once again, at the end of this quarter, MARKETPLACE made available cash flow and income statements and balance sheets in order for teams to evaluate their

performance. Teams could then adjust the firm's strategies and tactics if necessary after examining this data.

Quarter 5 was a pivotal quarter—the halfway point—with the critical midpoint feedback occurring here. In this quarter, teams had to obtain capital from venture capitalists in order to substantially expand their position in the market (which would occur by investing in research and development, new sales outlets, factory capacity, logistics, and/or employee recruitment and retention programs). Prior to making their pitch to the venture capitalists, teams received a review of marketing, human resource, manufacturing, and accounting data from Quarter 4. Then they formulated a one-year business plan to obtain outside funding. The plan had to include an assessment of market opportunities, a review of performance to date, and a strategy for the second year of business operations. It had also to include coordinated marketing, manufacturing, human resources, and financial strategies, in addition to a tactical plan that included the sequencing and timing of events to achieve the firm's goals. Finally, the plan had to include historical financial statements from the first four quarters (year 1) in addition to pro-forma statements for the second four quarters (year 2).

The simulation was designed such that at this point teams provided this information as a formal presentation during the middle of the day allocated for Quarter 5 play to a panel of venture capitalists (volunteers who were chosen from the Robert H. Smith School of Business community of alumni, executives, and faculty), who on the basis of what the teams presented offered them advice and some amount of "virtual" funding. Each team presented to one panel of venture capitalists; there were eight panels of seven venture capitalists, each of which viewed five team presentations (each set of

five teams was in the same universe). After each team completed its presentation, venture capitalists completed a 6-item questionnaire that reflected their impressions of each team's potential and gave these questionnaire responses to the teams. Teams then met with the venture capitalists and had a chance to receive additional funding. All the venture capitalists had the same amount to offer in terms of funding; they were making their investment decisions based on the teams that they believed were in the best position to perform well during the remainder of the simulation. Although teams and venture capitalists negotiated over the funding level and price of stock, the virtual money each team could receive from the venture capitalist panel was capped at five million dollars; the funding cap ensured that the simulation could continue into the second year of play without completely eliminating any teams.

It is important to note here that the amount of capital that teams received from the venture capitalists was not a pure measure of whether the venture capitalists were willing to invest money in any given team. Teams approached their negotiations with the venture capitalists with different strategies in mind. Some teams were, indeed, interested in obtaining as much capital as possible, no matter what their stock price. Other teams were more cautious about diversifying ownership; rather than sell a lot of stock, these teams were interested in driving a hard bargain for the price of their stock. Finally, some teams were simply not as interested in selling their stock to receive funding from the venture capitalists, no matter how high their stock price. Due to the many strategies utilized by different teams, the amount of capital received by each team was, again, not a pure measure of the interest venture capitalists had in investing in that team's stock.

Receiving feedback and capital from the venture capitalists was considered to be the critical midpoint of the simulation. Teams had received not just objective performance results from Quarters 1-4, but also outside assessments of past performance and expected future potential. The situation provided an opportunity for teams to reflect upon whether they were on track, based on previous performance trajectory, to meet their performance goals that had been set in Quarter 2. Teams finished Quarter 5 by allocating the newly procured funding to different investment opportunities of their choice (e.g. research and development, new sales outlets, etc.) and then responding to the second survey for the purposes of this research, which included leader efficacy, transformational leadership, team efficacy, team goal, and team action and transition processes.

Quarters 6-8 were a time in which the team continuously monitored and adjusted different areas of the firm (such as marketing, manufacturing, etc.). Competition also heightened during this period, as other firms began introducing new technology, more reliable products, better prices, etc. Teams during this time also had the opportunity to explore new relationships through cross-licensing and supply outsourcing. At the end of Quarter 8, the team prepared another report to assess strategy and performance in year 2 of operations and to give an assessment of how well the firm was prepared to take on the challenges of the future. Table 2 provides a summary overview of the sequence of events in the simulation, in addition to describing what variables were collected when and what were their uses.

As noted above, I considered a number of parameters when choosing the appropriate research design for this study. MARKETPLACE, as the centerpiece task, provided an excellent context in which to test my theoretical model. The simulation was

Table 2. Sequence of Events, Measures Collected, and Measure Uses in MARKETPLACE Simulation

Quarter	Team Activities	Measures Collected	Measure Use
1	• team gets organized, assigns corporate responsibilities, sets broad goals • team names the company • team purchases initial market research • team members sell stock to themselves during this period as owners in order to raise capital for initial operation • no performance feedback yet available	Before Quarter 1: Core Self-Evaluations (collected pre-ELM)	Independent variable
2	• market research arrives • team engages in data analysis • team makes decisions regarding overall business strategy, including corporate goals, target markets, and strategic direction • team makes tactical decisions: brand design, plant location, production capacity, and sales office location • no performance feedback yet available	End of Quarter 2: Team Efficacy Team Goal	 Used to create ability residual Used to create ability residual
3	• team tests market: tries its marketing strategy (including brands, prices, ad copy, media campaigns, and sales staffing) • team decides on hiring policies and production processes for the quarter,	End of Quarter 3: Team Performance (profit)	Used to create ability residual—and provided to teams as feedback

	and then schedules production for the quarter • team purchases market research in order to discover customer reactions to marketing decisions and to find out what the competition has done • team forecasts market demand and simulates its production operation given the supply chain decisions • cash-flow and income statements available at end of quarter, in addition to a balance sheet to help team members evaluate potential financial impact of the firm's first quarter of total business operation		
4	• team receives market data purchased in Quarter 3 regarding the test market • team receives manufacturing and accounting data from the first quarter of sales • team uses data to evaluate performance and adjust the firm's strategies and tactics if necessary	End of Quarter 4: Team Performance (profit)	Used to create ability residual—and provided to teams as feedback
5	• team receives review of marketing, human resource, manufacturing, and accounting data from Quarter 4 • team must formulate a one-year business plan to obtain outside funding. Plan includes: assessment of market opportunities, review of performance to date, strategy for the Year 2 (coordinated marketing,	End of Quarter 5: VC Rating Leader Efficacy Transformational Leadership	 Independent variable Independent variable Independent variable—and used to determine leader

	manufacturing, human resources, and financial strategies), tactical plan (with sequencing and timing of events to achieve the goals), historical financial statements from year 1 in addition to pro-forma statements for year 2 • team physically presents this information to venture capitalists • VC panel offers team advice and some amount of funding • team may negotiate with the panel • team allocates funding to different investment opportunities (e.g. research and development, new sales outlets, etc.)	Team Efficacy Team Goal Team Processes	Independent variable Independent variable Independent variable
6-8	• team monitors and adjusts different areas of the firm (such as marketing, manufacturing, etc.) • competition heightens during this period as other firms begin introducing new technology, more reliable products, better prices, etc. • team has the opportunity to explore new relationships through cross-licensing and supply outsourcing	End of Quarter 8: Team Performance (profit)	Dependent variable

meant to introduce teams to a constantly changing environment to which they had to adapt in order to survive. Also, the critical midpoint of the simulation was very clearly defined. Variance in performance at the end of the simulation was assured due to the fact that teams were directly competing against each other. Indeed, some teams finished with extremely high performance ratings, while others drifted into the final quarter bankrupt (though they did not have to stop play).

Sample

Dr. Joyce Russell, coordinator of the Smith School's full-time MBA program Educational Learning Module (ELM)[1] project, granted me access to the 2002 ELM. The ELM took place during the last week of August 2002; all first year full-time MBA's were included in the project. As such, 198 individual participants competed in 38 teams of five members and two teams of four members. The sample was appropriate for a number of reasons. First, teams were made up of first-year MBA's who devoted a full, uninterrupted week to the ELM project, playing two quarters each day. Teams worked full days in the hopes of gaining an edge over the competition. In addition, teams were divided so as to ensure there were at least two women and two racial/ethnic minorities (but not more than three of either), including foreign students, on each team; it was likely that differences in performance of these teams would be a result of leadership or team process factors rather than as a result of any demographic differences.

[1] The ELM is designed to be the first activity first-year MBA students complete when they arrive on campus; it is intended to give them both an opportunity to receive some hands-on business decision-making experience and to gain a valuable experience in team interaction. MARKETPLACE is the simulation program used in the ELM.

Measures

Dependent Variable

Team Performance. Table 3 provides a summary of concepts and measures used in this study. Teams received financial information regarding their operating profit at the end of every quarter following Quarter 3. Operating profit was the most critical and salient measure of whether a team's strategies and decisions were effective; it was generated by the simulation after team decisions had been inputted. Therefore, Quarter 8 operating profit (the profit with which teams ended the simulation) was used as the basis of the team performance measure. However, in order to control for team ability, a standardized residual score was created from a regression that considered Quarter 8 performance as a dependent variable and the team ability control variable, described below, as the independent variable; it was this standardized residual score that was the actual dependent variable used in all the analyses.[2] More information regarding the mean and standard deviation of this variable, in addition to zero-order correlations with other study variables, can be found in Chapter 5.

I also examined Quarter 8 rank (a number between 1 and 10 reflecting each team's relative final position, based on operating profit, with respect to the other teams in the same universe) as a measure of final performance, using a similar procedure to that which is described above to control for ability. Due to the strong similarity of the results attained for each measure of performance, however, I will focus exclusively on Quarter 8 profit as the team performance measure in Chapter 5.

[2] All analyses were also run with a separate ability control measure and the Quarter 8 profit measure as the dependent variable; these analyses yielded virtually identical results. For purposes of parsimony, I only report the use of and results associated with the standardized residual final performance measure as the dependent variable.

Table 3. List of Concepts and Measures Used

Concept	Measures
Team Performance	Standardized residual of regression with team profit in Quarter 8 as dependent variable and ability (i.e., standardized residual of first half performance regressed on team efficacy and goal assessed after Quarter 2) as the independent variable
Core Self-Evaluations	I am confident I get the success I deserve in life. Sometimes I feel depressed. (r) When I try, I generally succeed. Sometimes when I fail I feel worthless. (r) I complete tasks successfully. Sometimes, I do not feel in control of my life. (r) Overall, I am satisfied with myself. I am filled with doubts about my competence. (r) I determine what will happen in my life. I do not feel in control of my success in my life. (r) I am capable of coping with most of my problems. There are times when things look pretty bleak and hopeless to me. (r)
Venture Capitalist Feedback	This team acts like a unified team. This team seems to have strong leadership. I might invest some money in this team. This team seems to have a clear strategy for the future. This team was responsive in answering questions. This team's presentation was effective.
Leader Efficacy	During Quarter 5 of the simulation, I had a high degree of confidence in my ability to… …steer this team in a successful direction. …get the team to develop viable strategies. …inspire others to be motivated to do well. …build this team's sense of spirit and cohesiveness. …get the people on this team to be excited about working together.
Transformational Leadership	Leadership behavior ratings matrix—please see Figure 4

Team Efficacy	Please take a moment to discuss and agree upon what your team's confidence levels are. What is your team's confidence level (ranging from 0% to 100%) in being able to attain the following performance rankings in your universe by the end of the game? Top 9 or better: _____ Top 8 or better: _____ Top 7 or better: _____ Top 6 or better: _____ Top 5 or better: _____ Top 4 or better: _____ Top 3 or better: _____ Top 2 or better: _____ Top 1 or better: _____
Team Goal	Please take a moment to discuss and agree upon what your team's goal is in terms of end ranking within your universe. At the conclusion of this simulation, our team's goal is to be ranked _____ out of the 10 teams in our universe (1 = top performing team; 10 = lowest performing team).
Team Processes	During Quarter 5 of the simulation, the members of my team… …set specific goals for our team to accomplish. …collected and analyzed all information we could before making decisions. …monitored changing environmental conditions. …developed and implemented a comprehensive strategy. …adjusted our strategy in keeping with what we had learned. …coordinated activities among team members.
Team Ability	Standardized residual of regression with first half (Quarters 3 and 4) profit as dependent variable and team efficacy and team goal in Quarter 2 as independent variables

Control

Team Ability. Performance prior to the critical midpoint— an average of operating profit information provided by the simulation in Quarters 3 and 4—was used as the basis for the measure of team ability. In order to control for motivational variables that may have been affecting performance, I conducted a regression analysis, with profit prior to the critical midpoint (an average of Quarter 3 and Quarter 4 profits) as the dependent variable and Quarter 2 team efficacy and team goals as the independent variables[3]. Because the residuals from these regressions represented observed team performance early in the simulation, controlled for team efficacy and goals, they served as measures of actual team ability. These residuals were used as independent variables in the regression to create the Quarter 8 performance residuals—the standardized final performance residuals—to control for team ability.

Independent Variables

Venture Capitalist Feedback. As noted in the description of the critical midpoint transition (Quarter 5), venture capitalists completed a six-item, Likert-type assessment of each team immediately after viewing each team's presentation of their past performance and future strategies and goals. Sample items were as follows (1 = strongly disagree; 5 = strongly agree): "This team acts like a unified team"; "I might invest some money in this team"; and "This team seems to have a clear strategy for the future." The inter-item reliability for the six-item measure as assessed by Cronbach's alpha was .82; the within-group agreement as assessed by r_{wg} (James, Demaree, & Wolff, 1984; 1993) was .86;

[3] In creating the rank-based ability measure, I used rank prior to the critical midpoint, as determined by an average of Quarter 3 and Quarter 4 profit.

Lindell's (Lindell & Brandt, 1999) alternative within-group agreement statistic was .83; ICC(1) (Bartko, 1976; James, 1982; McGraw & Wong, 1996) was .45; and ICC(2) (Bartko, 1976; James, 1982) was .79. These agreement and reliability statistics were at levels that allowed me to meaningfully average venture capitalists' individual assessments to reflect an overall venture capitalist assessment for each team.

Team Leader Core Self-Evaluations. Core self-evaluations was measured by self-report using the 12-item Core Self-Evaluations Scale, developed by Judge, Erez, Bono, & Thoreson (2003). Judge et al. (2003) found substantial support for the validity of the scale; it is reliable and displays acceptable levels of internal consistency and test-retest reliability. In addition, inter-source (self-significant other) level of agreement is comparable to that of other personality measures. Sample items are as follows (assessed on a 1-5 Likert scale; 1 = strongly disagree, 5 = strongly agree): "I am confident I get the success I deserve in life"; "Sometimes I feel depressed" (r); "When I try, I generally succeed"; and "Overall, I am satisfied with myself." Cronbach's alpha for the scale was .80, suggesting adequate inter-item reliability.

Leaders were emergent rather than formally designated. I first used the transformational leadership scale score (discussed below) collected after the critical midpoint transition to identify which team member was considered to be the team leader by his/her teammates during the critical midpoint period. I then utilized that individual's core self-evaluations score as the team leader's core self-evaluations score.

Team Leader Efficacy. I developed a measure for this concept that assessed the extent to which individuals felt confident in assuming different aspects of the team leadership role. Just as was noted for the assessment of the leader's core self-evaluations,

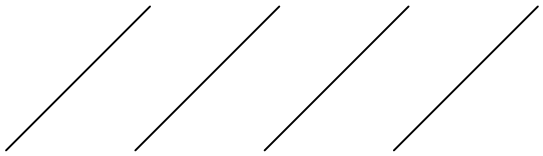
I was only interested in the leader efficacy scale scores of the individual who was recognized by his/her teammates as being the emergent leader during the critical midpoint transition period.

The 5-item, Likert-type scale was tailored to refer to the level of efficacy experienced by the leader during the critical midpoint. Sample items are as follows (1–5 Likert scale, 1 = strongly disagree, 5 = strongly agree): "During Quarter 5 of the simulation, I had a high degree of confidence in my ability to…" 1) "…steer this team in a successful direction"; 2) "…get the team to develop viable strategies"; 3) "…inspire others on this team to be motivated to do well." The scale demonstrated a high level of inter-item reliability; Cronbach's alpha was .90.

Team Leader's Transformational Leadership. All participants completed a measure assessing their perceptions of their teammates' transformational leadership. For each team, I created a matrix (see Figure 1) with space for team member names horizontally across the top and three items listed vertically down the left-hand column. The three items were intended assess transformational leadership as conceptualized by Bass's (1985) four dimensions: idealized influence, inspirational motivation, intellectual stimulation, and individual consideration. Each participant rated all his/her team members on the extent to which they exhibited the transformational leadership behaviors listed. Team members assessed each other following the critical midpoint period (end of Quarter 5); the emergent leader for the team was defined as the individual who received the highest score from his/her teammates. I used that individual's score to serve as the leader's transformational leadership rating, and—as noted above—I used that individual's core self-evaluations and leadership efficacy scores. Team members were

Figure 4. Transformational Leadership Ratings Matrix

Directions: Please write each of your fellow team members' names on the diagonal lines across the top of the grid. Then, rate each team member on the extent to which he/she exhibited the behaviors listed below in the first two quarters of the simulation. Do not rate yourself.



1=never; 2=very infrequently; 3=sometimes; 4=often; 5=always				
Inspired team members by demonstrating confidence in the team and showing optimism.				
Encouraged other team members to be creative problem solvers.				
Demonstrated sensitivity to and support of the needs and concerns of other team members.				

instructed with the following directions to fill out the matrix: “Please write each of your fellow team members’ names on the diagonal lines across the top of the grid. Then rate each team member on the extent to which he/she exhibited the behaviors listed below during Quarter 5 of the simulation.” Sample items team members used to rate each other are as follows (1-5 Likert, 1 = Never, 5 = Always): “Encouraged others to be creative problem solvers” and “Inspired team members by demonstrating confidence in the team and showing optimism.” Cronbach’s alpha for this 3-item measure was .89, suggesting a high level of inter-item reliability. Additionally, r_{wg} was .97, Lindell’s alternative r_{wg} was .92, ICC(1) was .52, and ICC(2) was .85, suggesting outstanding levels of within-team agreement and inter-rater reliability for this measure that justified the aggregation of this measure across raters. In order to ensure that the transformational leadership measure was stable, I also collected the same measure at the end of the simulation. 70% of the individuals who received the highest transformational leadership scores following the midpoint feedback also received the highest transformational leadership scores at the conclusion of the simulation, suggesting that the measure indeed was stable and was being consistently utilized by raters. Therefore, each individual’s transformational leadership score reflected an aggregation of their peer’s ratings.

Team Efficacy. A scale was created to assess this measure based on the recommendations of Locke, Frederick, Lee, and Bobko (1984) and others (e.g., Gibson, Randel, & Earley, 1999; Gist & Mitchell, 1992; etc.). This measure was tied directly to the team’s belief in its capabilities to achieve 10 specific performance rankings. Teams were asked to indicate their confidence (using a 100 point scale, where 0 = certainly cannot be achieved and 100 = certainly can be achieved) as to whether their team will

finish in the top 9 or better, top 8 or better, top 7 or better, etc. all the way up to top 1 in their respective 10-team universes, based on their assessments of the team's capabilities. Teams completed this scale by consensus—directions were as follows: "Please take a moment to discuss and agree upon what your team's confidence levels are. Please write your team's assessment of confidence below."

The team efficacy score that was used to test hypotheses was assessed at the end of the midpoint transition period (end of Quarter 5). Cronbach's alpha of this scale was .94, suggesting high levels of inter-item agreement. Due to the fact that the scores were captured through group consensus, intra-team agreement and reliability measures could not be calculated. The team efficacy scale was also captured following Quarter 2 of the simulation; that initial efficacy score was used in the calculation of the team's ability measure. Cronbach's alpha for the post-Quarter 5 collection of team efficacy was .94. Cronbach's alpha for team efficacy post-Quarter 2 was .92.

Team End Goal. Teams were asked to provide a response to one question regarding their team's end goal after the critical midpoint transition period. The team completed this item by consensus. Directions were as follows: "Please take a moment to discuss and agree upon what your team's goal is in terms of end ranking within your universe." The item itself read as follows: "At the conclusion of this simulation, our team's goal is to be ranked ____ out of the 10 teams within our universe (1 = top performing team; 10 = lowest performing team)." Team end goal was also assessed in the same manner at the end of Quarter 2; this initial goal measure was used as a control to calculate the team ability measure.

Team Processes. Team members provided individual responses to questions developed for this dissertation that were intended to reflect Marks et al.'s (2001) action and transition processes, discussed in Chapters 2 and 3. At the end of the critical midpoint transition period (end of Quarter 5), team members assessed the extent to which they believed that their team had engaged in action and transition processes reflected by a six-item, Likert-type scale. Sample items (1 = strongly disagree to 5 = strongly agree) are as follows: "The members of my team…" (1) "…set specific goals for our team to accomplish"; (2) "collected and analyzed all information we could before making decisions"; (3) "developed and implemented a comprehensive strategy"; and "coordinated activities among team members." Cronbach's alpha was .83, suggesting an acceptable level of inter-item agreement; r_{wg} was .98; Lindell's alternative r_{wg} measure was .88; ICC(1) was .26, and ICC(2) was .64. These statistics suggested that the items could be meaningfully aggregated into a score that reflected the team's action and transition processes.

Analytic Strategy

I used path analysis through covariance structure analysis in Bentler's (1989) EQS program to test the strength of the relationships among leader core self-evaluations, venture capitalist feedback, leader efficacy, transformational leadership, team efficacy, team processes, team goals, and team performance (hypotheses 1, 2a, 3a, 4a, 5a, and 6a). Data from the 40 groups were input into EQS in the form of a correlation matrix with accompanying standard deviations. Model structural paths were evaluated for significance, and goodness of fit of the overall model was assessed by several fit indices:

the comparative fit index (CFI; .90 and above is considered to be indicative of acceptable model fit; Bentler, 1989), the LISREL goodness of fit index (GFI; .90 and above is considered to be indicative of acceptable model fit; Joreskog & Sorbom, 1989), the Bentler-Bonett Normed Fit Index (NFI; .90 and above is considered to be indicative of acceptable model fit; Bentler, 1989), and the Bentler-Bonett Non-Normed Fit Index (NNFI; .90 and above is considered to be indicative of acceptable model fit; Bentler, 1989).

Because the model tested 16 parameters with a sample size of 40, which falls short a great deal of the rule-of-thumb requirement that there should be at least 5 cases per parameter tested in a structural model, I also tested the model using traditional path analysis in SPSS regression. This regression revealed virtually identical results, suggesting that the parameter estimates derived from structural equations modeling were stable. Klein, Conn, and Sorra (2001) advocated the use of both regression and covariance structure modeling in their study, which also considered a particularly small sample size (n = 39); they also noted that in cases of such small sample size, fit statistics for the overall model should be interpreted very cautiously.

Chi-squared difference tests (James, Mulaik, & Brett, 1982) were conducted to determine the degree to which hypothesized mediators indeed acted as mediators, as proposed by hypotheses 2b, 3b, 4b, 5b, and 6b. I followed Baron and Kenny's (1986) guidelines for testing mediation in this set of analyses in conjunction with a model-comparison approach. I compared the chi-squared statistic of my hypothesized model with chi-squared statistics of models that included the hypothesized mediated paths in addition to direct paths. If the difference in chi-squared statistics was significant, the

model with the direct path was a better fit with the data, indicating either partial mediation or no mediation. The results from these mediation tests also mirrored the results from traditional SPSS regression mediation tests, once again supporting the stability of the model in EQS.

Chapter 5

Results

The following report of results begins with the results of the covariance structure analysis of the original model and mediation analyses. I then present a revised version of the model and discuss results of exploratory analyses.

Descriptive Statistics

Table 4 presents the descriptive statistics, scale reliabilities, rwgs, and ICCs of the study variables; Table 5 presents the intercorrelations among study variables. In both cases, team goal is reverse scored (a score of 10 indicates the team's goal was to end in first place within its universe). Also, team performance is a standardized variable representing the residual of a regression of ability on Quarter 8 (end) profit.[4] Additionally, the results reported here are associated exclusively with the use of final (Quarter 8) profit as the basis for the dependent variable. As noted in the measures section, all analyses were also run with Quarter 8 rank as the dependent variable. Results for each set of analyses were virtually identical; therefore, only results associated with Quarter 8 profit are reported here.

[4] The use of this residual, as noted in the previous chapter, was intended to control for any differences in ability across teams. In the following chapter, I report only the results associated with this performance measure. Analyses were also run, however, using a separate variable for ability and the raw final profit scores for each team; due to the similarity of the two sets of results, and the relative simplicity associated with reporting the results associated with the residual performance measure, I have reported only the results associated with the residual performance measure.

Table 4. Descriptive Statistics, Scale Reliabilities, R_{wg}s, and ICCs

	N	M	SD	Number of Items	α	r_{wg}	r_{wg} Lindell	ICC(1)	ICC(2)
1. Leader CSE's	38	5.46	.67	12	.80	--	--	--	--
2. VC Feedback	40	3.68	.35	6	.82	.86	.83	.45	.79
3. Leader Efficacy	40	3.92	.62	5	.86	--	--	--	--
4. Trans. Leadership	40	4.31	.34	3	.89	.97	.92	.52	.85
5. Team Efficacy	40	76.26	20.77	9	.94	--	--	--	--
6. Team Goals	40	8.60	2.16	1	--	--	--	--	--
7. Team Processes	40	4.07	.53	6	.82	.98	.88	.26	.64
8. Team Performance	40	0.00	.99	--	--	--	--	--	--

Notes.

Team goal is reverse scored (scores of 10 indicate goals of first place).

Team performance is a standardized variable representing the residual of a regression of ability on Quarter 8 (end) profit.

Table 5. All Study Variable Intercorrelations.

	1	2	3	4	5	6	7	8
1. Leader CSE's	--							
2. VC Feedback	-.03	--						
3. Leader Efficacy	.40*	.33*	--					
4. Transformational Leadership	.18	.27	.39*	--				
5. Team Efficacy	.16	.38*	.43**	.24	--			
6. Team Goals	.20	.33*	.23	.11	.58**	--		
7. Team Processes	.39*	.37*	.70**	.28	.52**	.54**	--	
8. Team Performance	.29	.32*	.26	.19	.16	.20	.37*	--

Notes.

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

Team goal is reverse scored (a score of 10 indicates the team's goal was to end in first place within its universe.

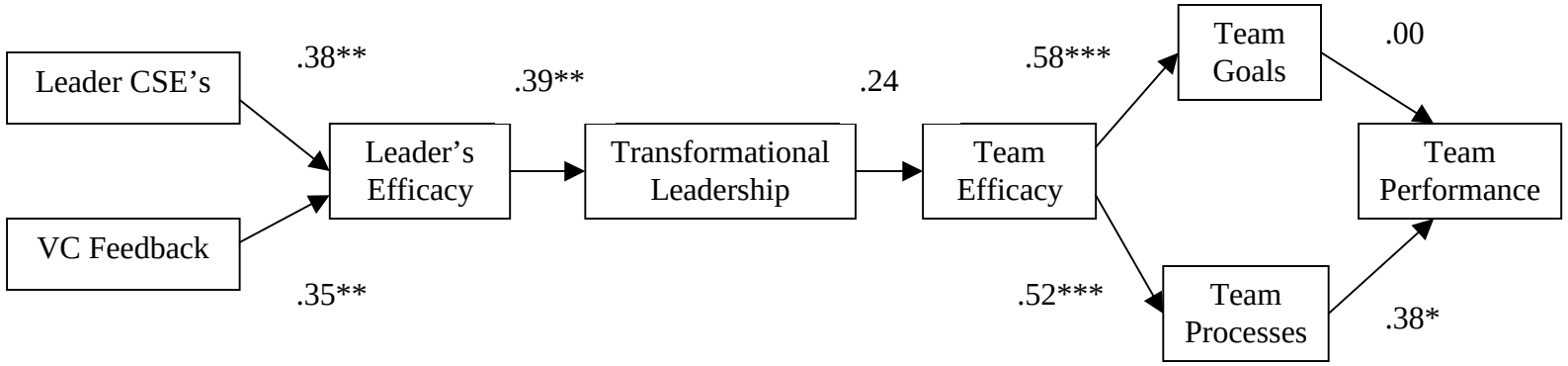
Team performance is a standardized variable representing the residual of a regression of ability on Quarter 8 (end) profit.

Results

I tested the hypothesized model presented in Chapter 3 by analyzing the covariance matrix using EQS; the results of this test are depicted in graphically in Figure 5 below. Hypothesis 1 suggested that the team leader's core self-evaluations and feedback the team receives at critical points would simultaneously have an impact on the leader's own efficacy to lead effectively. This hypothesis was supported; paths leading from the leader's core self-evaluations and team feedback to leader efficacy were both positive and significant (.38, $p < .01$, and .35, $p < .01$, respectively). The percentage of variance explained in leader efficacy was 26% ($R^2 = .26$).

Hypothesis 2a postulated that the leader's efficacy would be related to transformational leadership behaviors. This hypothesis was also supported; the path leading from leader efficacy to transformational leadership was significant (.39, $p < .01$). The percentage of variance explained in transformational leadership was 16%. Hypothesis 2b postulated that leader efficacy would mediate between both the leader's core self-evaluations and venture capitalist feedback and subsequent transformational leadership. In order to test for the presence of mediation, I separately tested two models with direct paths added between core self-evaluations and transformational leadership and between venture capitalist feedback and transformational leadership, respectively. Neither direct path model proved to be a better fit with the data ($\Delta\chi^2 = .05$ on one degree of freedom, NS; $\Delta\chi^2 = 1.01$ on one degree of freedom, NS; respectively). Therefore, hypothesis 2b was also supported.

Figure 5. Results of the Hypothesized Model.



Notes. Note that the values are standardized parameter estimates

*** p < .001 ** p < .01 * p < .05

Hypothesis 3a concerned the relationship between the leader's transformational leadership and team efficacy. This hypothesis was not supported (.24, NS); transformational leadership was not significantly related to team efficacy (with $R^2 = .06$). Hypothesis 3b, which suggested that transformational leadership would mediate the relationship between leader efficacy and team efficacy, was also not supported, as there was no evidence of a direct effect between transformational leadership and team efficacy.

Hypothesis 4a suggested that team efficacy would be related to team goal. This hypothesis was supported; team efficacy was significantly related to team goal (.58, $p < .001$, $R^2 = .34$). Hypothesis 4b suggested that team efficacy would mediate the relationship between transformational leadership and team goal. To begin, transformational leadership had to be significantly related to team efficacy (hypothesis 3a); because hypothesis 3a was not supported, hypothesis 4b also was not supported.

Hypothesis 5a suggested that team efficacy would be related to team action and transition processes. This hypothesis was supported; team efficacy was significantly related to team action and transition processes (.52, $p < .001$, $R^2 = .27$). Hypothesis 5b suggested that team efficacy would mediate the relationship between transformational leadership and team action and transition processes; once again, because transformational leadership was unrelated to team efficacy (hypothesis 3a), hypothesis 5b was not supported.

Hypothesis 6a suggested that both team goals and team action and transition processes would be related to higher levels of team performance. This hypothesis was partially supported; team action and transition processes were significantly related to team performance (.38, $p < .05$), but team goal was not (.00, NS). Team action and

transition processes accounted for 14% of the variance in performance ($R^2 = .14$). Hypothesis 6b suggested that team goal and team action and transition processes would mediate the relationship between team efficacy and team performance; although team efficacy was related to both team action and transition processes and team goals (hypotheses 4a and 5a), only team action and transition processes was related to performance. When an alternative model was tested that included a direct path from team efficacy to team performance, a chi-squared difference test revealed no model improvement ($\Delta\chi^2 = .11$ on one degree of freedom, NS). Therefore, it is reasonable to conclude that team action and transition processes do, in fact, serve as a mediating mechanism between team efficacy and team performance; hypothesis 6b was partially supported.

On the whole, the hypothesized model provided a poor fit with the data, with χ^2 (20) = 47.34; $p < .001$; CFI=.63; GFI=.82; NFI=.54; NNFI=.49. Given the poor fit with the data and the fact that many of the hypothesized relationships were not supported, I shifted to an exploratory mode to revise the hypothesized model.

Revised Model[5]

Based on the above findings and modification indices provided by the covariance structure analysis, I determined that several changes could be made to my original path model in order to create a more parsimonious model and improve fit. It seemed reasonable to drop transformational leadership out of the model, as it was not a

[5] I also ran the revised model through a more traditional path analysis regression to ensure findings established by EQS were stable, due again to the exceptionally low ratio of cases to parameters. Findings from the revised model in SPSS regression mirrored the EQS results described here almost exactly,

significant predictor of team efficacy; modification indices indicated that leader efficacy was a direct predictor of team efficacy. Also, evidence presented in the above analysis suggested that team goals—when entered together with team processes—do not directly predict performance; I therefore dropped the path from goals to performance.

Previous research, however, suggests that goals may be stimulants to both specific strategy development and the amount of planning or specific planning attributes (Locke & Latham, 1990), which may then impact performance. Given past findings, it is reasonable to suggest that goals may stimulate team action and transition processes, which then may result in higher levels of performance. Additionally, one of the revisions specified by the modification index suggested that fit could be improved with an added path from goals to team action and transition processes; given the theoretical and empirical justification for the presence of this new path, I added it in. Relationships between team efficacy and team goal and between team processes and team performance remained similar to the findings in my original model.

Figure 6 depicts this revised path model; the only other change not described above is the addition of a direct path between the leader's efficacy and team action and transition processes. This was the remaining major source of model misspecification once I had dealt with the above issues; after adding this path in, model fit statistics for the revised model were $\chi^2(14) = 10.16$; $p = .75$; CFI=1.00; GFI=.94; NFI=.89; NNFI=1.08. This was both a good fit and a significant improvement ($p < .001$) over the original hypothesized model, based on a chi-squared difference test ($\Delta\chi^2 = 37.18$ on six degrees of freedom, $p < .001$).

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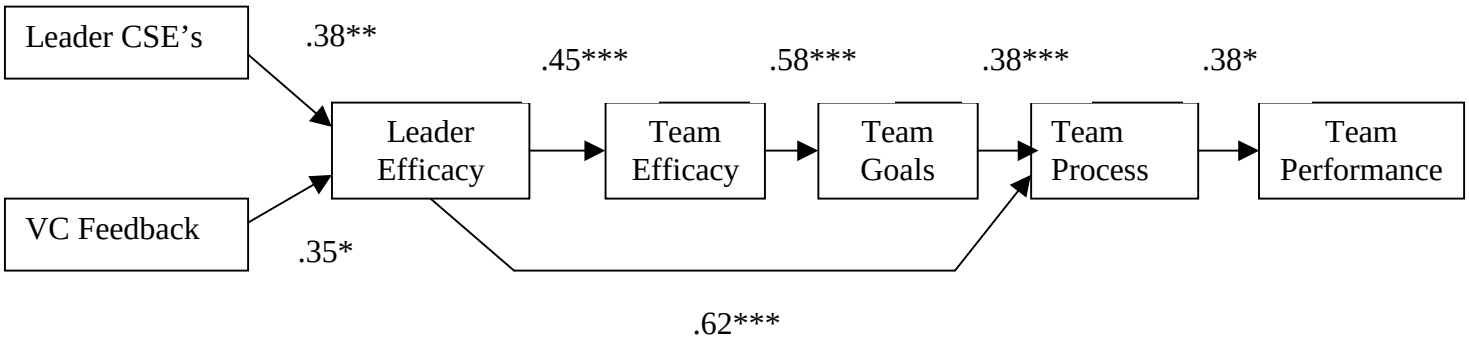
including indicating the presence of a direct path from leader efficacy to team action and transition processes.

Figure 6. Revised Path Model.



Notes.

*** p < .001 ** p < .01 * p < .05

Summary of Results

Though not all hypotheses were supported, a revised path model was found to significantly link the following connections between variables: core self-evaluations and venture capitalist feedback to leadership efficacy; leadership efficacy to team efficacy; team efficacy to team goals; team goals and leadership efficacy to team action and transition processes; and team action and transition processes to team performance.

Chapter 6

Discussion

The purpose of this investigation was to examine team leaders' core self-evaluations and the effects of this dispositional concept on leader efficacy, transformational leadership, team efficacy, team goals, team processes, and team performance. This research found support for a causal model with the following links: (1) team leaders' core self-evaluations and team feedback at the critical midpoint (in the form of feedback from the venture capitalists) to the leaders' self-efficacy; (2) team leaders' efficacy to both team efficacy and team action and transition processes; (3) team efficacy to team goals; (4) team goals to team action and transition processes; and (5) team action and transition processes to team performance.

The first three sections of this chapter discuss the theoretical, methodological, and practical implications of the findings presented in this dissertation. The chapter concludes with a discussion of limitations and directions for future research.

Theoretical Implications

As noted above, this research found support for a model linking a number of leader and team level variables. Through the rest of this section, the theoretical implications of the findings regarding each of these links will be discussed.

One of the main purposes of this research was to investigate the role of team leaders' core self-evaluations. There was theoretical reason to believe that leaders' core

self-evaluations might have important motivational effects, as one of the four indicator traits of core self-evaluations is generalized self-efficacy. Generalized self-efficacy is likely related to more specific task-based efficacy; as Bandura (1997, p. 54) noted, "People's appraisals of their efficacy in a given domain is undoubtedly based, in part, on judgment of their general self-regulatory capabilities. Thus, general and domain self-efficacies are not entirely independent." Indeed, this research found that leaders' core self-evaluations were positively and significantly related to leaders' self-efficacy. This is an important finding that lends support to the idea that the study of core self-evaluations should be expanded beyond the boundaries of what has been researched to date (i.e., core self-evaluations at the individual level and their influence on job satisfaction and performance; e.g., Judge & Bono, 2001a). It is clear that the concept holds a great deal of promise in explaining why leaders may be more or less motivated, especially when leading teams facing with difficult situations. Given ample anecdotal evidence provided by stories such as the tale of Ernest Henry Shackleton's heroic trip across Antarctica, it is not surprising that this research showed core self-evaluations to hold promise in this respect.

It was also hypothesized that team feedback received at the critical midpoint would have a direct influence on team leaders' efficacy. This relationship was also supported; additionally, the coefficients of the paths leading from core self evaluations to leader efficacy and from team feedback received to leader efficacy were similar. Although this may be a result of the idiosyncratic nature of the research design of this study, it is interesting to note that a personality variable and external feedback had similar

influences on leaders' efficacy. More research should be conducted in order to explore the nuances of team feedback in tandem with leader personality variables. For example, there may be situations in which feedback will interact with leaders' core self-evaluations to have an impact on their efficacy. Judge, Locke, et al. (1998) speculated that core self-evaluations may be important partly through their effects on framing; in ambiguous situations, where feedback valence is not entirely clear, it is plausible that leaders' core self-evaluations may interact with feedback to influence motivation. In these types of situations, the role of core self-evaluations may be doubly critical. Future research is clearly needed to more fully investigate the effects of core self-evaluations and ambiguous feedback on subsequent levels of motivation. It may also be that leader core self-evaluations are of exceptional importance when teams are exceptionally challenged, under a great deal of stress, and unclear as to what course of action is most prudent; future research could examine team decision-making in these contexts and whether team leaders' core self-evaluations influence the effectiveness of team decision-making in some way.

A last point to note about the finding linking core self-evaluations to leader efficacy is that this may be a first step toward answering Judge and colleagues' (2002) call for more leadership trait research that is process-oriented. Trait theories of leadership in the future will likely not simply list traits that are associated with more effective leadership—or even leader emergence—but rather may explore the specific pathways through which a leader's personality may influence his/her followers. The motivational links provided by Bandura's (1997) social cognitive theory provide a useful start; as

demonstrated by the findings of this dissertation, core self-evaluations influenced followers through motivational pathways.

Another finding presented in this dissertation was that leaders' efficacy was directly linked to team efficacy rather than being mediated through transformational leadership. Indeed, dropping transformational leadership out of the model altogether provided a more parsimonious model that fit the data far better. The original intent of this aspect of the hypothesized model was to identify whether leader behaviors were the way in which the leader's efficacy was conveyed to team members. Although Pescosolido (2001) found evidence of a direct influence of leaders' efficacy on team efficacy, which was then related to team performance, it seemed prudent to ask at the outset of this research what mediating mechanism might exist linking the two types of efficacy. It was reasonable to conjecture that leaders' efficacy does not merely beget team efficacy, but rather that leaders' efficacy must be demonstrated overtly in order to be perceived by team members and then be translated into a team-level concept. Findings, however, did not support the idea that transformational leadership behaviors mediated the link between leaders' efficacy and team efficacy.

There could be several reasons for this apparent lack of mediation. The first is methodological. The transformational leadership measure may have provided a poor representation of leaders' behaviors that actually occurred in each team. Although all team members filled out the scale and evaluated every other team member, it is possible that an unobstrusive measure or an outside observer might have resulted in a more fine-grained picture of the leadership behaviors involved, perhaps revealing the true mediating

role of transformational leadership. Related to this point, another measure of emergent leadership was collected as part of this research. Individuals were asked to write in the name of the individual on the team "to whom… other group members look[ed] for leadership most often during [the relevant quarters being considered]." This write-in measure should have been highly correlated with the emergent transformational leader's leadership score. That correlation, however, was only .34 ($p < .01$). The moderate correlation may have been indicative of low validity with respect to the transformational leadership measure. The transformational leadership measure, however, was used in this research (despite this low correlation) due to its theoretical association with the research questions that were examined. To conclude, the transformational leadership measure itself may not have been an adequate representation of the concept.

A theoretical explanation for the null result lies in the idea that a mediating mechanism may exist linking leaders' efficacy and team efficacy, but that mediating mechanism may not be transformational leadership behaviors. It may be that other behaviors not examined by this research, which are indicative of different types of contributions leaders make, are the true mediators of the relationship. Some examples of these behaviors are leader contributions to team discussion, problem-solving, and persuasive communication; all of these are logical antecedents to team efficacy and could be outgrowths of leader efficacy. Another possibility is that leaders' efficacy may influence the team's efficacy through the modeling process (Bandura, 1997); the transformational leadership variable examined in this research may not have adequately

assessed the modeling inherent in the interactions between the leader and the team, thus missing a mediator.

Another theoretical explanation is that the role of leader behaviors may be more complex than the conclusions to be drawn from examining the leadership of a single identified leader would reveal. It may be that including only the behaviors of a single emergent leader as a mediating mechanism was too simplistic and restrictive. There is little doubt that team leaders' self-efficacy is an important antecedent of team efficacy, but it may be that shared leadership (e.g., Seers, 1996) and leadership behaviors at the team level, rather than at the level of an individual leader, are critical mediating mechanisms. In other words, the leadership structure of some teams may be more complex than a single, emergent leader, and this structure may be the key to determining what (and whose) leader behaviors are the mediating mechanisms. Future research needs to be conducted in order to determine whether the leader efficacy to team efficacy relationship is truly direct or mediated by some other variable.

Yet another theoretical explanation for the lack of apparent mediation lies in the idea that the relationship between leaders' efficacy and team efficacy may truly be a direct, non-mediated relationship. As noted above, empirical evidence does exist in support of this relationship (Pescosolido, 2001). From a theoretical perspective, it can be argued that leaders' efficacy in and of itself may be driving team efficacy.

Another interesting finding of this dissertation associated with leader efficacy was in the direct relationship it exhibited to team action and transition processes. This was a relationship that was included in the final revised model based on the covariance

structure analysis path modification indices. There are a number of theoretical explanations for why leader efficacy may be an important antecedent for team action and transition processes. The items associated with team action and transition processes were as follows: “The members of my team…” (1) “…set specific goals for my team to accomplish”; (2) “…collected and analyzed all the information we could before making decisions”; (3) “…monitored changing environmental conditions”; (4) “…developed and implemented a comprehensive strategy”; (5) “…adjusted our strategy in keeping with what our team had learned”; and (6) “…coordinated activities among group members.” In the following paragraph, each item and its potential connection to leadership efficacy is discussed; other conceptual connections between leadership efficacy and team processes are then discussed.

With respect to the first item, leader efficacy could certainly be related to team goal setting activity. The efficacious leader may express confidence in the team or verbally encourage the team, which may encourage the team to be more focused regarding its goal setting activity. With respect to the second and third items, more efficacious leaders may be willing to accept reality, regardless of whether the situation with which they are faced is positive or negative. Teams may pick up on the confidence that efficacious leaders have in their ability to face different situations and may therefore exhibit more monitoring of the external environment and information collection. With respect to the fourth and fifth items, leader efficacy may be related to team strategy formulation and adjustment through a mechanism similar to what occurs at the individual and team levels. Research has shown that efficacy at both the individual and team levels

is related to goals, which may then stimulate knowledge seeking, utilization, and strategy formation in order to achieve those goals (Locke, 2000). A similar pathway may be occurring with the connection between leader efficacy and team action and transition processes. It is likely that leader efficacy will result in higher goals set by the leader; that these higher goals will encourage the leader to strategize; and that teams may also begin focusing more on strategy as a result. Finally, with respect to the sixth item, leaders may feel more able to coordinate successfully because they know what their teams should do; that knowledge may in part be driving teams' action and transition processes.

A discussion of three other possible explanations regarding the appearance in the revised model of a path between leaders' efficacy and team action and transition processes follows in the next few paragraphs. The first possible explanation is that general modeling processes (Bandura, 1997) may have been at work as well. The efficacious team leader may have been an individual who was prone to being proactive with respect to all the activities denoted in the items described above, and as a result other team members may have followed that example.

A second possible explanation is that team leaders may be influencing processes through establishing role clarity for team members. With respect to role clarity, or the extent to which individuals clearly understand what is expected of them at work (e.g., King & King, 1990), Chen and Bliese (2002) found that higher levels of role clarity were associated with higher levels of self-efficacy at the individual level. Higher levels of efficacy, in turn, have been found to be associated with taking action to improve performance (Bandura, 1997). It may be that a similar process operated within the teams

examined in this research; leaders might have influenced team processes through influencing team members' role clarity, which in turn might have influenced their self-efficacy and subsequent team-level processes.

A third possible explanation is that leadership may have also been related to team processes through the development of shared cognition or understanding regarding the task among team members. With respect to this point, leaders may have facilitated the communication process among team members by utilizing influence strategies such as consensus building, persuasion, and sense-making (Zaccaro & Marks, 1999). As the team leader influenced team members, it is likely that their individual conceptualizations of the task at hand were converging to a more shared understanding. This shared understanding, in turn, may have been positively related to activities they performed to complete the task.

Thus, it is likely that the more efficacious and influential a leader is, the more team members become convinced that productive team activities—as exhibited by the above team action and transition process items—may make a difference. To conclude, although previous research (e.g., Marks et al., 2001) has examined theoretical and empirical connections between team efficacy and team processes, little if any research to date has focused on the direct relationship between leader efficacy and team action and transition processes that was found here. More research is needed to tease out exactly how and why leader efficacy has a direct influence on team action and transition processes.

This research also provided support for the set of linking relationships between team efficacy, goals, processes, and performance. Although it was hypothesized that team efficacy would be directly related to both team goals and team performance, both of which would be directly related to performance, model revisions suggested a chain of mediating relationships between four variables. The relationship between team efficacy and team goals that emerged was not surprising (this relationship has been strongly supported in the past—e.g., Bandura, 1997; Locke & Latham, 1990; Marks et al., 2001). The major difference between the hypothesized and the revised model with respect to these variables was that in the revised model goals appeared to stimulate team action and transition processes that then were associated with performance.

Although these relationships were not predicted a priori, they are a logical extension of existing empirical findings. At the individual level, much support exists for the role of goals as stimulants to strategy development (e.g., Adam, 1975; Blau, Blank, & Katerberg, 1987; Chesney & Locke, 1991; Latham & Baldes, 1975; Latham & Saari, 1982; Locke & Latham, 1990). Support also exists for the mediating role of task strategies; DeShon and Alexander (1996) and Locke and Kristof (1996) both found that on moderately complex tasks, strategies completely mediated goal effects on performance. As Locke and Latham (1990) wrote, "Numerous studies have found that when given a goal, individuals develop task strategies on their own. This is not surprising in that one of the first questions people ask themselves when confronted with a goal is, 'How can it be achieved?'" Other findings at the individual level support the relationship between goal setting and the amount of planning or specific planning attributes (e.g.,

Earley, 1986, 1988; Earley, Lee & Hanson, 1989; Locke & Latham, 1990). Additionally, Locke (2000) also noted that goal effects are likely to be mediated by task knowledge, which, in a generic sense, has three components: ability, tactical task knowledge, and strategic task knowledge. While tactical task knowledge refers to specific actions utilized to implement strategy, strategic task knowledge refers to knowledge regarding the grand plan of activities. On the whole, the findings at the individual level suggest that goals may be stimulants to both specific strategy development and the amount of planning or specific planning attributes, particularly when the individuals involved lack relevant task knowledge (Durham et al., 2000).

At the group level, less clear empirical support exists for the mediating role of task strategies, group planning activities, or other types of team processes. Durham et al. (2000) found that team information seeking fully mediated the relationship between team-set goals and team performance; Durham et al. (1997), however, found that both quality of team tactics and team goals directly influenced performance, and that an interaction between tactics and goals was also related to performance. The findings in this dissertation present further support for the mediating role of specific processes at the team level that may be utilized to help teams achieve their goals. More research should be conducted at the team level to determine which processes may be most likely to mediate the relationship between team goals and team performance; the role of the nature of the task and task complexity will also be important characteristics to examine in the context of these relationships. More on these issues will be discussed in the section below on directions for future research.

As a final point to note with respect to the connection between team goals and team action and transition processes, both concepts encompassed certain aspects of team goal setting. The team goal measure, of course, was a measure of end goal level or goal difficulty (ends-oriented), whereas the team process measure included an item that assessed the extent to which team members set specific goals for the team to accomplish (means-oriented). It makes conceptual sense that team end goal level would drive the more specific intermediate goal setting processes that teams utilize; this conceptual connection provides additional support to the findings presented in the revised model.

Methodological Implications

This research makes several important methodological contributions. The first is that two levels of analysis were utilized that typically have not been examined in tandem in the existing literature. As noted in the Chapter 1, the teams literature has not fully utilized the potential in examining leadership, while the leadership literature tends to focus on the organizational level of analysis. As a result, although there is an emerging literature that focuses on leadership in team situations (e.g., Durham, Knight, & Locke, 1997; Pescosolido, 2001; Zaccaro & Marks, 1999; Zaccaro et al., 2002), there is dearth of empirical work that includes concepts from both levels of analysis. This dissertation does exactly that and presents a host of new research questions that are relevant to the team leader-team interface.

Another methodological contribution this study makes is in the use of a detailed, realistic, week-long team simulation that provided objective performance feedback to

teams. This type of situation was ideal for the examination of this dissertation's research questions; although it was a controlled environment, it allowed for the natural development of leadership, team dynamics, shared team history, and team processes over time. Weingart (1997) noted that there are many barriers, both practical and methodological, to conducting effective team process research; the use of a simulation such as MARKETPLACE addresses many of the issues she illuminates. Simulations may be an excellent microcosm in which to view a team's development and interactions over its entire life-cycle.

A third methodological contribution of this research is in the steps that were taken toward the development of several new, reliable scales to measure concepts. New scales were developed for the measurement of the leader self-efficacy, transformational leadership, and team action and transition processes. It is important to note that although the transformational leadership variable did not serve as a mediating mechanism between leader efficacy and team efficacy as was expected, it did serve an extremely useful purpose: it allowed for a methodologically sound way to identify emergent team leaders. The three-item scale that was developed for this research and utilized in data collection proved to be reliable, both in terms of its items and in terms of the reliability and agreement among raters. The fact that leaders were not self-identified afforded an opportunity to avoid any self-report bias associated with this measure. The scales developed in this dissertation may provide future researchers with a base from which to begin examining similar concepts.

A fourth methodological contribution of this research is that it provides further evidence of the prudence of utilizing covariance structure analysis for the purposes of path analysis when sample size is small. Although there were only 40 teams participating in this research, results from structural equations modeling-based path analysis were virtually identical to the results that were obtained through regression-based path analysis. Although model fit statistics (which are often considered to be a main advantage of structural equations modeling methodology) are difficult to interpret in the case of small sample size (e.g., Klein et al., 2001), there are other advantages to selecting this particular analytic strategy. One of the major advantages of the use of covariance structure analysis is the relative parsimony and simplicity associated with the reporting of results; also, the modification indices provided by this type of analysis suggest ample possibilities for model revision, which often results in a simpler, more elegant revised model.

Practical Implications

One practical implication of this research is in the potential implications of the findings for selection and staffing purposes in organizations. Because of the findings supporting the key role of team leaders' core self-evaluations in developing team efficacy through their own self-efficacy, organizations with teams in difficult situations may want to specifically choose leaders on the basis of their core self-evaluations. It may be that leaders who exhibit more positive core self-evaluations should be selected for teams

facing challenging situations, as the trait may help them cope with adversity and still be both high performers and satisfied with their jobs.

Another practical implication of this research is that it increases understanding of the possible chain of causation that links leader core self-evaluations, team feedback, leader efficacy, team efficacy, team goals, team action and transition processes, and team performance. Having a better understanding of the nature of these relationships will assist in the development of relevant interventions at appropriate points in the causal chain so as to improve team performance. For example, the finding that team feedback may be an antecedent to team leaders' efficacy suggests that organizations should attempt to provide unambiguous feedback regarding team progress as much as possible. In the event that feedback is positive, it will increase leaders' efficacy; in the event that feedback is negative, although this may have a negative influence in the short term on team leaders' efficacy, teams should be better positioned to readjust their strategies appropriately to approach the situation at hand more effectively.

Additionally, the findings linking team efficacy to team performance suggest that team efficacy plays a critical role in making teams more effective. Organizations may benefit from this increased understanding of the role of team efficacy and how to build it (i.e., through effective leadership) that this research provides. The most effective teams in this sample were the teams whose leaders helped them to build the confidence to set high goals and who helped to encourage effective team processes; this is an important practical conclusion of this research.

Limitations

There are a number of important limitations to note about the research described in this dissertation. The first is that a certain type of team working on a certain type of task was examined; as a result, conclusions to be drawn from this research must be limited. The teams examined in this study were newly formed teams, without an initially designated leader, whose members did not know each other prior to the start of their work on the task. Furthermore, these teams worked on a highly complex, engaging, and dynamic task and received timely and objective feedback based on their decisions at numerous points in time throughout their interactions. However, task outcomes did not have significant career consequences for the participants; additionally, the task involved some degree of competition, as teams always competed against each other to attain market share. A discussion of these nuances associated with team and task types follows.

While the use of self-managed work teams in modern organizations continues to become more common, team members may be familiar with each other prior to the start of the team's work and may have pre-established roles and behavioral expectations prior to working together as a team. In other words, members of newly formed work groups in organizational contexts may not be as unfamiliar with each other prior to the start of team formation as the participants in this research were. Furthermore, teams in modern organizations may have an external manager who serves as the de facto leader; in these situations, the emergence of an internal leader may be stifled—or simply different in some way—due to the presence of the external leader. Clearly, the fact that the research presented here was not conducted in an organizational context was a limitation.

Additionally, scholars have identified numerous taxonomies of team types in modern organizations, ranging from Cohen and Bailey's (1997) work, parallel, project, and management teams to Sundstrom, DeMeuse, and Futrell's (1990) advice and involvement, production and service, projects and development, and action and negotiation teams. Although the nature of the teams examined in this study was ideally closest to that of management teams, the teams examined in this study were in reality difficult to categorize as being a single team type. The teams in the sample were responsible for numerous activities on several levels. At the highest level, these teams had to strategize and coordinate a set of activities among themselves. Teams also had to retain the short-term flexibility needed to operate under stress by solving problems, continually looking to improve their internal processes, and staying vigilant about monitoring the competition and the dynamic external environment. Furthermore, teams were operating under a great deal of time pressure and knew that they would only be working together for a limited period of time. These characteristics are important to consider when attempting to generalize the findings of this study to other types of teams; future research should examine different types of teams to determine whether the findings presented in this dissertation are generalizeable to other types of teams.

The nature of the task is also important to examine. A number of authors (e.g., Hackman, 1987) have pointed out that task characteristics are critical antecedents of group functioning. Hackman (1987) notes that groups are expected to work particularly hard on tasks when the following conditions are met: the group task requires members to use a variety of high-level skills; the task is a whole, meaningful piece of work; outcomes

have significant consequences for the organization; the task provides a high level of autonomy for the team; and work on the task generates regular, trustworthy feedback. The task used in this dissertation met most but not all of Hackman's (1987) criteria for being engaging enough to be meaningful. In this case, the outcome had no significant consequences for any real organization or for team members' careers. Future research should examine the extent to which the task type and Hackman's criteria may influence the relationships explored in this research.

Another limitation of this research is that causal associations among the variables studied cannot be proven due to the correlational nature of the study's design. However, it is important to note that the independent variables (leader core self-evaluations, team feedback, leader efficacy, team efficacy, team goals, and team action and transition processes) were all measured a significant amount of time before the final dependent variable (team performance). The timing of the assessment of these variables gives plausibility to the inference of causality, which is one of the advantages of laboratory studies.

A related point is the necessity for future empirical research on teams working closely over periods of time to utilize dynamic models. This dissertation did not test a dynamic model; although the simulation lasted for a five-day period, the focus in this research was only on the second half of the team's existence. Although this is a limitation of this research, some theory has already begun to characterize team processes by a repeated set of episodic interactions (both within the team and as the team maintains its boundaries—e.g., Ancona & Caldwell, 1992) that are fundamentally dynamic in nature

(e.g., Marks et al., 2001). There is much potential for future research to use realistic, multiple-day simulations such as the one described here to examine the changes in team emergent states such as team efficacy and team action and transition processes over time. In doing so, these models may better capture the dynamic interactions occurring both within teams and as teams maintain their boundaries. As noted above, the use of a multiple-day simulation may help to address a number of the common issues present in research on team process (Weingart, 1997), in addition to aiding researchers who are attempting to test dynamic models.

As a side note, emerging statistical methods that specifically model the non-independence in the data generated by the same individual's or team's responses over multiple points in time, such as growth modeling using covariance structure analysis (e.g., Willett & Sayer, 1994) or random coefficient modeling (e.g., Bliese & Ployhart, 2002), have untapped potential in terms of their instrumentality for assessing empirical data on dynamic change over time. A wide variety of research questions—not just the questions posed by this dissertation—could be examined from a more dynamic perspective, which would add depth to many existing process models of interactions at the individual, group, and organizational levels. For example, Ployhart and Hakel (1998) examined the nature of intraindividual performance variability over time, in addition to the individual difference predictors of such variability. They found support for the idea that latent intraindividual performance follows a negatively accelerated "learning" curve and modest support for the importance of individual difference factors in accounting for variability around the latent growth parameters; the use of such statistical methodology

could be utilized to assess the growth of important variables examined in this dissertation at higher levels of analysis, such as team and organizational efficacy, team processes, team and organizational goals, and team and organizational performance.

Additionally, the scope of this dissertation did not include time in the examination of the nature of emergent team leadership. A particular point in time was chosen and teams were essentially forced to have a single designated leader based on the transformational leadership ratings from that single point in time (though, as noted in Chapter 4, 70% of the emergent leaders following the midpoint feedback were still the emergent leaders at the conclusion of the simulation). Questions remain, however, as to whether that individual was the true team leader for the entire duration of the team's life cycle. A fruitful direction for future research may involve examining whether all teams designate a single individual as the emergent leader over multiple points in time. It is likely that teams will differ in the number of emergent leaders they exhibit; it is also possible that some teams—with a more shared leadership structure (e.g., Seers, 1996)—may not be able to identify a single emergent leader at any point in time. Indeed, a follow-up analysis of the data collected for this dissertation suggested that teams do differ in the number of emergent leaders they exhibit over time and that some teams cannot identify a single emergent leader. These types of questions need to be more fully addressed, as they suggest that the nature of emergent leadership may be quite complicated. A further question to be examined is whether teams that do have single emergent leaders exhibit different levels of performance than teams with more than one emergent leader or no emergent leaders. Another follow-up analysis, using additional

data that was collected to address this point, suggested that teams with different numbers of emergent leaders do not differ significantly in terms of performance; however, this question should be explored more thoroughly. Follow-up questions would then be whether it is necessary to have a match between team contexts, task type, and emergent leadership, or whether a single type of emergent leadership may be most beneficial in all situations for teams. These questions provide ample opportunities for future research; answers would provide a great deal of value in both theoretical and practical realms.

Another important limitation to note is in the research design itself. Although there are undeniable advantages to the use of simulations in teams research, issues with this approach abound. The most important of these is the fact that teams participating in the simulation operated devoid of any organizational context. Teams researchers (e.g., Hackman, 1987; Ilgen, 1999; Tesluk & Mathieu, 1999) consider organizational context as being a critical influence on team processes and outcomes; as such, the findings presented here must be examined in a field context to truly determine whether the similar relationships between variables can be observed in organizations. Another important issue associated with the use of the simulation is the extent to which participants were truly engaged in the task at hand. As noted above, the simulation's characteristics did not meet all of Hackman's (1987) recommendations ensuring that it was meaningful and engaging for team members, as team members were most certainly aware that their decisions were made and activities occurred in a simulated context. Therefore, the possibility certainly existed that team members may not have been as engaged or as interested in the team's activities and decisions as would individuals in work teams in

organizations. Observations of the teams' interactions during the course of the week of the ELM suggested, however, that the majority of participants were highly engaged in their work on the simulation. Additionally, teams were aware that the venture capitalists were prominent business leaders and faculty and alumni of the Smith School; it is likely that team members were highly engaged in part to make positive impressions on these individuals.

Another limitation to note is the nature of the sample. Team members were all first-year MBA students; although the majority of them had had some years of work experience prior to entering the MBA program, participants may not have had the same amounts of experience in working in team environments as typical employees in organizations do. This relative lack of experience may have made a difference in how team members interacted. Also, the simulation took place immediately after two days of orientation for the MBA's—though participants appeared to be highly engaged in the activity, they might have been in a frame of mind that reflected their interest in meeting their new classmates rather than in concentrating solely on the task at hand. Once again, however, there was good reason to believe all participants were highly engaged and focused on attaining high levels of team performance.

In considering the validity of the survey instruments used, two other limitations arise. One issue concerns the overlap in the measurement of team goals and team action and transition processes. The team goal measure was designed to assess team goal level or difficulty, while the team processes measure assessed the extent to which teams "set specific goals for [themselves] to accomplish." The two measures obviously overlap to

the extent that they assess aspects of team goals; this overlap may partly explain the significant relationship between team goals and team processes. However, there is a fundamental distinction between the two measures: the team goal measure is more a reflection of a team's end goals, while the team action and transition processes item is more a reflection of the process of team goal setting through member interactions. Therefore, although the relationship between team goals and team action and transition processes may have been influenced by the overlapping content of the items related to team goals, it is unlikely that the entire relationship between the two variables can be explained by this overlapping content.

Another survey instrument issue concerns the team action and transition processes measure. Team processes, again, are notoriously difficult to study; researchers have recommended that observational measures be used so as to fully capture the nuances of these processes (e.g., Weingart, 1997). Observational measures were not used in this research, however; rather, team members were asked to self-report their individual assessments of team processes, which were then aggregated to the team level. The use of an observational measure of team process would have helped alleviate any common method variance that may have inflated correlations between the team processes and other variables examined in this study. Therefore, the fact that self-report measures were used to assess team processes is another limitation of the findings; indeed, alternative methods of assessing many of the variables examined in this research would have lent additional support to the findings presented here.

Yet another limitation is that this research was not an exhaustive examination of all variables relevant to the paths studied here. Team leaders' core self-evaluations, for instance, may influence team efficacy through pathways other than the motivational pathway examined here. Additionally, other variables that were not considered in this research—for example, team member personality variables as assessed by the Five Factor or "Big Five" structure of personality (Barrick & Mount, 1991; Costa & McCrae, 1988) and team member skills—may have been influencing results.

Another important variable that was not considered in this research that should be included in future research due to the centrality of its role in the relationship between goals and performance is task knowledge (Locke, 2000). Though a measure of ability was examined in this dissertation, no measures of tactical or strategic task knowledge (the other two components of task knowledge; Locke, 2000) were measured; as a result, an important mediating variable in the relationship between goals and performance (Locke, 2000) was not examined.

To conclude, there are numerous limitations associated with this research, ranging from methodological issues and research scope issues to issues of generalizeability. Given these limitations, the research presented here may prompt more questions than it answers.

Future Research Directions

There are many potential directions for future research, as pointed out throughout the course of this chapter. Four of the most promising venues are elaborated on here.

The first major future research direction is in the further examination of core self-evaluations in the context of both teams and team leaders. Based on the findings presented in this dissertation, core self-evaluations do appear to have an important motivational influence on leaders, which subsequently can be traced to influencing team performance. This finding suggests that core self-evaluations may be useful in the context of teams and leadership research. In the teams research, an emerging stream of literature has begun to examine personality as a compositional variable in teams (e.g., Barry & Stewart, 1997; Barrick, Stewart, Neubert, & Mount, 1998; Lepine, Hollenbeck, & Ilgen, 1997; Neumann & Wright, 1999). This literature has tended to focus on the Five Factor structure of personality (Barrick & Mount, 1991; Costa & McCrae, 1988). However, Judge and colleagues' (1997, 1998, etc.) work on core self-evaluations suggests that the examination of this personality taxonomy, in tandem with the Big Five dimensions, may help explain additional variance in predicting individual-level attitudes and behaviors. It is likely that examining core self-evaluations as a compositional variable at the group level may do the same. The mean level, the maximum level, and the variance of team members' core self-evaluations may all be important compositional variables to consider in the future.

There is also clearly much promise in further examination of team leaders' core self-evaluations scores. Future research should be conducted to determine whether leaders' core self-evaluations influence other important variables, such as leader attitudes and other non-transformational leader behaviors. Leaders with high core self-evaluations scores may exhibit important differences in attitudes and behaviors that may have

implications for their teams' performance; as a result, these relationships should be examined.

It should also be noted that although this research took a step toward examining the influence of leaders' core self-evaluations in the context of teams facing stress by also considering the influence of team feedback on leaders' efficacy, there is much work yet to be done—both in terms of examining the more general relationship between feedback and individual core self-evaluations and in terms of examining the more specific relationship between team context and leaders' core self-evaluations. Other aspects of team context not discussed in this dissertation—such as the external support the team receives and the reward system the team is operating under (e.g., Campion, Medsker, & Higgs, 1993; Hackman, 1987)—may be important to consider in tandem with team leaders' core self-evaluations. It may be that team leaders with particularly high levels of core self-evaluations are better able to remain efficacious in the face of less supportive environments, thus being more effective in a wider variety of situations. With respect to reward systems, previous research has noted the importance of a match between task and outcome interdependencies for individuals working in team situations (e.g. Hackman, 1987; Lawler, 1981; Wageman, 2001). Despite this, many organizations do not have reward systems in place to complement the structure of work that is present. Team leaders with more positive core self-evaluations may be able to motivate the team despite that lack of consistency in task and reward structure. There is much potential for further theoretical development in this realm.

The second major future research direction is in the extension of the findings presented in this dissertation over time. The use of dynamic models in tandem with growth modeling may be helpful in delineating the trajectory of both leader level and team level variables over time and whether the intercepts and slopes of those trajectories significantly differ between leaders and teams, respectively. If they do, future research could examine what leader-level factors (such as leader core self-evaluations or other personality variables) or team-level factors (such as initial cohesion or team efficacy) may be related to the intercepts and slopes of the variables being examined over time. This type of research could add much depth to the field's current understanding of relationships between a number of important variables.

As an example, in this dissertation, the relationship between team leaders' core self-evaluations and their self-efficacy was examined at a single point in time, after the critical midpoint of the team's existence. However, follow-up questions that may be relevant are whether core self-evaluations had an influence on only the initial level of efficacy displayed by the leader, or whether core self-evaluations had an impact on the slope of the leader's efficacy over time. Delineating these differential effects of core self-evaluations may be an interesting way to make more fine-grained observations as to exactly how core-self evaluations is an important influence on a leader's efficacy. It may be that core self-evaluations simply result in a higher level of initial efficacy, which would provide support for the idea that more global personality measures may influence more specific, role- or task-related assessments of efficacy. However, if core self-evaluations were to also influence the slope of leader efficacy—in that leaders with more

positive core self-evaluations also demonstrated more positive rates of change in leader efficacy over time—the role of core self-evaluations would be doubly critical. A relevant follow-up question that may be important to pose is how much meaningful additional information can be gleaned from such analyses. Such questions can only be answered by considering how fine-grained of an analysis the research questions posed require.

In addition to the data analyzed for the purposes of this dissertation (most of which was collected after midpoint feedback had been received), data regarding leader efficacy, transformational leadership, team efficacy, team goals, team action and transition processes, and team performance was collected at three other points in time: after Quarters 2, 4, and 8 of the simulation. This additional data can be used in the future to begin to examine some of the questions posed in the above paragraph regarding whether leaders' core self-evaluations have an impact on the slope and intercept of leaders' efficacy. Other questions that would be interesting to examine with this additional data are what the trajectories of team efficacy, team action and transition processes, and team performance are over time (i.e., linear, quadratic, or cubic) and whether the intercepts and slopes of those trajectories significantly differ between teams. If they do, interesting follow-up questions would be whether leader-level variables (e.g., personality, attitudes, and/or behaviors) may be related to the slopes and intercepts of these team variables over time.

The questions posed above, while valid and potentially interesting to examine, lack the theoretical foundation that would be necessary to justify an in-depth examination. However, theories that currently exist in the organizational literature can be

utilized in order to provide that foundation. As an example, one relevant theoretical perspective involving team efficacy that takes time into account Lindsley et al's (1995) multilevel theory of efficacy-performance spirals. The theory suggests that efficacy and performance are reciprocally related, which then may result in deviation-amplifying loops that may in turn result in upward and downward spirals in efficacy and performance. The theory would predict that teams start off with a certain level of efficacy, which would then be adjusted based on performance feedback that the team receives as it performs the task. If the team does well, subsequent efficacy levels would be higher, resulting in subsequent higher levels of performance, ultimately leading to an upward spiral. Similarly, if the team performs poorly, subsequent efficacy levels would be lower, reflecting the negative performance feedback, which would ultimately lead to a downward spiral. The fact that these recursive loops are deviation amplifying, according to the theory, suggests that the change over time in team efficacy may in fact be quadratic or cubic. Growth modeling techniques would help to determine whether that is the case.

Lindsley et al's (1995) theory also suggests that other variables may have an influence on the efficacy-performance relationship; in other words, the relationship between the two over time may be moderated by external factors. The findings presented in this dissertation suggest that leadership has an important impact on team efficacy. It is likely that effective leadership may act either to enhance or diminish the influence of team efficacy on performance and performance on efficacy. In the case of positive spirals, effective leadership may act to enhance the influence of efficacy on performance and vice versa, creating even more positive deviation-amplifying loops. In the case of

negative spirals, effective leadership may act to buffer the influence of performance on efficacy and vice versa, essentially minimizing any deviation amplification that might result in a downward spiral. Growth modeling could again be utilized to test such propositions—for example, leadership could be examined as an independent variable that might be related to the rate of change of team efficacy over time. It may be that leadership may interact with team feedback to influence the rate of change in team efficacy over time. To conclude, it is important that attempts to model growth over time with the variables mentioned above are not conducted as "fishing expeditions"; it is important to have a strong theoretical base to make reasonable a priori conjectures regarding expected results. Existing theories that include the element of time can be utilized to do exactly that.

A third major area of future research that is posed by this dissertation is the set of questions that remain outstanding regarding the nature of emergent leadership. As noted above, this research assumed that leaders identified as such after the critical midpoint were the only leaders of each team. However, the nature of emergent leadership over time may be more dynamic—emergent leaders may surface, resurface, or not appear at all, depending on the team being considered. Future research is necessary to examine the nuances of emergent leadership more closely.

Finally, this research took an important step toward delineating the antecedents and consequences of team efficacy; more work needs to be done, however, to illuminate both. Therefore, a fourth major area of future research is in examining how team efficacy can be built and how it translates into performance. With respect to the antecedents of

team efficacy, more research needs to be conducted in order to better determine whether the leader efficacy to team efficacy is direct or mediated by some other variable. More research also should be conducted to examine whether shared leadership may have an impact on team efficacy. Additionally, although findings presented in this dissertation showed team feedback to influence team efficacy indirectly through its influence on leader efficacy, the relationship between team feedback and team efficacy is certainly worth revisiting.

With respect to the influence team efficacy had on performance, in this study, team efficacy was related to team goals, which were in turn related to team action and transition processes. It was these team processes that were related to team performance. The highly complex and engaging nature of the task may be related to this particular finding. It is important to acknowledge that during the completion of these types of tasks, the role of task knowledge is critical. In particular, the relationship between goals and performance on complex tasks requiring task knowledge is an interesting one—as Locke, (2000) noted,

> Three types of relationships have been obtained between goals, task knowledge, and performance:
>
> 1) Independent main effects of goals and task knowledge.
> 2) Interactive effect of goals and task knowledge.
> 3) Mediation effects, whereby task knowledge mediates the effect of goals. (p. 416)

Locke (2000) then postulated a single model to describe the relationship between goals, task knowledge and performance: that of mediation, described above. After close examination of the conditions under which each of the above relationships was observed, Locke (2000) determined that each of the first two above relationships (the independent main effects model and the interactive effect model) were both special cases of the latter situation (mediation model). As he wrote (2000),

> …to get performance, you need goals that activate or produce task knowledge and/or other motives that activate or produce task knowledge. This means that… *there are literally no "direct" effects of goals on performance* (italics in original). All performance requires *some* degree of knowledge. In those studies where "direct" effects were obtained, the subconscious knowledge was present but was simply not measured (even though, in principle, it could have been measured). In the interaction and mediation studies, it was measured. (p. 424)

The finding presented in this research—that team action and transition processes served as a mediating mechanism between team goals and team performance—may be related to Locke's (2000) mediation model, to the extent that it reflected the team's attempts to seek out the relevant knowledge necessary to succeed in the simulation and make subsequent adjustments to their strategies and tactics if necessary.

It is important to note that this dissertation did not examine actual tactical task knowledge or strategic task knowledge, as noted above in the limitations section, but rather team action and transition processes; it was the first study to my knowledge to identify these types of processes as a mediating variable between team goals and team

performance. More research clearly needs to be done in order to place findings associated with these types of processes into an appropriate context given the existing research indicating the mediating role of task knowledge in the team goal to team performance relationship. It will also be important to examine how team efficacy might play a role in these relationships.

Conclusion

In sum, the purpose of this investigation was to examine core self-evaluations of leaders and the effects of this dispositional concept on transformational leadership, team efficacy, goals, process, and performance. While a number of hypothesized relationships were not supported, this research found considerable support for the importance of the role of team leaders' core self-evaluations and their leadership efficacy as being important antecedents of team efficacy. In this dissertation, it was evident that the team leader's core self-evaluations indeed made a difference through motivational pathways; moreover, a full "causal" chain linking team leaders' core self-evaluations to team performance was delineated. The specification of this set of pathways was the major contribution of this research.

In conclusion, the examination of core self-evaluations offers important insight into why some leaders may be able to inspire team members to face difficult challenges. Based on the historical evidence that exists, it is reasonable to conjecture that legendary positive leaders such as Ernest Henry Shackleton probably exhibited high levels of core self-evaluations and were able to face extreme adversity successfully as a result. Modern-

day work teams and organizations that face extremely trying circumstances have much to learn from these examples.

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