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The validity of the transformational, transactional, and laissez-faire leadership model as measured by the Multifactor Leadership Questionnaire (MLQ 5X)

John Antonakis

THE VALIDITY OF THE TRANSFORMATIONAL, TRANSACTIONAL, AND LAISSEZ-FAIRE LEADERSHIP MODEL AS MEASURED BY THE MULTIFACTOR LEADERSHIP QUESTIONNAIRE (MLQ 5X)

by

John Antonakis

Dissertation Submitted in Partial Fulfillment of
the Requirement for the Degree of
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ABSTRACT

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ABSTRACT

The Multifactor Leadership Questionnaire (MLQ), the most frequently used instrument for gauging Bass and Avolio's full-range leadership model, underwent numerous revisions to answer criticisms about its construct validity. Because researchers found conflicting results regarding the number of factors that best constitute the model, this study examined whether the factor structure of the MLQ (5X) was consistent across a diverse array of samples. The total size of the samples was 6,525, integrated from 18 independent studies. Using confirmatory structural equation modeling techniques, results indicated that the factor structure was best represented by nine single-order factors, as asserted by Bass and Avolio. These results were prevalent when all samples were integrated for the factor structure invariance test, or when individual samples were grouped into homogenous units for strict factorial or factor structure invariance. Thus, the validity of the model was a function of sample conditions explaining why independent researchers who used nonhomogenous samples failed to confirm the nine-factor model. These conditions—interpretable as moderators that bounded the theoretical model—included various environmental and organizational settings, leader gender, and the hierarchical level of the leader. The criterion validity of the MLQ was also tested, but results should be viewed cautiously as the leadership and outcome measures were each collected from the same source. Nonetheless, the regression paths of the MLQ factors were interpretable, and followed theoretical propositions. Transformational and contingent reward leadership was positively related to performance, and passive-avoidant leadership negatively related. Management-by-exception active varied according to sample conditions. These findings suggest that a standard set of leadership behaviors is

not universally related to effectiveness, and that leaders operationalize their behaviors differently depending on contextual factors. As a consequence, the interfactor relationships of the MLQ, and the relationships of the factors to criterion measures may be a function of the conditions under which the model is examined. Therefore, testing the MLQ's validity—and indeed that of other leadership instruments—should be performed under homogenous sample conditions. Finally, this dissertation suggests that the MLQ should be retained for future research and training. Possible improvements to the theory and measurement model are also discussed.

DEDICATION

To Athena, Saskia, and our precious baby you are carrying—thank you for making each day beautiful and for providing meaning for my existence.

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Finishing a Ph.D. is a long and grueling road that few try, and even fewer accomplish. Being who I am, I tried to make my life as difficult as possible. At times I felt that I was never going to make it. My journey, however, was made less treacherous and more fun by many people who were sources of hope and inspiration.

The most important person for me in this journey was my partner Saskia, who was a continuous source of intellectual strength and wisdom. She has helped build my confidence to pursue my goals. Saskia, if I made it, you can, too, a hundred times over. Get your map out and start planning, for your road is tarred, is as flat as a mirror, and has no bends! And you too, Athena—by the time you read this I know that you will realize the value of education, and do what is right. Thank you for being patient with me and for teaching me so much about parenthood, life, and love.

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Gordon, Bob Harrington, John Kowalczyk, Christina Melnarik, Markus Mueller, Andy Papademetriou, Roger Meyenberg, Erdogan Topuz, and Eve Graham-Weber. Thank you for keeping me going, and making me realize that I am not alone in the struggle.

It was with a heavy heart that I wrote the last sentence of this dissertation. I really enjoyed my journey, and I hope that whoever has the courage to embark on a similar travel will reach their destination.

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CHAPTER 1: INTRODUCTION TO THE STUDY

Introduction

Leadership as a discipline of study has gained prominence in the recent years. The resurgent interest in leadership results from a redefinition of leadership theory and a refocusing on its visionary, emotional, transforming, and, charismatic components (Bryman, 1992; Conger & Hunt, 1999; Hunt & Conger, 1999). In the past, conventional wisdom and research concentrated on trait approaches, and sought to identify the superior characteristics, intelligence, and skills leaders have that set them apart from ordinary people (Bass, 1990a). Indeed, leadership research first centered on attempting to find these characteristics; however, several decades of research led to few consistent results (Robbins, 1996). Interest thereafter shifted to behavioral (Katz, Maccoby, Gurin, & Floor, 1951; Stogdill & Coons, 1957) and contingency approaches (Fiedler, 1967; Hersey, 1975; House, 1971).

Current research generally focuses on the emotional aspects of leadership and in particular transformational and charismatic theories and their derivatives (Bass, 1985; Bass 1998; Bass & Avolio, 1994; Bennis, 1989; Conger, 1989; Conger & Kanugo, 1998; House, 1977; Kotter, 1988; Nanus, 1992; Tichy and Devanna, 1990). According to Bryman (1992), these approaches can be characterized as the "new leadership" models.

It appears that these new scholarly initiatives have yet to penetrate deeply into current practice. Numerous calls have been made in the literature for linking these new models of leadership to organizational effectiveness while also making organizations more meaningful places for employees (Avolio, 1999; Bass, 1998; Bennis, 1989; Conger

& Kanugo, 1998; Kotter, 1988; Steers, Porter, & Bigley, 1996; Zaleznik, 1989). This call has been taken to an even higher level by some scholars who argue that the very core of society is threatened if active and moral forms of leadership are not developed to a greater extent (Burns, 1978; Gardner, 1990).

Others have questioned the entire notion of leadership since the social purpose it serves is to perpetuate institutional interests that keep followers dependent on the leader, thus not allowing them to develop and self-actualize (Gemmill & Oakley, 1996). Argyris (1957), one of the early proponents of the human relations movement, argued that these stifling developmental outcomes on followers depend in part on the style the leader deploys. For instance, Argyris stated that certain styles of leadership—specifically directive, pressure-oriented styles, which only serve the purposes of the organization and leader—create the elements that drive in the Gemmill and Oakley argument. Moreover, Keeley (1995) argued that styles of leadership capable of transforming individuals to follow a collective goal are unethical since they produce a "majority will that represents the interests of the strongest faction" and that "might is an arbitrary guide to right" (p. 77). However, according to Howell and Avolio (1992), the efficacy of leadership depends on the ethical and moral orientation of the leader since unethical leaders seek to create obedient and dependent followers, while ethical leaders seek to develop followers and emphasize collective goals.

Others characterize leadership as a romanticized conception resulting from a "strong belief . . . in the importance of leadership factors to the functioning and dysfunctioning of organized systems" (Meindl & Ehrlich, 1987, p. 92), stemming from assumptions and attributions made by individuals to rationalize and comprehend organizational outcomes. Robbins (1996) stated that attribution theory "deals with people trying to make sense out of cause-effect relationships" (p. 435) and that when an event occurs, it must be attributed to something. According to Conger and Kanugo (1998), "leadership is both a relational and attributional phenomenon" (p. 38), and the leader is legitimized through an attributional process as the leader's influence is accepted in a relational exchange. In the context of an organizational setting, McElroy and Hunger (1988) argued "leadership theory can be viewed as a product of the causal attributions employed by theorists in their search for the antecedents of performance" (p. 169). Whether and under what conditions leadership exists could be interpreted in many ways, one of which is the "attribution hypothesis that subordinate descriptions of leader behavior are systematically influenced by perceptions of outcomes such as group success" (Yukl, 1998, p. 50). Furthermore, Yukl stated, "Stereotypes, implicit theories, and simplified assumptions about causality aid people in making sense out of events that would otherwise be incomprehensible" (p. 410), which has led to a mystified and heroic perspective of leadership. According to Downton (1973), the god-like dispositions of leaders has led to a romantic view of leadership, perhaps because of Weber's characterization of leadership's charismatic effect. Furthermore, this perspective may be complicated by the "impression management" techniques that leaders use. For instance, according to Gardner and Avolio (1998), charismatic leaders use specific actions to influence the leader-follower relationship, and the image building techniques of those leaders differ substantially from those of noncharismatic leaders.

As is evident, many organizational scholars view leadership as simply a romanticized notion. Some such arguments may be valid, and attributions play an important role in the reification of leadership. Nevertheless, the literature also shows that leadership has an important impact on organizational performance and that it is vital for an organization's success. Conger and Kanugo (1998) argued, "'the romance of leadership' in groups and organizations and among both researchers and management practitioners is too strong to deny its legitimate status as a behavioral phenomenon to be captured and studied scientifically" (p. 37). In referring to transformational and charismatic leadership approaches, Hunt, Baliga, Dachler and Schriesheim (1988), affirmed that "aspects of the leadership process are not simply 'mystical attributes' of a particular leader" (p. 2). Instead, leadership can be viewed from a "realist perspective . . . independent of the observer and subject to laws and regularities assumed to be inherent in the objective nature of leadership 'out there,' waiting to be discovered by the leadership researcher" (Hunt et al., 1988, p. 1). This view contrasts with the social "constructionist perspective," which states that leadership "emerges out of the complex social-political networks of relationships in organizations" (Hunt et al., 1988, p. 1). Strand (1988) stated that leadership is not merely constructed and that theorists from the constructionist perspective "may be prone to feedback into their theorizing data that possibly support such a notion and devote great effort to refine methods and measures that make the theory likely and justifiable" (p. 230). Strand noted further that leadership is not "an ultimate cause, but an acting force and also a result of circumstances" (p. 234), and that the way leadership affects and is affected by organizational demands must be studied longitudinally to determine its consequences. Chemers (1993) suggested that "leaders have real effects on organizational performance as well as on the thoughts and emotions of followers" and that leadership style can be "reliably predictive of variability in objectively measured indices of group performance. At least some of the observed effects of leadership are more than social constructions" (p. 294). In summary, Bass (1990a) argued that leadership "is not a figment of the imagination [and that] In industrial, educational and military settings and in social movements, leadership lays a critical, if not the most critical role, and as such, is an important subject for study and research" (p. 20).

In support of the realist perspective, Katz and Kahn (1978) argued that leadership is required in organizations as a result of design imperfections, changing external and internal conditions, complex human interactions, and the development required in its human resources. Indeed, many scholars in leadership and management cite the importance of leadership and its relationship to various aspects of organizational effectiveness (Argyris, 1976; Barnard, 1968; Bennis, 1989; Deming, 1986; Drucker, 1955; Etzioni, 1964; Garratt, 1987; Peters & Austin, 1985; Schien, 1992; Senge 1990). Even Taylor (1911/1998), with his rationalist-scientific approach, made reference to the importance of leadership in organizational effectiveness. And now, contemporary research, especially in the new leadership arena, is empirically establishing these links (Avolio, Howell, & Sosik, 1999b; Barling, Weber, & Kelloway, 1996; Howell & Higgins, 1990; Howell & Avolio, 1993; Howell & Frost, 1989; Keller, 1992; Koh, Steers, & Terborg, 1995; Lowe, Kroeck, & Sivasubramaniam, 1996; Ristow, Amos, & Staude, 1999; Sosik, 1997; Yammarino, Dubinsky, Comer, & Jolson, 1997; Yammarino, Spangler, & Bass, 1993). Thus, even if leadership is a constructed, mystical, and romantic notion, and in part attributional, the fact that leadership behaviors can be clearly linked to effectiveness measures suggests that leadership exists in some form, and that it is important for organizational success.

Background to the Problem

The scholarly community has defined leadership in various ways. Bass (1990a), whose leadership handbook has been called "*the* outstanding foundation source for information on leadership theory and research" (Schriesheim, Scandura, Gardiner & Lankau, 1993, p. 104), defined it as

> an interaction between two or more members of a group that often involves a structuring or restructuring of the situation and the perceptions and expectations of the members. Leaders are agents of change—persons whose acts affect other people more than other people's acts affects them. Leadership occurs when one group member modifies the motivation or competencies of others in the group. . . . Finally, room is needed for a conception of leadership as an attribution that is consistent with the implicit theories about it that are held by the individuals and groups who are led. (pp. 19-20)

Transformational leadership as it is used in this paper follows the above definition but focuses more narrowly on the postulates of Bass (1998) and Bass and Avolio (1994, 1997). Transformational leadership was originally defined by Bass (1985), based on the work of germinal scholars such as Burns (1978), Downton (1973), House (1977), and Weber (1924/1947). For Bass, previous leadership scholarship generally focused on transactions between leaders and followers relating to goals and role clarification that the latter were given and the way leaders rewarded or punished desired behavior. This *transactional* leadership was limited to influencing only basic changes in followers; a paradigm shift was required to make followers transcend their self-interest for the greater good and to reach challenging goals. This has been referred to as *transformational* leadership.

According to Bass (1998), transformational leadership entails developing trust and faith in followers to reach a collective vision and goals. It is about developing followers to higher levels and improving their abilities, challenging followers to change the status quo, view problems in new ways, and produce creative solutions. It is about motivating, exciting, and energizing followers, and expecting high levels of performance from them while leading them to a tangible vision and a level of performance that was not originally expected. Bass argued that transactional leadership entails clarifying roles and tasks and rewarding desired performance, actively monitoring deviation from standards, and taking corrective action or intervening only when standards are not met. The "full-range of leadership," as referred to by Bass and Avolio (1994), is completed by laissez-faire leadership, in which leaders abdicate responsibilities and avoid decision-making. Bass believed that transformational leadership is more predictive of satisfaction with the leader and of organizational effectiveness than is transactional or laissez-faire leadership. This proposition has found empirical support from a variety of scholars (Barling et al., 1996; Howell & Avolio, 1993; Howell & Frost, 1989; Howell & Higgins, 1990; Keller, 1992; Koh et al., 1995; Lowe et al., 1996; Ristow et al., 1999; Sosik, 1997; Yammarino et al., 1993).

The current version of the Multifactor Leadership Questionnaire (MLQ 5X), hereafter referred to as the MLQ, has been utilized to assess the leadership constructs explicated by the theory (Bass & Avolio, 1995). According to Conger (1999), "Bass was the first organizational scholar to operationalize the transformational leadership model into a measurement instrument" (p. 151), and the MLQ, is the most often-used instrument to gauge transformational leadership (Hunt, 1999; Yukl, 1998). The MLQ was initially generated by exploratory methods and then tested in the field using factor analysis (Bass, 1985). Since its introduction, the MLQ has undergone a number of changes to better gauge the full-range of leadership and to answer criticisms about its validity (Avolio, Bass, & Jung 1995). According to Avolio et al., the MLQ measures five transformational leadership constructs, three transactional leadership constructs, and one nonleadership construct. The nine scales are (a) idealized influence (attributed), (b) idealized influence (behavior), (c) inspirational motivation, (d), intellectual stimulation, (e) individualized consideration, (f) contingent reward, (g) management-by-exception (active), (h) management-by-exception (passive), and (i) laissez-faire leadership, and are described in detail in the following chapter.

The first five scales refer to transformational leadership, the next three to transactional leadership, and the last scale to nonleadership. The MLQ also measures three outcomes of leadership: extra effort of followers, effectiveness of the leader, and follower satisfaction with the leader. According to Avolio et al. (1995), the constructs are hierarchically correlated in the following manner: the five transformational constructs are strongly correlated among each other, moderately correlated with contingent reward, and negatively correlated to management-by-exception active and passive, and to laissez-faire leadership. Contingent reward is unrelated to management-by-exception active, and negatively correlated to management-by-exception passive and laissez-faire leadership. Management-by-exception active is positively correlated to management-by-exception passive and to laissez-faire leadership. And finally management-by-exception-passive is positively correlated to laissez-faire leadership. This hierarchical structure is hypothesized to be prevalent in determining effectiveness outcomes with independent criteria (Bass, 1998); that is, the transformational constructs and contingent reward are positive predictors of effectiveness, and the passive constructs are negative predictors. Management-by-exception active has been found to be a weak positive predictor in some instances, and a zero or negative predictor in other (Avolio, 1999; Bass, 1998; Lowe et al., 1996). Avolio and Bass argued that in some cases it may be necessary to use management-by-exception when safety is of concern or in situations of extreme risk, as recommended by Bycio, Hackett, and Allen (1995). That does not mean that the transactional/passive constructs are irrelevant. Bass and Avolio (1997) affirm that they are necessary components of effective leadership as long as they are not the dominant behaviors of leaders; that is, leaders should display transformational behaviors most often, then contingent reward, then management-by-exception active, then management-by-exception passive, and finally laissez-faire leadership.

Using powerful confirmatory techniques in the form of structural equation modeling that can test a prespecified model, Avolio et al. (1995) provided evidence that the MLQ is a reliable and valid instrument. Indeed, they affirmed that the latest version of the MLQ has addressed the criticisms the instrument previously received regarding its construct validity; however, the literature has reported conflicting results. The MLQ has been the focus of many research inquiries to establish its validity and reliability, and researchers using confirmatory techniques with a priori specified factor structures have given it mixed reviews (Avolio, Bass, & Jung 1999a; Avolio et al., 1995; Avolio et al., 1999b; Bycio et al., 1995; Carless, 1998a; Geyer & Steyrer, 1998; Howell & Avolio, 1993; Tepper & Percy, 1994; Tracey & Hinkin, 1998; Yammarino et al., 1993). Other researchers have also reported varied factor structures using less powerful exploratory factor analysis (Den Hartog, Van Muijen, & Koopman, 1997; Druskat, 1994; Hater & Bass, 1988; Koh et al., 1995). This confusion in the literature about the validity of the MLQ must be addressed.

Purpose of the Study

The way leadership is characterized depends on how it is defined and measured. However, leadership has been difficult to define, and especially to measure (Yukl, 1998). In the new leadership arena, the MLQ is the most widely used instrument to gauge transformational, transactional, and nonleadership behavior (Hunt, 1999; Lowe et al., 1996; Yukl, 1999). Given the popularity of the MLQ, it is important that scholars and practitioners are informed about its reliability and validity. The purpose of this study was therefore threefold:

1. To ascertain whether the MLQ's factors exhibit a reliable and consistent pattern of relationships across samples, as characterized by the theory.

2. To establish the validity of the MLQ in determining organizational or follower effectiveness measures across samples, as predicted by the theory.

3. To establish moderating effects (Baron & Kenny, 1986) of the above, that is, whether the validity and reliability of the MLQ is dependent on certain situational variables. This goal is based on the assumption that leadership is a process that can be affected by the context in which it is embedded.

Statement of the Problem

The problem this study sought to investigate was the extent to which the MLQ is a reliable and valid instrument. Specifically, is the relationship of the MLQ factors invariant across samples? Are the factors of the MLQ reliably related to a dependent criterion? And, is the reliability and validity of the MLQ moderated by situational variables?

Theoretical Basis of the Study

Leadership, generally included under the rubric of organizational behavior (Robbins, 1998), is seen as an integral part of the management function (Koontz & Weihrich, 1988), a key determinant of organizational success (Argyris, 1976; Barnard, 1968; Deming, 1986; Drucker, 1955; Katz & Kahn, 1978; Peters & Austin, 1985; Schien, 1992; Senge 1990), and an important element of the organizational system (Argyris, 1957, 1964; Etzioni 1964; Scott, 1992; Weber, 1968). Weick (1978) argued that the leader acts as a medium or catalyst to integrate organizational resources in the process of adapting the organization to the external environment. According to Barge and Schlueter (1991), "the chief function of leadership is to facilitate the construction of an organizing *system*" [italics added] that will fulfill the organization's goals (p. 543). Furthermore, Vaill (1978) stated that leaders must be "experts in the techniques of the *system's* basic activity" [italics added], in combining human and technological resources to reach the organization's objectives (p. 111). Thus, knowledge of systems and an understanding of leadership in the organizational system appear to be important elements of the leadership function.

A system, according to Boulding (1985), is "anything that is not in chaos [and] a structure that exhibits order and pattern" (p. 9). Boulding adds, "Virtually all systems consist of components, or parts. These are subsystems, the relationships among which constitute the larger system" (p. 31). An organizational system "is a set of objects together with relationships between the objects and between their attributes" (Hopeman, 1969, pp. 21-22). Furthermore, Hopeman stated, "The management of large-scale operations, faced with a multitude of technological changes and staffed by highly competent specialists, requires, above all else, skill integration and synthesis" (p. 3).

Leadership itself has been viewed from a systems perspective, where it is at the core of the organizational system (Weisbord, 1978). The components of the system include the purpose, structure, relationships, rewards, and policies and procedures of the organization, in relation to the changing needs of the external environment. According to Weisbord, the leadership of an organization has the information to influence the other categories, and thus maintain their stability and coherence in pursuing the organization's purpose. Yukl (1998) viewed the causal effects of leadership systemically, but argued that outcomes of effect are delayed in determining follower effort and organizational results.

Understanding the outcome of leadership means understanding the subsystemic nature of the organization, and how its leadership is able to synthesize and integrate its human resources to compensate for deficiencies in the system and changes in the environment, and to maintain system's stability (Katz & Kahn, 1978). The responsibility of those in positions of power is large in terms of how the destiny of the system is governed, how decisions are made, and how individuals in the organization, and ultimately the organization itself, learns (Argyris, 1994). According to Deming (1986), 94% of all problems that might occur in an organizational system are a result of the system itself, which can only be changed by those who have power since they determine who works in it, the management and leadership style, the structure and environment, and ultimately how individuals behave.

One of the contemporary leadership approaches characterized by Bryman (1992) as a new leadership model is transformational leadership, which is said to hold one of the keys to organizational effectiveness (Bass & Avolio, 1994). This theory, proposed by Bass (1985) and later revised by Bass and Avolio (1994, 1997), has been the focus of many research inquiries in this discipline (Yukl, 1999) and has helped shift the leadership paradigm to what it is today (Conger, 1999; Hunt, 1999). Since transformational leadership has received much attention in the literature, researchers have examined many hypothesized links between transformational leadership and various organizational outcomes. This is important because if transformational leadership cannot be linked to improved organizational effectiveness, then all research areas in this domain should cease. However, there appear to be strong empirical and theoretical reasons to justify the resources invested by the scholarly community in understanding the antecedents and consequences of the theory as characterized by Bass (1985, 1998) and Bass and Avolio (1994, 1997). The way the theory may affect organizational outcomes is presented below.

According to Kuhnert (1994), transformational leadership is necessary for followers and leaders to be developed to their highest potential. By delegating and being individually considerate, leaders help themselves and others continually learn, and become more autonomous and independent, which contributes to long-term organizational effectiveness. This is a very important link to investigate since increased autonomy and a follower-centered approach contribute to increased satisfaction and motivation in followers and thus to organizational effectiveness. Because of the nature of transformational leadership and the ways these leaders communicate, Yammarino (1994) argued that transformational leadership has a direct as well as an indirect effect on followers. In other words, transformational leadership can work effectively from a distance even though the leader does not come into contact with followers. By using transformational leadership, leaders can make teams more innovative, reduce inter-group conflict, and develop their members to be more effective in meeting the organization's goals (Atwater and Bass, 1994). As regards cross-functional teams, Waldman (1994) stated that transformational team leaders can improve productivity by increasing the learning and development of team members and concurrently managing overlapping phases of product development to reduce product development cycle times. Bass (1994) showed that transformational leadership augments the process of organizational decision-making, by allowing information to flow freely so that the organization can discover and correct problems, find the appropriate solutions to those problems, and implement them effectively. For Avolio (1994), efforts towards total quality management necessitate transformational leadership behavior at all levels of the organization, and an active change of philosophy and culture required by such quality efforts can only occur when of transformational and transactional contingent reward leadership are employed. Atwater and Atwater (1994) argued that organizational transformation only occurs with the effective use of transformational and transactional contingent reward leadership. Finally, Kroeck (1994) showed that with transformational leadership, organizational change, and in particular downsizing, can be better managed and can have positive implications on human resource management.

As is evident, transformational leadership influences a variety of processes and functions in organizations. As a theory it appears to be compatible with a variety of managerial functions, and useful in a broad range of situations and across many levels of analysis that were hitherto discrete from previous leadership theories. Thus, it may be universal in its application and unifying in its approach.

Hypotheses

This study empirically tested the multidimensionality of the full-range-of-leadership model and its predictive validity through the following eight hypotheses:

H1. The nine leadership factors and the way their a priori structure is specified among its factors to freely covary will fit the data as determined by various fit indices.

$H1_a$ The five transformational leadership factors will be positively associated with one another and with contingent reward.

$H1_b$ The five transformational leadership factors will be negatively associated to management-by-exception active, management-by-exception passive, and laissez-faire leadership.

$H1_c$ Contingent reward will be negatively associated with management-by-exception active, management-by-exception passive, and laissez-faire leadership.

$H1_d$ Management-by-exception active, management-by-exception passive, and laissez-faire leadership will be positively associated with one another.

H2. The nine leadership factors, how their a priori structure is specified among its factors to freely covary, and how they predict the dependent measure, will fit the data as determined by various fit indices.

$H2_a$ The paths of the five transformational leadership factors to the criterion variable will be positive and significant as measured by the unstandardized regression coefficients.

$H2_b$ The path of contingent reward to the criterion variable will be positive and significant as measured by the unstandardized regression coefficient.

$H2_c$ The paths of management-by-exception active, management-by-exception passive and laissez-faire leadership to the criterion variable will be negative and significant as measured by the unstandardized regression coefficients.

As with Avolio et al. (1995, 1999a), other first order models were also tested to determine whether there are more parsimonious full-range models. The models that were tested included (a) one general single-order factor; (b) two correlated single-order factors of active and passive leadership; (c) three correlated single-order factors of transformational, transactional, and laissez-faire; (d) three correlated single-order factors of transformational, transactional, and passive leadership; (e) six correlated single-order factors of idealized influence attributed/idealized influence behavior/inspirational motivation, intellectual stimulation, individualized consideration, contingent reward, active management-by-exception, and passive leadership; (f) seven correlated single-order factors of idealized influence attributed/idealized influence behavior/inspirational motivation, intellectual stimulation, individualized consideration, contingent reward, active management-by-exception, passive management-by-exception, and laissez-faire leadership; (g) eight correlated single-order factors of idealized influence attributed/idealized influence behavior, inspirational motivation, intellectual stimulation, individualized consideration, contingent reward, active management-by-exception, passive management-by-exception, and laissez-faire leadership; and (h) eight correlated single-order factors of idealized influence attributed, idealized influence behavior, inspirational motivation, intellectual stimulation, individualized consideration, contingent reward, active management-by-exception, and passive leadership. The reason for testing different model combinations is because of the possible indistinguishable nature of some of the constructs from each other, for instance idealized influence from inspirational motivation, or laissez-faire leadership from passive management-by-exception, as parts of the literature contend.

Method

A confirmatory approach was utilized in this study to test the hypotheses (Jöreskog, 1974). This approach was chosen because to confirm rather than to explore the existence of a model that specifies the constructs beforehand and their interrelationships, a structural equation modeling approach must be utilized (Heck, 1998; Long, 1983). According to Byrne (1994), "Structural equation modeling (SEM) is a statistical methodology that takes a hypothesis-testing (i.e. confirmatory) approach to the multivariate analysis of a structural theory bearing on some phenomenon" (p. 3).

Structural equation modeling is useful to compare models from different groups of data (Maruyama, 1998). In this study, data from different groups were used to test whether the same factor relationship is prevalent across studies (Jöreskog, 1971) and whether these factor relationships predict relevant dependent measures. Since a discrete number of studies were utilized to test the hypotheses, each study's data was the unit of analysis. Only studies that reported the means, standard deviations, and intercorrelations of the factors with one another, and with a dependent measure were utilized. From that data, covariance matrixes were constructed for each study because they are deemed more useful in multiple-group comparisons (Cudeck, 1989). The covariance matrixes formed the multiple groups for a test of model invariance to determine whether the implied model is consistent across multiple groups (Bollen, 1989). Hypotheses were tested by the analysis of various fit indices that measure the discrepancy between the hypothesized and observed covariance matrixes (Marcoulides & Hershberger, 1997). The AMOS SEM software program was utilized to analyze the data, and to report the relevant fit indices (Arbuckle & Wothke, 1999).

Significance of the Study

Most studies evaluating the outcomes of transformational leadership have relied on the MLQ with the assumption that it is a valid and reliable instrument. The MLQ has also been used extensively in the training domain (Avolio & Bass, 1998; Barling et al., 1996; Bass, 1990b; Bass, 1998; Bass & Avolio, 1999; Dvir, Eden, Avolio, & Shamir, 1999). Since this study questioned the validity and reliability of the MLQ, it will provide scholars, practitioners, and policy makers with information to make educated choices regarding research, practice, or policy.

Scholars will benefit from this study because (a) they will have a better understanding of the issues pertaining to the validity and reliability of the MLQ's measure of the full-range of leadership, (b) they will be able to make an informed decision about the reliability and validity of the MLQ when evaluating research in this domain, (c) they will be able to make informed decisions regarding future research initiatives, and (d) they will better understand why conflicting viewpoints regarding the reliability and validity of the MLQ have emerged. Furthermore, this study is beneficial to the scholarly community because it is the first time the MLQ will be tested by such a statistical procedure. This may enhance the generalizability of the model as a result of the wide array of studies that were included in this study.

Practitioners will benefit from this study because they will have a better understanding of (a) leadership in general and transformational leadership in particular, (b) the relationship of transformational leadership to organizational outcomes, (c) issues of measurement in leadership, and (d) the developmental potential of people in positions where they can exercise their leadership skills.

Policy makers will benefit from this study because (a) they will have a clearer understanding of leadership in general and transformational leadership in particular, (b) they will be able to make informed choices regarding the sponsorship of research in the leadership domain, and (c) they will be able to make informed choices regarding the sponsorship of leadership training programs.

This study also makes an important contribution to the understanding of social change and how it can be fostered. According to Bass (1985, 1998), and Bass and Avolio (1994, 1997), transformational leaders are capable of fostering rapid change, especially in turbulent times. Assuming that this theory is correctly characterized, this change should result in something better for the individuals being led, for the leader, for their organization, and for the society at large (Avolio, 1999; Bass, 1998). It appears that the world needs leaders, especially leaders who can foster positive social change and promote ethical and moral values and goals (Burns, 1978; Gardner, 1990). Thus it is only through active and transformational leadership that attitudes can be changed so that new orders are created, and a more tolerant and ethical society can emerge (Avolio, 1999; Bass, 1998).

Definition of Terms

Technical terms used throughout this dissertation are defined as follows:

Construct validity: apart from the measurement of constructs or latent variables, construct validity "describes the properties of the resulting measures in terms of how constructs interrelate" (Nunnally & Bernstein, 1994, p. 85) and whether the constructs "behave as expected" (p. 90).

Effectiveness (organizational): "an organization increases in effectiveness as it obtains: (a) increasing outputs with constant or decreasing inputs, or (b) constant outputs with decreasing inputs, and (c) is able to accomplish this in such a way that it can continue to do so" (Argyris, 1964, p. 123). As a result of the varied constituencies of organizations, effectiveness is not a unitary concept but is multidimensional, that is, it can be measured in a variety of ways (Katz & Kahn, 1978).

Error in measurement: "variance unaccounted for in the relationship between a theoretical [or latent] variable and an empirical observation" (Fornell, 1982, p. 11).

Invariance of a SEM model: "whether the . . . model structure, and/or causal parameters of a model are equivalent across samples of the same or different populations" (Bagozzi & Yi, 1988, p. 83).

Fit indices: "the degree to which the pattern of fixed and free parameters specified in a model is consistent with the pattern of variances and covariances from a set of observed data (Hoyle, 1995, p. 3).

Latent variables: "unobserved variables implied by the covariances among two or more indicators. . . . Often referred to as factors, latent variables are free of random error and uniqueness associated with the indicators (Hoyle, 1995, p. 3).

Laissez-faire leadership: "the avoidance or absence of leadership [It] is, by definition, most inactive, as well as most ineffective" (Bass, 1998, p. 7).

Measurement model: "specifies how latent variables . . . are indicated by the observed variables. . . . [and] describes the measurement properties . . . of the observed variables (Jöreskog & Sörbom, 1996, p.1).

Moderator variable: "a qualitative . . . or quantitative . . . variable that affects the direction and/or strength of the relation between an independent or predictor variable and a dependent or criterion variable" (Baron & Kenny, 1986, p. 1174).

Observed/manifest variable: "measured scores [that] serve as indicators of the underlying construct [or latent variable] that they are presumed to represent" (Byrne, 1994, p. 4).

Predictive validity: "using an instrument to estimate some criterion . . . that is external to the measuring instrument itself" (Nunnally & Bernstein, 1994, p. 94).

Reliability: "the extent to which . . . [a] test, or any measuring procedure yields the same results on repeated trials" (Carmines & Zeller, 1979, p. 11).

SEM: "structural equation modeling . . . is the ultimate approach to the analysis of complex data structures . . . [and is] essentially, the analysis of the varying together of variables that are in a structure dictated by theory" (Kerlinger, 1986, p. 139).

Structural model: the model of interrelations between and among constructs (Nunnally & Bernstein, 1994).

Transactional leadership (constructive): "defining agreements or contracts to achieve specific work objectives, discovering individuals' capabilities, and specifying the compensation and rewards that can be expected upon successful completion of the tasks" (Bass & Avolio, 1997, p. 2).

Transactional leadership (corrective): "focuses on setting standards and either passively waiting for mistakes to occur before taking action . . . or . . . closely monitoring for the occurrence of any mistake" (Bass & Avolio, 1997, p. 2).

Transformational leadership: transforming "followers' attitudes, beliefs, motives, and confidence . . . from a lower to a higher plane or arousal and maturity" (Bass, 1985, p. xiii) to "transcend their own self-interest for the good of the group, organization, or country" (p. 15)

Validity: "the extent to which any measuring instrument measures what it is intended to measure" (Carmines & Zeller, 1979, p. 17).

Delimitations and Limitations

This study was narrow in scope and focused specifically on analyzing transformational, transactional, and laissez-faire leadership theory as measured by the MLQ. Specifically, it focused on how the theory was developed and on its antecedents and consequences. Most important, the study focused on how the theory has been operationalized and measured through the MLQ, how the MLQ factors are interrelated, and how they predict dependent criteria.

The method of data collection and the reliance on a single measure of leadership bound this study. Since the unit of analysis is the study, data points for the statistical analysis and controls are confined to that level. Results, interpretations, and generalizations that are derived from this type of analysis are a function of the representativeness and rigor of the studies that were utilized. Consequently, generalizations are only valid to the study level domain and its populations.

Another boundary condition for this study was its reliance on data using questionnaire-based measures since they are restrictive, may ignore contextual issues, and may be unreliable in terms of response bias (Binning, Zaba, & Whattam, 1986; Brown & Lord, 1999; Lord, Binning, Rush, & Thomas, 1978). Using studies based on survey measures limits the generalizations that can be made about the measurement of the full-range of leadership.

This study was also based on a survey measure that was developed in the United States by two U.S. authors (Bass & Avolio, 1995); thus, components of the survey may be culturally bounded. Lastly, since the structural relations of linear composites (MLQ factors) were analyzed, the confirmatory model was restricted to the structural model, and implications regarding the measurement model were restricted to the composites and not to the indicants of the composites.

Assumptions

Since this study used the data points of various studies, the measurement model of the MLQ was not directly tested. Measurement was implicit in the statistical tests that were employed since the composites of the factors were tested, which has direct implication on the validity for the measurement model. Thus, a traditional confirmatory factor analytic approach was not utilized to test whether the factors had the appropriate measurement items as Avolio et al. (1995) hypothesized. This decision was made because information on measurement items is typically not reported in studies, whereas data on the linear composites of the factors are usually reported in the form of means, standard deviations, scale reliabilities, and correlations among factors.

Outline of the Study

This study comprises five chapters. Chapter 1 introduced the study's justification and need, its purpose, the problem that was addressed, and the hypotheses that were tested. In chapter 2 pertinent literature is reviewed, with a focus on leadership theory and transformational leadership in particular. In this chapter the measurement of leadership based on the MLQ, and issues regarding its reliability and validity are explored. Chapter 3 describes the method used for testing the hypotheses. Chapter 4 presents the results of the investigation and whether the hypotheses can be accepted or rejected. Finally, in chapter 5 the results are analyzed and various implications are discussed.

Summary

This study investigated key issues in the leadership literature regarding the characterization and measurement of the nine-factor transformational, transactional, and laissez-faire model of Bass and Avolio (1995). The most widely used instrument to measure this model is the MLQ. A salient issue therefore is to better understand how the MLQ ostensibly captures the latent factors of the model, and whether the interfactor relationships and their relationship to a dependent measure behave as predicted by the theory and are invariant across available populations of leaders and raters.

The next chapter reviews literature on the leadership domain and transformational leadership in particular, and places it within the broader framework of organizational theory, namely organizational behavior and systems perspective of organizations. The

MLQ was closely scrutinized for its psychometric qualities, and literature that has tested its validity and reliability is reviewed to provide the theoretical basis for this study.

CHAPTER 2: REVIEW OF THE LITERATURE

Introduction

According to Steers et al. (1996), leadership is a key element to understanding the behavior of individuals in organizations. Precisely how leadership is defined is difficult to determine since it can be viewed from different perspectives depending on the assumptions and philosophical context of the theory being promoted. Leadership as a discipline is generally placed under the umbrella of organizational behavior, and relates to work in psychology, and in particular industrial and organizational psychology (Robbins, 1998).

Argyris (1957) first coined the term *organizational behavior* to describe this body of knowledge and the utilization of the branch of psychology for the systematic and systemic study of individuals in industrial settings. According to Robbins (1998), the term organizational behavior encompasses a variety of disciplines including psychology, sociology, social psychology, anthropology, and political science. Leadership can also be subsumed as a part of the managerial function and systems, which are traditionally expressed as planning organizing, staffing, leading and controlling (Koontz & Weihrich, 1988). Leadership and management, however, are distinct processes whose differences will be discussed below. Since a variety of disciplines comprise organizational behavior, the study of leadership cannot be confined to studying one discipline. Therefore, to clearly understand the boundaries of leadership a cross-disciplinary perspective will be utilized here to examine the theoretical propositions of the various leadership schools, and how they relate to the transformational, transactional, and laissez-faire leadership theory. Pettigrew (1996) stated that theories advance our knowledge of social life by "proposing particular concepts (or constructs) that classify and describe the phenomenon: then they offer a set of interrelated statements using these concepts" (p. 21). Kerlinger (1986) defined theory as being "a set of interrelated constructs (concepts), definitions, and propositions that present a systematic view of phenomena by specifying relations among the variables, with the purpose of explaining and predicting the phenomena" (p. 9). Leadership, therefore, as any other concept is in itself unobservable, and has been constructed by social scientists to explain a phenomenon using various indicators that measure the concept. What it is as a concept, and the way it is related to its subcomponents, will be investigated in this review of the literature, so that it can be defined, operationalized, and measured.

Many definitions and functions of leadership exist. According to Katz and Kahn (1978), "the concept of leadership has an ambiguous status in organizational practice, as it does in organizational theory" (p. 526). Katz and Kahn defined leadership in terms of three dimensions: "as the attribute of a position, as the characteristic of a person, and as a category of behavior" (p. 527). Fiedler (1971) noted that "There are almost as many definitions of leadership as there are leadership theories—and there are almost as many theories of leadership as there are psychologists working in the field" (p. 1).

Interest and research in leadership has been growing, and as can be verified in the reference list of this study, journals within the management, organizational behavior, personnel, human resources, and applied psychology arena publish articles that are focused on this area. According to Yukl (1998), over 5,000 published articles exist on leadership, and several hundred are added each year. Leadership therefore appears to be one of the most studied phenomena (Horner, 1997). Furthermore two journals are entirely devoted to the study of leadership: The Leadership Quarterly and The Journal of Leadership Studies. However, given the large amount of literature on leadership, Yukl argued that leadership is in a confused state because of

> the sheer volume of publications, the disparity of approaches, the proliferation of confusing terms, the narrow focus of most researchers, the high percentage of irrelevant or trivial studies, the preference for simplistic explanations, and the lack of research designed to integrate different aspects of leadership and develop a general theory. As the old adage goes, it is difficult to see the forest from the trees. (p. 494)

Therefore, this section will clarify the leadership domain and its distinction from the management function. Leadership theories will be examined historically to determine their boundary conditions and limitations, and will be utilized as a basis to promote a general approach and explanation of transformational leadership as proposed by Bass (1985). The transformational, transactional, and laissez-faire leadership theory will be presented in terms of its development and relation to the other approaches, its role in the organizational system, and the way it affects the behavior of individuals in organizations. The assumptions of leaders will also be investigated, and humanistic approaches will be analyzed. More importantly this section will also explore how transformational leadership has been operationalized through the MLQ, and the theoretical and empirical links of transformational leadership to organizational performance. Since this dissertation will focus on the measurement of transformational leadership using the MLQ, research studies that have tested its psychometric validity will be presented, and their limitations highlighted to identify a gap in the literature. In this way, the aims of this study, and the problem investigated will be justified.

The Distinction Between Leadership and Management

Bennis (1989) argued, "Many an institution is very well managed and very poorly led" (p. 17). This statement is a good basis from which to launch the discussion that leadership and management are distinct but complementary concepts. This distinction is necessary to include in this study for two reasons. First, some management theorists include leadership as part of the managerial function (Koontz & Weihrich, 1988). And second, the leadership/management dichotomy is integral to understanding Bass's (1985) distinction between transformational and transactional leadership.

In some of his earlier work, Zaleznik (1989) was the first to investigate in-depth the differences between leadership and management. Drucker (1955), however, should be credited for first drawing a line between the two concepts. According to Zaleznik, managers and leaders differ in their philosophies, values, approaches, and behaviors. Managers typically follow rational, bureaucratized processes, take a passive and reactive stance to events, avoid confrontations, and utilize formal and impersonal mechanisms in dealing with followers. Managers rely on formal structures to control and influence behaviors, and focus on tasks and process. Follower satisfaction comes primarily in the form of material reward, and emotional transactions are shunned. As will be seen below, managers can be characterized as transactional leaders.

On the other hand, Zaleznik (1989) defined leaders as focusing on substance and creating reality. They redefine the status quo, and cultivate innovation and dynamism.

They create vivid images, and transmit visions to their followers. Followers identify and idealize leaders who use emotional means and charisma to inspire them, and who shift their values and beliefs. Leaders deal directly with followers and do not avoid confrontation, which when dealt with correctly is beneficial. Leaders develop their followers both emotionally and cognitively. Leaders do not fear the unknown, and seek and promote discovery. As will be seen below, they are transformational leaders.

The leadership-management dichotomy should not be seen as though the two approaches are at loggerheads. Indeed, as will be discussed below in the presentation of Bass's (1985) theory, management and leadership are needed in organizations, and that leadership is built on top of management. As Bjerke (1999) stated, organizations must find a balance between leadership and management since "for a company to be underled and overmanaged could be as dangerous as for a company to be overled and undermanaged" (p. 57).

In the following section, leadership will be examined from a historical perspective ranging from the behavioral studies, contingency, and charismatic approaches, culminating with Bass's (1985) approach on transformational, transactional, and laissez-faire leadership. As will become evident, Bass's theory embraces the core elements discussed in the above, and elements of the theories presented below. This unifying approach examines and explains the nature of leadership, and how it impacts organizational functions.

Historical Perspective of Leadership Theory

According to Bass (1990a), leadership is a universal activity evident in humankind and also the animal world. The study of leadership is not only apparent in modern times, for instance as seen in Sarachek's (1968) description of the leadership styles proposed in the Iliad dating to the 4th century B.C.E., and how Machiavelli (1952/1538) depicted the consummate political leader at about 1532 C.E. Although concepts of leadership appeared across many time spans and cultures (Bass, 1990a), leadership, and the questions that surround it are universal (Adler, 1997). For instance, one can find reference to leadership in the Old and New Testaments, in Greek and Latin classics, Icelandic sagas, the Odyssey, as well as in Eastern literature, for instance in Asoka and Confucius (Bass, 1990a). As mentioned by Bass

> The study of leadership rivals in age the emergence of civilization, which shaped its leaders as much as it was shaped by them. From its infancy, the study of history has been the study of leaders—what they did and why they did it. (p. 3)

Although the types of leadership behaviors expected and operationalized in countries vary as a function of the local culture (Bjerke, 1999; Hickson & Pugh, 1995; Hofstede, 1980; Trompenaars, 1998), leadership as a phenomenon is universal across cultures (Bass, 1996, 1997; Bjerke, 1999; Dorfman, Howell, Hibino, Lee, Tate, & Bautista, 1997; Gibson & Marcoulides, 1995). Furthermore, according to Den Hartog, House, Hanges, Ruiz-Quintanilla, and Dorfmann (1999), aspects of charismatic and transformational leadership are universal across 62 cultures. This finds support from Bass (1996, 1997) as well, who believed the concept of leadership, as viewed from the transactional-transformational leadership model, is universal.

The following sections will trace the historical development of leadership research, and focus on the schools of thought that generated the most attention. Many approaches to studying leadership exist, including personal and situational theories, interaction and social learning theories, theories and models of interactive processes, perceptual and cognitive theories, and hybrid explanations (Bass, 1990a). However the focus of this study is on the following five major theoretical perspectives: "great-man" theories, trait theories, behavioral theories, contingency theories, and finally charismatic and neocharismatic theories. The explanation of these five schools of thought will provide the theoretical scaffolding from which to present one of the hybrid approaches: Bass's (1985) theory of transformational, transactional, and laissez-faire leadership.

"Great-Man" Theories

According to Katz and Kahn (1978), the theoretical significance and conceptual definitions of leadership is subject to disagreement as a result of different schools of thought. For instance "the 'great man' school views history as the study of biography [while] On the other hand, the cultural determinists see history in terms of social patterns relatively unaffected by the intervention of leaders" (p. 527). According to Bass (1990a), many theorists speculated that "great men" shaped history. For instance, Bass noted that according to William James, "the mutations of society were due to great men, who initiated movement and prevented others from leading society in another direction" (p. 37).

Bass (1990a) argued that those baptized as great men were characterized as such for their ability to transform faltering organizations or radically reshape social or political institutions—for example, Douglas MacArthur, Lee Iacocca, John F. Kennedy and Martin Luther King. Since leadership is a reified dimension that individuals create to rationalize and attribute outcomes to great men, according to Meindl and Ehrlich (1987), leadership "has achieved a heroic, larger-than-life value" (p. 93).

Although the great-man school of thought has certain elements that may be valid, it has not yielded any useful solutions to the systematic study of leadership, and the proposition of a theory regarding why these great men surfaced in the first place. Since it is not gender inclusive either in terminology or in characterization, another approach may be necessary to make it more inclusive and universal in nature. As stated by Bass (1990a), "Despite the examples of Joan of Arch, Elizabeth I, and Catherine the Great, great women [in this approach] were ignored" (p. 37). Furthermore, this school is similar in nature to the trait school, which attempted to discover some universal traits that distinguished great leaders from others, and is presented next.

Trait Leadership Theories

In the times of the ancient Greeks, it was believed that leaders were born with certain innate traits (Sarachek, 1968). This perception still bears a heavy weight on common thought, as evidenced by some influential thinkers (Drucker, 1955; Weber, 1968). Indeed the debate of whether leaders are born or made is weighted heavily to the born side, especially with idioms such as "that person is a born leader." The majority of research has, however, shown that this conclusion is controversial and that an attempt to find a set of common characteristics of leaders has resulted in conflicting results (Robbins, 1996). Furthermore, according to Katz and Kahn (1978), "leadership conceived of as an ability is a slippery concept, since it depends too much on properties of the situation and of the people to be 'led'" (p. 527).

According to Bass's (1990a), between 1904 and 1947 the trait approaches to leadership were the first serious attempts to study what caused leadership in individuals. Bass stated in his survey of trait leadership theories that character attributes required for successful leadership differed along with the situation. Bass believed that although certain characteristics of leaders were relevant in determining their acceptability, important moderating factors are the "characteristics, activities, and goals of the followers" (p. 76). Thus a person does not simply "become a leader by virtue of the possession of some combination of traits," although traits do play a role (Bass, 1990a, p. 76). According to Bass, "leadership is not a matter . . . of some combination of traits [but] a working relationship among members of a group, in which the leader acquires status through active participation and demonstration of his or capacity to carry cooperative tasks to completion" (p. 77). Bass adds that although situational moderators are important to leadership, certain characteristics are more associated with leaders such as "intelligence, alertness to the needs and motives of others . . . insights into situations, further reinforced by such habits as responsibility, initiative, persistence, and self-confidence" (p. 77). In conclusion Bass argued that leaders may emerge because of "traits of consequence in the situation, . . . situational effects, and . . . the interaction of traits and situation" and that therefore, "There is no overall comprehensive theory of the personality of leaders" (p. 87).

According to Avolio (1999), the major reason why leaders are distinguished from nonleaders is the life experiences that people have. Although Avolio argued that genetic predisposition plays a role in leader determination, leadership development is to a large degree a function of life experiences and heavily influenced by upbringing. Furthermore, this does not exclude the fact that interventions can be made to improve individuals' leadership capabilities in adult life (Avolio, 1999). For instance, current research in leadership development has shown that leadership skills can be taught to individuals in organizational settings (Barling et al., 1996; Bass, 1998; Dvir et al., 1999) as indicated in pre- and post-test measures. Furthermore, evidence for the manipulation of leadership style can be seen in studies that used trained confederates to display specific leadership behaviors in experimental designs, and where these behaviors had significant outcomes as compared to a control group (Howell & Frost, 1989; Jung & Avolio, 1999; Shea & Howell, 1999; Sosik, 1997).

Because of the conflicting results in the trait leadership domain leadership research in the 1950s focused on behavioral approaches by studying what good leaders did. These approaches generally identified two major dimensions of leadership, which can be summarized as being production or employee-oriented approaches.

Behavioral Approaches

In the University of Michigan studies, Katz et al. (1951) investigated the relationship between supervisory behaviors, productivity, and morale in railroad workers. This study emulated a previous University of Michigan study on clerical workers whose outcomes were very similar to the railroad study. The results of this study pointed toward two elements of supervisor or leader behavior, which played a significant role in determining productivity outcomes: the degree to which a supervisor is employee oriented or production oriented. Although the latter was not referred to as such specifically, the way it was described points towards the term *production oriented.* Katz et al. identified what were high or low performing teams, and measured the attitudes of supervisors and followers relating to the formers' behaviors. The most important differences that emerged related to leadership style. Supervisors of "high" performing teams tended to be more employee-oriented than the supervisors of "low" teams who were more production oriented. The employee-oriented leaders took more interest in their followers, spent time coaching and teaching them, and did not use punitive methods for undesirable performance as compared to the production-oriented leaders.

The Ohio State studies were conducted at about the same time as the Michigan Studies, and the same two dimensions of leadership emerged, which were referred to as consideration and initiating structure (Stogdill & Coons, 1957). The Ohio State studies suggested that leaders exhibiting high consideration and high initiating structure were the most effective. The data, however, differed slightly across the studies, with some indicating that higher amounts of consideration should be used, and others indicating higher initiating structure.

An important implication found by Fleishman (1957) was that "Other factors, such as type of work, may also be contributing" to differences between the amount of consideration required in different work settings (pp. 131-132). Evidence that situational factors played a role was also prevalent in other studies. Based on this, it seemed that a contingency perspective might be helpful to use to study leadership behavior. Thus, although leadership theory made a drastic jump in the 1950s it appeared that the success of the type of leadership used was a function of situational variables. As a result, leadership theory in the 1960s began to focus on the contingencies of leadership and how they could be better managed to aid in leadership effectiveness.

Contingency Theory Approaches to Leadership

In 1960 McGregor (1960/1985) stated that using a universal approach to dealing with followers would be wrong, and that style should be contingent on the situation and the nature of the relationships a leader has to manage. Others have called for a similar approach to leadership. According to Tannenbaum and Schmidt (1991/1973), leadership styles employed should reflect the situational factors in which leaders are found, determining the degree to they should be democratic or autocratic. Hersey (1975) used a similar dichotomy, but focused on developing followers to their maximum potential. Other scholars of contingency theories (Fiedler, 1967; House, 1971) viewed the leadership outcome in a different manner. The point however in all contingency approaches is that a match must be found between leadership style and environmental conditions.

The contingency theory movement of leadership is credited to Fiedler (1967, 1971), who stated that leader-member relations, task structure, and the position power of the leaders would determine a leader's effectiveness. Fiedler believed that that a leader's style cannot change from either being task or relationship oriented. Thus to be effective either the environmental contingencies, or the leader must be changed. According to

Robbins (1996), Fiedler's model has yielded some support in empirical tests, but the method utilized to gauge a leader's style is not reliable. Furthermore, according to Schriesheim and Kerr (1977), Fiedler's model lacks in dimensionality, and the leadership instrument used to gauge a leader's style lacks empirical validation. As summarized by Schriesheim and Kerr, "the theory suffers from several major shortcomings and problems which are sufficient to seriously impair its usefulness" (p. 13). In a later meta-analysis on the validity of the theory, Schriesheim, Tepper, and Tetrault (1994) find some support for its major propositions, albeit in a slightly different manner than Fiedler proposed, and call for more empirical testing on the validity of the model.

Another well-known contingency approach is House's (1971) path goal theory, which has been seen to be more valid (Robbins, 1996), and not plagued by as many theoretical and empirical problems as Fiedler's model (Schriesheim & Kerr, 1977). House's propositions, and their implications to motivational theory are crucial to understanding the development of Bass's (1985) approach to contingent reward leadership. Using two basic dimensions of the Ohio State Studies, initiating structure and consideration, and the expectancy theory of motivation, House (1971) advanced the contingency approach to leadership. According to House, the expectancy motivational theory states that a person is motivated to perform when they are cognizant that their behavior will lead to an outcome, and that the outcome will result in personal satisfaction. House argued that prior studies analyzing the effect of the dimensions initiating structure and consideration yielded conflicting results as to which combination of behaviors contribute to high performance and follower satisfaction. House proposed that a leader must compensate for the situational variables that make it difficult for the follower to achieve their goal, by changing the degree of initiating structure and consideration behavior that the leader displays to positively influence the satisfaction followers will achieve. Furthermore, House stated that when the reward is self-administering the satisfaction achieved is intrinsic. This is preferable to rewards administered by the leader, which can be termed extrinsic. The rewards discussed in shaping behavior, and the proposition of self-administered rewards is similar to the tenets of radical behaviorism (Skinner, 1976), which stated that behavior is largely shaped by its contingencies of reinforcement. As noted by Skinner, these reinforcers are "the subtle and complex relations among three things: the situation in which behavior occurs, the behavior itself, and its consequences" (p. 163).

Another situational theory that has proven to be very popular among practitioners, and which supports the developmental approach of transformational leadership is the situational leadership theory (SLT). Although the SLT has not held up to empirical testing, it is presented here as it makes an important contribution to the leadership literature for its implications to the development of followers. The SLT originally proposed by Hersey (1975), stated that there is no best style of managing or leading people. The style should fit the situation, and in particular the function that is to be performed should be directed by taking into consideration the competencies and motivations of the follower. Since it is the followers who will ultimately determine whether the leader is successful by either accepting or rejecting the leader, it is imperative that the correct style is utilized in the appropriate situation so that the task at hand is performed well, and that the follower is satisfied. In contrast to Fiedler (1967, 1971), the Hersey approach proposed that a leader's style could be changed and adapted to the situation. This is an important development as the general belief previously was that leadership styles were fixed.

The SLT focused on two variables: task behavior and leadership relationship behavior. These variables are functions of the "maturity" of the follower which is "the capacity to set high but obtainable goals, willingness and ability to take responsibility, and education and/or experience of an individual or group" (Hersey, 1971, p. 10). Hersey proposed four basic leadership styles that can be used: (a) high task, low relationship; (b) high task, high relationship; (c) high relationship, low task; and (d) low relationship, low task. These four styles must be matched to the following four respective maturity levels of task performance: (a) not willing and not able, (b) willing but not able, (c) not willing and able, and (d) willing and able. The point of this is to use the appropriate style and develop followers to the highest possible maturity level. According to Hersey, the model can also be used regressively in other words when the follower behaves less maturely the leader reverts to the appropriate leadership style. Hersey admitted that problems surfaced in the measurement of maturity of a group or of an individual, which is the main weakness of the SLT. There is agreement in the literature that the SLT is intuitively appealing, simple, and that it is widely used in the business, training, and educational arena. However, empirical support cannot be found for the theory because of the proposed curvilinear function between style and maturity, and the problems of measuring maturity. The literature that has tested the SLT is sparse, which is not surprising given the theory's internal validity and measurement problems. Several studies have found the theory and the way it is operationalized to be flawed (Blank, Weitzel, & Green, 1990; Cairns, Hollenback, Preziosi, & Snow, 1998; Fernandez & Vecchio, 1997; Goodson, McGee, & Cashmann 1989; Norris & Vecchio, 1992; York, 1996; York & Hastings, 1985). Others using qualitative methods generally agree that the theory is theoretically and empirically invalid (Graeff, 1997).

After House's (1977) germinal article on charisma, and its psychological implications on leadership functions, leadership research switched gears and began to focus on the emotional aspects of leadership. The following section presents a school of leadership that has played a substantive role in the development of Bass's conceptualization of the transformational leader. According to Weber (1968), the term charisma refers to the "gift of grace" (p. 47). Weber (1924/1947, 1968) discussed the concept of charismatic leadership in the bureaucracy from a sociological perspective, which served as a basis for the theoretical propositions of many scholars. Weber's basic theory and House's (1977) approach serve as an important foundation for Bass's (1985) characterization of the transformational leader.

Charismatic Leadership

For Weber (1968), authority could either be based on rational, traditional or charismatic means. Weber stated that charismatic leaders are natural leaders that arise "in times of psychic, physical, economic, ethical, religious, [and] political distress" (p. 18). Weber believed that these leaders hold "specific gifts of the body and spirit [that are] not accessible to everybody" (p. 19), and exhibit almost magical powers. Weber

(1924/1947) also stated that charisma refers to individuals that are "endowed with supernatural, superhuman, or at least specifically exceptional powers or qualities" (p. 358). Therefore these types of leaders are promoted to a larger-than-life status by followers. Furthermore, Weber (1968) believed that charismatic leaders receive unquestioned loyalty as a result of their mission that arises out of "enthusiasm, or of despair and hope" (p. 49), and that the goals of a charismatic leader are different to those of the institutional domain. In fact Weber (1968) argued that "charismatic domination is the very opposite of bureaucratic domination" (p. 20), and that charisma works against methodical, rational, and economic ideals.

Thus the basis of charisma, the way it works, is based on emotional means and its "attitude is revolutionary and transvalues everything; it makes a sovereign break with all traditional or rational norms" (Weber, 1968, p. 24). Weber believed that once charismatic leadership succeeds in changing the status quo, its influence gives way to the rational bureaucratic systems and processes that it overthrew. As Weber (1924/1947) noted, "Both rational and traditional authority are specifically forms of everyday routine control of action; while the charismatic type is the direct antitheses of this" (p. 361). Therefore, as the organization loses its emotional character and is subsumed in the disciplined and methodical processes of the institution, the emotional effects of charisma wane. The cycle therefore continues until followers ultimately seek another charismatic leader to deliver them from their plight.

House (1977) presented the first integrated approach for explaining the psychological impact of charismatic leaders on followers and proposed a major shift in the way leadership was conceived. This theory, along with the transformational and transactional paradigm of Burns (1978), helped shape the theoretical propositions of Bass (1985). House, as well as Bass, explained the importance of Weber's (1924/1947) explication of the charismatic leader whose concept spurred research in the sociological arena. The importance of House's work to the leadership field was fundamental, and he could be credited for laying the foundations of the contemporary approaches to viewing leadership from a charismatic, transformational, or emotional perspective. Indeed, Bass (1985) pays his dues to House, and stated that with the exception of House, "Charisma has been widely discussed by sociological, psychoanalytic, and political commentators, but shunned for the most part by experimental social and organizational psychologists and by behaviorists" (p. 35). Therefore the inclusion of House's work is imperative to better understand Bass's theory and how it was operationalized.

According to House (1977), the term charisma referred to "leaders who by force of their personal abilities are capable of having profound and extraordinary effects on followers" (p. 189). House believed that charismatic leaders are born out of crisis situations. The charismatic leader in this case is one in whom followers can express their ideals and sentiments. For instance, Kets de Vries (1988) noted, "charismatic leadership has a salvationistic or messianic quality" (p. 238). Since the leader takes a risk by not following established institutional goals, they are revered by followers and seen as courageous. As noted by House, "Because of other 'gifts' attributed to the leader, such as extraordinary competence, the followers believe that the leader will bring about social change and will thus deliver them from their plight" (p. 204). House states that charismatic leaders are role models and objects of identification, command loyalty, trust and devotion, and inspire followers to support the leader's cause and achieve unimaginable goals. These types of leaders challenge the status quo and "through their leadership *major social changes* are accomplished" [italics added] (House, 1977, p. 189).

House (1977) proposed that the foundation of charismatic leadership are emotional interactions with followers, who show affection and a sense of belonging to the mission of the leader as their psychological needs for affiliation and achievement are aroused. For House, charismatic leaders display confidence in achieving their goals, make these goals explicit to their followers, heighten their awareness to achieve the goals, and then communicate their confidence to followers that they are able to reach these goals. In this way they enhance their followers' self-esteem and belief in achieving the goals.

As is evident from the above, leadership is more complex than originally conceived by the other scholars, and that the emotional component of leadership may account for many of its outcomes. Another important element proposed by House (1977) is that charismatic leadership can be measured, and that empirical research can determine its scales. Perhaps this task was left for Bass (1985), who reworked the characterization of charisma to broaden its scope, and dissected its components into unique, but highly interrelated components.

To better understand the way Bass (1985) presented his model of leadership, it is important to realize that leaders and followers function in an organizational system with both organizational and human needs. Furthermore, it is important to examine how humans are affected in organizations, and the role of leadership in this regard (Argyris, 1957). These are salient concepts to grasp especially from a psychological perspective, as the workings of Bass's (1985) theory will be better understood, as too will the way in which employee attitudes are affected by organizations and their leadership.

The Effect of Formal Systems and Leadership on Human Behavior

Argyris (1964) argued that the goals or core activities of an organization are to reach its objectives, adapt to its environment, and to maintain the stability of its system. Furthermore, the way in which the organizational designers structure the organization, the types of control systems that are used, the way its goals are pursued, and the type of leadership that is utilized will affect all organizational outcomes. According to Scott (1992), the goals of organizations and of the individuals that comprise it will always conflict, and can never be reconciled. Etzioni (1964) suggested the contrary, and stated that it is possible to synthesize the rational goals of the organization with natural goals of its human constituents. According to Etzioni, organizational conflict arises as a result of the goal differences of the formal and informal contingents, which is always prevalent and whose resulting friction is a necessary and beneficial element to achieve organizational harmony. As stated by Etzioni,

> The problem of modern organizations is thus how to construct human groupings that are as rational as possible, and at the same time produce a minimum of undesirable side effects and a maximum of satisfaction. . . .Not all that enhances rationality reduces happiness, and not all that increases happiness reduces efficiency. (p. 2)

Furthermore, Etzioni (1964) noted that "Generally the less the organization alienates its personnel, the more efficient it is. Satisfied workers usually work harder and better than frustrated ones" (p. 2). Etzioni's point is that social conflict can be reduced by aligning the goals of the individual with those of the organization or vice-versa, or to match individuals in positions where their goals will complement organizational requirements.

Integral to Etzioni's structuralist (1964) perspective is the effect that the formal leadership will have on individuals, and the source of power that the formal leadership will utilize to exert influence. Etzioni differentiated three types of power bases that leaders may use namely: (a) physical power, entailing the use of threats or coercion; (b) material power, entailing the use of rewards; and (c) symbolic power, entailing the use of normative or social power. Symbolic power is what Etzioni (1961) referred to as "charisma" (p. 203). According to Etzioni (1964), greater commitment and less alienation will be displayed in followers when using symbolic over material or physical power, and material over physical power. The use of physical power as compared to material or symbolic power, or material as compared to symbolic power will result in alienation of the followers.

To obtain a better grasp of how leadership, and in particular transformational leadership works, it is important to understand the psychological transactions that occur in followers as a result of their exposure to an organizational and leadership system. In the past, theoretical and empirical links were made to understand the effect of organizational systems and job design on motivation (Hackman & Oldham, 1975). Similarly, a link can also be established between leadership style, its effects and consequences on systems and motivation in followers.

Argyris's (1957) landmark work in this area of industrial psychology focused on the negative outcomes that are created when mentally fit individuals are placed under directive and rationalistic leadership styles, and in restrictive organizational settings that do not complement those individuals' state of psychological and developmental maturity. Argyris's point was that the psychological goals of individuals must be reconciled with the objectives of the organization so that the organization can operate efficiently, but concurrently serve the needs of its individuals. The organizational structure, including the control systems and leadership style, determine to a large degree whether individuals will be able to cultivate their learning abilities and reach the highest degree of their potential psychological development. Based to the Argyris framework, the goal of organizations is to foster a challenging environment where followers can learn, express their feelings and abilities, reach a higher state of existence, and become well-balanced, integrated individuals. This is similar to what Maslow (1998) refers to as self-actualization. Salient to this is to develop and sustain the psychological energy that governs individuals—the type of energy that motivates them to behave, and is a function of their needs. Argyris noted further, "One of the big tasks of a parent (and, later, of administrators) is to help the individual learn and develop appropriate abilities to express his [or her] needs" (p. 33). According to Argyris,

> To the extent that individuals who are hired to become agents of organizations are predisposed toward maturity, they will want to express needs or predispositions related to the adult end of each specific developmental continuum. Theoretically, this means that healthy adults will tend to obtain optimum personality expression while at work if they are provided with jobs which permit them to be more active than passive; more independent than dependent; to have longer rather that shorter time perspectives; to occupy higher position that their peers; to have control over their world; and to express many of their deeper, more important abilities. These

> developmental trends may be considered as basic properties of the human personality. (p. 53)

Argyris (1957) argued that in the event that the work environment is incongruent to the individual's maturity level, the individual would adapt to the organizational setting to restore a psychological balance. This adaptation is what Argyris referred to as defense mechanisms, which serve to reduce the perceived threat individuals sense in their environment, and leads to informal activities that are not foreseen or desired in the formal organizational setting. Argyris believed that because of the perceived threats on individuals, defense mechanisms take the form of "anxiety, conflict, frustration and failure" (p. 37), and result in actions that may be damaging to the psychological development of individuals. Argyris noted these defensive actions prevent individuals from fulfilling organizational goals, and may lead to organizational ineffectiveness and inefficiency as a result of "increases in waste, errors, absenteeism, sickness, apathy, disinterest in work [i.e., featherbedding and goldbricking], and increase in importance of material (financial) aspects of work" (p. 123).

Thus Argyris (1957) believed the main function of the leaders is to provide the climate in which followers can self-actualize and express their needs. Argyris noted it would be wrong to simply assume that not allowing this to occur leads to ineffective and inefficient organizations, since it is quite possible to have organizational effectiveness and efficiency with repressed followers. However, as will be noted below one can assume a direct link between follower satisfaction and organizational effectiveness, which apart from making business sense, is the moral and ethical order of the day (Bass, 1998).

Another humanistic approach to viewing leadership is that of McGregor (1960/1985), whose classic account of the theory of management, and its affect on organizational behavior is perhaps the best know staple in basic management and leadership courses. McGregor's underlying theme was that the methods that formal management uses to control human behavior in organizations, and how these are manifested in the leadership behaviors of individuals, are contingent on the assumptions that managers make about human beings and their underlying motives in work-related situations. More often than not, these means of control are contrary to human nature, and will generally have negative ramifications on the behaviors of followers, thus requiring more of these "unnatural" control methods. The assumptions therefore that management makes about human nature are crucial in understanding the theoretical framework that permeates management thought. McGregor differentiated these assumptions into two distinct approaches to management: Theory X and Theory Y, which are seen as two mutually exclusive philosophies in managing and controlling human resources in an organizational setting.

According to McGregor (1960/1985), Theory X assumptions of management entail that workers have an "inherent dislike of work and will avoid it" when possible (p. 33). Workers generally tend to avoid responsibility and prefer direction, which satisfies their security needs. As a result management must use draconian methods and "most people must be coerced, controlled, directed, [and] threatened with punishment" for the organization to achieve its objectives (p. 34). The control methods in this case are what McGregor blamed as being the cause of undesirable outcomes. Since higher order needs cannot be fulfilled in the workplace, and can only be fulfilled outside it, workers will behave in the way that Theory X predicts and will more often than not view work as punishment. Moreover, monetary rewards become all the more important as workers satisfy their higher order needs outside the workplace in the form of material possessions or other services. On the other hand, McGregor's Theory Y approach assumed that humans do not inherently avoid work but "depending upon controllable conditions, work may be a source of satisfaction (and will be voluntarily performed)" (p. 47). Coercive means in an effort to secure desired behaviors is not necessary if a person is committed to given objectives, since humans actively learn to pursue responsibility, and their predisposition is to be creative and self-directed.

McGregor (1960/1985) believed that human goals of individuals can be integrated with those of the organization if management allows them the opportunity to learn and grow on the job. This can only be achieved if trust is established between followers and leaders, fostering an environment where individuals are allowed to direct themselves with limited control by their superiors, and where they can actively participate in all decision-making processes that might affect their position. If integration does not occur, McGregor notes that it is the organization that will suffer mostly in the long run in the form of increased costs and inefficiencies.

As is seen above, integral to understanding how leadership works is to understand the impact of leadership and formal organizational systems on the behavior of individuals. As was also determined, how followers are managed in the pursuit of the organization's objectives may have deleterious or beneficial outcomes. Therefore, an awareness of the functioning of leadership in reaching the goals of the organization in an efficient manner, while concurrently serving the interests of the followers is the order of the day. Bass's (1985) integrated approach is an attempt at this.

Transformational and Transactional Leadership Theory

The concept of transformational leadership was derived from political science from the writings of Downton (1973) and Burns (1978). The distinction between the concepts of transformational and transactional leadership can probably be traced to Weber's (1968) charismatic versus bureaucratic typology discussed earlier. Downton (1973), however, was the first to use the categorization of transactional, charismatic, and inspirational leadership although in the context of the rebel political leader. Although he was the first to use this typology, Downton was not discussed by Bass (1985) or Burns (1978). Downton used the term transaction to refer to "a process of exchange that is analogous to contractual relations in economic life [and] contingent on the good faith of the participants" (p. 75). According to Downton, the fulfillment of transactional obligations creates trust and a stable relationship where mutual benefits can be exchanged. Downton distinguished between positive and negative transactions, with the former referring to rewards contingent on being obedient to the leader, and the latter referring to coercion in the form of punishment for noncompliance. For Downton, charismatic leaders commit followers as a result of their transcendental authority, and belief in a transcendental ideal. Downton stated that psychological exchanges and idealization of, and identification with the leader characterize the charismatic relationship, which augments the trust between the leader and follower. Furthermore, commitment and trust can be further strengthened with inspirational leadership, by providing meaning for actions that are distinct from the charismatic process. Downton stated that all sources of leadership, whether transactional, inspirational, and charismatic leadership should be used in varying degrees. To conclude, Downton stated:

> A system of personal rule may derive its legitimacy from the manipulation of rewards as well as punishments [i.e., transactional leadership], from the manipulation of myths and symbols that give meaning to action and suffering [i.e., inspirational leadership], and from the presence of leaders who are able to provide security, a new identity, or cultural reinforcement for those whose psychological dispositions or socialization require that they obey orders [i.e., charismatic leadership]. (pp. 284-285)

Tichy and Devanna (1986) also proposed a theory of transformational leadership a year after Bass (1985). For Tichy and Devanna, transformational leaders are those who transform an organization for the better. Transformational leaders see themselves as change agents, are courageous, take risks, and work on an emotional and substantive level with people. Furthermore, Tichy and Devanna stated that transformational leaders believe in, and communicate a set of core values, and that they develop and share a vision which serves as a guiding light for others. Transformational leaders learn from experience, find value in failure, and are able to deal with complex and turbulent environmental sets. Tichy and Devanna's explication of the transformational leader is quite congruent to what Bass proposes.

As will be shown, Bass's (1985) theory of transformational and transactional leadership is based theoretically on the work of Burns (1978) in his characterization of the transforming leader, as well as that of House (1971), in terms of path-goal theory, and House (1977) and Weber (1924/1947, 1968) in terms of charisma. Direct links to Argyris

(1957), and McGregor (1960/1985) can be made regarding its humanistic orientation and its focus on developing and self-actualizing followers by avoidance of coercive means. Bass's approach eschews pressure-oriented, coercive, and controlling approaches as Argyris and McGregor profess. Similar to Etzioni (1964), it uses a structuralist approach in viewing the reconciliation that can be achieved between organizational and individual goals, and how the leader should use symbolic power. It differentiates the importance of management functions and leadership as proposed by Zaleznik (1989). Similar to Argyris and Zaleznik, it focuses on the emotional aspects of human interaction. It uses a contingency and motivational approach proposed by House (1971), and the follower-focused developmental perspective of Hersey (1975). Furthermore, it builds on the task- and employee-oriented approaches of the behavioral movements, but uses the typology of the rebel leader as explicated by Downton (1973). Its articulation of a leader's strategic role parallels the approaches of Bennis (1989), Gardner (1990), Kotter (1988), and Nanus (1992). And lastly, it uses as a foundation the emotional interactions that occur between leaders and followers, as proposed by Weber (1968) and House (1977).

In summary, Bass (1985) presents a unifying theory of leadership that encompasses many of the philosophical and ontological assumptions of previous approaches, and unites them under a single, integrated perspective that appears to be logically derived and internally valid. Since it has spawned much contemporary research, the theory's merits and limitation must be determined to better understand how its measurement model and multidimensionality were developed.

For Bass (1985), previous models of leadership merely centered on clarifying tasks, rewarding desired behavior in followers, and generally focused on the "when's and how's" of leadership. Indeed, until House's (1977) introduction of charisma into the organizational leadership literature, the initiating structure and consideration dimensions had the most pervasive impact on leadership studies. These types of leadership, according to Bass, may be termed transactional, and are limited to influencing basic changes in followers; a shift of philosophy was thus required to explore a different type of leadership that could make followers transcend their self-interest, and reach challenging goals.

Bass (1985) believed that transformational leaders change organizational environments, provide new realities, are proactive, and create emotional relationships with followers, as opposed to transactional leaders who accept the status quo, are reactive, and focus on creating material relationships with followers. Transactional leaders focus on the "what's," while transformational leaders focus on the "why's." The distinction between these two forms of leadership is derived from Burns who stated: "The chief monitors of transactional leadership are modal values, that is, values of means. . . . Transformational leadership is more concerned with end-values" (p. 426). According to Bass, a transactional leader is one who clarifies role and task requirements, rewards desired performance, sanctions undesired performance, and focuses on the immediate self-interests of followers. However, in the current economic, technical and competitive milieu, this approach has set parameters. Thus, Bass, argued "Followers' attitudes, beliefs, motives, and confidence need to be transformed from a lower, to a higher plane of arousal and maturity" (p. xiii). This may be defined as transformational leadership, which focuses on elevating followers' higher order needs, from "security and affiliation to concerns for recognition, achievement, and self-actualization" (Bass, 1985, p. 4), and to make them even "transcend their own self-interest for the good of the group, organization, or country" (p. 15). Thus transformational leaders make followers aware of, and believe in values and goals that go beyond their self-interest, by arousing and expanding their psychological desires.

In contrast to Burns (1978), Bass (1985) did not see transformational and transactional leadership as opposing ends on a spectrum, and believed that both are requisites to effective leadership. In other words a leader must exhibit both transactional as well as transformational behaviors. Based on Bass's empirical evidence, it is the transformational behaviors that will yield superior performance and increased satisfaction in followers when augmenting the transactional behaviors. Empirical support for this proposition can be found in the literature (Bycio et al., 1995; Geyer & Steyrer, 1998; Hater & Bass, 1988). This is what Bass named the "augmentation hypothesis," which refers to the increase in effect when transformational factors are added to transactional factors. Theoretical support for this proposition can be found in Drucker (1955), who differentiated between management and leadership, and stated:

> Leadership is the lifting of a man's vision to higher sights, the raising of a man's performance to a higher standard, the building of a man's personality beyond its normal limitations. Nothing better prepares the ground for such leadership than a spirit of management that confirms in the day-to-day practices of the organization strict principles of conduct and responsibility, high standards of performance, and respect for the individual and his work. (p. 195)

As is evident from this section, transactional leadership is typical of the management function, which stresses rewards and sanctions in the meeting of objectives.

However, as the theory predicts, these kinds of behaviors may be effective, but are limited. Leadership is thus needed to take the process beyond simple transactions to a higher meaning and purpose. This type of leadership and its dimensions are presented next.

Transformational Factors

Based on empirical evidence as well as theoretical reasoning, Bass (1985) proposed that transformational leadership behavior is composed of four distinct, but highly interrelated factors. The most important one is charisma, which accounts for most of the variance in follower ratings of leaders' behavior. The other factors are inspirational leadership, intellectual stimulation and individualized consideration. As compared to the transactional factors, the transformational factors correlate higher with items such as perceived leader and group effectiveness, as well as follower motivation.

According to Bass (1985), charisma is the emotional component of leadership, which is "used to describe leaders who by the power of their person have profound and extraordinary effects on their followers" (p. 35). Followers revere these types of leaders, who are able to command loyalty and devotion, make followers disregard their self-interest, and make them feel good about being with them. These types of leaders give followers a vision, a sense of mission and direction, are role models, create trust and respect, and "arouse achievement, affiliation, and power motives among their subordinates linked to the mission of their group" (Bass, p. 47). The charismatic leader uses "symbols, images, and vision of a better state of affairs along with his [or her] persuasive language. It is stimulated by increased feelings of identity with the leader, hence with the leader's goal's" (p. 66). This kind of leadership can create intense emotional attachment that can foster love in those who accept the leader, as well as hate in those who do not.

Inspirational leadership is the type of leadership that inspires and motivates followers to exert efforts beyond what they thought were their original capabilities. Here, Bass (1985) proposed that the leader "employs or adds nonintellectual, emotional qualities to the influence process" (p. 63), which appeals to the followers' feelings and intuition. This leader raises followers' expectations and inspires action, confidence and belief in goal achievement, and is described in terms of the *Pygmalion effect* by Bass. This means that by expecting good performance from followers, their confidence is inspired to reach that high performance, and a self-fulfilling prophecy occurs (i.e., they reach that high level of performance).

Individualized consideration is the component that contributes to follower satisfaction by advising, supporting, and paying attention to the individual needs and wants of followers. Bass proposed that the leader in this instance gives "individualized attention and a developmental or mentoring orientation toward subordinates" (p. 83), by tracking their performance, and counseling them as required. Here leaders have frequent face-to-face contact with their followers. Bass stated that the leader takes a mentoring role, teaches and listens to the employee, and acts as their counselor when required, to help them develop and self-actualize. The construct of individualized consideration appears to be somewhat related to the behavioral studies of consideration. Seltzer and

Bass (1990) empirically reported this link, and demonstrated that transformational leadership accounts for more variance beyond the consideration scale.

Intellectual stimulation is the component that appeals to the followers' sense of logic and analysis, and creates in followers "problem awareness and problem solving, of thought and imagination, and of beliefs and values," which affect "followers' conceptualization, comprehension, and discernment of the nature of the problems they face, and their solutions" (Bass, 1985, p. 99). The leader uses vivid images to communicate clear and explicit messages and symbols where necessary, and challenges followers to find solutions to difficult problems.

As can be deduced, the four factors are conceptually related, and mutually reinforcing. For instance by intellectually stimulating a follower, the leader is also being individually considerate in that he or she better understands how the follower thinks. Both of these factors work together to motivate the follower, especially if the leader communicates heightened expectations, and creates an emotional attachment with the use of charisma. The transactional factors, which mostly focus on economic exchanges as conceptualized by Bass's (1985), are presented next.

Transactional Factors

Based on empirical data, this component of leadership is characterized by two factors, namely contingent reward and management-by-exception (Bass, 1985). Contingent reward is an effective leadership method, but alone is not as effective as when used with the transformational factors. Management-by-exception, which is also a part of transactional leadership, is a less productive form of leadership. According to Bass, transactional leadership is what typical management is all about, differentiating it from true leadership (i.e., transformational leadership).

Contingent reward focuses on clarifying role and task requirements, and rewarding desired outcomes. According to Bass, this component gets its theoretical inspiration from House's (1971) path-goal theory, which explains why contingent reward is an effective method of leadership. The amount of direction that followers require, as posited by the path-goal theory will depend on situational factors. Again, a similarity exists between this construct and initiating structure or task orientation, on which House's theory is based.

Management-by-exception, which is also defined as contingent aversive reinforcement is similar to contingent reward in terms of clarifying outcomes, but here, the leader acts on negative feedback by providing sanctions according to whether standards have been met (Bass, 1985). The sanctions can take the form of reprimands, disapproval, penalization or worse, punishment. This is typically a less productive form of leadership and can create anxiety, hostility or guilt in followers, especially if the self-esteem of the follower is hurt.

On a theoretical level, it appears that Bass (1985) has interwoven many approaches to leadership into a cohesive unit. The factors are clearly based on previous theoretical and empirical reasoning, and are logically derived. How the factors would predict performance criteria appears to be theoretically valid and logical. The factors still do not account for the full variation of leadership performance. As will be seen below, Bass (1998) and Bass and Avolio (1994, 1997), update the model as a result of more than a decade of research.

The Full-Range-of-Leadership Model

As a result of his empirical work with Avolio, Bass expanded the theory of transformational and transactional leadership (Bass & Avolio, 1994, 1997). The newest version of the theory (Bass, 1998), and the way it is measured and explicated (Avolio et al. 1995; Bass & Avolio, 1995, 1997), resulted in an updated model of transformational leadership with a broader array of factors. The new theory is now referred to as the "full-range-of-leadership model." The model includes highly active forms of leadership (i.e., transformational and contingent reward leadership), moderately active forms of leadership (i.e., management-by-exception active), and finally inactive or passive leadership (i.e., management-by-exception passive and laissez-faire leadership). According to Bass, active leadership should be displayed more often than passive leadership, and it is active leadership that will lead to higher performance and greater satisfaction with the leader.

A point to note here is the difference between laissez-faire leadership and empowerment, which are opposite concepts. According to Bass (1998), "empowering leadership means providing autonomy to one's followers [while] On the other hand laissez-faire leadership means that the autonomy of one's followers is obtained by default" (p. 138). Bass stated that empowerment is a result of individualized consideration however based on the precepts of the theory all the transformational constructs as well as contingent reward work jointly to empower followers. In other words, followers are provided with a vision, direction, structure and socio-emotional support, yet are given the freedom to be creative, self-controlling and challenge the status quo, and concurrently are assisted to develop to their potential. In fact, according to Bass, the leader's goal in this sense is to develop followers and teams to self-lead. In contrast to this, Bass argued that the laissez-faire leader "avoids providing direction and support, shows lack of caring for what the followers do and abdicates responsibilities by. . . . deflecting requests for help, abdicating any responsibility for follower performance and/or absenting himself or herself from the scene physically or mentally" (p. 138).

On a macro-scale, Bass (1998) changed certain technical elements of the theory, to include moral and ethical implications, which were very important to Burns (1978), but which were not included in Bass's (1985) original positions. In fact, in the earlier version of the theory, he did not make the distinction between true transformational leaders who serve the interest of the greater good, and leaders who use transformational leadership for their own self-serving purpose or for immoral and unjust causes. In his updated version of his theory, Bass referred to these kinds of leaders as being self-aggrandizing and narcissistic, and generally labeled them as inauthentic. For Bass, these leaders are pseudotransformational, and the commitment that followers display to them is public, not private. Bass believed that "transformational leaders [should] shift goals [of followers] away from personal, safety and security towards achievement, self-actualization, and the greater good" (p. 41). House (1977), Zaleznik (1989), and Gardner (1990), previously identified the importance of the moral and ethical dimensions of leadership. This area is increasingly becoming an important element of leadership thinking (Bass & Steidlmeier, 1999; Carlson & Perrewe, 1995; Drouillard & Kleiner, 1996; Grundstein-Amado, 1999; Howell & Avolio 1992). However, given the importance of ethics in leadership some question the notion that promoting a collective sense of mission is ethical per se, since it may go against the minority's goals (Keeley, 1995).

As indicated by Avolio et al. (1995), and Bass and Avolio (1997), the number of factors accounted for in the model has been increased. Charisma has been renamed idealized influence, and has been split into a behavioral and attributional element, to answer previous criticisms (Hunt, 1991; Yukl, 1998). This occurred as the MLQ did not account for "charismatic leadership that was behaviorally-based . . . versus an attribution or impact on followers referred to as idealized influence" (Avolio et al., p. 7). Furthermore, as a result of Hater and Bass's (1988) research, management-by-exception was been split into an active and passive component. To fully cover the full-range-of-leadership model, the scale of nonleadership was been added to indicate an absence of leadership.

Below is the presentation of literature to support the propositions of the theory in the field. In particular how the full-range-of-leadership model determines outcomes will be presented for two reasons. First, it will confirm the predictive or criterion validity of the constructs, and second, it will support the way the theory has been proposed.

The Need for Transformational Leadership in Organizations

Based on the literature reviewed, transformational leadership is coterminous with increased motivation, effectiveness, innovation, and the ability to cope with change. Ten years ago, Ansoff and McDonnell (1990) predicted that the escalation of change would continue unabated. Indeed, the adage that the only constant today is change is truer now than it ever has been. Ansoff and McDonnell made reference to the importance of leadership in coping with change. Indeed their characterizations of individuals in organizations that are entrepreneurial are that they view change positively, take risks, use their problem-solving abilities, and develop and motivate individuals. These characterizations overlap remarkably with the dimensions of transformational leadership.

Bass (1998) linked transformational leadership to many organizational outcomes. For instance, Bass showed that transformational leadership serves the purpose of facilitating new learning and innovation so that individuals become adept to continually improve their learning and performance, and are better able to comprehend and adapt to work-related phenomena and change. Furthermore, Bass noted that leaders who are transformational have a cascading effect on their followers and the organization. They provide modeling behaviors that are emulated by followers, and thus, the behaviors become ingrained in all organizational activities and its artifacts, that is, the organizational culture. Creativity is cultivated, and the problem-solving ability of the followers is promoted. As regards employee motivation and commitment, Bass proposed that it is at its highest, and more associated with transformational leadership. Furthermore, in investigating employee stress and its antecedents, Bass suggested this is strongly associated with management-by-exception, which, apart from creating stress in employees, is "the kiss of death" (p. 88) for organizations, in terms of the mediocrity and change averseness that it promotes. The literature analyzed below is supportive of Bass's (1985, 1998) conjectures regarding the relationship of the full-range-of-leadership model to organizational outcomes. However, prior to presenting the literature an awareness of the problems associated with empirically linking leadership to effectiveness is in order.

Problems of Determining Leadership Effectiveness

According to Conger and Kanugo (1998), "As a social and behavioral phenomenon, leadership manifests itself in various forms" (p. 35). As any other construct or factor, leadership can be reified by using a measurement model that focuses on isolating observable characteristics that can be attributed to the phenomenon (Long, 1983). However, as noted by Cliff (1983), the fact that "we name something . . . does not mean we understand it" (p. 120). Cliff referred to this as the "nominalistic fallacy," which is an important issue in research dealing with latent variables. This is further compounded by the attributional process of leadership as discussed in chapter 1 of this dissertation, in that individuals attempt to make sense of the world by assigning causes to events. For instance, as indicated by Yukl (1998), followers that perceive a group to be effective may incorrectly attribute this to successful leadership when rating the leader. Also, as Yukl notes, is a leader successful because he or she is leading a group that performs well, or is it the leader's behavior that is contributing towards success?

Another major problem in organizational research is common methods variance, which suggests that when subjects rate both a leadership style as well as effectiveness outcomes subjects will strive to achieve cognitive consistency by aligning their rating of the leader to that of the outcome (Avolio, Yammarino, & Bass, 1991). The problem of common or same-methods variance and its halo effect was originally explicated by Thorndike (1920), and received wide attention from other scholars (Cooper, 1981;

Fisicaro & Vance, 1994; King, Hunter, & Schmidt 1980; Murphy & Reynolds, 1988; Pulakos, Schmitt, & Ostroff, 1986). According to Avolio et al., the effect of common methods variance leads to inflated correlations between ratings of leadership and outcomes of leadership. Avolio et al. indicated that statistical methods cannot control for common methods variance. Elements in the design, for instance gathering measures of leadership and outcomes from different sources or different times, is the best way to control for the inflated relationships. Furthermore Avolio et al. stated that for the MLQ, statistical evidence does not conclusively support the existence of inflated correlations between the leadership scales and the outcome measures of effectiveness, satisfaction, and extra effort. Rather they concluded that a number of factors other than the "halo" bias may be responsible for possible increased correlations, for instance "situational factors, individual differences, implicit theories, and actual group effect, the survey measure itself, or some combination of these factors" (p. 584). They suggested that research should focus on a design that would minimize the potential inflation, as statistical procedures cannot possibly control for inflated correlations.

The issue of differences in magnitude of correlations of the organizational and follower measures lends some support to problems associated with single-source bias in a meta-analysis on transformational leadership using the MLQ (Lowe et al., 1996). According to Lowe et al., follower measures of effectiveness, which are normally gathered with the leadership measures, were substantially higher than organizationally determined measures. Although both categories of measures were strongly correlated with the transformational scales as compared to the transactional scales, the authors contended that organizational effectiveness measures are by nature more conservative, and do not fully capture the essence of transformational leadership. Lowe et al. believed that the best course of action is to take a variety of measures into consideration, but do mention that organizational measures may be the litmus test in such kinds of research.

Therefore, as will be evident in the literature reviewed below, both "soft" and "hard" measures have been used to determine the link between the full-range-of-leadership model and organizational effectiveness, which consequently have been found to be more strongly associated with the transformational constructs.

Research in Transformational Leadership and Organizational Effectiveness

Transformational leadership may influence a variety of processes and functions in organizations. As a theory, it reconciles previous attempts to explain the leadership process and is integrally linked to the many of the functions and outcomes of management. It appears to be applicable across many contexts and in a diverse range of conditions.

As predicted by the theory, the literature shows that transformational leadership has a consistent, reliable, and positive relationship to effectiveness measures, whether organizationally based or subjectively determined. Transformational leadership has been found to have a substantive and significant relationship on organizational and group effectiveness (Avolio et al., 1999b; Avolio, Waldman, & Einstein, 1988; Barling et al., 1996; Bycio et al., 1995; Geyer & Steyrer, 1998; Howell & Avolio, 1993; Jung & Avolio, 1999; Lowe et al., 1995; Yammarino et al, 1997; Ristow et al., 1999), perception of performance of the leader (Hater & Bass, 1998; Yammarino et al., 1993), and quality creation in followers (Keller, 1992). In a meta-analysis of 39 studies, substantial evidence is provided by Lowe et al. (1996) that a strong relationship exists between the transformational scales and leadership effectiveness measures, whether using organizationally determined criteria, or the scale embedded in the MLQ. Furthermore, transformational leadership has a powerful modeling effect on followers, and on the organizational culture (Bass, Waldman, Avolio, & Bebb, 1987). Transformational leadership is predictive of innovation and creativity (Howell & Higgins, 1990; Keller 1992; Sosik, 1997; Sosik, Kahai, & Avolio, 1998), "sales efforts, overall work attitude, and product knowledge" (Yammarino et al., 1997, p. 211), using a variety of quantitative or qualitative criteria as a result of the learning orientation (Coad & Berry, 1998), responsibility, and empowerment that it may inspire in followers (Howell & Higgins, 1990). Transformational leadership is also predictive of satisfaction with the leader (Barling et al., 1996; Druskat, 1994; Howell & Frost, 1989; Koh et al., 1995; Ross & Offermann, 1997; Sosik, 1997), follower commitment (Yammarino et al., 1997), organizational commitment (Barling et al., 1996; Koh et al., 1995) and organizational citizenship (Koh et al., 1995), and that past leadership capability appears to be predictive of transformational leadership (Yammarino, et al., 1993). Moreover, it has been suggested that individuals can be trained to exhibit transformational or charismatic leadership behavior (Avolio, 1999; Bass, 1998; Bass & Avolio, 1997; Barling et al., 1996; Howell & Frost, 1989; Shea & Howell, 1999).

As evidenced in the literature, the empirical work on transformational leadership covers a large area, and applies the concepts in a number of practical disciplines and settings. The importance here is the amount of research studies that have been done on this particular area of leadership, which appear in broad base of scholarly publications. As confirmed by the literature this suggests that it is one of the most important contemporary leadership topics. Furthermore, as promulgated by Bass (1985), transformational leadership implies that leadership goes beyond the traditional notions that hitherto focused on exchanges and transactions between leaders and their followers. Also, as seen in the review of the literature the full-range-of-leadership model serves to unify previous theories, and adds to it the emotional and rational elements of how individuals can be transformed to serve purposes that are noble and for the greater good. Thus, based on the evidence provided above, it appears that transformational leadership appears to hold one of the keys to predicting organizational effectiveness and social change. The following section analyzes possible contingencies and limitations of the full-range-of-leadership model.

Contingencies and Limitations of the Full-Range of Leadership Model

The theory appears to be a function of certain situational variables. For instance organizational turbulence may be a key condition that would support the emergence of transformational leadership in contrast to transactional leadership, which "is likely to emerge and be relatively effective when leaders face a stable, predictable environment" (Bass, 1998, p. 52). Also, as mentioned by Lowe et al. (1996), the theory is clearly moderated by situational variables including level of the leader, type of organization, and type of criterion used to determine effectiveness. Moderators are variables that have an impact on the strength of the independent variables (Baron & Kenny, 1986).

According to Bass (1985), situational factors will affect what type of leadership arises, depending on the leader's personality, the external environment, the organizational environment, and followers. Transformational leaders will more often emerge in times of crises or of major change. Transformational leaders are more likely to emerge in organic types of organizations that are not highly structured and do not have routine tasks and functions, in contrast to transactional leaders who prevail in steady types of environmental sets. According to Bennis (1989), the stifling effect of bureaucracy on leaders is what he described as the unconscious conspiracy of society, which "prevents leaders—no matter what their original vision—from taking charge and making changes" (p. xii). Although this point appears to make theoretical sense, Lowe et al. (1996) found the existence of transformational leadership more prevalent in public organizations, which are generally more bureaucratic. Lowe et al. believe this may be the case since transformational behaviors may be expected more in private organizations, and when they occur in public organizations the contrast is greater, hence the followers are more cognizant of them when they are exhibited. Since this would be the norm in private organizations, Lowe et al. stated that this contrasting effect does not exist; hence transformational behavior may not easily noticed.

Other elements on which transformational leadership is contingent are the type of tasks to be performed, which is generally a function of the organizational environment, the needs and aspirations of the followers, and the degree to which they idealize the leader. Bass (1998) believed the model, and the manner in which a leader can display its constructs can be done in a directive or in a participative manner. However, as discussed previously, Argyris (1957) argued that directive leadership creates dependency, and will not have positive outcomes. Bass agrees with this, and stated that a directive approach may be good in the short run, and for instance in stressful, emergency or dangerous situations. Bycio et al. (1995) for example, found that transactional measures would be very important in situations where safety is a major concern. Thus, leaders should change their style depending on environmental contingencies for example in conflict or difficult situations (Bass, 1998).

In terms of the differences between men and women leaders, Druskat (1994), Bass, Avolio, and Atwater (1996), Carless (1998b), and Bass (1998) note that women tend to display transformational behaviors more often than men. This is in contrast to the findings of Komives (1991) and Maher (1997), who stated there are no differences between men and women leaders. According to Bass et al., and Bass, the differences that were found may be explained by the fact that women are socialized to display more nurturing, caring and developmental behaviors than men, and these behaviors are essential elements of transformational leadership. Maher states that potential differences that have been found may not be universal, and may be attributable to situational or contextual variables. An interesting point to note here is these types of "feminine" behaviors may have not been deemed important previously, but are currently seen as predictive of good leadership. As noted by Druskat, labels of typical feminine behavior are now seen in a different light as research uncovers evidence that they are extremely valuable to transformational leadership.

Since Bass (1998) has presented this model in terms of the contingencies that determine it and the types of behaviors the leader should display in different situations, the model may also be a function of national culture constraints. According to Bass and Stogdill's (1981) survey of the literature, leadership styles vary across cultures as a result of culture-specific requirements of the leader. For instance, the amount of authoritarianism, direction, consideration, and trust, among others, is a function of the norms and values inherent in a culture. Bass supports this conjecture (1998), and stated, "whether transformational or transactional leadership emerges and is successful and effective will depend to some extent on the environment, the organization [structure, culture, control systems], the tasks and goals involved, and the distribution of power between the leaders and the followers" (p. 61). This can be supported to a large degree by the work of Hofstede (1980, 1991), who proposed that national cultures differ among four dimensions, the three most important of which are (a) power distance, which refers to the acceptance of unequal power differentials and how they are distributed in society; (b) uncertainty avoidance, which refers to the degree to which people can cope with an uncertain future; and (c) individualism or collectivism, which refers to the degree that people are individualistic in their goals and objectives in life, as opposed to looking out for the greater good of the collectivity. Thus, it can be deduced that in societies where power distance and the uncertainty avoidance is high, and which are collectivist, a directive leadership style that is generally more transactional-like and autocratic may be supported, with an organizational structure that is mechanistic and hierarchically tall. This finds support in Hofstede's work, as well as in the cross-cultural psychology literature (Bochner & Hesketh, 1994; Gerstner & Day, 1994; Offermann & Hellmann, 1997; Pavett & Morris, 1995; van Muijen & Koopman, 1994). However, would the above type of culture (i.e., collectivist, high power distance, and high uncertainty avoidance) support a transformational leader? According to Triandis (1993), a culture with high power distance that is collectivist would support a charismatic-type leader that is parentalistic. The influence of uncertainty avoidance may not be clear.

The cultural anthropology literature indicates cultures that are risk averse would not gravitate towards change, and prefer stability (Hofstede, 1980, 1991). In some instances, however, Bass (1998) may not fully address these cultural implications, and suggests that the full-range of leadership is universally applicable in its entirety. According to Hofstede, this argument may be difficult to fully support since a culture that has high uncertainty avoidance would tend to avoid the radical change that a transformational leader would bring. Moreover, Bass deduces from the work of cultural anthropologists, including Hofstede, that a collectivist society would support a transformational leader. This is true, in part, since it would be easier to promote a collective vision in such a culture, and spur its members to do what is good for the collectivity. Also, by definition however, a collectivist society must display management-by-exception behaviors, since group norms must be respected, and group members cannot deviate from the norms (Hofstede, 1980, 1991). Thus, less radical changes can be promoted in such cultures, and changes should be introduced incrementally suggesting that transactional elements may be more important in this type of society. As a result of the complicated nature of culture, Singer and Singer (1990) found that transformational and transactional leadership was "equally evident within Chinese organizations" (p. 391). Singer and Singer also found that in a Taiwanese sample, management-by-exception was displayed most frequently; however, the difference between composite transactional and transformational behaviors was nonsignificant. Furthermore, Singer and Singer found that Taiwanese employees actually preferred transformational over transactional leaders. Confucian and Mandarin traditions (Singer & Singer, 1990) may have confounded these effects because of the nature of Chinese culture and its influence. Thus, it is possible that culture may operate as a moderator of the pattern of relationships that we find among the MLQ scales, which may or may not be invariant across cultures.

In terms of changing a collectivistic group, the leader would need to manage it from a strong position of power, and would need to be socially accepted in the group (Harzing & Hofstede, 1996). Also, the fact that the leader can transform the group from a position of power would be a function of the power distance of that society, an issue that Bass does not address. Furthermore, many of the examples that Bass gives regarding collectivist societies are from Asia, which have other variables that may affect the outcome. For instance, The Chinese Culture Connection (1987) found that Hofstede's dimensions are culture bound per se, and added another dimension, long-term orientation, to Hofstede's taxonomy. Earlier it was identified that the components of transformational leadership are universal (Den Hartog et al., 1999). The question however regarding the degree of compatibility of transformational leadership in a non-Anglo-Saxon type society as compared to an Anglo-Saxon society, and the extent to which these behaviors are required is an empirical question that will require further research.

The limitations of the transformational/transactional theory are important to note since how the data will be coded and tested is contingent on the conditions under which the theory is said to hold. Bacharach (1989) noted that "A theory is a statement of relations among concepts within a set of *boundary assumptions and constraints*" [italics added] (p. 496). As can be deduced from the review of literature on the transformational/transactional theory, the theory appears to be bounded by certain conditions. According to Bacharach, Dubin [1969] stated that the boundaries of theories are threefold and include (a) the values of the theorist, that is, his/her implicit assumptions; (b) spatial constraints, which refer to the level or unit of analysis in which the theory holds to be true; and (c) temporal constraints, which refer to the applicability of the theoretical system in temporal domains. Bacharach noted that since the purpose of theory is to understand and predict, a theory must be able "to answer the questions of *how, when, and why*" events in the empirical world have occurred (p. 498). Furthermore Bacharach argued that the more generalizable a theory is the less bounded it is, and the less detail exists in the way it is operationalized. Thus, the boundary conditions of the theory determine the domains in which the theory is valid, that is, where the units of the theory still exist and continue to interact in the manner specified by the theory (Dubin, 1976). Dubin argued further that, unfortunately, "we often assume we can safely ignore the boundary conditions surrounding a given theoretical model, or even apply the model indiscriminately to all realms of human interaction" (pp. 28-29).

The theory proposed by Bass (1998) and Bass and Avolio (1994, 1997) must therefore be bounded by certain conditions, and these conditions must be taken into consideration in understanding how the theory works. This is especially important for the purposes of this study in terms of coding the data for analysis, which is discussed further in chapter 3, since the factor structure of the theory may be dependent on the conditions in which it is applied. In other words what is proposed here is that only studies whose data were gathered in homogenous conditions should be included in the same test since in nonhomogenous conditions too much variability in the structure may affect the results. Therefore any boundary conditions of the theory must be made explicit. Based on the review of the literature it is proposed that the boundaries may include but not limited to the following:

1. The relationships among the transformational constructs under certain cultural conditions may vary. For example, in collectivist cultures transformational leadership may be more prominent (Bass, 1998; Jung & Avolio, 1999; Triandis, 1993), while in individualistic, low power distance cultures contingent reward may be more prevalent (Bass, 1998; Jung & Avolio, 1999). The factor structure thus may vary as a function of culture.

2. The relationships of the constructs may vary based on variations in organizational conditions. For example, where safety is a priority, management-by-exception active may play a more prominent role in determining organizational effectiveness (Avolio, 1999; Bass, 1998; Bycio et al., 1995), and this may affect the factor structure accordingly.

3. The relationship of the constructs to the performance criteria may be a

function of whether they are organizationally determined (objective), or follower determined (subjective), based on prior meta-analytic results (Lowe et al., 1996).

4. The level of analysis associated with the theory may also limit the type of model that is validated. For example, the MLQ focuses on measuring individual leadership. If the linkage between individual leadership and organizational performance is examined, there may be some limitations to predictions given the unit of analysis used to measure leadership (Avolio & Yammarino, 1990; Avolio & Bass, 1995; Yammarino & Bass, 1990; Yammarino & Dubinsky, 1994).

5. Organizational characteristics may also operate as a moderator whereby transformational leadership may be supported or more evident in organic versus mechanistic organizations (Bass, 1998). This, however, has been contested by the results of a meta-analysis where transformational and management-by-exception leadership were both found to be more prevalent in public and hence mechanistic organizations, as compared to private organizations (Lowe et al., 1996). Thus this boundary will be cautiously explored and both options will be investigated.

6. Level of the leader, that is, differences in the factor structure may be found depending on whether the leader is a supervisor or a top-level executive, since the latter appear to display more transformational behaviors as compared to the former (Lowe et al., 1996).

7. Organizational and environmental turbulence, that is, turbulent and uncertain environments may favor the emergence of transformational leadership, and may function as a moderator (Pawar & Eastman, 1997; Bass 1998).

8. Gender of the leader may operate as a moderator, namely that women leaders may tend to exhibit more transformational leadership than men (Druskat, 1994; Bass, 1998; Bass, Avolio, & Atwater, 1996; Carless 1998b), which thus entails that the factor structure may be different as a function of gender.

The study will now shift its focus to presenting the MLQ factors, and the items that comprise it, as included in the full-range-of-leadership model. The instrument that has been developed to gauge the leadership constructs is the MLQ. The factors of the MLQ, and the way relate to the model are presented below.

The MLQ Factors and Measurement Items

The MLQ is comprised of 45 items, each relating to a specific factor (Avolio et al. 1995). Respondents are normally followers; however for training purposes, colleagues can rate the leader, as too can the leaders themselves on a self-rating form. Respondents judge the frequency of the behavior described by the item on a scale, which includes "not at all," "once in while," "sometimes," "fairly often," and "frequently if not always." The scale has a magnitude estimation ratio of 0:1:2:3:4 corresponding to the above descriptors (Bass, Cascio, & O'Connor, 1974).

Below is a list of the scales with samples of their measurement items. Each leadership scale is comprised of four items. According to Hinkin, Tracey and Enz (1997), four to six items are deemed to be sufficient as a basis for adequate internal consistency reliability. The face or content validity of the sample items is analyzed below if they appear to be problematic. Face validity is a judgmental observation as to whether the measures actually represent the right construct being measured (Pettigrew, 1996;

Kerlinger, 1986). Reported for each scale is the alpha reliability coefficient based on exploratory factor analysis of a pooled sample of 2,080 respondents (Avolio et al., 1995). The alpha scale reliability is a measure of internal consistency of a scale, and values above 0.70 indicate satisfactory reliability (Nunnally & Bernstein, 1994). The composite scale reliability is also reported which provides a measure of reliability, and values above 0.70 are deemed satisfactory (Fornell & Larker, 1981). According to Bagozzi and Yi (1998), a value above 0.60 is satisfactory. Furthermore, the average variance extracted by the constructs, which is the average squared factor loading, is also reported. Values greater than 0.50 indicate that the measurement items account for more variability than error (Fornell & Larker, 1981).

The loading of the items on their respective constructs using confirmatory factor analysis, and partial least squares analysis based on a pooled sample of 1,394 are also reported (Avolio et al. 1995). The loading is a standardized regression coefficient, and values above 0.40 (Heck, 1998), or 0.60 (Bagozzi & Yi, 1988) are considered acceptable. Based on the data presented by Avolio et al., the MLQ appears to be a reliable and valid instrument.

<u>Idealized Influence-Attributed</u>

According to Bass and Avolio (1997), the scale of idealized influence (attributed) gauges how followers are influenced as a result of their idealization of the leader, and the emotional correlates of that idealization. Here the leader is a risk-taker, makes followers feel good to be with him or her, creates a sense of belonging to the common cause, and cares about the interests of the followers. This factor, as measured by the MLQ, determines attributed charisma, and reflects attributions of the leader made by followers. The alpha scale reliability of this item is 0.86, its composite scale reliability is 0.86, and its average variance extracted is 0.61 (Avolio et al., 1995), thus meeting all cut-off criteria. Furthermore, all factor loadings using partial least squares analysis and confirmatory factor analysis exceeded the minimum value recommended by the literature. Sample items of this scale include:

- (item 18) Goes beyond self-interest for the good of the group.
- (item 21) Acts in ways that builds my respect.

Idealized Influence-Behavior

According to Bass and Avolio (1997), the scale of idealized influence (behavior) is measures how followers are influenced as a result of their idealization of the leader, and the emotional correlates of that idealization. Here the leader displays a high ethical and moral code, is a risk-taker, and has a strong sense of mission (Bass, 1998). This factor, as measured by the MLQ, determines behavioral charisma. This scale reflects behaviors of the leader as viewed by the followers. The alpha scale reliability of this item is 0.87, its composite scale reliability is 0.85, and its average variance extracted is 0.59 (Avolio et al., 1995), thus meeting all cut-off criteria. Furthermore, all factor loadings using partial least squares analysis and confirmatory factor analysis exceeded the minimum value recommended by the literature. Sample items of this scale include:

- (item 14) Specifies the importance of having a strong sense of purpose.
- (item 23) Considers the moral and ethical consequences of decisions.

Inspirational Motivation

As seen in Bass and Avolio (1997), and Bass (1998), inspirational leadership has been re-baptized inspirational motivation. This is characterized by behaviors that provide meaning, challenging goals, a sense of vision and mission, and belief that the individuals can reach these goals, which they may have originally thought difficult or impossible to achieve. The alpha scale reliability of this item is 0.91, its composite scale reliability is 0.88, and its average variance extracted is 0.65 (Avolio et al., 1995), thus meeting all cut-off criteria. Furthermore, all factor loadings using partial least squares analysis and confirmatory factor analysis exceeded the minimum value recommended by the literature. Sample items of this scale include:

- (item 9) Talks optimistically about the future.
- (item 36) Expresses confidence that goals will be achieved.

Intellectual Stimulation

According to Bass (1998), and Bass and Avolio (1997), intellectual stimulation refers to questioning underlying assumptions publicly, reframing problems, finding creative solutions to difficult problems, and hence developing the potential of followers to be able to solve problems in the future. The alpha scale reliability of this item is 0.90, its composite scale reliability is 0.89, and its average variance extracted is 0.66 (Avolio et al., 1995), thus meeting all cut-off criteria. Furthermore, all factor loadings using partial least squares analysis and confirmatory factor analysis exceeded the minimum value recommended by the literature. Sample items of this scale include:

- (item 2) Re-examines critical assumptions to question whether they are appropriate.
- (item 30) Gets me to look at problems from many different angles.

Individualized Consideration

According to Bass (1998), and Bass and Avolio (1997), the construct of individualized consideration explains the leader's behavior in focusing on the growth and development of each follower, providing them with new opportunities to learn, and giving them personalized attention. Here the leader delegates challenging tasks to the followers, and instead of checking-up and controlling them, the leader coaches, mentors and teaches them in an attempt to help them reach those goals. The alpha scale reliability of this item is 0.90, its composite scale reliability is 0.86, and its average variance extracted is 0.61 (Avolio et al., 1995), thus meeting all cut-off criteria. Furthermore, all factor loadings using partial least squares analysis and confirmatory factor analysis exceeded the minimum value recommended by the literature. Sample items of this scale include:

- (item 19) Treats me as an individual rather than just as a member of a group.
- (item 29) Considers me as having different needs, abilities, and aspirations from others.

Contingent Reward

The contingent reward factor has remained intact, and forms the basis of the constructive element of transactional leadership behavior (Bass, 1998; Bass & Avolio, 1997). Here the leader stresses an exchange, and promises and delivers rewards when the follower reaches predefined goals. The alpha scale reliability of this item is 0.87, its composite scale reliability is 0.85, and its average variance extracted is 0.59 (Avolio et al., 1995), thus meeting all cut-off criteria. Furthermore, all factor loadings using partial least squares analysis and confirmatory factor analysis exceeded the minimum value recommended by the literature. Sample items of this scale include:

- (item 11) Discusses in specific terms who is responsible for achieving performance targets.
- (item 16) Makes clear what one can expect to receive when performance goals are achieved.

Management-by-Exception-Active

The transactional leadership scales have also been expanded. The contingent aversive reinforcement factor has been divided into two distinct elements: (a) management-by-exception active, and (b) management-by-exception passive. The former, is a corrective transaction, whereby the leader actively watches for deviations from the norm, and takes action when outcomes do not match standards. The alpha scale reliability of this item is 0.74, its composite scale reliability is 0.76, and its average variance extracted is 0.46 (Avolio et al., 1995), thus meeting all cut-off criteria except for the average variance extracted. Since the scale exceeds the reliability estimates it appears to be consistently measuring its common factor. Sample items of this scale include:

- (item 22) Concentrates his/her full attention on dealing with mistakes, complaints and failures.
- (item 24) Keeps track of all mistakes.

All factor loading exceeded the minimum cut-off point, except for item 22, where one of the loadings using confirmatory factor analysis is reported to be 0.37. Perhaps the word *complaints* should not be used, as it may refer to the leader's complaining behavior, and not the fact that the leader focuses on complaints when standards are not met. Item 22 could perhaps be improved by eliminating the word complaints to read "Concentrates his/her full attention on dealing with mistakes, and failures." Another possibility is to specify what is meant by complaints as follows: "Concentrates his/her full attention on dealing with mistakes, failures, and complaints when standards are not met."

Management-by-Exception-Passive

Passive management-by-exception entails waiting, and intervening only if standards are not met, or when things go wrong (Bass, 1998; Avolio & Bass, 1997). The alpha scale reliability of this item is 0.82, its composite scale reliability is 0.85, and its average variance extracted is 0.60 (Avolio et al., 1995), thus meeting all cut-off criteria. Sample items of this scale include:

- (item 12) Waits for things to go wrong before taking action.
- (item 17) Shows that he/she is a firm believer in "If it ain't broke, don't fix it."

All factor loading exceeded the minimum cut-off point, except for item 17 where both the loadings as measured by confirmatory factor analysis and partial least squares analysis are reported to be 0.37. Although the item is clearly an indicant of passive management-by-exception, the idiom is not simple and could confuse respondents. This is further complicated by the use of a double negative (Converse & Presser, 1986). Perhaps the item should read, "Shows that he/she is a firm believer in 'Fix it only if it is broken.'" This, however, loses the power of the idiom. Perhaps an entirely new item should be considered, for instance, "Intervenes only when standards are not met."

Laissez-Faire Leadership

Finally, laissez-faire leadership has been added to indicate a nontransaction of leadership, that is, the leader avoids making decisions and does not use his/her authority (Bass 1998; Bass & Avolio, 1997). This is the most inactive form of leadership. The alpha scale reliability of this item is 0.83, its composite scale reliability is 0.81, and its average variance extracted is 0.53 (Avolio et al., 1995), thus meeting all cut-off criteria. Furthermore, all factor loadings using partial least squares analysis and confirmatory factor analysis exceeded the minimum value recommended by the literature. Sample items of this scale include:

- (item 7) Is absent when needed.
- (item 28) Avoids making decisions.

As regards the content validity of item 7, it could possibly be improved since the word *absent* may refer to absence from work, instead of not being there when required. The item could be improved to read, "Is not there when needed."

In addition to the above scales, the MLQ also measure three outcomes. The scales are not the targets of this study as they do not measure leadership per se but outcomes of leadership. Depending which studies are found to satisfy inclusion for analysis in this dissertation, it may be possible that the effectiveness scale is used as a criterion variable, hence its inclusion below.

Effectiveness

This factor represents the effectiveness of the leader in four areas, namely job-related needs of followers, representation of the followers to higher-level managers, contribution to organizational effectiveness, and performance of the leader's team. The alpha scale reliability of this item is 0.91, its composite scale reliability is 0.90, and its average variance extracted is 0.68 (Avolio et al., 1995), thus meeting all cut-off criteria. Furthermore, all factor loadings using partial least squares analysis exceeded the minimum value recommended by the literature. Sample items of this scale include:

- (item 37) Is effective in meeting my job-related needs.
- (item 43) Is effective in meeting organizational requirements.

The Optimal Leadership Profile

The good leader, according to Bass (1998), is one who displays the transformational factors frequently and to a high degree. The good leader should also display the contingent reward factor and management-by-exception factor less frequently, and the passive factors least frequently. More specifically, when rating a leader on behaviors on the scale 0:1:2:3:4, corresponding to not at all, once in while, sometimes, fairly often, frequently if not always, Bass and Avolio (1999) state that the ideal leader profile is as follows: laissez-faire <1.0, management-by-exception passive <1.0, management-by-exception active <1.5, contingent reward >2.0, idealized influence (attribute) >3.0, idealized influence (behavior) >3.0, intellectual stimulation >3.0, individualized consideration >3.0, and inspirational motivation >3.0.

The above proposition is clearly supported by the theoretical reasoning of the scholars presented in the earlier sections. Active leadership is required more often than passive leadership. Emotional components of leadership are more powerful than economic transactions. Positive or constructive transactions are required more often that corrective transactions. And finally the absence of leadership is the most undesirable of all. According to Avolio et al. (1995), the data show that laissez-faire leadership is negatively related to the active factors of leadership and to subordinate-related effectiveness measures. In support of this notion, Argyris (1957) argued that laissez-faire leadership is even worse than directive, pressure-oriented leadership.

The next section discusses validity issues in leadership measurement, and presents studies that have critiqued the MLQ and its psychometric validity.

The Validity of the MLQ

Based on to the evidence presented by Avolio et al. (1995) above, the MLQ has demonstrated high reliability and validity. The MLQ has high alpha scale validity, and composite validity coefficients. The average variance extracted from each factor was mostly found to be satisfactory, and so too were the factor loadings.

The current MLQ was developed using exploratory and confirmatory factor analysis, the results of previous research using an earlier version of the MLQ, as well as the expert judgment of six leadership scholars who recommended additions or deletions of items (Avolio et al., 1995). Yukl (1998), and Hunt (1991), as well as other scholars listed below had criticized previous versions of the MLQ for measuring leadership outcomes and not specific behaviors, amongst others. These criticisms have been rebutted or addressed (Bass & Avolio, 1993), and consequently the MLQ 5X has been revised to include a broader range of leadership measures (Avolio et al., 1995).

Based on the results of a pooled study, measures of the MLQ behave according to the theory. Avolio et al. (1995) stated that the transformational factors are highly correlated among themselves, with an average of 0.83. The transformational scales also correlate highly with contingent reward with an average of 0.71. Avolio et al. argued that the transformational scales and contingent reward are both active and positive leadership forms. Further they stated, "as Shamir [1995] argues, the consistent honoring of transactional agreements builds trust, dependability and perceptions of consistency with leaders by followers, which are each a basis for transformational leadership" (p. 11). Management-by-exception active "exhibited either low positive or negative correlations with the transformational" and contingent reward scales (Avolio et al., p. 11). Management-by-exception active positively correlated with its passive counterpart management-by-exception passive, and laissez-faire leadership, which are generally negatively correlated with the active measures. Thus the active forms of transformational and contingent reward leadership are all positively associated with each other, as are the passive forms of leadership. According to Avolio et al.,

> This hierarchical pattern of relationships . . . parallels results of two meta-analyses. . . . Specifically, in descending order, the transformational, transactional and non-transactional leadership factors were correlated with extra effort, effectiveness and satisfaction, with the more corrective and passive forms of leadership being negatively correlated with the outcome measures. (p. 12)

Support for the hierarchical nature of the constructs is found in the literature as indicated in Lowe et al. (1996), and by other authors (e.g., Bycio et al., 1995; Den Hartog et al., 1997).

According to Avolio et al. (1995), the MLQ 5X was tested using confirmatory factor analysis on a total sample of 1,394 respondents, collected by nine independent researchers. Avolio et al. tested the MLQ for a two-factor model (i.e., active and passive leadership), a three-factor model (i.e., transformational, transactional, and nonleadership), and the nine-factor model, which the MLQ 5X was designed to represent. According to Avolio et al., the models improved, "as one progressed from the two-factor model to the three-factor model and again from the three-factor model to the full nine-factor model" (p. 25). The improvements were noted in various fit indices used in structural equation modeling (SEM). Also convergent and discriminant validity measures using partial least squares analysis indicated general support for the model. Similar results have been reported in Bass and Avolio (1997). Using the same procedure as above, on another independently gathered sample of 1,490 respondents, the nine-factor model again emerged using confirmatory factor analysis. The assertions of Avolio et al. (1995), as well as Bass and Avolio (1997) regarding the validity of the MLQ are further examined below.

Review of Literature on the MLQ

This section presents studies that critiqued or utilized various versions MLQ, and have made reference to its validity. Although there appears to be a lack of consistency among the findings in terms of the proposed factor structure of the MLQ, the studies indicate that empirical support can be found for various elements of the MLQ's factor structure, and for the patterns of correlations between the factors.

The fact that the MLQ has received mixed reviews in many instances is not surprising given that various versions of the MLQ have been tested in different languages, in a variety of industrial and cultural settings, and with different levels of leadership. Furthermore, the samples that have been utilized by the various researchers have been completely different, and oftentimes parts of the instrument were eliminated or modified (Avolio et al., 1999a). Since factor structures are generally sensitive to samples (Kerlinger, 1986), and compounded by the versions and language situation, it is reasonable to believe that the factor structure of the MLQ might not behave as expected in such situations.

Based on the literature reviewed, a legitimate concern that can be raised about the MLQ is the issue of multicollinearity of the transformational constructs, that is, their high inter-correlation suggesting that they may not measure different underlying constructs (Bycio et al., 1995; Carless, 1998a). This presents some concerns regarding the discriminant validity of the MLQ. On a theoretical level however, Bass (1985, 1998), Bass and Avolio (1994, 1997), argued that the factors are highly interrelated and mutually reinforcing. This would entail that the factors are oblique (i.e. correlated), and not orthogonal as is generally tested in exploratory studies. Moreover, exploratory studies are not the right procedure to test the construct validity of an instrument. Normally this would be left to procedures that use structural equation modeling in a confirmatory factor analysis (Long, 1983). However, in some of the articles below only exploratory techniques were used, which cannot confirm the validity of the constructs or latent variables. In reviewing the literature, what is notable though is that the components of the full-range-of-leadership model have been identified in various combinations by a variety of researchers. These studies are presented below.

Apart from Avolio et al. (1995), and Avolio et al. (1999a), the newest MLQ (Form 5X) has not been tested by scholars using confirmatory factor analysis on a large, independently gathered sample from which generalizations can be made. Avolio et al. (1995) noted the fact that some scholars claim that it lacks construct validity is not correct as all those researchers used a single, small sample, from which generalizations should not necessarily be made. This issue will be discussed later, after the presentation of articles below that have tested the MLQ factor structure.

Avolio et al. (1999a) tested a six-factor model similar to Bass's (1985) original propositions to show that it does not lack in discriminant validity. Using the MLQ 5X in a confirmatory factor analysis, Avolio et al. found support for a six-factor model including charisma, intellectual stimulation, individualized consideration, contingent reward, management-by-exception active, and passive-avoidant leadership. Although the full nine-factor model could have been tested, it appears that Avolio, Bass, and Jung used this study to rebut previous criticisms that were leveled at Bass for his original conceptualization of the model. Using a confirmatory approach, Avolio et al. (1999b), found that, for purposes of parsimony in testing the effect of humor on the leadership function, the MLQ 5X could be characterized by a three-factor model of transformational, transactional and nonleadership. Bycio et al. (1995) tested the factor structure of a 1985 version of the MLQ in Canada and found support for an active-passive model of leadership. Using confirmatory factor analysis on the MLQ 5X in an Australian sample, Carless (1998a) found support for a five-factor model. Furthermore, Carless found that transformational leadership could be divided into charisma, intellectual stimulation, and individualized consideration, but that the transformational factors could be accounted for by an overarching factor. Den Hartog et al. (1997) tested the MLQ 8Y (1989 version) in Dutch, and using exploratory factor analysis found support for a three-factor model (i.e., transformational, transactional, and laissez-faire). Druskat (1994) tested the MLQ 8Y (1990 version) with exploratory factor analysis, and found five factors labeled charisma/individualized consideration, intellectual stimulation/inspiration, contingent reward, laissez-faire/passive management-by-exception, and active management-by-exception. Using a confirmatory approach, and a German version of the MLQ 5R, Geyer and Steyrer (1998) found a core transformational leadership scale, and three transactional scales including contingent reward, and management-by-exception passive. Using principal components analysis, Hater and Bass (1988) found support for charisma, individualized consideration, intellectual stimulation, contingent reward and management-by-exception active and passive with the MLQ Form 5 (1985 version). Hinkin et al. (1997) used exploratory factor analysis and found that the MLQ 5X included inspirational motivation, individualized consideration, and intellectual stimulation. Using a confirmatory approach, Howell and Avolio (1993) found that the factor structure of the MLQ Form 10 (1990 version) included charisma, intellectual stimulation, individualized consideration, contingent reward, management-by-exception active and passive. Koh et al. (1995) tested the MLQ 5-S in Singapore, and using exploratory techniques validated a five-factor structure including charisma, contingent reward, active management-by-exception, passive management-by-exception, and laissez-faire leadership. Using confirmatory factor analysis, Tepper and Percy (1994) tested the discriminant validity of the MLQ Form X (1990 version) and found that charismatic and inspirational leadership measured the same underlying latent construct, and that individualized consideration, intellectual stimulation, and contingent reward formed distinct constructs. Tracey and Hinkin (1998) compared the underlying factor structure of the transformational scales of a 1990 version of the MLQ 5X to that of the Managerial Practices Survey (MPS), and with confirmatory factor analysis found that the factor structure of the transformational scales MLQ can be represented in a single scale. And finally, using a confirmatory factor analysis model, Yammarino et al. (1993) validated five factors of the model including transformational leadership (included charisma and inspiration items), transactional leadership (included contingent rewards and individualized consideration items), active management-by-exception, passive management-by-exception, and laissez-faire leadership.

A point to note is the amount of studies that have used the MLQ, and invested resources in testing its validity. Based on the above it appears that the factor structure of the MLQ can be found in some form or another. Furthermore, as noted in the MLQ technical report (Avolio et al., 1995), which utilized a very large sample, it can be deduced that the MLQ is a valid and reliable instrument for measuring the nine aforementioned leadership constructs. The fact that inconsistent evidence emerges regarding the construct validity of the MLQ scales by other researchers could be explained in terms of varied samples or units within samples that have been utilized. According to Bass and Avolio (1997), "single sample studies that have not fully confirmed the factor structure proposed by Bass (1985), and expanded by Avolio and Bass (1991), may underestimate the validity of the model and instrument due to sample biases (e.g. small *N*-sizes, unique sample characteristics, etc.)" (p. 60). Moreover, according to Avolio et al. (1999a), the varied results are attributed to "type of analyses employed, poor item/scale construction, restricted sampling. . . . and to the frequent practice of modifying the MLQ survey (e.g. some researchers have dropped whole scales, while others have not included all of the items contained in the original scales)" (p. 442). As discussed previously, when independent samples were combined, confirmatory factor analysis indicated strong support for a nine-factor model. This nine-factor model emerged in two occasions thus confirming the MLQ's construct validity. Thus the limitations of some of the above articles are further highlighted.

Another criticism of the exploratory studies is regarding small sample sizes. According to Kerlinger (1986), as a rule of thumb the sample size should be about 10 times larger than the number of measures in the instrument (p. 593). Thus if an instrument has 45 items, the sample size should be about 450. Yeh (1996) supports this proposition and states that results based on anything less than a 10:1 ratio, and an sample size less than 200, should be viewed with skepticism. Some of the above studies did not meet the minimum cut-off points suggested by Kerlinger, and Yeh. Moreover, based on the guidelines of MacCallum, Browne, and Sugawara (1996), many studies were underpowered.

As a further critique of exploratory factor analysis which was the type of analysis used by many of the researchers, according to Kerlinger, "Factors . . . differ . . . with different samples" (p. 591), and are inherently unstable. According to Long (1983), "The exploratory factor model's inability to incorporate substantively meaningful constraints, and its necessary imposition of substantively meaningless constraints, has earned it the scornful label of *garbage in/garbage out . . . model*" [italics added] (p. 12). To confirm the existence of a model that specifies the constructs beforehand, and their interrelationship, confirmatory factor analysis must be utilized. Indeed, according to Long, confirmatory factor analysis tests "whether the data *confirm* the substantively generated model" and its structural relations (p. 12).

As has been established above by the review of current literature, since all the samples were quite distinct differences in loading patterns would be expected. The loading refers to the standardized regression path of the construct to the manifest variable. These differences in loadings could result from the contextualized nature of leadership style, and moderator effects. Consequently, although not all the factors of the MLQ appeared in all situations, most factors did appear in various combinations, thus confirming that certain constructs are being reliably measured. Apart from those problems, many of the researchers that analyzed the criterion validity of the MLQ as well as its discriminant validity with multiple regression analysis, encountered problems as a result of the multicollinear nature of the transformational constructs. Structural equation modeling may overcome the limitations of other multivariate techniques in handling multicollinear factors (Marcoulides & Hershberger, 1997; Maruyama, 1998; Rigdon, 1998).

As noted by Lowe et al. (1996), "The MLQ has . . . acquired a history of research as the primary quantitative instrument to measure the transformational leadership construct" (p. 388). According to van Velsor (1991), the MLQ is included in the most frequently used "multiple-perspective management-assessment instruments" (p. 1). Indeed as stated in the Mental Measurement Yearbook (Bessai, 1995), Bass and Avolio "are to be commended on a carefully constructed instrument. . . . The theoretical basis of the scales is clearly explained and ample evidence of construct validity, including the factor structure is provided" (p. 247). Furthermore Bessai stated, "All in all, it appears to be an adequate test with good construct validity, adequate reliability, and a strong research base" (p. 247). Also in the Mental Measurement Yearbook Kirnan (1995), stated, "The MLQ stands apart from other measures of leadership in its sound psychometric properties" (p. 248). Based on the evidence presented and the limitation of the studies that independently tested the MLQ, the cumulative results suggest that the MLQ 5X may be valid and reliable psychometric assessment instrument, which can be used to gauge the full-range-of-leadership model. However this proposition must be independently ascertained.

Summary

This section explained the concept of leadership and placed it under the broader field of organizational systems and behavior. Leadership was examined historically, to identify its dimensions from an exchange and emotional perspective, which is useful to undergird the full-range leadership theory. The need for transformational leadership was expressed, as was the way it can facilitate organizational outcomes. Issues of measurement in leadership were presented and the validity of the MLQ was examined. Lastly, this section highlighted the need for structural equation modeling techniques to test the validity of psychometric instruments. The next details the design of the study, and the statistical procedures that tested the hypotheses.

CHAPTER 3: METHOD

Introduction

The review of literature described leadership theory and placed it in the context of organizational behavior. The way transformational leadership theory encompasses most traditional approaches was discussed to identify its underlying dimensions. Furthermore, it was noted that to confirm a factor structure and its measurements, confirmatory factor analysis—part of structural equation modeling (SEM)—should be used. The literature reviewed also revealed that the MLQ factor structure has exhibited inconsistent results in independent studies, even though substantial evidence for its validity and reliability has been provided by Avolio et al. (1995).

The purpose of this section to identify how disparate data of various studies can be statistically synthesized to test whether the full-range-of-leadership model displays a consistent pattern of relationships among its constructs and whether the constructs can reliably predict a dependent measure. Therefore, this chapter describes a method to test whether MLQ is an accurate and consistent instrument across different samples, and to determine how studies were identified and coded for purposes of analysis.

Research Design

SEM, the methodological technique used in this dissertation, has been referred to as causal modeling, causal analysis, LISREL modeling (after the computer program LISREL), and analysis of covariance structures, and includes techniques such as confirmatory factor analysis (Bollen, 1986; Kerlinger, 1986; Marcoulides & Schumacker, 1996; Maruyama, 1998). SEM analysis is based on the principles of multiple regression, econometric, path and factor analysis (Bollen, 1986), and "is broadly defined to accommodate models that include latent variables, measurement errors in both dependent and independent variables, multiple indicators, reciprocal causation, simultaneity, and interdependence" (Marcoulides & Schumacker, 1996, p. 1).

The reasons for choosing SEM over other approaches are several. According to Kerlinger (1986), SEM is useful for testing theories since "implications of a theory are built into a model that reflects the theory and its implications: latent variables are included, their relations and effects assessed, and the whole structure of relations subjected to simultaneous test" (p. 616). Bagozzi, Yi, and Phillips (1988) provided a detailed explanation of the superiority of SEM techniques for construct validation compared with Campbell and Fiske's (1959) multitrait-multimethod matrix. Others have indicated that SEM is the preferred method when a specified theoretical structure requires testing and have demonstrated its superiority to other multivariate methods, for example multiple regression or exploratory factor analysis (Bollen, 1989; Marcoulides & Hershberger, 1997; Maruyama, 1998). SEM methodology provides a powerful way to test factor structures since it explicitly tests how the factor structure is supposed to behave (Long, 1983). In comparing SEM to exploratory factor analysis, Kim and Mueller (1978) noted that "the chance that . . . specific hypotheses will be supported by a given covariance structure is smaller, if in fact some factorial causation is not in operation" (p. 46). Finally, with SEM, theoretical frameworks and hypothesized causal relationships can be tested for the purposes to validate psychometric instruments (Nunnally & Bernstein, 1994). Apart from the studies cited in chapter 2 in the field of leadership, SEM is widely used across various management-related domains: (a) organizational behavior to determine aggression in the workplace, (b) services marketing to validate models of service value, (c) general marketing to measure market orientation, (d) services marketing to determine manager's perceptions of service quality, (e) management to determine extrarole efforts of employees in initiating change, and (f) management to validate quality control models (Aquino, Grover, Allen, & Bradfield, 1999; Brady & Robertson, 1999; Caruana, 1999; Eriksson, Majkgård, & Sharma, 1999; Morrison & Phelps, 1999; Noronha, 1999). As a result of the advantages listed above, and given SEM's wide use, it has been chosen as the methodology to test this study's hypotheses.

The hypotheses tested were twofold, each with three subhypotheses relating to nine leadership factors: (a) idealized influence (attributed), (b) idealized influence (behavior), (c) inspirational motivation, (d), intellectual stimulation, (e) individualized consideration, (f) contingent reward, (g) management-by-exception (active), (h) management-by-exception (passive), and (i) laissez-faire leadership. The hypotheses tested were the following:

H1. The nine leadership factors and the way their a priori structure is specified among its factors to freely covary will fit the data as determined by various fit indices.

$H1_a$ The five transformational leadership factors will be positively associated with one another and with contingent reward.

$H1_b$ The five transformational leadership factors will be negatively associated to management-by-exception active, management-by-exception passive, and laissez-faire leadership.

$H1_c$ Contingent reward will be negatively associated with management-by-exception active, management-by-exception passive, and laissez-faire leadership.

$H1_d$ Management-by-exception active, management-by-exception passive, and laissez-faire leadership will be positively associated with one another.

H2. The nine leadership factors, how their a priori structure is specified among its factors to freely covary, and how they predict the dependent measure, will fit the data as determined by various fit indices.

$H2_a$ The paths of the five transformational leadership factors to the criterion variable will be positive and significant as measured by the unstandardized regression coefficients.

$H2_b$ The path of contingent reward to the criterion variable will be positive and significant as measured by the unstandardized regression coefficient.

$H2_c$ The paths of management-by-exception active, management-by-exception passive and laissez-faire leadership to the criterion variable will be negative and significant as measured by the unstandardized regression coefficients.

As with Avolio et al. (1995, 1999a), other first order models were also tested to determine whether there are more parsimonious full-range models. The models that were tested included (a) one general single-order factor; (b) two correlated single-order factors of active and passive leadership; (c) three correlated single-order factors of transformational, transactional, and laissez-faire; (d) three correlated single-order factors of transformational, transactional, and passive leadership; (e) six correlated single-order factors of idealized influence attributed/idealized influence behavior/inspirational motivation, intellectual stimulation, individualized consideration, contingent reward, active management-by-exception, and passive leadership; (f) seven correlated single-order factors of idealized influence attributed/idealized influence behavior/inspirational motivation, intellectual stimulation, individualized consideration, contingent reward, active management-by-exception, passive management-by-exception, and laissez-faire leadership; (g) eight correlated single-order factors of idealized influence attributed/idealized influence behavior, inspirational motivation, intellectual stimulation, individualized consideration, contingent reward, active management-by-exception, passive management-by-exception, and laissez-faire leadership; and (h) eight correlated single-order factors of idealized influence attributed, idealized influence behavior, inspirational motivation, intellectual stimulation, individualized consideration, contingent reward, active management-by-exception, and passive leadership. The reason for testing different model combinations is because of the possible indistinguishable nature of some of the constructs from each other, for instance idealized influence from inspirational motivation, or laissez-faire leadership from passive management-by-exception, as parts of the literature contend.

The above two hypotheses are designed to test whether the MLQ is a valid and reliable instrument. According to Carmines and Zeller (1979), validity is "the extent to which any measuring instrument measures what it is intended to measure" (p. 17). According to Nunnally and Bernstein (1994), three types of validity exist: (a) content, (b) construct, and (c) predictive validity. Content validity is concerned with the representativeness of the measures of the domain, and is mostly judgmental (Kerlinger, 1986; Pettigrew, 1996). Construct and predictive validity are more complex, and are the major focus of this study. According to Nunnally and Bernstein, construct validity is concerned with two important components of any theoretical framework: (a) the measurement of constructs or latent variables, and (b), their underlying structure. The former is referred to as the measurement component, and seeks to examine the internal consistency or reliability of scales. The measurement component was not of primary concern in this study since it was not tested directly, but indirectly through linear composites. The structural component was the major focus of the study since, according to Nunnally and Bernstein, it "describes the properties of the resulting measures in terms of how constructs interrelate" (p. 85) and whether the constructs "behave as expected" (p. 90). Predictive validity, on the other hand, "concerns using an instrument to estimate some criterion . . . that is external to the measuring instrument itself" (Nunnally & Bernstein, 1994, p. 94). Furthermore, "The extent to which such tests serve prediction functions enhances the overall construct validity of the instrument" (Nunnally & Bernstein, 1994, p. 108). Nunnally and Bernstein stressed that the type of criterion variable used in predictive validity must be guided by theory and that the relationship should be logical and obvious. This leads to the so-called "criterion problem" and associated problems for example the halo effect or common methods variance. Therefore this study attempted to use dependent measures that were separate from the independent measures to determine the MLQ's predictive validity. Since however such data could not be found the dependent scales of the MLQ were utilized.

Carmines and Zeller (1979) defined reliability it as "the extent to which [a] test, or any measuring procedure yields the same results on repeated trials" (p. 11). Reliability is concerned with the internal consistency of the measurement model of a theoretical framework. Since this study only tested the factor-level covariance structure and its predictiveness, it could not test for the measurement model directly. However, a factor is a linear composite of its measures (Nunnally & Bernstein, 1994); as a consequence, if the MLQ's factor structure is invariant across samples while maintaining errors and loadings equal across groups, this has direct bearing on its stability (Bagozzi & Yi, 1988), which is de facto proof of its reliability. Also, under conditions of invariance where errors and loadings are constrained to equality across groups, SEM fit results will direct bear on the measurement model and hence on the instrument's reliability. Furthermore, validity implies that an instrument must also be reliable (Williams, 1992).

Therefore, in order to determine whether the MLQ is reliable and valid, the theory's measurement and structural model must be validated. This study was concerned with the structural model associated with the full-range leadership theory, and its construct validity. Implications for its measurement model were assumed since the linear composites of the factors were analyzed and constrained to equality across groups, which thus affected the validity of the MLQ measurement model. To validate a theory's measurement and structural model, one can use SEM procedures to test the hypothesized structural model. According to Bollen (1986), the hypothesis tested in a structural equation model is whether the predicted structure, based on a theoretical framework, actually fits the sample data. Specifically,

> The procedures emphasize *covariances* rather than cases. Instead of minimizing functions of observed and predicted individual values [in SEM] we minimize the difference between the sample covariances and the covariance predicted by the model. The observed covariances minus the predicted covariances form the residuals. The fundamental hypothesis for these structural equation procedures is that the covariance matrix of the observed variables is a function of a set of parameters. If the model were correct and if we know the parameters, the population covariance matrix would be exactly reproduced. (p. 1)

Structural equation modeling can also be used to test whether a structural model is invariant across various samples, that is whether the model is the same across samples, by studying "similarities and differences in factor structures between different groups" (Jöreskog, 1971, p. 409). The technique is useful "to investigate whether the . . . model structure, and/or causal parameters of a model are equivalent across samples of the same or different populations" (Bagozzi & Yi, 1988, p. 83). Furthermore, multiple group comparisons provide information about the "comparability of causal processes in different populations. The focus on processes means attention directed toward relationships, namely covariance structure comparisons" (Maruyama, 1998, p. 259). The assumption of this method is "that independent, random samples are available from each population" (Bollen, 1989, p. 356).

According to Maruyama (1998), the multiple group test is a powerful but underutilized technique perhaps because of its complex nature. However, it appears to be used for a variety of contexts and approaches: (a) perceptions and attitudes across cultures, (b) leadership styles across cultures, (c) aptitude tests across sex and race subgroups, (d) perceptions of work in teacher groups, (e) intelligence tests in groups of children, (f) problem behavior in adolescents across cultural groups, and (g) substance abuse across gender groups (e.g., Cheung & Rensvold, 1999; Gibson & Marcoulides, 1995; Hattrup, Schmitt, & Landis, 1992; Hofmann, Mathieu, & Jacobs, 1990; Lee & Lam, 1988; Widaman & Reise, 1997; Williams, Ayers, Abbott, Hawkins, & Catalano, 1996).

Based on the literature regarding SEM and the test of model invariance, it appears that this methodology is the most suitable to test the MLQ. According to Heck (1998), "comparative studies involving different groups yield not only information about potential group or sample differences, but also additional insight into the construct validity of measures" (p. 211). Therefore, an implied model for both hypotheses was specified, and data from the studies that have used the MLQ were employed to test whether the parameters were equal across groups. This method provided a rigorous test for the MLQ's validity and reliability.

Research Procedure and Sample

The variables in this study were the nine leadership factors of the full-range-of-leadership model, as well as variables dependent on leadership outcomes. The unit of analysis was the data points of studies, which were located using online searches of PSYCHLIT, SOCIOFILE, EMERALD, and ABI-INFORM databases; references lists of unpublished and published studies; and collaboration with the Center for Leadership Studies of the State University of New York, Binghamton, which houses published and unpublished studies on leadership. The studies used met the selection criteria below. Based on discussions with the Center for Leadership Studies, it was originally estimated that about 50 studies were eligible for evaluation and inclusion in this study. A sample of studies eligible for inclusion (Daughtry, 1995; Masi, 1994; Southwick, 1998; Stepp, Cho, & Chung, n.d.) and other studies that have tested the MLQ as cited in the review of the literature were analyzed to determine possible moderator variables and the type of dependent measures that might be available for use in the current study. Coding procedures for testing moderators and identifying dependent variables are discussed below.

Only studies were included that used the MLQ 5X empirically, and reported data on the nine MLQ factors of leaders as rated by followers, or by leader self reports. Furthermore, studies must have reported a correlation matrix of the factors, sample size, factor means and standard deviations. Studies with this information, and those reporting correlations of leadership measures to a criterion measure were utilized. Studies without the criterion variable were used to test the factor structure, while studies with the criterion variable were used to test both the factor structure and the MLQ's predictive validity.

The correlation matrix was converted to a covariance matrix. The conversion for each correlation was based on the formula that the covariance between two variables is the correlation of the two variables multiplied by the square root of the product of the variances of the variables (Kerlinger, 1986). This conversion is vital because "Multi-sample comparisons always should work with covariance matrices, for only such matrices can deal adequately with differences in variability across samples" (Maruyama, 1998, p. 258). Other scholars in the SEM also stress this point field (Bagozzi & Yi, 1988; Cudeck, 1989).

To test the structure of the MLQ factors, the covariances of the factors were set to equality across the groups. According to Byrne (1994), this can be termed structural invariance. Also, according to Maruyama (1998), constraining the relationships between the structural part of the model is useful to test "whether or not the latent variables [display] the same relationships across samples" (p. 262). The alpha scale reliabilities of the data reported in the MLQ technical report (Avolio et al., 1995) were used to estimate error residuals and factor loadings. The residual variance of error variable was estimated using the procedure recommended by Bollen (1989): 1 minus the alpha scale reliability multiplied by the variance of the linear composite. To identify the equation the loading of the error variable was set to 1.0 (Maruyama, 1998). For scaling purposes the variance of the latent variable was also set to 1.0, which simply provides a metric for the latent variable, and does not affect the outcome of the fit (Maruyama, 1998). In order to account for the total variance of the linear composite, the loading of the theoretical variable on the linear composite is equal to the square root of the variance of the linear composite minus the residual variance. In this way, the total variance in the linear composite is accounted for since the residual "is made up of all causes of a measure that are not included in the model" (Maruyama, 1998, p. 82). The variance for the manifest variable can thus be expressed as follows: $var(y_1).(\lambda_1^2) + var(\varepsilon_1).(\lambda_2^2)$, where

1. $var(y_1)$ is the variance of the latent variable,
2. λ_1^2 is the squared loading of the latent variable,
3. $var(\varepsilon_1)$ is the variance of the error variable, and
4. λ_2^2 is the squared loading of the error variable.

For a more stringent test of the MLQ, apart from the constrained covariances, the loadings of the latent variables on the manifest variables and the residual variances were set to equality across the groups. This is known as strict or full factorial invariance and provides a test of the factor model, its measurement items, and the error variance across samples (Widaman & Reise, 1997). According to Byrne (1986), strict factorial invariance is "excessively stringent"; however, it provides the most conservative estimates for a model's invariance.

To test the MLQ factors with the criterion variable, in addition to the above constraints, the standardized regression coefficient paths of the factors to the criterion variable was also set to equality across the groups.

Based on the four studies that were prescreened and were included in this dissertation (Daughtry, 1995; Masi, 1994; Southwick, 1998; Stepp, Cho, & Chung, n.d.), and on the review of the literature that has used the MLQ, the following subjective and objective dependent variables could have been utilized: unit financial performance, follower perception of the leader's effectiveness, level of extra effort of followers, quality and quantity of followers performance, unit and follower innovation, follower creativity, performance in followers, that is "sales efforts, overall work attitude, and product knowledge" (Yammarino et al., 1997, p. 211), learning orientation in followers, follower satisfaction with the leader, follower commitment to the job, follower commitment to the organization, and organizational citizenship (Avolio et al., 1999b; Avolio, Waldman, & Einstein, 1988; Barling et al., 1996; Bycio et al., 1995; Coad & Berry, 1998; Druskat, 1994; Geyer & Steyrer, 1998; Hater & Bass, 1998; Howell & Higgins, 1990; Howell & Avolio, 1993; Howell & Frost, 1989; Jung & Avolio; Kahai, & Avolio, 1998; Keller, 1992; Koh et al., 1995; Lowe et al., 1995; Ristow et al., 1999; Ross & Offermann, 1997; Sosik, 1997; Yammarino et al., 1993; Yammarino et al., 1997). However, since not enough of these measures could be found across most studies, the outcome scales of the MLQ were employed as they are reported most often.

If the models did not yield acceptable fit results for both the tests of validity and reliability, moderating variables were sought to ascertain the contextual nature of leadership. According to Baron and Kenny (1986), "moderation implies that the casual relation between two variables changes as a function of the moderator variable" (p. 1174). Furthermore they state that this type of analysis can "probe more deeply into the nature of casual mechanisms and integrate seemingly irreconcilable theoretical positions" (p. 1173). Baron and Kenny add, "Moderator variables are typically introduced when there is an unexpectedly weak or inconsistent relation between a predictor and criterion variable (e.g. a relation holds in one setting but not in another, or for one subpopulation but not for another)" (p. 1178). Finally, when the moderator is a categorical variable, and the independent variable is continuous, multiple groups in a structural equation model can be utilized to test for the moderator (Baron & Kenny, 1986. A test for moderators could also be used to test for the consistency of relations among constructs in different moderating conditions. To test for moderators, the studies considered in this dissertation were coded according to the relevant categories identified in chapter 2. The moderator categories included but were not limited to the following, depending on the variability found as indicated by the fit indices:

1. National culture, using the three dimensions of Hofstede (1991) discussed previously and, if applicable, Hall's (1971) framework of monochronic versus polychronic cultures, and high versus low context cultures.

2. Organizational conditions, that is, high- or low-risk conditions.

3. Organizational characteristics, that is, organic or mechanistic organizations.

4. Level of the leaders, that is, supervisory on up to top-level leaders.

5. Organizational and environmental turbulence, that is, turbulent and uncertain environments, or stable and predictable environments.

6. Gender of leaders.

7. Gender of followers.

The coding process was heuristic that is, it varied depending on the results of the analysis. Where data groupings resulted in high within-group variability as indicated by the fit indices, moderators were sought to discover the variability's source. In this case new moderator categories were created and studies were grouped accordingly to test whether the actual fit of the implied model improved. The coding method for moderators was based on theoretical propositions and prior empirical findings, however it was also grounded on the pattern of results in the current data set. Important here was that groups were similar enough from a theoretical perspective to be included together in an analysis, and were not simply driven by statistical results.

Data Analysis

SEM has been made a popular statistical technique primarily by the software program LISREL, which is often used interchangeably with structural equation modeling (Bollen, 1989; Marcoulides & Hershberger, 1997). For this study, the AMOS program was used to analyze the data (Arbuckle & Wothke, 1999). This program is currently one of the most frequently used in SEM because of its straightforward nature, ease of use in generating path diagrams for structural models, and powerful imputation method (Arbuckle, 1994; Hox, 1995; Kline, 1998a; Miles & Shevlin, 1998).

Prior to conducting any SEM procedure, the model must be identified (Maruyama, 1998; Rigdon, 1998). This entails determining whether the model has positive degrees of freedom, that is, enough information for the parameters to be estimated (Hoyle, 1995), and whether the parameters that require estimation are less than the available variances-covariances (MacCallum, 1995). According to Maruyama (1998), degrees of freedom are calculated by the following formula: "$v(v+1)/2$ (where v is the number of measures)" (p. 188). Therefore, as constraints to the model are added, degrees of freedom are gained (Maruyama, 1998).

In a test of model invariance, various indices can be used to evaluate whether the model actually fits the data. The model tested in any structural procedure consists of the

> differences between the variance/covariance matrix predicted by the model and the sample variance/covariance matrix from the observed data [The] differences are referred to as 'fit' or 'goodness of fit,' namely, how similar the hypothesized model is to the observed data. (Maruyama, 1998, p. 196)

According to Maruyama (1998), the solution can be estimated in an iterative process, the most popular of which is maximum likelihood estimation, whose goal it is to "reduce discrepancies between observed and predicted matrices" (p. 196), while estimating the values of the free parameters (Hoyle, 1995). The discrepancy function is generally expressed as F, where the assumption is that as the predicted and the observed matrix converge, their difference thus approaches zero and the residuals are minimized (Bollen. 1989; Marcoulides & Hershberger, 1997; Maruyama, 1998). When only observed variables are used, according to Maruyama, the formula used for this discrepancy function is the following: $F = \ln|\Sigma| - \ln|S| + tr(S\Sigma^{-1}) - n$ (p. 164), where

1. $\ln|\Sigma|$ is the log of the determinant of the implied covariance matrix,
2. $\ln|S|$ is the log of the determinant of the sample covariance matrix,
3. $tr(S\Sigma^{-1})$ is the trace of the sample matrix (S) times the inverse of the implied matrix (Σ^{-1}), and
4. n is the size of the input matrix.

Since the product of a matrix with its inverse produces an identity matrix (Marcoulides & Hershberger, 1997), as S and Σ converge, the trace of the product of the sample matrix and the determinant of the implied matrix (which is the sum of the diagonal) approaches *n*, and their difference approaches zero (Maruyama, 1998). Others cite similar formulas for maximum likelihood estimation (Bollen; 1989; Browne & Cudeck, 1993; Chou & Bentler, 1995). The discrepancy function for a multiple group comparison is similar to the above but takes into account the constraints of group parameters (Jöreskog, 1971).

Thus, fit is conventionally evaluated for statistical significance, where "a nonsignificant goodness of fit statistic" (Maruyama, 1998, p. 200) indicates a good fit, and where the fit is assessed by "the chi-square goodness of fit test of the residuals" (p. 200). According to Marcoulides and Hershberger (1997), "this is one of those rare occasions in which a researcher is more interested in retaining the null hypothesis" (p. 222). Marcoulides and Hershberger state that the formula for calculating the chi-square is as follows: $\chi^2 = (n - 1)(F)$. However, this statistic is limited since it depends entirely on sample size. Many scholars have noted this problem, since in large samples any model can be rejected and in small samples incorrect models may be accepted (Bagozzi and Yi, 1988; Bentler, 1990; Bentler & Bonet, 1980; Marsh, Balla, & McDonald, 1988). Consequently, to limit the effect of sample size, the use of a ratio (χ^2/df) has been proposed by some; however, the cut-off point recommended by researchers is not consistent, with recommendations of ratios ranging below five, three, two, or less (Arbuckle & Wothke, 1990; Bollen, 1989).

As a result of the χ^2 problem, various indices have been developed to evaluate structural equation models. Since there is much disagreement regarding which index or indices are most appropriate, it is generally agreed that a variety of indices should be used to assess model fit (Bollen, 1989; Bollen & Long, 1993; Heck, 1998; Marcoulides & Hershberger, 1997; Maruyama, 1986; Marsh, Balla, & Hau, 1996; Rigdon, 1998). Regarding the evaluation of multiple-group structural equation models, a common strategy is to use relative or adjunctive fit indices, where the model is compared to a baseline or null model (Bollen, 1989; Byrne, 1994, 1995; Hu & Bentler, 1995; Maruyama, 1998; Tanaka, 1994; Widaman & Reise, 1997). The best-known indices follow:

1. Bentler's (1990), Comparative Fit Index or CFI.
2. Bentler and Bonett's (1980), Normed Fit Index or NFI.
3. Bollen's (1986), ρ_1 or Relative Fit Index (RFI).
4. Bollen's (1989), Δ_2 or Incremental Fit Index (IFI).
5. Tucker and Lewis's (1973), ρ_2 or Tucker Lewis Index (TLI).

For the above five indices, values close to 1.00 indicate a very good fit and those .90 are considered acceptable; however, personal judgment may often be called upon (Heck, 1998; Hoyle, 1995; Maruyama, 1998; Rigdon, 1998). Another useful measure of fit is the Root Mean Square Error of Approximation (RMSEA) (Browne & Cudeck, 1993). The RMSEA value, including the upper confidence interval, should not exceed .10, with values between .08 to .05 indicating mediocre fit, and values below .05 and close to zero indicating a very good fit. The RMSEA has also been proven useful for establishing the power of a test (MacCallum et al., 1996). As a further test, all estimated parameters should be reasonable (Bollen, 1989; Rigdon, 1998); for instance, correlations should not exceed 1.0 and variances should not be negative.

The process of choosing the best fitting model from nested models is straightforward since "the difference between the chi-squares of the two models provides a test of whether fixing one or more parameters results in a significant decrement in fit" (Marcoulides & Hershberger, 1997, p. 249). Given that the process for identifying the best fitting model from nonnested models is difficult and may result in a judgment call, and since there is no statistical method to test for significant differences in fit indices, two additional fit measures were also used to maximize the credibility of the results. These were the Akaike Information Criteria (AIC) (Akaike, 1987) and the Expected Cross-Validation Index (ECVI) (Browne & Cudeck, 1989), which according to Marcoulides and Hershberger (1997), Maruyama (1998), and Kline (1998b), are useful in comparing nonnested or nonhierarchical competing models. The model with the lowest value of the AIC and ECVI indicates the best fit. Indeed, according to Kline,

> The $\chi^2_{\text{difference}}$ statistic can be used as a test of significance only for hierarchical [nested] models. However, sometimes researchers specify alternative models that are not hierarchically related. Although the values of the χ^2 statistics from two nonhierarchical models can still be compared, the difference between them cannot be tested for significance. Any such comparison, though, should take account of the number of parameters because more complex models tend to fit the data better. Something called the Akaike [1987] Information Criterion (AIC) allows such comparison. The AIC is a modification of the standard goodness-of-fit χ^2 statistic that includes a 'penalty' for complexity. . . . Given two nonhierarchical models, the one with the lowest AIC is preferred. (pp. 137-138)

Similarly, the ECVI (Browne & Cudeck, 1989) can be used to give an expected value if a cross-validation sample is used in the analysis of covariance structures. Again, a lower number means a better model. Thus, using indices such as the ECVI and the AIC is useful "because of their ability to order models from best fitting to worst fitting" (Maruyama, 1998, p. 246).

Studies Included in Analysis

Studies included for analysis were identified according to the criteria for inclusion stipulated above. Apart from studies that were identified by the means indicated in this chapter, the Center for Leadership Studies (CLS) at the State University of New York at Binghamton allowed for the use of the data from Avolio et al. (1995), and Avolio et al. (1999a) that were gathered by independent researchers for the CLS up to and including 1995. Studies published from the data included in the first validation sample of Avolio et al. (1995) were also obtained to determine categorical variables that could moderate the outcomes of this study.

The following five independent studies were found to meet the criteria for inclusion:

1. Daughtry (1995).
2. Masi (1994).
3. Peters (1997).
4. Schwartz (1999).
5. Stepp et al. (n.d.).

Data from Avolio et al. (1995) were based on the following eight studies:

1. Anthony (1994).
2. Carnegie (1998).
3. Colyar (1994).
4. Kessler (1993).

5. Kilker (1994).

6. Lokar (1995).

7. Maher.

8. Uhl-Bien study.

The studies conducted by Karen Maher and Mary Uhl-Bien could not be located. Consequently, any deductions pertaining to moderating conditions of those studies were assumed based the information provided by Avolio et al. (1995). Also, one of the studies by Ben Tin-Pang that was included in Avolio et al. (1995) was excluded from this study, as data were not reported for all nine factors of the MLQ.

No published studies from the extended sample used by of Avolio et al. (1999a) could be located. Consequently, any deductions pertaining to moderating conditions were assumed based on the information provided in Avolio et al. (1999a). Data from Avolio et al. (1999a) were based on the following five studies:

1. U.S. business firm study A.

2. U.S. business firm study B.

3. U.S. fire departments study.

4. U.S. not-for-profit agency study.

5. U.S. political organization study.

Based on the information available, the above 18 studies were coded so that moderators could be identified. A summary of the studies and the coding categories are provided in Table 1.

Table 1

Summary of Studies and Coding Conditions Included for Analysis

Author	Rater n-size	Source of data	Dependent Variable	Industry Type	Risk Conditions	Environmental Conditions	Degree of Organizational Structure	Level of leader	Gender of leader	Gender of followers
Daughtry	260	Dissertation		Vocational academic	Low	Stable	Assumed medium	Middle	64.3% M; 35.7% F	Unknown
Masi	305	Dissertation	ee	Military recruit. unit	Low	Stable	Assumed high	Middle	93% M; 7% F	Assumed mostly M
Peters	632	Dissertation	ee, eff, sat	Hospitality/retail	Low	Stable	Assumed low	Low	57.5% M; 42.5% F	28% M; 66% F[b]
Schwartz	962	Dissertation	ee, eff, sat	Perioperative nurse	High	Unstable	Assumed high	Low	8.4% M; 91.6% F	4.37% M; 95.63% F
Stepp et al.	592	Unpublished	ee, eff, sat	Govt. research	Low	Stable	Assumed high	Various	75.7% M; 24.3% F	57.5% M; 42.6% F[c]
Anthony	456	CLS		Public telecom. Co.	Low	Stable	Assumed high	Various	Unknown	Unknown
Carnegie	99	CLS	ee, eff, sat	Gas exploration	High	Unstable	Assumed high	Low	Assumed mostly M	Assumed mostly M
Colyar	45	CLS	ee	Nurse educ. execs.	Low	Stable	Assumed medium	Middle	5% M; 95% F	Assumed mostly F
Kessler	66	CLS	ee	Govt. research	Low	Assumed stable	Assumed high	Assumed middle	Unknown	Unknown
Kilker[a]	436	CLS	ee, eff, sat	Nurse educators	Low	Stable	Assumed medium	Assumed Middle	Assumed mostly F	3% M; 97% F
Lokar	194	CLS	ee	Military platoons	High	Unstable	Assumed high	Low	100% M	100% M
Maher	162	CLS	ee, eff, sat	Various firms	Unknown	Assumed stable	Assumed low	Unknown	Unknown	Unknown
Uhl-Bien	314	CLS	ee	Business firm	Assumed low	Assumed stable	Assumed low	Unknown	Unknown	Unknown
"Business firm A"	215	CLS	ee, eff, sat	Business firm	Assumed low	Unstable	Assumed low	Unknown	Unknown	Unknown
"Political org."	428	CLS	ee, eff, sat	Political org.	Assumed low	Assumed stable	Unknown	Unknown	Unknown	Unknown
"Business firm B"	549	CLS	ee	Business firm	Assumed low	Assumed stable	Assumed low	Unknown	Unknown	Unknown
"Fire department"	308	CLS	ee, eff, sat	U.S. Fire dept.	High	Unstable	Assumed high	Unknown	Assumed mostly M	Assumed mostly M
"Not-for-profit agency"	172	CLS	ee, eff, sat	U.S. Non-profit org.	Assumed low	Assumed stable	Assumed high	Unknown	Unknown	Unknown

Note. ee = extra effort, eff = effectiveness, sat = satisfaction; M = male, F = female. In addition to the 18 samples listed above, the Stepp et al. study also included leader self-ratings (n = 229), as did the Daughtry study (n = 101). Total n size of samples, including self and follower ratings was 6,525 from a total of 20 samples.

[a]These results are based on self-ratings. [b]6% unknown. [c]Rounded.

For ease of reference, the studies are referred to henceforth as follows:

1. The Daughtry (1995) study is referred to as "vocational academic."
2. The Masi (1994) study is referred to as "military recruiting unit."
3. The Peters (1997) study is referred to as "hospitality/retail."
4. The Schwartz (1999) study is referred to as "perioperative nurses."
5. The Stepp et al. (n.d.) study is referred to as "government research organization (2)."
6. The Anthony (1994) study is referred to as "public telecommunications."
7. The Carnegie (1998) study is referred to as "gas exploration."
8. The Colyar (1994) study is referred to as "nurse educator executives."
9. The Kessler (1993) study is referred to as "government research organization (1)."
10. The Kilker (1994) study is referred to as "nurse educators."
11. The Lokar (1995) study is referred to as "military platoon."
12. The Maher study is referred to as "various firms."
13. The Uhl-Bien study is referred to as "business firms (1)."
14. The U.S. business firm study A is referred to as "business firms (2)."
15. The U.S. business firm study B is referred to as "business firms (3)."
16. The U.S. fire departments study is referred to as "fire departments."
17. The U.S. not-for-profit agency study is referred to as "not-for-profit agency."
18. The U.S. political organization study is referred to as "political organization."

The data from Kilker (1994) were based on self-ratings. Data from Stepp et al. (n.d.), and Daughtry (1995) included separate self-rating results in addition to follower ratings. As such, all self-reported data were included with caution in subsequent analyses because self-ratings of leaders tend to be inflated or biased (Atwater & Yammarino, 1992; Bass & Avolio, 1997; Podsakoff & Organ, 1986). This could allow for the possibility of a different factor structure from that of ratings provided by followers.

As is evident from Table 1, not enough studies were found with objective or organizational-determined criteria. Since most studies included the outcome variables embedded in the MLQ, it appeared that the "Effectiveness" scale was the most appropriate variable for inclusion in the analyses of the criterion validity of the MLQ. Since the Effectiveness scale is the most objective and least emotional MLQ outcome scale, the scales of "Satisfaction" and "Extra Effort" were not included in subsequent analyses. Although the inclusion of an MLQ outcome scale may seem to be a limitation, its incorporation has the advantage that it is a standard measure across studies and as such minimizes the impact of using variables that are not conceptually and metrically equivalent.

Unfortunately, all of the studies but one were conducted in the United States. As such, national culture could not be analyzed as a moderating condition. Given the similarity of British culture to that of the United States, including the Carnegie (1998) study with samples from United States did not warrant concern.

Since no information was available to classify organizations by their internal structure, different degrees of structure were assumed. These included high, medium, and low degrees of structure, which were used as a general classification scheme to detect moderators. This strategy will be discussed further in chapter 4.

Limitations of Methodology

As has been noted, all theories have boundaries (Dubin, 1976). This study and the methodology used was bounded or limited by various elements. The most obvious limitation was that data selection was exclusionary and nonrepresentative. As noted above, generalizations may only be made to the study level and the particular contexts/culture from which the data used in this study were collected. Furthermore. analyzing secondary data implies that the quality of the analysis is based on the quality of the secondary data.

An issue related to analyzing secondary data is the inclusion of unpublished studies, referred to as the "file drawer problem," since those studies allegedly did not find significant effects and were destined for the file drawer (Rosenthal, 1979). However, based on the results of a meta-analysis of the MLQ literature, Lowe et al. (1996) found similar patterns of correlations for 22 published and 17 unpublished studies. A difference was found in only one of the five scales used; consequently, Lowe et al. combined the results of the published and unpublished studies, practice they say is common.

As noted above the method was limited in that only survey-based measures were used, which may not capture important contextual elements of how the leadership process works (Conger, 1998). Also, since only one method for gauging leadership was used that had a predefined structure, it does not necessarily cover all of the potential leadership constructs discussed in previous research. Thus, the use of the MLQ survey potentially limits the validity and generalizability of the findings. Furthermore, the method is limited by the assumptions made regarding the coding conditions. Finally, the method of grouping data and determining moderators was bounded by the categorization process, and the theoretical propositions behind that process. As discussed by Widaman and Reise (1997), a challenge in conducting invariance studies is how to define a group, and whether there are strong enough theoretical considerations in differentiating populations into various groups. Thus, the results were limited to how the groups were defined.

General limitations of structural equation modeling are discussed by Cliff (1983), who stated that data cannot ever confirm a model but simply fail to disconfirm it. This means that there may be other models that might not be disconfirmed by the data that are themselves viable and which may not have been tested. Furthermore, as other critics note, causation cannot be implied from covariance structure modeling (Breckler, 1990), meaning that any causal inferences must be guided by strong theoretical propositions. Also, there is still much disagreement regarding the assessment of fit indices (Rigdon, 1998), which often leads to judgment calls on the part of the researcher. Finally, alternative estimation procedures may exist, for instance partial least squares analysis, which has less stringent assumptions about data distributions and which may be better suited for purposes of prediction with complex models in an emerging area (Chin, 1998; Falk & Miller, 1992; Wold, 1982, 1985).

Summary

This section detailed the importance of reliability and validity in psychometric instrument validation. Reliability and validity issues were linked to how they can be tested using SEM. The SEM procedure was described, with particular emphasis on the multiple-groups procedure, its utility in construct validation, and how this can be performed with the data sets that were gathered. Furthermore, various indices of fit were presented to rate the viability of the models used to test the MLQ's validity and reliability. Finally, limitations of both SEM, and the procedures of this study were discussed. The results obtained are described and analyzed in chapter 4, and conclusions and recommendations are made in chapter 5 of this dissertation.

CHAPTER 4: RESULTS

Introduction

This chapter reports the results based on the methodological approach described in chapter 3. The aim of this chapter is to establish whether the data can be interpreted in a meaningful manner, and to determine whether the hypotheses of this study can be accepted or rejected. Patterns in the results are applied to the research questions so that the appropriate deductions can be made, the implications of which are discussed in the final chapter.

Moderating Conditions Found

Initially, the entire set was grouped together to determine whether the data fit the model. To test for the improvement of fit, moderating conditions were sought. The process for identifying moderating conditions was guided by theory. The process was also heuristic in that for all categories of results, samples were added or removed from moderated groups to determine which combination of groups had the best fit while concurrently ensuring that the group was homogenous in some aspects and made what could be termed "theoretical sense." Theoretical sense in this context implies that the samples were compatible to their moderator label, and were similar enough to be included in a common category.

Using the procedures outlined in the previous chapter, the following moderators were found:

1. Normal low-risk business conditions.
2. Normal low-risk academic conditions.

3. High-risk/unstable conditions.

4. High bureaucratic conditions.

5. Majority male leaders.

6. Majority female leaders.

7. Low-level leaders.

8. Middle-level leaders—sample one. This moderator is henceforth referred to as middle-level leaders (1).

9. Middle-level leaders—sample two. This included the same data set as in the normal low-risk academic conditions, and is referred to as middle-level leaders (2).

10. Majority male raters—this included the same data set as in the majority male leader condition.

11. Majority female raters—this included the same data set as in the majority female leader condition.

Given that three of the above conditions were included in other conditions, eight moderators were tested:

1. Normal low-risk business conditions.
2. Normal low-risk academic conditions, and/or middle-level leaders (2).
3. High-risk/unstable conditions.
4. High bureaucratic conditions.
5. Majority male leaders, and/or male raters.
6. Majority female leaders, and/or female raters.
7. Low-level leaders.
8. Middle-level leaders (1).

Since three samples included self-ratings, a self-rating condition was tested but did not fit the data well. Possible reasons may include problems of inflated or unreliable ratings associate with self-rating measures (Atwater & Yammarino, 1992; Bass & Avolio, 1997; Podsakoff & Organ, 1986). This could allow for the possibility of a different factor structure from that of ratings provided by followers. Another potential problem could have been the small sample size, and the fact that the government research sample differed in organizational conditions compared to the other two samples.

Models Tested

As stated previously, nine competing models were tested to determine which of the models was the best representative of the data:

1. Model 1—one general single-order factor.

2. Model 2—two correlated single-order factors of active and passive leadership.

3. Model 3—three correlated single-order factors of transformational, transactional, and laissez-faire leadership.

4. Model 4—three correlated single-order factors of transformational, transactional, and passive leadership.

5. Model 5—six correlated single-order factors of idealized influence attributed/idealized influence behavior/inspirational motivation, intellectual stimulation, individualized consideration, contingent reward, active management-by-exception, and passive leadership.

6. Model 6—seven correlated single-order factors of idealized influence attributed/idealized influence behavior/inspirational motivation, intellectual stimulation,

individualized consideration, contingent reward, active management-by-exception, passive management-by-exception, and laissez-faire leadership.

7. Model 7—eight correlated single-order factors of idealized influence attributed/idealized influence behavior, inspirational motivation, intellectual stimulation, individualized consideration, contingent reward, active management-by-exception, passive management-by-exception, and laissez-faire leadership.

8. Model 8—eight correlated single-order factors of idealized influence attributed, idealized influence behavior, inspirational motivation, intellectual stimulation, individualized consideration, contingent reward, active management-by-exception, and passive leadership.

9. Model 9—the MLQ, model consisting of nine correlated single-order factors of idealized influence attributed, idealized influence behavior, inspirational motivation, intellectual stimulation, individualized consideration, contingent reward, active management-by-exception, passive management-by-exception, and laissez-faire leadership.

Results

The results are reported in two general sections:

1. Results concerning H1 and its subhypotheses, which sought to test the factor structure and measurement model of the MLQ and its interfactor relationships.

2. Results concerning H2 and its subhypotheses, which apart from testing the factor structure, also tested the unstandardized path from the independent variable to the outcome measure.

Goodness-of-Fit Results

As regards H1, the results for the invariance of the factor structure of the entire data set are reported in Table 2 and for the full factorial invariance in Table 3.

As is evident, the nine-factor model best represents the data for the weaker test, that is, the test of the factor structure invariance of the MLQ. As regards the full invariance of the MLQ, Model 8 (eight correlated single-order factors of idealized influence attributed, idealized influence behavior, inspirational motivation, intellectual stimulation, individualized consideration, contingent reward, active management-by-exception, and passive leadership) appeared to best represent the data.

After conducting the tests on the entire data set, the self-rating samples were removed to determine whether the fit improved. These results are reported in Table 4 for the factor structure test of invariance, and in Table 5 for the test of full invariance. Based on the results under both testing conditions, it appeared that the Kilker (1994) study could be included with the follower ratings since the fit was not affected when included with the other studies. Conversely, the fit improved substantially with the removal of the other two self-rating studies of Stepp et al. (n.d.) and Daughtry (1995).

The results of the tests that excluded the self-ratings paralleled those of the entire data set; that is, for the factor structure invariance test the nine-factor model best represented the data, and for the full factorial invariance Model 8 best represented the data. However, given how hypotheses are tested in SEM analysis, alternative models and/or data sets should be tested. This is because data either succeed or fail to succeed in disconfirming the model but never actually confirm it. By testing competing models and different data groupings, one can ensure that as many viable options as possible of rejecting the model are exhausted so that the best fitting model under certain data conditions is tentatively accepted.

As expected, the results of the moderating conditions found improvement in the fit. The results for the test of the factor structure invariance are reported as follows:

1. Normal low-risk business conditions—see Table 6.
2. Normal low-risk academic conditions, and/or middle level leaders (2)—see Table 8.
3. High-risk/unstable conditions—see Table 10.
4. High bureaucratic conditions—see Table 12.
5. Majority male leaders, and/or male raters—see Table 14.
6. Majority female leaders, and/or female raters—see Table 16.
7. Low-level leaders—see Table 18.
8. Middle-level leaders (1)—see Table 20.

The results for the test of full factorial invariance are reported in the following tables:

1. Normal low-risk business conditions—see Table 7.
2. Normal low-risk academic conditions, and/or middle level leaders (2)—see Table 9.
3. High-risk/unstable conditions—see Table 11.
4. High bureaucratic conditions—see Table 13.
5. Majority male leaders, and/or male raters—see Table 15.
6. Majority female leaders, and/or female raters—see Table 17.
7. Low-level leaders—see Table 19.

8. Middle-level leaders (1)—see Table 21.

The nine-factor model consistently represented the data better in every moderating condition both for the invariance test of the factor structure and for the full factorial invariance test. For both invariance tests, the nine-factor model consistently had the lowest values for the AIC and ECVI, and all other fit results pointed towards a good fit for the nine-factor model. Indeed, in 18 out of the 18 invariance tests, the nine-factor model exceeded *all cut-off criteria* for model fit and better represented the data than did the competing models.

For the test of the invariance of the factor structure, a summary of the results of nine-factor model under the different moderating conditions is provided in Table 22, and for the full factorial invariance a summary is provided in Table 23. Furthermore, a summary of the moderator categories and corresponding samples is provided in Table 24, and a summary list of samples, coding conditions, and moderator categories is provided in Table 25.

All results pertaining to the aforementioned tables are presented below. A basic description and an explanation of results are also provided for each table.

Table 2

Goodness-of-Fit Results for Entire Data Set for Test of Factor Structure Invariance

Model	χ^2	Df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	165227.39	880	-2.201	-1.619	-2.240	-1.642	.000	.169	165267.389	25.406
Model 2. Two factors	48596.10	859	.058	.211	.059	.214	.062	.092	48678.100	7.483
Model 3. Three factors	64885.88	837	-.257	-.081	-.261	-.083	.000	.108	65011.880	9.994
Model 4: Three factors	32360.52	837	.373	.461	.379	.467	.381	.076	32486.519	4.994
Model 5. Six factors	9863.716	765	.809	.820	.821	.832	.821	.042	10133.716	1.558
Model 6. Seven factors	8229.50	720	.841	.841	.852	.852	.852	.040	8589.500	1.320
Model 7. Eight factors	6438.24	693	.875	.870	.887	.883	.887	.036	6852.239	1.053
Model 8: Eight factors	5506.25	693	.893	.889	.905	.902	.905	.033	5920.251	.910
Model 9: Full nine factors	3968.91	684	.923	.919	.935	.932	.935	.027	4400.912	.677
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	lowest value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (N = 6,525).

Table 3

Goodness-of-Fit Results for Entire Data Set for Test of Full Factorial Invariance

Model	χ^2	df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	8318.06	692	.839	.832	.850	.844	.850	.041	8737.060	1.343
Model 2. Two factors	6165.87	672	.881	.872	.892	.884	.892	.035	6621.867	1.018
Model 3. Three factors	8490.71	671	.835	.823	.846	.835	.846	.042	8748.709	1.376
Model 4: Three factors	5867.63	651	.886	.874	.898	.887	.897	.035	6365.627	.979
Model 5. Six factors	5397.12	662	.895	.886	.907	.899	.907	.033	5873.122	.903
Model 6. Seven factors	5692.51	677	.890	.883	.902	.895	.901	.034	6138.510	.944
Model 7. Eight factors	5630.05	652	.891	.880	.902	.892	.902	.034	6126.053	.942
Model 8: Eight factors	5117.64	652	**.901**	.891	**.912**	**.903**	**.912**	**.032**	**5613.643**	**.863**
Model 9: Full nine factors	5437.38	684	.895	.889	.907	.902	.907	.033	5869.379	.902
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	lowest value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (N= 6,525).

As is evident from the results presented in Table 2 for the test of the factor structure invariance, the nine-factor model exceeded all six of the cut-off criteria recommended by the literature, had the largest values for the adjunctive fit indices, and has the lowest AIC and ECVI values. As noted in chapter 3, the AIC and ECVI values provide useful comparisons for nonnested models. As a matter of degree, models with lower values better represent the data. Furthermore, the upper RMSEA interval was also below the conservative value of .05 recommended by the literature. Apart from the full nine-factor model, no other competing model came close to satisfying the cut-off criteria recommended by the literature while concurrently having the lowest AIC and ECVI values. Based on these results, H1, which stated that the nine leadership factors and the way their a priori structure is specified among its factors to freely covary will fit the data as determined by various fit indices, is fully supported.

Table 3 shows results for the full factorial test of invariance. Here, Model 8 was the best fitting model since it exceeded five of the six cut-off criteria, had the largest values for the adjunctive fit indices, and had the lowest AIC and ECVI values. Its upper RMSEA interval was also below the conservative value of .05 recommended by the literature. The nine-factor model satisfied four of the six cut-off criteria and had the second lowest AIC and ECVI values. As such it was the second-best fitting model. Based on these results, H1, which stated that the nine leadership factors and the way their a priori structure is specified among its factors to freely covary will fit the data as determined by various fit indices, was not supported.

In sum, the evidence points to mixed support for H1 for the entire data set.

In the next step of the analysis, the self-ratings were removed from the data set to determine whether the fit improved. As expected the fit did improve, however, the results still mirrored those of the entire data set namely that the nine-factor model best represented the data for the factor structure test of invariance, and Model 8 best represented the data for the full factorial invariance test. The results are presented in Tables 4 and 5.

Table 4

Goodness-of-Fit Results for Entire Data Set Excluding Self-Evaluation Data Sets for Test of Factor Structure Invariance

Model	χ^2	df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	156073.94	792	-2.090	-1.528	-2.124	-1.548	.000	.178	156109.940	25.273
Model 2. Two factors	43535.50	773	.138	.277	.140	.281	.142	.095	43609.495	7.060
Model 3. Three factors	59724.12	753	-.183	-.018	-.185	-.018	.000	.113	59838.117	9.687
Model 4: Three factors	28420.20	753	.437	.516	.444	.522	.445	.076	28534.203	4.619
Model 5. Six factors	8643.05	687	.829	.839	.840	.849	.840	.043	8889.054	1.439
Model 6. Seven factors	7207.96	646	.857	.857	.868	.868	.868	.041	7535.955	1.220
Model 7. Eight factors	5750.97	621	.886	.881	.897	.893	.897	.037	6128.971	.992
Model 8: Eight factors	5022.36	621	.901	.896	.912	.908	.912	.034	5400.355	.874
Model 9: Full nine factors	3667.07	612	**.927**	**.923**	**.939**	**.935**	**.939**	**.028**	**4063.072**	**.658**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	lowest value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 6,195). The sample excludes the self-rating data of the government research organization (2), and the vocational academic study, but includes the results of the nurse educators study.

Table 5

Goodness-of-Fit Results for Entire Data Set Excluding Self-Evaluation Data Sets for Test of Full Factorial Invariance

Model	χ^2	df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	7946.81	622	.843	.836	.853	.847	.853	.044	8322.814	1.347
Model 2. Two factors	5749.06	604	.886	.878	.897	.889	.897	.037	6161.063	.997
Model 3. Three factors	7968.67	603	.842	.830	.852	841	.852	.044	8382.665	1.357
Model 4: Three factors[a]										
Model 5. Six factors	4936.57	594	.902	.893	.913	.905	.913	.034	5368.570	.869
Model 6. Seven factors	5201.55	607	.897	.890	.908	.902	.908	.035	5607.552	.908
Model 7. Eight factors	5196.65	601	.897	.889	.908	.901	.908	.035	5614.653	.909
Model 8: Eight factors	4677.67	601	**.907**	.900	**.918**	**.912**	**.918**	**.033**	**5095.674**	**.825**
Model 9: Full nine factors	4924.73	612	.902	.897	.914	.908	.913	.034	5320.729	.861
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	lowest value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 6,195). The sample excludes the self-rating data of the government research organization (2), and the vocational academic study, but includes the results of the nurse educators study.

[a]Failed to converge after 500 iterations.

The results presented in Table 4 for the test of the factor structure invariance indicate that the nine-factor model exceeded all six cut-off criteria recommended by the literature, had the largest values for the adjunctive fit indices, and had the lowest AIC and ECVI values. The upper RMSEA interval was also below the conservative value of .05 recommended by the literature. Apart from the full nine-factor model, no other competing model came close to satisfying the cut-off criteria recommended by the literature while concurrently having the lowest AIC and ECVI values. Based on these results, H1, which stated that the nine leadership factors and the way their a priori structure is specified among its factors to freely covary will fit the data as determined by various fit indices, is fully supported.

As regards the results presented in Table 5 for the full factorial test of invariance, Model 8 was the best fitting model, satisfied five of the six cut-off criteria, and had the largest values for the adjunctive fit indices. Model 8 also had the lowest AIC and ECVI values, and its upper RMSEA interval was below the conservative value of .05 recommended by the literature. The nine-factor model did exceed five of the six cut-off criteria, and had the second lowest AIC and ECVI values. As such it was the second best fitting model. Based on these results, H1, which stated that the nine leadership factors and the way their a priori structure is specified among its factors to freely covary will fit the data as determined by various fit indices, was not supported.

In sum, the evidence points to mixed support for H1 for the entire data sets excluding self-evaluations.

It is interesting to note the comparisons of results regarding the two invariance tests. Under the stricter testing condition Model 8 best represented the data. Model 8 has the same factor structure as the nine-factor model; however, the two passive leadership constructs, management-by-exception passive and laissez-faire leadership, are included in one single-order factor. The fact that Model 8 is the best fitting model is perhaps because of the dissimilar samples, and the need to represent these samples as parsimoniously as possible. The fact that the data sets should be grouped according to homogeneity makes theoretical sense since if the residual variances and the loadings are constrained to be equal, this entails that the samples should be similar too, which they were not. In the more flexible test of invariance, loadings, and residuals variances, which includes all variance not accounted for by the latent factor, is individually determined. As a result, the more flexible test can be considered the most appropriate test to use when samples are dissimilar.

Consequently, for the more stringent test of full factorial invariance, the data must be grouped such that the loadings and residual variances can be constrained to be equal. This is another methodological justification for identifying moderating conditions supported by theory. Under different moderating conditions, the results for the full factorial test of invariance changed, with the nine-factor model best representing the data. For the factor structure test of invariance, the nine-factor model continued to be the best model to represent the data. The results of the first moderator test for the normal business conditions data sets are presented in Tables 6 and 7 below.

Table 6

Goodness-of-Fit Results for Normal Business Conditions Data Sets for Test of Factor Structure Invariance

Model	χ^2	df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	30408.03	176	-2.027	-1.476	-2.063	-1.498	.000	.373	30416.025	24.608
Model 2. Two factors	8465.10	171	.157	.290	.160	.295	.162	.198	8483.102	6.863
Model 3. Three factors	10197.71	165	-.015	.114	-.015	.116	.000	.222	10227.712	8.275
Model 4: Three factors	4982.91	165	.504	.567	.512	.575	.513	.154	5012.911	4.056
Model 5. Six factors	898.60	141	.911	.909	.924	.922	.923	.066	976.602	.790
Model 6. Seven factors	706.69	128	.930	.921	.942	.934	.942	.060	810.692	.656
Model 7. Eight factors	487.47	117	.951	.940	.963	.954	.963	.051	613.465	.496
Model 8: Eight factors	471.58	117	.953	.942	.964	.956	.964	.050	597.581	.483
Model 9: Full nine factors	279.19	108	**.972**	**.963**	**.983**	**.977**	**.983**	**.036**	**423.186**	**.342**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	lowest value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 1,240). The following studies were included in the tests: various firms, business firms (1), business firms (2), and business firms (3).

Table 7

Goodness-of-Fit Results for Normal Business Conditions Data Sets for Test of Full Factorial Invariance

Model	χ^2	df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	1777.97	132	.823	.807	.834	.819	.834	.100	1873.966	1.516
Model 2. Two factors	1031.12	128	.897	.885	.909	.897	.909	.076	1135.117	.918
Model 3. Three factors	1658.94	127	.835	.813	.846	.825	.845	.099	1764.937	1.428
Model 4: Three factors	952.69	123	.905	.889	.916	.902	.916	.074	1066.688	.863
Model 5. Six factors	598.57	118	.940	.927	.952	.941	.951	.057	722.565	.585
Model 6. Seven factors	578.96	117	.942	.929	.953	.943	.953	.057	704.956	.570
Model 7. Eight factors	557.80	111	.944	.928	.955	.941	.955	.057	695.795	.563
Model 8: Eight factors	503.54	111	.950	.935	.960	.949	.960	.053	641.544	.519
Model 9: Full nine factors	473.27	108	**.953**	**.937**	**.963**	**.951**	**.963**	**.052**	**617.268**	**.499**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	lowest value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 1,240). The following studies were included in the tests: various firms, business firms (1), business firms (2), and business firms (3).

Based on the results presented in Table 6 for the factor structure test of invariance, the nine-factor model again was the best fitting model. It exceeded all six cut-off criteria recommended by the literature, and had the largest values for the adjunctive fit indices. It also had the lowest AIC and ECVI values, and its upper RMSEA interval was below the conservative value of .05 recommended by the literature. Apart from the full nine-factor model no other competing model came close to satisfying the cut-off criteria recommended by the literature while concurrently having the lowest AIC and ECVI values. Based on these results, H1, which stated that the nine leadership factors and the way their a priori structure is specified among its factors to freely covary will fit the data as determined by various fit indices, is fully supported.

For the full factorial test of invariance, the results in Table 7 paralleled those of the above test, namely that the nine-factor model again was the best fitting model, had the largest values for the adjunctive fit indices, and exceeded all six cut-off criteria recommended by the literature. It also had the lowest AIC and ECVI values, and its upper RMSEA interval was below the cut-off value of .08 recommended by the literature. Apart from the full nine-factor model, no other competing model came close to satisfying the cut-off criteria recommended by the literature, while concurrently having the lowest AIC and ECVI values. Based on these results, H1, which stated that the nine leadership factors and the manner in which their a priori structure is specified among its factors to freely covary will fit the data as determined by various fit indices, is fully supported.

In sum, the evidence points to full support for H1 for the normal business conditions data sets.

The next moderator that was tested was termed normal low-risk academic conditions. As with the above analysis, the nine-factor model best represented the data for both invariance tests.

Table 8

Goodness-of-Fit Results for Normal Low-Risk Academic and/or Middle Level Leaders (2) Data Sets for Test of Factor Structure Invariance

Model	χ^2	Df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	18536.31	132	-3.157	-2.401	-3.253	-2.461	.000	.435	18542.309	25.125
Model 2. Two factors	7971.36	128	-.788	-.508	-.811	-.521	.000	.288	7985.364	10.820
Model 3. Three factors	6016.98	123	-.349	-.185	-.359	-.189	.000	.255	6040.983	8.186
Model 4: Three factors	3683.83	123	.174	.275	.179	.281	.182	.198	3707.826	5.024
Model 5. Six factors	1313.83	102	.705	.688	.722	.705	.722	.127	1379.830	1.870
Model 6. Seven factors	1026.53	91	.770	.727	.786	.745	.785	.118	1114.526	1.510
Model 7. Eight factors	626.88	81	.859	.813	.875	.833	.875	.096	734.878	.996
Model 8: Eight factors	430.46	81	.903	.871	.920	.893	.920	.076	538.463	.730
Model 9: Full nine factors	157.14	72	**.965**	**.947**	**.981**	**.971**	**.980**	**.040**	**283.137**	**.384**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	lowest value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 741). The following studies were included in the tests: nurse educators, nurse educator executives, and vocational academic administrators.

Table 9

Goodness-of-Fit Results for Normal Low-Risk Academic and/or Middle Level Leaders (2) Data Sets for Test of Full Factorial Invariance

Model	χ^2	Df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	1026.08	97	.770	.744	.787	.762	.786	.114	1102.076	1.493
Model 2. Two factors	584.22	94	.869	.849	.888	.871	.887	.084	666.222	.903
Model 3. Three factors[a]										
Model 4: Three factors	420.77	90	.906	.887	.924	.909	.924	.071	510.769	.692
Model 5. Six factors	315.57	84	.929	.909	.947	.932	.947	.061	417.570	.566
Model 6. Seven factors	315.33	82	.929	.907	.947	.929	.946	.062	421.325	.571
Model 7. Eight factors	268.19	76	.940	.915	.956	.937	.956	.059	386.185	.523
Model 8: Eight factors	218.11	76	.951	**.930**	.968	**.954**	.967	.050[b]	336.106	.455
Model 9: Full nine factors	209.09	72	**.953**	**.930**	**.969**	.953	**.968**	**.051**	**335.093**	**.454**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	lowest value	Lowest Value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 741). The following studies were included in the tests: nurse educators, nurse educator executives, and vocational academic administrators.

[a]Failed to converge after 500 iterations. [b]The upper value of the confidence interval was higher than that of Model 9.

As is indicated from the results of Table 8 for the factor structure test of invariance, the nine-factor model again was the best fitting model, had the largest values for the adjunctive fit indices, and exceeded all six cut-off criteria recommended by the literature. It also had the lowest AIC and ECVI values, and its upper RMSEA interval was below the conservative value of .05 recommended by the literature. Apart from the full nine-factor model no other competing model came close to satisfying the cut-off criteria recommended by the literature while concurrently having the lowest AIC and ECVI values. Based on these results, H1, which stated that the nine leadership factors and the way their a priori structure is specified among its factors to freely covary will fit the data as determined by various fit indices, is fully supported.

For the full factorial test of invariance the results were not as convincing. However as indicated in Table 9 the nine-factor model was the best fitting model since it exceeded five of six cut-off criteria recommended by the literature and had the largest values for four of the five adjunctive fit indices. It also had the lowest AIC and ECVI values, and its upper RMSEA interval was below the cut-off value of .08 recommended by the literature. Although the differences in some instances were very small, it is clear from the literature that the indices give a good indication as to which is the better model when comparing nonnested models. Since the indices provide a relative indication of which is a better model but cannot determine the statistical significance of this, a model with a better value or combination of values is chosen. Fit in this instance is a matter of degree, and the model with the best result is considered the best-fitting model. There is no way to gauge whether there is a statistically significant difference between the first- and second-best fitting models using these indicators. Since the nine-factor model generally had better adjunctive fit values, the lowest AIC and ECVI values, *and also* a lower discrepancy statistic (χ^2), *and is* theoretically and substantively more appealing, the decision to accept this model as the best representative of the data is justified.

Apart from the full nine-factor model, no other competing model came close to satisfying the cut-off criteria recommended by the literature while concurrently having the lowest AIC and ECVI values. Only Model 8 had one cut-off value, the TLI, better than Model 9. Even though the results for the nine-factor model were incrementally better than that of Model 8, the nine-factor model's results were comparatively more satisfactory and as such, better represented the data. Based on these results the evidence points towards the support of H1 which stated that the nine leadership factors, and the manner in which their a priori structure is specified among its factors to freely covary will fit the data as determined by various fit indices, is supported.

In sum, the evidence points to support for H1 for the normal low-risk academic and/or middle level leaders (2) data sets.

The next moderator that was tested was termed high risk/unstable conditions. For both test of invariance, the nine-factor model best represented the data. Results are displayed in Tables 10 and 11.

Table 10

Goodness-of-Fit Results for High Risk/Unstable Conditions Data Sets for Test of Factor Structure Invariance

Model	χ^2	Df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	11480.73	88	-1.452	-1.006	-1.480	-1.002	.000	.509	11484.728	22.969
Model 2. Two factors	2448.25	85	.477	.557	.486	.566	.487	.236	2458.254	4.917
Model 3. Three factors	3270.74	81	.301	.379	.307	.385	.308	.281	3288.738	6.577
Model 4: Three factors	961.13	81	.795	.818	.809	.830	.809	.147	979.129	1.958
Model 5. Six factors	191.40	63	.959	.953	.972	.968	.972	.064	245.398	.491
Model 6. Seven factors	160.91	54	.966	.954	.977	.969	.977	.063	232.901	.466
Model 7. Eight factors	121.67	45	.974	.958	.983	.973	.983	.058	211.667	.423
Model 8: Eight factors	102.07	45	.978	.965	.988	.980	.988	.050	192.065	.384
Model 9: Full nine factors	64.04	36	**.986**	**.973**	**.994**	**.988**	**.994**	**.039**	**172.036**	**.344**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	lowest value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 502). The following studies were included in the tests: military platoon, and fire departments.

Table 11

Goodness-of-Fit Results for High Risk/Unstable Conditions Data Sets for Test of Full Factorial Invariance

Model	χ^2	Df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	847.67	62	.819	.790	.830	.802	.830	.159	903.667	1.807
Model 2. Two factors	443.20	60	.905	.886	.917	.900	.917	.113	503.197	1.006
Model 3. Three factors	799.09	59	.829	.792	.840	.804	.839	.158	861.088	1.722
Model 4: Three factors	259.53	57	.945	.930	.856	.845	.956	.084	325.530	.651
Model 5. Six factors	154.90	50	.967	.952	.977	.967	.977	.065	234.895	.470
Model 6. Seven factors	146.54	47	.969	.952	.979	.967	.978	.065	232.535	.465
Model 7. Eight factors	118.47	41	.975	.956	.983	.970	.983	.061	216.466	.433
Model 8: Eight factors	93.85	41	.980	.965	.989	.980	.989	.051	191.847	.384
Model 9: Full nine factors	75.24	36	**.984**	**.968**	**.992**	**.983**	**.991**	**.047**	**183.242**	**.366**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	lowest value	Lowest Value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 502). The following studies were included in the tests: military platoon, and fire departments.

As is apparent from the results presented in Table 10 for the factor structure test of invariance, the nine-factor model again was the best fitting model, exceeded all six cut-off criteria recommended by the literature, and had the largest values for the adjunctive fit indices. It also had the lowest AIC and ECVI values, and its upper RMSEA interval was below the cut-off value of .08 recommended by the literature. Apart from the full nine-factor model no other competing model came close to satisfying the cut-off criteria recommended by the literature, while concurrently having the lowest AIC and ECVI values. Based on these results, H1, which stated that the nine leadership factors and the manner in which their a priori structure is specified among its factors to freely covary will fit the data as determined by various fit indices, is fully supported.

For the full factorial test of invariance, the results in Table 11 paralleled those of the previous test, namely that the nine-factor model again was the best fitting model, had the largest values for the adjunctive fit indices, and exceeded all six cut-off criteria recommended by the literature. It also had the lowest AIC and ECVI values, and its upper RMSEA interval was below the cut-off value of .08 recommended by the literature. Apart from the full nine-factor model, no other competing model came close to satisfying the cut-off criteria recommended by the literature while concurrently having the lowest AIC and ECVI values. Based on these results, H1, which stated that the nine leadership factors and the manner in which their a priori structure is specified among its factors to freely covary will fit the data as determined by various fit indices, is fully supported.

In sum, the evidence points to full support for H1 for the high risk/unstable conditions data sets.

The next moderator that was tested was termed high bureaucratic conditions. As has come to be expected, the nine-factor model best represented the data for both invariance tests.

Table 12

Goodness-of-Fit Results for High Bureaucratic Conditions Data Sets for Test of Factor Structure Invariance

Model	χ^2	df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	40234.27	220	-1.958	-1.420	-1.990	-1.439	.000	.339	40244.273	25.375
Model 2. Two factors	12200.46	214	.103	.246	.105	.249	.107	.188	12222.463	7.706
Model 3. Three factors	17230.84	207	-.267	-.102	-.271	-.103	.000	.228	17266.837	10.887
Model 4: Three factors	8637.32	207	.365	.448	.371	.454	.372	.160	8673.318	5.469
Model 5. Six factors	2308.73	180	.830	.830	.841	.841	.841	.086	2398.730	1.512
Model 6. Seven factors	1769.10	165	.870	.858	.881	.870	.880	.078	1889.097	1.191
Model 7. Eight factors	1326.31	153	.902	.885	.913	.897	.913	.070	1470.311	.927
Model 8: Eight factors	1354.94	153	.900	.883	.911	.895	.910	.070	1498.943	.945
Model 9: Full nine factors	775.76	144	**.943**	**.929**	**.953**	**.941**	**.953**	**.053**	**937.761**	**.591**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	lowest value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 1,591). The following studies were included in the tests: government research organization (1), public telecommunications, not-for-profit agency, government research organization (2), and military recruiting unit.

Table 13

Goodness-of-Fit Results for High Bureaucratic Conditions Data Sets for Test of Full Factorial Invariance

Model	χ^2	Df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	1677.89	467	.877	.867	.888	.879	.887	.076	1793.893	1.131
Model 2. Two factors	1157.17	162	.915	.905	.926	.918	.926	.062	1283.168	.809
Model 3. Three factors	1554.16	161	.886	.872	.896	.884	.896	.074	1682.163	1.061
Model 4: Three factors	1124.90	156	.917	.905	.928	.917	.928	.063	1262.899	.796
Model 5. Six factors	969.73	152	.929	.916	.939	.928	.939	.058	1115.732	.703
Model 6. Seven factors	1000.98	152	.926	.913	.937	.925	.937	.059	1146.976	.723
Model 7. Eight factors	948.37	146	.930	.914	.940	.926	.940	.059	1106.369	.698
Model 8: Eight factors	887.50	146	.935	**.920**	.945	.932	.945	.057	1045.509	.659
Model 9: Full nine factors	865.32	144	**.936**	**.920**	**.946**	**.933**	**.946**	**.056**	**1027.322**	**.648**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	lowest value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 1,591). The following studies were included in the tests: government research organization (1), public telecommunications, not-for-profit agency, government research organization (2), and military recruiting unit.

As is evident from the results presented in Table 12 for the factor structure test of invariance, the nine-factor model again was the best fitting model, had the largest values for the adjunctive fit indices, and exceeded all six cut-off criteria recommended by the literature. It also had the lowest AIC and ECVI values, and its upper RMSEA interval was below the cut-off value of .08 recommended by the literature. Apart from the full nine-factor model no other competing model came close to satisfying the cut-off criteria recommended by the literature while concurrently having the lowest AIC and ECVI values. Based on these results, H1, which stated that the nine leadership factors and the manner in which their a priori structure is specified among its factors to freely covary will fit the data as determined by various fit indices, is fully supported.

For the full factorial test of invariance, the results in Table 13 mirrored those of the previous test, namely that the nine-factor model again was the best fitting model, had the largest values for the adjunctive fit indices, and exceeded all six cut-off criteria recommended by the literature. It also had the lowest AIC and ECVI values, and its upper RMSEA interval was below the cut-off value of .08 recommended by the literature. Although these results are not as convincing as the previous test, the same arguments that were used to support the nine-factor model in the low-risk academic moderator condition can be used here regarding the adjunctive fit indices, AIC, ECVI, and χ^2. Only one value (RFI) was the same for Model 8 as for the nine-factor model. However, since all other values supported the nine-factor model, it was accepted as the best fitting model. Apart from the full nine-factor model, no other competing model came close to satisfying the cut-off criteria recommended by the literature while concurrently having the lowest AIC and ECVI values. Based on these results, H1, which stated that the nine leadership factors and the manner in which their a priori structure is specified among its factors to freely covary will fit the data as determined by various fit indices, is supported.

In sum, the evidence points to support for H1 for the high bureaucratic conditions data sets.

The next moderator that was tested was termed majority male leaders, and/or male rater conditions. Again the nine-factor model best represented the data for both invariance tests.

Table 14

Goodness-of-Fit Results for Majority Male Leaders and/or Male Raters Data Sets for Test of Factor Structure Invariance

Model	χ^2	df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	22628.36	176	-1.520	-1.062	-1.551	-1.079	.000	.376	22636.361	25.096
Model 2. Two factors	5275.37	171	.412	.505	.420	.513	.422	.182	5293.369	5.868
Model 3. Three factors	7522.66	165	.162	.269	.165	.273	.167	.222	7552.660	8.373
Model 4: Three factors	3058.63	165	.659	.703	.672	.714	.672	.139	3088.630	3.424
Model 5. Six factors	892.82	141	.901	.898	.915	.913	.915	.077	970.823	1.076
Model 6. Seven factors	745.41	128	.917	.907	.930	.921	.930	.073	849.409	.942
Model 7. Eight factors	554.32	117	.938	.924	.951	.939	.950	.064	680.315	.754
Model 8: Eight factors	553.16	117	.938	.924	.951	.939	.951	.064	679.157	.753
Model 9: Full nine factors	387.03	108	**.957**	**.943**	**.969**	**.958**	**.968**	**.054**	**531.033**	**.589**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	lowest value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 906). The following studies were included in the tests: military platoon, gas exploration, fire departments, and military recruiting unit.

Table 15

Goodness-of-Fit Results for Majority Male Leaders and/or Male Rater Data Sets for Test of Full Factorial Invariance

Model	χ^2	df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	1931.53	132	.863	.850	.871	.860	.871	.091	1927.531	1.236
Model 2. Two factors	947.15	128	.895	.881	.907	.896	.907	.084	1051.148	1.165
Model 3. Three factors	1320.83	127	.853	.833	.865	.847	.865	.102	1426.832	1.582
Model 4: Three factors	794.91	123	.911	.896	.924	.911	.924	.078	908.907	1.008
Model 5. Six factors	598.11	118	.933	.919	.946	.934	.946	.067	722.018	.800
Model 6. Seven factors	597.30	117	.933	.918	.946	.933	.946	.067	723.297	.802
Model 7. Eight factors	550.57	111	.939	.920	.950	.935	.950	.066	688.565	.763
Model 8: Eight factors	515.03	111	.943	.926	.954	.941	954	064	653.031	.724
Model 9: Full nine factors	485.74	108	**.946**	**.928**	**.957**	**.943**	**.957**	**.062**	**629.740**	**.698**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	lowest value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 906). The following studies were included in the tests: military platoon, gas exploration, fire departments, and military recruiting unit.

The results presented in Table 14 for the factor structure test of invariance indicate that the nine-factor model again was the best fitting model, had the largest values for the adjunctive fit indices, and exceeded all six cut-off criteria recommended by the literature. It also had the lowest AIC and ECVI values, and its upper RMSEA interval was below the cut-off value of .08 recommended by the literature. Apart from the full nine-factor model no other competing model came close to satisfying the cut-off criteria recommended by the literature while concurrently having the lowest AIC and ECVI values. Based on these results, H1, which stated that the nine leadership factors and the manner in which their a priori structure is specified among its factors to freely covary will fit the data as determined by various fit indices, is fully supported.

For the full factorial test of invariance, the results in Table 15 were the same as those of the previous test, namely that the nine-factor model again was the best fitting model, had the largest values for the adjunctive fit indices, and exceeded all six cut-off criteria recommended by the literature. It also had the lowest AIC and ECVI values, and its upper RMSEA interval was below the cut-off value of .08 recommended by the literature. Apart from the full nine-factor model, no other competing model came close to satisfying the cut-off criteria recommended by the literature while concurrently having the lowest AIC and ECVI values. Based on these results, H1, which stated that the nine leadership factors and the manner in which their a priori structure is specified among its factors to freely covary will fit the data as determined by various fit indices, is fully supported.

In sum, the evidence points to full support for H1 for the majority male leaders, and/or males raters data sets.

The next moderator that was tested was termed majority female leaders, and/or female raters conditions. As with the previous analyses, the nine-factor model again best represented the data for both invariance tests.

Table 16

Goodness-of-Fit Results for Majority Female Leaders and/or Female Raters Data Sets for Test of Factor Structure Invariance

Model	χ^2	df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	12138.47	88	-4.639	-3.614	-4.837	-3.739	.000	.535	12142.466	25.350
Model 2. Two factors	5902.63	85	-1.742	-1.323	-1.814	-1.369	.000	.378	5912.634	12.344
Model 3. Three factors	4526.00	81	-1.103	-0.869	-1.146	-0.899	.000	.338	4543.999	9.486
Model 4: Three factors	3145.12	81	-0.461	-0.299	-0.479	-0.309	.000	.281	3163.115	6.604
Model 5. Six factors	1143.35	63	.469	.393	.483	.407	.481	.189	1197.347	2.500
Model 6. Seven factors	867.29	54	.597	.463	.612	.479	.609	.177	939.285	1.961
Model 7. Eight factors	499.22	45	.768	.629	.784	.651	.782	.145	589.223	1.230
Model 8: Eight factors	330.36	45	.847	.754	.865	.781	.863	.115	420.362	.878
Model 9: Full nine factors	53.56[a]	36	**.975**	**.950**	**.992**	**.983**	**.992**	**.032**	**161.559**	**.337**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	lowest value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 481). The following studies were included in the tests: nurse educators, and nurse educator executives.

[a]$p < 0.05$

Table 17

Goodness-of-Fit Results for Majority Female Leaders and/or Female Raters Data Sets for Test of Full Factorial Invariance

Model	χ^2	df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	471.84	62	.781	.745	.804	.771	.803	.117	527.842	1.102
Model 2. Two factors	299.37	60	.861	.833	.886	.862	.885	.091	359.374	.750
Model 3. Three factors[b]										
Model 4: Three factors[b]										
Model 5. Six factors	126.40	50	.941	.915	.964	.947	.963	.056	206.400	.431
Model 6. Seven factors	112.55	47	.948	.920	.969	.952	.968	.054	198.550	.415
Model 7. Eight factors	94.35	41	.956	.923	.975	.955	.974	.052	192.346	.402
Model 8: Eight factors	87.68	41	.959	.928	.978	.961	.978	.049	185.684	.388
Model 9: Full nine factors	69.89	36	**.968**	**.935**	**.984**	**.967**	**.984**	**.044**	**177.893**	**.371**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	lowest value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 481). The following studies were included in the tests: nurse educators, and nurse educator executives

[a]$p < 0.05$. [b]Failed to converge after 500 iterations.

The evidence presented in Table 16 for the factor structure test of invariance indicates that the nine-factor model again was the best fitting model, had the largest values for the adjunctive fit indices, and exceeded all six cut-off criteria recommended by the literature. It also had the lowest AIC and ECVI values, and its upper RMSEA interval was below the conservative cut-off value of .05 recommended by the literature. Apart from the full nine-factor model no other competing model came close to satisfying the cut-off criteria recommended by the literature while concurrently having the lowest AIC and ECVI values. Based on these results, H1, which stated that the nine leadership factors and the manner in which their a priori structure is specified among its factors to freely covary will fit the data as determined by various fit indices, is fully supported.

For the full factorial test of invariance, the results in Table 17 mirrored those of the previous test, namely that the nine-factor model again was the best fitting model, had the largest values for the adjunctive fit indices, and exceeded all six cut-off criteria recommended by the literature. It also had the lowest AIC and ECVI values, and its upper RMSEA interval was below the cut-off value of .08 recommended by the literature. Apart from the full nine-factor model, no other competing model came close to satisfying the cut-off criteria recommended by the literature, while concurrently having the lowest AIC and ECVI values. Based on these results, H1, which stated that the nine leadership factors and the manner in which their a priori structure is specified among its factors to freely covary will fit the data as determined by various fit indices, is fully supported.

In sum, the evidence points to full support for H1 for the majority female leaders, and/or female raters data sets.

The next moderator that was tested was termed low-level leader conditions. Again the nine-factor model best represented the data for both invariance tests.

Table 18

Goodness-of-Fit Results for Low-Level Leader Data Sets for Test of Factor Structure Invariance

Model	χ^2	Df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	49566.34	176	-1.883	-1.358	-1.902	-1.370	.000	.386	49574.342	26.327
Model 2. Two factors	9078.83	171	.472	.555	.477	.560	.478	.166	9096.825	4.831
Model 3. Three factors	20301.80	165	-.181	-.030	-.182	-.031	.000	.255	20331.803	10.798
Model 4: Three factors	7600.60	165	.558	.614	.563	.619	.564	.155	7630.598	4.052
Model 5. Six factors	2051.88	141	.881	.878	.888	.886	.888	.085	2129.879	1.131
Model 6. Seven factors	1770.02	128	.897	.884	.904	.892	.904	.083	1874.018	.995
Model 7. Eight factors	1281.78	117	.925	.908	.932	.916	.932	.073	1407.781	.748
Model 8: Eight factors	983.21	117	.943	.930	.949	.937	.949	.063	1109.206	.589
Model 9: Full nine factors	680.78	108	**.960**	**.947**	**.966**	**.955**	.966	**.053**	**824.781**	**.438**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	lowest value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 1,887). The following studies were included in the tests: military platoon, gas exploration, perioperative nurses, and hospitality/retail.

Table 19

Goodness-of-Fit Results for Low-Level Leader Data Sets for Test of Full Factorial Invariance

Model	χ^2	Df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	2046.27	132	.881	.870	.888	.878	.888	.088	2142.269	1.138
Model 2. Two factors	1423.59	128	.917	.907	.924	.915	.924	.073	1527.587	.811
Model 3. Three factors	2048.71	127	.881	.865	.887	.872	887	.090	2154.712	1.144
Model 4: Three factors	1396.91	123	.919	.905	.925	.913	.925	.074	1510.910	.802
Model 5. Six factors	1223.37	118	.929	.913	.935	.921	.935	.071	1347.365	.716
Model 6. Seven factors	1240.91	117	.928	.911	.934	.919	.934	.071	1366.912	.726
Model 7. Eight factors	1134.08	108	.934	.912	.940	.920	.940	.071	1278.080	.679
Model 8: Eight factors	871.56	108	.949	.932	.955	.940	.955	.061	1015.562	.539
Model 9: Full nine factors	860.08	108	**.950**	**.933**	**.956**	**.941**	**.956**	**.061**[a]	**1004.079**	**.533**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	lowest value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 1,887). The following studies were included in the tests: military platoon, gas exploration, perioperative nurses, and hospitality/retail.

[a]The lower value of the confidence interval was lower than that of Model 8, and the upper value of the confidence interval was equal to that of Model 8.

Based on the results presented in Table 18 for the factor structure test of invariance, the nine-factor model was the best fitting model, had the largest values for the adjunctive fit indices, and exceeded all six cut-off criteria recommended by the literature. It also had the lowest AIC and ECVI values, and its upper RMSEA interval was below the cut-off value of .08 recommended by the literature. Apart from the full nine-factor model no other competing model came close to satisfying the cut-off criteria recommended by the literature while concurrently having the lowest AIC and ECVI values. Based on these results, H1, which stated that the nine leadership factors and the manner in which their a priori structure is specified among its factors to freely covary will fit the data as determined by various fit indices, is fully supported.

For the full factorial test of invariance, the results in Table 19 indicate that the nine-factor model was the best fitting model. Although the results between the nine-factor model and Model 8 were close, the nine-factor model had the largest values for the adjunctive fit indices, and exceeded all six cut-off criteria recommended by the literature. It also had the lowest AIC and ECVI values, and its upper RMSEA interval was below the cut-off value of .08 recommended by the literature. Similar to the justification for accepting the nine-factor model as the best fitting model in the low-risk academic conditions and the high bureaucratic conditions, the nine-factor model was considered the best representative of the data. Apart from the full nine-factor model, no other competing model came close to satisfying the cut-off criteria recommended by the literature while concurrently having the lowest AIC and ECVI values. Based on these results, H1, which stated that the nine leadership factors and the manner in which their a priori structure is specified among its factors to freely covary will fit the data as determined by various fit indices, is supported.

In sum, the evidence points to support for H1 for the low-level leaders conditions data sets.

The last moderator that was tested was termed middle-level leaders (1) conditions. The nine-factor model was the best representative of the data for both invariance tests.

Table 20

Goodness-of-Fit Results for Middle-Level Leaders (1) Data Sets for Test of Factor Structure Invariance

Model	χ^2	Df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	11034.76	88	-1.583	-1.113	-1.616	-1.133	.000	.581	11038.756	29.915
Model 2. Two factors	2482.93	85	.419	.508	.427	.516	.429	.277	2492.926	6.756
Model 3. Three factors	4135.34	81	.032	.140	.033	.142	.035	.368	4153.340	11.256
Model 4: Three factors	1813.09	81	.576	.623	.587	.633	.588	.241	1831.048	4.962
Model 5. Six factors	382.23	63	.911	.898	.924	.913	.924	.117	436.232	1.182
Model 6. Seven factors	325.93	54	.924	.898	.936	.914	.935	.117	397.932	1.078
Model 7. Eight factors	205.51	45	.952	.923	.962	.939	.962	.098	295.510	.801
Model 8: Eight factors	134.78	45	.968	.950	.979	.966	.979	.074	224.780	.609
Model 9: Full nine factors	63.46[a]	36	**.985**	**.970**	**.994**	**.987**	**.993**	**.045**	**171.456**	**.465**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	lowest value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 371). The following studies were included in the tests: government research organization (1), and military recruiting unit.

[a] $p < 0.005$.

Table 21

Goodness-of-Fit Results for Middle-Level Leaders (1) Data Sets for Test of Full Factorial Invariance

Model	χ^2	df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	466.57	62	.891	.873	.904	.888	.904	.133	522.574	1.416
Model 2. Two factors	364.17	60	.915	.898	.928	.913	.928	.117	424.173	1.150
Model 3. Three factors	450.38	59	.895	.871	.907	.886	.907	.134	512.376	1.389
Model 4: Three factors	338.61	57	.921	.900	.933	.915	.933	.116	404.614	1.097
Model 5. Six factors	197.69	50	.954	.933	.965	.949	.965	.089	277.686	.753
Model 6. Seven factors	162.68	47	.962	.942	.973	.958	.972	.082	248.675	.674
Model 7. Eight factors	129.48	41	.970	.947	.979	.963	.979	.076	227.480	.616
Model 8: Eight factors	122.91	41	.971	.949	.981	.966	.980	074	220.912	.599
Model 9: Full nine factors	69.06[a]	36	**.984**	**.968**	**.992**	**.984**	**.992**	**.050**	**177.064**	**.480**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	lowest value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 371). The following studies were included in the tests: government research organization (1), and military recruiting unit.

[a] $p < 0.005$.

The results presented in Table 20 for the factor structure test of invariance suggest that the nine-factor model again was the best fitting model, had the largest values for the adjunctive fit indices, and exceeded all six cut-off criteria recommended by the literature. It also had the lowest AIC and ECVI values, and its upper RMSEA interval was below the cut-off value of .08 recommended by the literature. Apart from the full nine-factor model no other competing model came close to satisfying the cut-off criteria recommended by the literature, while concurrently having the lowest AIC and ECVI values. Based on these results, H1, which stated that the nine leadership factors and the manner in which their a priori structure is specified among its factors to freely covary will fit the data as determined by various fit indices, is fully supported.

For the full factorial test of invariance, the results in Table 21 were the same as those of the previous test, namely that the nine-factor model again was the best fitting model, had the largest values for the adjunctive fit indices, and exceeded all six cut-off criteria recommended by the literature. It also had the lowest AIC and ECVI values, and its upper RMSEA interval was below the cut-off value of .08 recommended by the literature. Apart from the full nine-factor model, no other competing model came close to satisfying the cut-off criteria recommended by the literature while concurrently having the lowest AIC and ECVI values. Based on these results, H1, which stated that the nine leadership factors and the manner in which their a priori structure is specified among its factors to freely covary will fit the data as determined by various fit indices, is fully supported.

In sum, the evidence points to full support for H1 for the middle-level leaders (1) conditions data sets.

Summary of Goodness-of-Fit Results

All goodness of fit results are summarized in Tables 22 and 23 below. Some discussion and brief analysis follows the tables. The moderating conditions are also summarized and compared to the coding conditions and theoretical schemes. Brief analyses follow those two summary tables (Tables 24 and 25).

Table 22

Summary of Goodness-of-Fit Results for All Nine-Factor Models for Test of Factor Structure Invariance

Model	χ^2	Df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
All data sets	3968.91	684	**.923**	**.919**	**.935**	**.932**	**.935**	**.027**	**4400.912**	**.677**
All data sets less self eval.	3667.07	612	**.927**	**.923**	**.939**	**.935**	**.939**	**.028**	**4063.072**	**.658**
Normal business cond.	279.19	108	**.972**	**.963**	**.983**	**.977**	**.983**	**.036**	**423.186**	**.342**
Normal academic cond.	157.14	72	**.965**	**.947**	**.981**	**.971**	**.980**	**.040**	**283.137**	**.384**
High risk conditions	64.04	36	**.986**	**.973**	**.994**	**.988**	**.994**	**.039**	**172.036**	**.344**
High bureaucratic cond.	775.76	144	**.943**	**.929**	**.953**	**.941**	**.953**	**.053**	**937.761**	**.591**
Majority male leaders	387.03	108	**.957**	**.943**	**.969**	**.958**	**.968**	**.054**	**531.033**	**.589**
Majority female leaders	53.56[a]	36	**.975**	**.950**	**.992**	**.983**	**.992**	**.032**	**161.559**	**.337**
Low-level leaders	361.72	72	**.964**	**.946**	**.971**	**.957**	**.971**	**.057**	**487.717**	**.390**
Middle level leaders	63.46[b]	36	**.985**	**.970**	**.994**	**.987**	**.993**	**.045**	**171.456**	**.465**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	Lowest Value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$.

[a]$p < 0.05$. [b]$p < 0.005$

Table 23

Summary of Goodness-of-Fit Results for All Nine-Factor Models for Test of Full Factorial Invariance

Model	χ^2	Df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
All data sets	5437.38	684	.895	.889	.907	.902	.907	.033	5869.379	.902
All data sets less self eval.	4924.73	612	.902	.897	.914	.908	.913	.034	5320.729	.861
Normal business cond.	473.27	108	**.953**	**.937**	**.963**	**.951**	**.963**	**.052**	**617.268**	**.499**
Normal academic cond.	209.09	72	**.953**	**.930**	**.969**	**.953**	**.968**	**.051**	**335.093**	**.454**
High risk conditions	75.24	36	**.984**	**.968**	**.992**	**.983**	**.991**	**.047**	**183.242**	**.366**
High bureaucratic cond.	865.32	144	**.936**	**.920**	**.946**	**.933**	**.946**	**.056**	**1027.322**	**.648**
Majority male leaders	485.74	108	**.946**	**.928**	**.957**	**.943**	**.957**	**.062**	**629.740**	**.698**
Majority female leaders[a]	69.89	36	**.968**	**.935**	**.984**	**.967**	**.984**	**.044**	**177.893**	**.371**
Low-level leaders	479.77	72	**.953**	**.929**	**.959**	**939**	**.959**	**.067**	**605.772**	**.482**
Middle level leaders (1)[a]	69.06[a]	36	**.984**	**.968**	**.992**	**.984**	**.992**	**.050**	**177.064**	**.480**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	Lowest Value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$.

[a] $p < 0.005$.

As is shown in Tables 22 and 23 above, the results indicate a very clear, and consistent pattern of results namely that the nine-factor model of the MLQ 5X is a very good representative of the data sets tested. This is both true for the factor structure test of invariance as well as the most stringent invariance test, the full factorial invariance test. In the case of the factor structure test of invariance, the nine-factor model best represented the combined data sets, whereas for the full factorial invariance test, Model 8 best represented the data.

In Tables 24 and 25 below, summaries of the moderating conditions and their respective data sets, and a summary list of samples, their coding schemes, and their corresponding moderator conditions are presented.

Table 24

Summary List of Moderator Categories and Samples

Moderator category	Samples included	Sample size
1. Normal business conditions	Various firms, business firms (1), business firms (2), business firms (3)	1,240
2. Normal, academic cond. and/or middle level leaders (2)	Nurse educators, nurse educator executives, vocational academic administrators	741
3. High risk/unstable conditions	Military platoon, fire departments	502
4. High bureaucratic conditions	Govt. research org. (1), public telecom., not-for-profit agency, govt. research organization (2), military recruiting unit	1,591
5. Majority male leaders and/or male raters	Military platoon, gas exploration, fire departments, military recruiting unit	906
6. Majority female leaders and/or female raters	Nurse educators, nurse educator executives	481
7. Low-level leaders	Military platoon, gas exploration, perioperative nurses, hospitality/retail	1,887
8. Middle-level leaders (1)	Government research organization (1), military recruiting unit	371

Table 25

Summary List of Samples, Coding Conditions and Moderator Categories

Sample	Risk Conditions	Environmental Conditions	Degree of Organizational Structure	Level of leader	Gender of leader	Gender of Followers	Moderating condition 1	2	3	4	5	6	7	8
Vocational academic	Low	Stable	Assumed medium	Middle	64.3% M; 35.7% F	Unknown		√						
Vocational academic[a]	Low	Stable	Assumed medium	Middle	64.3% M; 35.7% F	Unknown								
Military recruiting unit	Low	Stable	Assumed high	Middle	93% M; 7% F	Assumed mostly male				√	√			√
Hospitality/retail	Low	Stable	Assumed low	Low	57.5% M; 42.5% F	28% M; 66% F[b]							√	
Perioperative nurses	High	Unstable	Assumed high	Low	8.4% M; 91.6% F	4.37% M; 95.63% F							√	
Govt. research org. (2)	Low	Stable	Assumed high	Various	75.7% M; 24.3% F	57.5% M; 42.6% F				√				
Govt. research org. (2)[a]	Low	Stable	Assumed high	Various	75.7% M; 24.3% F	57.5% M; 42.6% F								
Public telecommunications	Low	Stable	Assumed high	Various	Unknown	Unknown				√				
Gas exploration	High	Unstable	Assumed high	Low	Assumed mostly M	Assumed mostly M					√		√	
Nurse educator executives	Low	Stable	Assumed medium	Middle	5% M; 95% F	Assumed mostly F		√				√		
Govt. research org. (1)	Low	Assumed stable	Assumed high	Assumed middle	Unknown	Unknown				√				√
Nurse educators[a]	Low	Stable	Assumed medium	Assumed middle	Assumed mostly F	3% M; 97% F		√				√		
Military platoon	High	Unstable	Assumed high	Low	100% M	100% M			√		√		√	
Various firms	Unknown	Assumed stable	Assumed low	Unknown	Unknown	Unknown	√							
Business firms (1)	Assumed low	Assumed stable	Assumed low	Unknown	Unknown	Unknown	√							
Business firms (2)	Assumed low	Unstable	Assumed low	Unknown	Unknown	Unknown	√							
Political organization	Assumed low	Assumed stable	Unknown	Unknown	Unknown	Unknown								
Business firms (3)	Assumed low	Assumed stable	Assumed low	Unknown	Unknown	Unknown	√							
Fire departments	High	Unstable	Assumed high	Unknown	Assumed mostly M	Assumed mostly M			√		√			
Not-for-profit agency	Assumed low	Assumed stable	Assumed high	Unknown	Unknown	Unknown				√				

Note. M = male; F = female. A check (√) mark indicates that the sample was included in the moderating conditions listed. 1 = normal low-risk business conditions; 2 = normal low-risk academic conditions, and/or middle level leaders (2); 3 = high-risk/unstable conditions; 4 = high bureaucratic conditions; 5 = majority male leaders, and/or male raters; 6 = majority female leaders, and/or female raters; 7 = low-level leaders; 8 = middle-level leaders (1).

[a]Self ratings. [b]6% unknown.

As is evident in Tables 24 and 25, the samples that were included in the moderator categories made theoretical sense, that is, they fitted their moderator label, and were similar in nature to the other samples that were included in the category.

In the normal low-risk business conditions, data from business firms only was included for analysis. In the normal low-risk academic conditions, only data gathered from academic organizations was utilized. Furthermore, this data set also included predominantly what could be termed middle-level leaders. As regards the high-risk/unstable conditions, organizational types that posed risks and danger were included. In the bureaucratic condition, organizations that were public, or which required an elaborate organizational structure within stable operating conditions were included. With respect to the majority male leaders/raters category only samples that clearly indicated a majority of males was utilized. The same constraint was afforded to the majority female leaders/raters category. In the low-level leader condition, only leaders that were clearly in a supervisory role, and directly supervised followers, were utilized. And finally, as regards the middle-level leaders (1) moderating condition, only leaders that appeared to be at a middle level, and nonacademic, bureaucratic conditions were utilized.

As mentioned previously, when samples were added or taken away from the aforementioned groups, the fit generally deteriorated. Thus, different possible combinations of groups were tried to determine whether the fit statistics were acceptable and were concurrently similar enough from a categorical classification scheme to be included together. Given the empirical results that were reported, it appears that the manner in which the conditions were classified is appropriate, and serve as a useful scheme for further testing the hypotheses.

It must be noted that two self-rating samples—vocational academic and government research organization—were not included in any analysis for reasons discussed previously. The political organization sample was also not utilized possibly since it stood relatively isolated from the other types of organizations that were included in the analysis, and justifiably could not be included in any of the moderating conditions.

As regards the sample sizes included in the analyses, according to Kline (1998b), sample sizes above 200 in SEM analysis can be considered "large" (p. 12). As is evident from Table 24 the sample sizes ranged from 371 to 6,525. As a further test of sample size Kline suggests that 10 subjects should be available for every free parameter and that a minimum of three indicators per factor should be utilized in cases of small samples (i.e., samples below 100 cases). In the case of this study, since the MLQ has four indicators per factor, this rule-of-thumb could be relaxed somewhat. Using Kline's criteria, all moderator conditions exceed the minimum sample sizes for analysis, with the exception of (a) the high risk/unstable data set, which had 54 free parameters and required a sample of about 540 cases versus the actual 502 cases; (b) the majority female leaders, and/or female raters data set, which had 54 free parameters and required a sample of about 540 cases versus the actual 481 cases; and (c) the middle-level leaders (1) data set ,which also had 540 free parameters and required a sample of about 540 cases versus the actual 371 cases. Since (a) four indicators per factor were utilized, (b) the smallest sample size was 371, (c) all nine-sample analyses converged, and (d) the results did not include any improper values, that is, Heywood cases (Kline, 1998b), the sample sizes were deemed to be appropriate for this type of analysis.

In the next set of analyses, the subhypotheses $H1_a$, $H1_b$, $H1_c$, and $H1_d$, regarding the relationship between the MLQ factors was tested.

Factor Relationship Results

As regards $H1_a$, $H1_b$, $H1_c$, and $H1_d$, the results of the entire data set are reported in Table 26. It is evident that the results of the hypotheses are mixed, but follow the theoretical propositions that have been made by Avolio (1999), Avolio et al. (1995), and Bass (1998). These propositions, expressed in $H1_a$, $H1_b$, $H1_c$, and $H1_d$, and discussed in chapter 1, state that the five transformational constructs are strongly related to each other, moderately related to contingent reward, and negatively related to management-by-exception active and passive, and to laissez-faire leadership. Contingent reward is unrelated to management-by-exception active, and negatively related to management-by-exception passive and laissez-faire leadership. Management-by-exception active is positively related to management-by-exception passive and to laissez-faire leadership. And finally management-by-exception-passive is positively related to laissez-faire leadership.

As regards management-by-exception active, it has been found to be weakly related to outcomes (and thus indirectly to the transformational constructs, and contingent reward) in some instances, or a zero or negative predictor in other instances depending on circumstances (Avolio, 1999; Bass, 1998; Lowe et al., 1996). Avolio, and Bass believe that in some instances it may be necessary to use management-by-exception when safety is of concern, or in situations of extreme risk, as supported by Bycio et al. (1995). This is also confirmed by the correlation matrix ($\underline{n}$ = 2,080) reported by Avolio et al. (1995), where management-by-exception active was either negatively related or unrelated to the transformational constructs, and unrelated to contingent reward. The key point here is that management-by-exception active may or may not be positively related to outcome variables and also to the transformational constructs and contingent reward, depending on the work context in which MLQ ratings are obtained. Thus it would be expected that the relationship between management-by-exception active to the other constructs would be moderated by environmental conditions, which would be explained by the theoretical propositions made by Avolio (1999) and Bass (1998).

As with the goodness of fit results presented above, the interfactor relationships were tested under the moderating conditions established previously. General patterns emerged that were interpretable by theory, and supported the propositions made above.

These results are reported in Table 26 for the entire data set. Results for the entire data set less self-ratings is reported in Table 27. Results of the moderating conditions are reported in the following tables:

1. Normal low-risk business conditions—see Table 28.
2. Normal low-risk academic conditions, and/or middle-level leaders (2)—see Table 29.
3. High-risk/unstable conditions—see Table 30.
4. High bureaucratic conditions—see Table 31.
5. Majority male leaders, and/or male raters—see Table 32.
6. Majority female leaders, and/or female raters—see Table 33.
7. Low-level leaders—see Table 34.
8. Middle-level leaders (1)—see Table 35.

As will be evident from the results, the transformational constructs were always positively related to one another and to contingent reward, and negatively related to the passive constructs. The passive constructs were themselves positively related to one another and on the whole to management by exception active. As expected, management-by-exception active was an enigma, and its relationship to the transformational constructs, and to contingent reward was a function of moderator conditions.

For the results below, the covariance matrices of the various nine-factor models, which were tested in the previous analyses are displayed below. Both results from the factor structure test of invariance, and the full factorial invariance are included. It must be noted that the critical ratio estimates, that is the covariance estimate divided by the standard error, were almost identical for both the factor structure test of invariance and the full factorial invariance. Although the magnitude of the covariance estimates appears to be consistently larger for the factor structure test, those values are meaningless when compared to each other, since these results are unstandardized and not expressed in the same metric because of underlying differences in the variances of the various factors. The results for the entire data set are reported first in Table 26 below.

Table 26

SEM Estimation of Covariances between Variables of Nine-Factor Model for Entire Data

Variable	IIA	IIB	IM	IS	IC	CR	MBEA	MBEP	LF
1. IIA	-	.573*	.622*	.537*	.638*	.557*	.003	-.396*	-.384*
2. IIB	.894*	-	.583*	.520*	.577*	.517*	.046*	-.340*	-.328*
3. IM	.909*	.918*	-	.554*	.625*	.561*	.027*	-.377*	-.357*
4. IS	.848*	.867*	.864*	-	.571*	.514*	.036*	-.311*	-.291*
5. IC	.903*	.855*	.873*	.866*	-	.598*	.008	-.378*	-.358*
6. CR	.820*	.805*	.813*	.808*	.843*	-	.090*	-.291*	-.285*
7. MBEA	.011	.103*	.065*	.088*	.008	.169*	-	.109*	.083*
8. MBEP	-.601*	-.531*	-.552*	-.490*	-.534*	-.422*	.242*	-	.459*
9. LF	-.636*	-.555*	-.560*	-.491*	-.548*	-.456*	.188*	.874*	-

Note. For all tables, values above the diagonal are for the strict factorial invariance test; values below the diagonal are for the factor structure invariance test. IIA = idealized influence attributed; IIB idealized influence behavior; IM = inspirational motivation; IS = intellectual stimulation; IC = individualized consideration; CR = contingent reward; MBEA = management-by-exception active; MBEP = management-by-exception passive; LF = laissez-faire leadership. Using the standard error of the estimate, that is the standard deviation of the estimate, p is the probability of the critical ratio. The critical ratio is the covariance estimate divided by the standard error, having an approximate normal distribution which tests the null hypothesis that the estimate is zero (Arbuckle & Wothke, 1999). (N= 6,525).

*p < .000.

As expected the relationship between the five transformational constructs was positive and significant. The relationship between the two passive constructs and management-by-exception active was positive and significant. The relationship between the five transformational constructs and contingent reward was positive and significant. The relationship between contingent reward and the passive constructs was negative and significant.

Where management-by-exception was involved, the results varied as expected. In other words, it was either insignificantly related or weakly but significantly related to the transformational constructs, and positively and significantly related to contingent reward. It was also positively and significantly related to the passive constructs. As regards the critical ratio of the relationship between management-by-exception active and the other constructs, it was always smaller for the transformational constructs than for contingent reward, and larger for the passive constructs as compared to the transformational constructs and to contingent reward. Since the results reported are unstandardized, the magnitude of the relationship cannot be determined, however by noting the magnitude of the critical ratio, one can determine the degree of significance, which has bearing on the degree of the relationship. The values of the critical ratio thus suggest that management-by-exception active is more related to management-by-exception passive and laissez-faire leadership than to contingent reward, and that it is least related to the transformational constructs. This pattern of results was generally prevalent for all the analyses.

Thus the results indicate that $H1_a$, was fully supported. $H1_a$ stated that the five transformational leadership factors would be positively and significantly associated with one another, and with contingent reward.

$H1_b$ was partially supported in that the five transformational leadership factors were negatively and significantly associated with management-by-exception passive, and with laissez-faire leadership. Contrary to this hypothesis, the five transformational constructs were positively associated to management-by-exception active, and the association was either significant or insignificant.

$H1_c$ was also partially supported in that contingent reward was negatively and significantly associated with management-by-exception passive and laissez-faire leadership. Contrary to this hypothesis, contingent reward was positively and significantly associated with management-by-exception active.

$H1_d$ was fully supported. This hypothesis stated that management-by-exception active, management-by-exception passive, and laissez-faire leadership are positively and significantly associated with one another.

The results for the entire data set excluding self-ratings are reported in Table 27 below.

Table 27

SEM Estimation of Covariances between Variables of Nine-Factor Model for Entire Data Set Excluding Self-Evaluation Data Sets

Variable	IIA	IIB	IM	IS	IC	CR	MBEA	MBEP	LF
1. IIA	-	.596*	.647*	.560*	.664*	.581*	.002	-.414*	-.402*
2. IIB	.909*	-	.604*	.541*	.599*	.538*	.044*	-.354*	-.343*
3. IM	.924*	.930*	-	.576*	.650*	.585*	.025'	-.392*	-.372*
4. IS	.863*	.881*	.877*	-	.595*	.536*	.032*	-.323*	-.303*
5. IC	.920*	.871*	.888*	.882*	-	.623*	.007	-.394*	-.373*
6. CR	.836*	.820*	.828*	.823*	.860*	-	.089*	-.302*	-.296*
7. MBEA	.006	.096*	.057*	.076*	.002	.161*	-	.112*	.087*
8. MBEP	-.615*	-.544*	-.563*	-.500*	-.547*	-.433*	.246*	-	.476*
9. LF	-.651*	-.569*	-.571*	-.502*	-.560*	-.465*	.193*	.884*	-

Note. n = 6,195.

*p < .000. 'p < .001.

These results exactly mirrored the results reported in Table 26 regarding the significance of the interfactor relationships.

As is evident from the above, the results indicate that $H1_a$, was fully supported. $H1_a$ stated that the five transformational leadership factors would be positively and significantly associated with one another, and with contingent reward.

$H1_b$ was partially supported in that the five transformational leadership factors were negatively and significantly associated with management-by-exception passive, and with laissez-faire leadership. Contrary to this hypothesis, the five transformational constructs were positively associated to management-by-exception active, and the association was either significant or insignificant.

$H1_c$ was also partially supported in that contingent reward was negatively and significantly associated with management-by-exception passive and laissez-faire leadership. Contrary to this hypothesis, contingent reward was positively and significantly associated with management-by-exception active.

$H1_d$ was fully supported. This hypothesis stated that management-by-exception active, management-by-exception passive, and laissez-faire leadership are positively and significantly associated with one another.

The results for the normal business conditions data set are reported in Table 28 below.

Table 28

SEM Estimation of Covariances between Variables of Nine-Factor Model for Normal Business Conditions Data Sets

Variable	IIA	IIB	IM	IS	IC	CR	MBEA	MBEP	LF
1. IIA	-	.606*	.644*	.558*	.640*	.463*	-.102*	-.415*	-.377*
2. IIB	.927*	-	.628*	.548*	.590*	.476*	-.021	-.347*	-.311*
3. IM	.926*	.961*	-	.588*	.650*	.520*	-.048[b]	-.374*	-.320*
4. IS	.868*	.913*	.919*	-	.584*	.477*	-.019	-.294*	-.240*
5. IC	.901*	.884*	.914*	.894*	-	.543*	-.078*	-.365*	-.302*
6. CR	.704*	.780*	.799*	.792*	.831*	-	.034[b]	-.183*	-.118*
7. MBEA	-.175*	-.019	-.057	-.010	-.125*	.096[a]	-	.290*	.227*
8. MBEP	-.593*	-.519*	-.529*	-.446*	-.510*	-.259*	.547*	-	.561*
9. LF	-.580*	-.501*	-.482*	-.389*	-.444*	-.170*	.434*	.910*	-

Note. n = 1,240. The following studies were included in the tests: various firms, business firms (1), business firms (2), and business firms (3).

*$p < .000$. [a]$p < .01$. [b]$p < .05$.

In normal conditions, it would be expected that the relationship between the variables would differ as compared to the previous results that were presented. As is evident, the results follow theoretical propositions for the management-by-exception active construct, which is now negatively related to the transformational constructs; however, this relationship is not always significant. Management-by-exception active is still positively and significantly associated with management-by-exception passive and laissez-faire leadership.

Thus the results indicate that $H1_a$, was fully supported. $H1_a$ stated that the five transformational leadership factors would be positively and significantly associated with one another, and with contingent reward.

$H1_b$ was partially supported in that the five transformational leadership factors were negatively and significantly associated with management-by-exception passive, and with laissez-faire leadership. Also, in support of the hypothesis the five transformational constructs were negatively associated to management-by-exception active, and the association was either significant or insignificant.

$H1_c$ was also partially supported in that contingent reward was negatively and significantly associated with management-by-exception passive and laissez-faire leadership. Contrary to this hypothesis, contingent reward was positively and significantly associated with management-by-exception active.

$H1_d$ was fully supported. $H1_d$ stated that management-by-exception active, management-by-exception passive, and laissez-faire leadership are positively and significantly associated with one another.

It must be noted above that a difference occurred between the factor structure test of invariance results and those of the full factorial invariance regarding the covariance of inspirational motivation with management-by-exception active. For the former test, the relationship was insignificant and negative, and for the latter test, the relationship was significant and negative. This difference, however, is minor and does not complicate the interpretability of the results above.

The results for the normal low-risk academic conditions data set are reported in Table 29 below.

Table 29

SEM Estimation of Covariances between Variables of Nine-Factor Model for Normal Low-Risk Academic and/or Middle Level Leaders (2) Data Sets

Variable	IIA	IIB	IM	IS	IC	CR	MBEA	MBEP	LF
1. IIA	-	.146*	.160*	.140*	.157*	.098*	-.006	-.080*	-.070*
2. IIB	.800*	-	.159*	.166*	.161*	.109*	.010	-.077*	-.061*
3. IM	.831*	.871*	-	.170*	.170*	.122*	-.013	-.106*	-.079*
4. IS	.692*	.847*	.829*	-	.169*	.114*	-.009	-.072*	-.051*
5. IC	.790*	.848*	.852*	.792*	-	.131*	.007	-.087*	-.067*
6. CR	.387*	.453*	.483*	.420*	.506*	-	.123*	.012	.019
7. MBEA	-.043	.033	-.072	-.049	.013	.411*	-	.108*	.093*
8. MBEP	-.387*	-.386*	-.496*	-.318*	-.393*	.042	.426*	-	.190*
9. LF	-.360*	-.323*	-.398*	-.244*	-.323*	.079	.399*	.844*	-

Note. n = 741. The following studies were included in the tests: nurse educators, nurse educator executives, and vocational academic administrators.

*$p < .000$.

Similar to the results of the normal business conditions data set, these results are mixed for $H1_b$ and $H1_c$ regarding the relationship of management-by-exception active to the transformational constructs and to contingent reward. The relationships now with the transformational constructs are generally in the predicted direction and are negative, however they are not significant. Also the covariance between management-by-exception active and idealized influence (attributed) is now positive, but insignificant.

Thus the results indicate that $H1_a$ was fully supported. $H1_a$ stated that the five transformational leadership factors would be positively and significantly associated with one another, and with contingent reward.

$H1_b$ was partially supported in that the five transformational leadership factors were negatively and significantly associated with management-by-exception passive, and with laissez-faire leadership. Also, in support of the hypothesis, four of the transformational constructs were negatively associated to management-by-exception active but the association was insignificant. Contrary to this hypothesis, management-by-exception active was positively associated to idealized influence (attributed), but this relationship was insignificant.

$H1_c$ was rejected in that in that contingent reward was positively associated with management-by-exception passive and laissez-faire leadership, however this relationship was insignificant. Also, contrary to this hypothesis, contingent reward was positively and significantly associated with management-by-exception active.

$H1_d$ was fully supported. This hypothesis stated that management-by-exception active, management-by-exception passive, and laissez-faire leadership are positively and significantly associated with one another.

The results for the high risk/unstable conditions data set are reported in Table 30 below.

Table 30

SEM Estimation of Covariances between Variables of Nine-Factor Model for High Risk/Unstable Conditions Data Sets

Variable	IIA	IIB	IM	IS	IC	CR	MBEA	MBEP	LF
1. IIA	-	.727*	.773*	.619*	.807*	.518*	.179*	-.433*	-.431*
2. IIB	.975*	-	.716*	.595*	.713*	.496*	.214*	-.332*	-.333*
3. IM	.969*	1.001*	-	.606*	.754*	.532*	.229*	-.363*	-.341*
4. IS	.893*	.953*	.915*	-	.634*	.469*	.219*	-.217*	-.199*
5. IC	.993*	.980*	.972*	.936*	-	.538*	.190*	-.365*	-.356*
6. CR	.677*	.734*	.731*	.742*	.722*	-	.304*	-.054	-.055
7. MBEA	.300*	.400*	.402*	.438*	.328*	.563*	-	.161*	.115*
8. MBEP	-.573*	-.482*	-.501*	-.346*	-.496*	-.063	.301*	-	.616*
9. LF	-.602*	-.514*	-.497*	-.388*	-.512*	-.073	.225*	.966*	-

Note. n = 502. The following studies were included in the tests: military platoon, and fire departments.

*p < .000.

In high-risk/unstable conditions, it would be expected that the relationship between the variables would differ as compared to the previous results that were presented. As is evident, the results follow theoretical propositions in that the management-by-exception active construct is now positively and significantly related to the transformational constructs. Management-by-exception active is still positively and significantly associated with management-by-exception passive and laissez-faire leadership.

Thus the results indicate that $H1_a$, was fully supported. $H1_a$ stated that the five transformational leadership factors would be positively and significantly associated with one another, and with contingent reward.

$H1_b$ was partially supported in that the five transformational leadership factors were negatively and significantly associated with management-by-exception passive, and with laissez-faire leadership. Contrary to this hypothesis, the five transformational constructs were positively and significantly associated to management-by-exception active.

$H1_c$ was rejected in that contingent reward was positively and significantly associated with management-by-exception active, and was negatively and insignificantly related to management-by-exception passive and laissez-faire leadership.

$H1_d$ was fully supported in that management-by-exception active, management-by-exception passive, and laissez-faire leadership were positively and significantly associated with one another.

The results for the bureaucratic conditions data set are reported in Table 31 below.

Table 31

SEM Estimation of Covariances between Variables of Nine-Factor Model for High Bureaucratic Conditions Data Sets

Variable	IIA	IIB	IM	IS	IC	CR	MBEA	MBEP	LF
1. IIA	-	.709*	.785*	.656*	.798*	.672*	-.095*	-.516*	-.456*
2. IIB	.922*	-	.724*	.606*	.697*	.616*	-.065*	-.439*	-.425*
3. IM	.945*	.931*	-	.663*	.770*	.670*	-.064[a]	-.486*	-.425*
4. IS	.881*	.857*	.872*	-	.677*	.600*	-.045[b]	-.405*	-.355*
5. IC	.946*	.877*	.895*	.877*	-	.706*	-.125*	-.496*	-.439*
6. CR	.846*	.816*	.827*	.818*	.856*	-	-.021	-.400*	-.366*
7. MBEA	-.176*	-.178*	-.130*	-.096[a]	-.218*	-.046	-	.120*	.074*
8. MBEP	-.705*	-.634*	-.646*	-.605*	-.655*	-.561*	.236*	-	.487*
9. LF	-.711*	-.693*	-.639*	-.600*	-.660*	-.588*	.168*	.884*	-

Note. n = 1,591. The following studies were included in the tests: government research organization (1), public telecommunications, not-for-profit agency, government research organization (2), and military recruiting unit.

*$p < .000$. [a]$p < .005$. [b]$p < .05$.

Similar to the normal conditions the results begin to take shape as the theory predicts for the management-by-exception active construct, which is again negatively related to the transformational constructs, and this relationship is significant. Management-by-exception active is still positively and significantly associated with management-by-exception passive and laissez-faire leadership; however, it is positively but not significantly related to contingent reward. This latter result is interesting, and although it follows the hypotheses, it does not follow the previous patterns of results where under most conditions, management-by-exception active was positively related to contingent reward.

Thus the results indicate that $H1_a$, was fully supported. $H1_a$ stated that the five transformational leadership factors would be positively and significantly associated with one another, and with contingent reward.

$H1_b$ was fully supported in that the five transformational leadership factors were negatively and significantly associated with management-by-exception active, management-by-exception passive, and laissez-faire leadership.

$H1_c$ was also partially supported in that contingent reward was negatively and significantly associated with management-by-exception passive and laissez-faire leadership. Contrary to this hypothesis, contingent reward was negatively but insignificantly associated with management-by-exception active.

$H1_d$ was fully supported. $H1_d$ stated that management-by-exception active, management-by-exception passive, and laissez-faire leadership are positively and significantly associated with one another.

The results for the majority male leaders, and/or male raters conditions data set are reported in Table 32 below.

Table 32

SEM Estimation of Covariances between Variables of Nine-Factor Model for Majority Male Leaders and/or Male Raters Data Sets

Variable	IIA	IIB	IM	IS	IC	CR	MBEA	MBEP	LF
1. IIA	-	.724*	.781*	.626*	.809*	.586*	.082*	-.459*	-.423*
2. IIB	.989*	-	.731*	.584*	.724*	.546*	.123*	-.380*	-.381*
3. IM	.984*	1.000*	-	.628*	.773*	.595*	.123*	-.420*	-.392*
4. IS	.896*	.904*	.898*	-	.654*	.533*	.126*	-.294*	-.258*
5. IC	.987*	.962*	.950*	.909*	-	.632*	.079ª	-.424*	-.383*
6. CR	.785*	.800*	.800*	.812*	.823*	-	.162*	-.196*	-.175*
7. MBEA	.182*	.275*	.264*	.302*	.178*	.343*	-	.133*	.073*
8. MBEP	-.635*	-.569*	-.582*	-.454*	-.565*	-.284*	.253*	-	.516*
9. LF	-.648*	-.631*	-.598*	-.435*	-.563*	-.278*	.150*	.913*	-

Note. n = 906. The following studies were included in the tests: military platoon, gas exploration, fire departments, and military recruiting unit.

*p < .000. ªp < .005.

Similar to the high-risk/unstable conditions, the results of this analysis included some expected results and paralleled theoretical propositions regarding management-by-exception active, which was positively and significantly associated with the transformational constructs, contingent reward, and the passive constructs.

Thus the results indicate that $H1_a$, was fully supported. $H1_a$ stated that the five transformational leadership factors would be positively and significantly associated with one another, and with contingent reward.

$H1_b$ was partially supported in that the five transformational leadership factors were negatively and significantly associated with management-by-exception passive, and with laissez-faire leadership. Contrary to this hypothesis, the five transformational constructs were positively and significantly associated to management-by-exception active.

$H1_c$ was partially supported in that contingent reward was negatively and significantly related to management-by-exception passive and laissez-faire leadership, but positively and significantly associated with management-by-exception active.

$H1_d$ was fully supported in that management-by-exception active, management-by-exception passive, and laissez-faire leadership were positively and significantly associated with one another.

The results for the majority female leaders, and/or female raters conditions data set are reported in Table 33 below.

Table 33

SEM Estimation of Covariances between Variables of Nine-Factor Model for Majority Female Leaders and/or Female Raters Data Sets

Variable	IIA	IIB	IM	IS	IC	CR	MBEA	MBEP	LF
1. IIA	-	.111*	.117*	.096*	.102*	.087*	-.014	-.037ª	-.043*
2. IIB	.705*	-	.127*	.129*	.120*	.089*	-.014	-.065*	-.052*
3. IM	.725*	.829*	-	.132*	.128*	.105*	-.031ᵇ	-.080*	-.060*
4. IS	.532*	.755*	.747*	-	.115*	.082*	-.047ª	-.082*	-.041*
5. IC	.636*	.784*	.814*	.651*	-	.102*	-.015	-.075*	-.054*
6. CR	.393*	.419*	.487*	.333*	.464*	-	.113*	.004	.017
7. MBEA	-.054	-.060	-.141ᵇ	-.193ᵇ	-.074	.379*	-	.099*	.087*
8. MBEP	-.188ª	-.348*	-.415*	-.381*	-.397*	.014	.380*	-	.156*
9. LF	-.237*	-301*	-.338*	-.205*	-.317*	.070	.363*	.721*	-

Note. n = 481. The following studies were included in the tests: nurse educators, and nurse educator executives.

*p < .000. ªp<.005. ᵇp<.05.

Similar to the results of the normal business conditions data set, these results are mixed regarding the relationship of management-by-exception active to the transformational constructs, and to contingent reward. The relationships with the transformational constructs are all in the predicted direction and negative; however, they are not always significant.

Thus the results indicate that $H1_a$, was fully supported. $H1_a$ stated that the five transformational leadership factors would be positively and significantly associated with one another, and with contingent reward.

$H1_b$ was partially supported in that the five transformational leadership factors were negatively, but not always significantly associated with management-by-exception active, and were negatively and significantly associated with management-by-exception passive and with laissez-faire leadership.

$H1_c$ was rejected in that in that contingent reward was positively associated with management-by-exception passive and laissez-faire leadership, however this relationship was insignificant. Also, contrary to the hypothesis, contingent reward was positively and significantly associated with management-by-exception active. Similar to the scenario with the normal low-risk academic conditions, the former result is interesting, given that contingent reward is generally negatively and significantly related to the passive constructs.

$H1_d$ was fully supported. This hypothesis stated that management-by-exception active, management-by-exception passive, and laissez-faire leadership are positively and significantly associated with one another.

The results for the low-level leader conditions data set are reported in Table 34 below.

Table 34

SEM Estimation of Covariances between Variables of Nine-Factor Model for Low-Level Leader Data Sets

Variable	IIA	IIB	IM	IS	IC	CR	MBEA	MBEP	LF
1. IIA	-	.727*	.777*	.721*	.833*	.796*	.134*	-.539*	-.599*
2. IIB	.948*	-	.722*	.671*	.712*	.707*	.210*	-.450*	-.474*
3. IM	.937*	.928*	-	.699*	.764*	.742*	.143*	-.457*	-.533*
4. IS	.929*	.912*	.876*	-	.770*	.733*	.159*	-.435*	-.475*
5. IC	.963*	.863*	.855*	.929*	-	.835*	.133*	-.488*	-.551*
6. CR	.976*	.914*	.886*	.934*	.957*	-	.157*	-.476*	-.536*
7. MBEA	.250*	.382*	.246*	.281*	.218*	.271*	-	-.107*	-.051[a]
8. MBEP	-.685*	-.607*	-.567*	-.579*	-.578*	-.605*	-.211*	-	.617*
9. LF	-.787*	-.641*	-.670*	-.639*	-.663*	-.695*	-.126*	.874*	-

Note. n = 1,887. The following studies were included in the tests: military platoon, gas exploration, perioperative nurses, and hospitality/retail.

*p < .000. [a] p < .005.

These results are similar in nature to the high-risk/unstable conditions, and the majority male leader conditions results, but also included some interesting results. As expected, the results parallel theoretical propositions regarding management-by-exception active, which was positively and significantly associated with the transformational constructs, but unexpectedly was negatively related to the passive constructs. The only explanation regarding the latter result is that at low levels of leadership, continuous and active supervision is required and expected. Since management-by-exception active is an active leadership style, and the other two styles are passive, the former style may be viewed differently from the latter styles, which are generally absent of leadership, and which therefore might help explain the negative relationships.

Thus the results indicate that $H1_a$, is fully supported. $H1_a$ stated that the five transformational leadership factors would be positively and significantly associated with one another, and with contingent reward.

$H1_b$ was partially supported in that the five transformational leadership factors were negatively and significantly associated with management-by-exception passive, and with laissez-faire leadership. Contrary to this hypothesis, the five transformational constructs were positively and significantly associated to management-by-exception active.

$H1_c$ was partially supported in that contingent reward was positively and significantly associated with management-by-exception active, but was negatively and significantly related to management-by-exception passive and laissez-faire leadership.

$H1_d$ was partially supported in that management-by-exception passive and laissez-faire leadership were positively and significantly associated with one another. Contrary to this hypothesis, management-by-exception active was negatively and significantly related to the passive constructs.

The final sets of results for this analysis is for the middle-level leaders (1), reported in Table 35 below.

Table 35

SEM Estimation of Covariances between Variables of Nine-Factor Model for Middle-Level Leaders (1) Data Sets

Variable	IIA	IIB	IM	IS	IC	CR	MBEA	MBEP	LF
1. IIA	-	.830*	.908*	.739*	.945*	.749*	-.090[b]	-.602*	-.521*
2. IIB	1.032*	-	.843*	.662*	.831*	.677*	-.021	-.527*	-.511*
3. IM	1.034*	1.032*	-	.734*	.900*	.741*	-.044	-.590*	-.530*
4. IS	.922*	.888*	.901*	-	.780*	.663*	-.026	-.468*	-.384*
5. IC	1.013*	.960*	.953*	.901*	-	.827*	-.137*	-.602*	-.493*
6. CR	.899*	.873*	.877*	.856*	.917*	-	-.032	-.427*	-.367*
7. MBEA	-.169[a]	-.045	-.085	-.056	-.236*	-.059	-	.114*	.039
8. MBEP	-.831*	-.781*	-.801*	-.696*	-.768*	-.612*	.253*	-	.491*
9. LF	-.816*	-.860*	-.818*	-.650*	-.716*	-.595*	.097	.916*	-

Note. n = 371. The following studies were included in the tests: government research organization (1), and military recruiting unit.

*p < .000. [a]p < .01. [b]p < .05.

These results were generally consistent with the other results and followed the hypotheses with some exceptions. The results follow theoretical propositions for the management-by-exception active construct, which is negatively but not always significantly related to the transformational constructs. Management-by-exception active is still positively and significantly associated with management-by-exception passive, but unexpectedly positively and insignificantly related to laissez-faire leadership. Furthermore, management-by-exception active is negatively but insignificantly related to contingent reward.

Thus the results indicate that $H1_a$, was fully supported. $H1_a$ stated that the five transformational leadership factors would be positively and significantly associated with one another, and with contingent reward.

$H1_b$ was partially supported in that the five transformational leadership factors were negatively and significantly associated with management-by-exception passive, and with laissez-faire leadership. Also, in support of the hypothesis the five transformational constructs were negatively associated to management-by-exception active, but this association was not always significant.

$H1_c$ was partially supported in that contingent reward was negatively and significantly associated with management-by-exception passive and laissez-faire leadership, but negatively and insignificantly associated with management-by-exception active.

$H1_d$ was partially supported in that management-by-exception passive and laissez-faire leadership were positively and significantly associated with one another, and management-by-exception active was positively and significantly related to management-by-exception passive. Contrary to this hypothesis, management-by-exception active was positively but insignificantly related to laissez-faire leadership.

Summary results of this battery of tests are presented next.

<u>Summary of Factor Relationship Results</u>

For all nine moderating conditions strong evidence emerged in support of $H1_a$, namely that the five transformational constructs would be positively and significantly related to one another, and that they would be positively and significantly related to contingent reward.

As regards $H1_b$ and $H1_c$, results were mixed. For $H1_b$, results indicated that the transformational constructs were negatively and significantly related to management-by-exception passive and laissez-faire leadership in all nine moderating conditions. The relationship between the transformational constructs to management-by-exception active was however, either positive, negative, or nonsignificant, depending on moderating conditions.

For $H1_c$ it was observed that in five of the eight moderating conditions, contingent reward was significantly and negatively related to the passive constructs, and in three instances it was insignificant. Contrary to expectations, in the majority of cases contingent reward was positively and significantly related to management-by-exception active.

For $H1_d$, in seven of the eight moderating conditions management-by-exception active, management-by-exception passive and laissez-faire leadership were positively and significantly associated with one another. In the low-level leader moderating condition however the relationships between management-by-exception active, management-by-exception passive and laissez-faire leadership were negative, which is surprising.

Based on the above patterns of results, it thus appears that the moderating conditions did have a substantial impact on the interfactor relationships of the MLQ. A summary of the covariances between the factors under all moderating conditions is provided below.

Table 36

Summary Results of Covariances Under All Moderating Conditions

	Moderating condition															
	1		2		3		4		5		6		7		8	
Covariance	S	F	S	F	S	F	S	F	S	F	S	F	S	F	S	F
IIA – IIB	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
IIA – IM	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
IIA – IS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
IIA – IC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
IIA – CR	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
IIA – MBEA	-	-	n	n	+	+	-	-	+	+	n	n	+	+	-	-
IIA – MBEP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IIA – LF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IIB – IM	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
IIB – IS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
IIB – IC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
IIB – CR	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
IIB – MBEA	n	n	p	p	+	+	-	-	+	+	n	n	+	+	n	n
IIB – MBEP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IIB – LF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IM – IS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
IM – IC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
IM – CR	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
IM – MBEA	-	n	n	n	+	+	-	-	+	+	-	-	+	+	n	n
IM – MBEP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IM – LF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IS – IC	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
IS – CR	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
IS – MBEA	n	n	n	n	+	+	-	-	+	+	-	-	+	+	n	n
IS – MBEP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IS – LF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IC – CR	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
IC – MBEA	-	-	p	p	+	+	-	-	+	+	n	n	+	+	-	-
IC – MBEP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IC – LF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CR – MBEA	+	+	+	+	+	+	n	n	+	+	+	+	+	+	n	n
CR – MBEP	-	-	p	p	n	n	-	-	-	-	p	p	-	-	-	-
CR – LF	-	-	p	p	n	n	-	-	-	-	p	p	-	-	-	-
MBEA - MBEP	+	+	+	+	+	+	+	+	+	+	+	+	-	-	+	+
MBEA – LF	+	+	+	+	+	+	+	+	+	+	+	+	-	-	p	p
MBEP – LF	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Note. 1 = normal low-risk business conditions; 2 = normal low-risk academic conditions, and/or middle level leaders (2); 3 = high-risk/unstable conditions; 4 = high bureaucratic conditions; 5 = majority male leaders, and/or male raters; 6 = majority female leaders, and/or female raters; 7 = low-level leaders; 8 = middle-level leaders (1). S = strict factorial invariance; F = factor structure invariance. "+" = positive and significant covariance; "-" = negative and significant covariance; p = positive and insignificant covariance; n = negative and insignificant covariance.

Unstandardized Regression Path Results

The results for H2, $H2_a$, $H2_b$, $H2_c$, are presented next. The results in this section should be viewed with caution since the dependent measures were gathered from the same source as the leadership measures. Also, not all the moderating conditions were represented in these analyses since not all the samples included a dependent measure.

Using the methods discussed in chapter 3 to test the hypotheses did not produce results that were theoretically interpretable. Although the nine-factor model best represented the data under all conditions in the test of factor structure invariance, the unstandardized regression paths of the independent variables to the dependent variable produced uninterpretable results in many instances, which included sign reversal or insignificant results. These results may be because of the higher intercorrelations between the measures due to same source bias (Avolio et al., 1991), and possible suppressor effects (Kline, 1998b; Smith, Ager, & Williams, 1992; Tzelgov & Henik, 1991). The procedure was thus modified post-hoc in two ways.

First, only the factor structure invariance tests were utilized. The invariance test was relaxed since the criterion test is in itself a strict test. Also, effectiveness and the manner in which it may be perceived by varied samples will differ as a function of environmental and organizational constraints. Thus, error variances and loadings were allowed to vary between groups. Second, the structural equations were limited to testing the effect of each independent variable separately. This in essence is analogous to testing for effect using meta-analytic methods. Thus reporting the goodness-of-fit statistics for a model with only one independent variable was deemed irrelevant since as a model it does not adequately represent the full impact of leadership. As a result of the above, this section reports the structural equation modeling results of the unstandardized regression paths of each independent variable to the dependent measure separately under the moderating conditions that included a dependent measure.

It is evident that the results are mixed, but generally follow the theoretical propositions made. Regarding H2, the nine-factor model did best represent the data, however since the unstandardized paths were uninterpretable those results are not presented below. The results of model fit are however reported in Appendix A, B, C, D, E, F, and H, and as indicated, fully support H2 under all conditions tested.

As regards $H2_a$, $H2_b$, $H2_c$, the results for the entire data set are reported in Table 37. $H2_a$ and $H2_b$ were fully supported, but the results for $H2_c$ were mixed across different moderating conditions. The results of the entire data set less the self-evaluation data are reported in Table 38. The moderating conditions are reported as follows:

1. Normal low-risk business conditions—see Table 39.
2. High bureaucratic conditions—see Table 40.
3. Majority male leaders —see Table 41.
4. Low-level leaders—see Table 42.

As is evident from these results, the paths from the transformational constructs and contingent reward to the criterion measure were significant and positive. The path from management-by-exception active to the criterion measure was insignificant, positive and significant, or negative and significant, depending on moderating conditions. The path from management-by-exception passive and laissez-faire leadership to the criterion measure was always negative and significant. Results for the entire data set are included in the table below.

Table 37

SEM Estimation of Unstandardized Regression Paths of Each Variable Entered Individually to Subordinate Perceived Effectiveness for Entire Data Set

Independent variable	β estimate	SE	CR	p
Idealized influence attributed	.896	.011	83.228	.000
Idealized influence behavior	.751	.013	57.899	.000
Inspirational motivation	.748	.012	60.326	.000
Intellectual stimulation	.809	.012	70.292	.000
Individualized consideration	.823	.011	72.728	.000
Contingent reward	.812	.012	67.781	.000
Management-by-exception active	.022	.019	1.184	.237
Management-by-exception passive	-.562	.016	-35.784	.000
Laissez-faire leadership	-.677	.014	-46.832	.000

Note. β estimate = unstandardized regression estimate; SE = standard error of the estimate. CR = critical ratio, that is the β estimate divided by SE. p is the probability of the critical ratio having an approximate normal distribution which tests the null hypothesis that the estimate is zero (Arbuckle & Wothke, 1999). (n = 4,235). The following groups were included in the analysis: various firms, gas exploration, nurse educators, business firms (2), political organization, fire departments, not-for-profit agency, government research organization (2), perioperative nurses, hospitality/retail, and government research organization (2) self evaluations.

As is evident from the above results, the paths of the five transformational factors and contingent reward to the criterion variable are positive and significant, while the paths of the passive constructs are negative and significant. The path of management-by-exception active was not significant, but the direction of the sign was positive.

Table 38 displays the results of the entire data set, excluding the self-evaluation sample.

Table 38

SEM Estimation of Unstandardized Regression Paths of Each Variable Entered Individually to Subordinate Perceived Effectiveness for Entire Data Set Excluding Self Evaluations Data Sets

Independent variable	β estimate	SE	CR	p
Idealized influence attributed	.905	.011	82.924	.000
Idealized influence behavior	.763	.013	57.971	.000
Inspirational motivation	.757	.013	60.000	.000
Intellectual stimulation.819	.819	.012	70.164	.000
Individualized consideration	.835	.011	72.956	.000
Contingent reward	.822	.012	67.527	.000
Management-by-exception active	.022	.019	1.144	.253
Management-by-exception passive	-.575	.016	-35.904	.000
Laissez-faire leadership	-.686	.015	-46.498	.000

Note. n = 4,006. The following groups were included in the analysis: various firms, gas exploration, nurse educators, business firms (2), political organization, fire departments, not-for-profit agency, government research organization (2), perioperative nurses, and hospitality/retail.

As with the previous results, the paths of the five transformational factors and contingent reward to the criterion variable are positive and significant, while those of the passive constructs are negative and significant. The path of management-by-exception active was not significant, but the direction of the sign was positive.

In the next set of results, moderating conditions are explored, and in some instances appear to influence the results substantially. Table 39 displays the results of the normal business condition data set.

Table 39

SEM Estimation of Unstandardized Regression Paths of Each Variable Entered Individually to Subordinate Perceived Effectiveness for Normal Business Conditions Data Sets

Independent variable	β estimate	SE	CR	p
Idealized influence attributed	.612	.049	12.435	.000
Idealized influence behavior	.561	.050	11.127	.000
Inspirational motivation	.533	.050	10.761	.000
Intellectual stimulation	.518	.051	10.248	.000
Individualized consideration	.531	.050	10.614	.000
Contingent reward	.468	.053	8.849	.000
Management-by-exception active	.073	.063	1.154	.248
Management-by-exception passive	-.321	.058	-5.576	.000
Laissez-faire leadership	-.363	.056	-6.439	.000

Note. n = 377. The following groups were included in the analysis: various firms, and business firms (2).

The results in this case are unchanged. The paths of the five transformational factors, and contingent reward to the criterion variable are still positive and significant, while those of the passive constructs are negative and significant. The path of management-by-exception active was not significant, but the direction of the sign was still positive.

Table 40 displays the results of the high bureaucratic conditions data set, where a difference emerges regarding the management-by-exception construct.

Table 40

SEM Estimation of Unstandardized Regression Paths of Each Variable Entered Individually to Subordinate Perceived Effectiveness for High Bureaucratic Conditions Data Sets

Independent variable	β estimate	SE	CR	p
Idealized influence attributed	.877	.027	32.893	.000
Idealized influence behavior	.658	.033	19.698	.000
Inspirational motivation	.750	.029	25.592	.000
Intellectual stimulation	.759	.029	25.924	.000
Individualized consideration	.788	.028	27.852	.000
Contingent reward	.809	.029	28.195	.000
Management-by-exception active	-.243	.043	-5.587	.000
Management-by-exception passive	-.609	.036	-16.785	.000
Laissez-faire leadership	-.720	.033	-21.622	.000

Note. n = 764. The following groups were included in the analysis: not-for-profit agency, and government research organization (2).

The results here are the same for the five transformational factors and contingent reward, whose paths to the criterion measure are positive and significant. The paths of the passive constructs continue to be negative and significant. The path of management-by-exception active is now negative and significant.

As with the above set of the results, the majority male leaders moderating condition data set appears to affect the pattern of relationship of management-by-exception active, as shown in Table 41.

Table 41

SEM Estimation of Unstandardized Regression Paths of Each Variable Entered Individually to Subordinate Perceived Effectiveness for Majority Male Leaders Data Sets

Independent variable	β estimate	SE	CR	p
Idealized influence attributed	.941	.033	28.932	.000
Idealized influence behavior	.800	.040	20.063	.000
Inspirational motivation	.802	.038	21.364	.000
Intellectual stimulation	.748	.041	18.420	.000
Individualized consideration	.856	.035	24.343	.000
Contingent reward	.457	.051	8.921	.000
Management-by-exception active	.273	.059	4.584	.000
Management-by-exception passive	-.491	.052	-9.368	.000
Laissez-faire leadership	-571	.050	-11.364	.000

Note. n = 407. The following groups were included in the analysis: gas exploration, and fire departments.

The results are again the same for the five transformational factors and contingent reward, whose paths to the criterion measure are positive and significant. The paths of the passive constructs continue to be negative and significant, while the path of management-by-exception active is now positive and significant.

The results for the low-level leader data set are presented in Table 42, and parallel the results presented above.

Table 42

SEM Estimation of Unstandardized Regression Paths of Each Variable Entered Individually to Subordinate Perceived Effectiveness for Low-Level Leader Data Sets

Independent variable	β estimate	SE	CR	p
Idealized influence attributed	.987	.022	44.999	.000
Idealized influence behavior	.924	.025	37.552	.000
Inspirational motivation	.874	.025	35.007	.000
Intellectual stimulation	.973	.020	48.453	.000
Individualized consideration	.942	.022	42.993	.000
Contingent reward	.952	.023	41.166	.000
Management-by-exception active	.575	.041	13.958	.000
Management-by-exception passive	-.668	.036	-18.725	.000
Laissez-faire leadership	-.756	.033	-22.955	.000

Note. $n = 731$. The following groups were included in the analysis: gas exploration, and perioperative nurses.

The results in this analysis are the same as the previous set of analyses, namely that the paths of the five transformational factors and contingent reward to the criterion variable are positive and significant. The paths of the passive constructs are negative and significant, while the path of management-by-exception active is positive and significant.

Summary of Unstandardized Regression Path Results

Distinct patterns of results emerged in this series of analysis, namely that the transformational constructs were always positively and significantly related to the criterion variable. The same pattern of results occurred with contingent reward leadership. Management-by-exception passive and laissez-faire leadership were always negatively and significantly related to perceived effectiveness. Management-by-exception active was the only construct whose path to the criterion variable was either positive or negative and significant, or unrelated. A summary table of these results is presented below.

Table 43

Summary of Unstandardized Regression Paths Under All Conditions

Independent variable	Moderating condition 1	2	3	4	5	6
Idealized influence attributed	+	+	+	+	+	+
Idealized influence behavior	+	+	+	+	+	+
Inspirational motivation	+	+	+	+	+	+
Intellectual stimulation	+	+	+	+	+	+
Individualized consideration	+	+	+	+	+	+
Contingent reward	+	+	+	+	+	+
Management-by-exception active	p	p	p	+	-	+
Management-by-exception passive	-	-	-	-	-	-
Laissez-faire leadership	-	-	-	-	-	-

Note. 1 = entire data set; 2 = entire data set less self-evaluations; 3 = normal low-risk business conditions; 4 = majority male leaders, and/or male raters; 5 = high bureaucratic conditions; 6 = low-level leaders. "+" = positive and significant unstandardized path; "-" = negative and significant unstandardized path; p = positive and insignificant unstandardized path.

Summary of Results and Hypotheses Tested

This study empirically tested the multidimensionality of the MLQ model. Below are the eight hypotheses that were tested with indications of their acceptance or rejection, and some brief commentary.

H1. The nine leadership factors, and the way their a priori structure is specified among its factors to freely covary will fit the data as determined by various fit indices.

This hypothesis was clearly supported for the entire data set for the factor structure test of invariance, and all moderating conditions for both invariance tests. The fit was clearly moderated by various conditions that were theoretically identifiable.

H1$_a$ The five transformational leadership factors will be positively associated with one another and with contingent reward.

This hypothesis was clearly supported for the entire data set and for all moderating conditions. In other words, the covariances between the five transformational constructs were always positive and significant, as were the covariances between the five transformational constructs and contingent reward.

H1$_b$ The five transformational leadership factors will be negatively associated to management-by-exception active, management-by-exception passive, and laissez-faire leadership.

This hypothesis received mixed support, and appeared to be a function of moderator conditions. Specifically, for the entire data set and for all moderating conditions, the transformational factors covaried negatively and significantly with laissez-faire leadership and management-by-exception passive. As regards management-by-exception active, it was generally positively and significantly related to the transformational constructs for the entire data set. Under the moderating conditions, the covariances between the five transformational constructs and management-by-exception active were either positive or negative and significant, or were insignificant. This is explained by the need for management-by-exception in certain environmental conditions.

H1$_c$ Contingent reward will be negatively associated with management-by-exception active, management-by-exception passive, and laissez-faire leadership.

This hypothesis received mixed support. For the entire data set, contingent reward was positively and significantly related to management-by-exception active but negatively and significantly related to management-by-exception passive and laissez-faire leadership. In the majority of moderating conditions the covariances between contingent reward and the passive constructs of management-by-exception passive and laissez-faire leadership were negative, and in other instances the results were insignificant. Contrary to expectations, in the majority of situations the covariances between management-by-exception active and contingent reward were positive and significant, and were never negative and significant.

$H1_d$ Management-by-exception active, management-by-exception passive, and laissez-faire leadership will be positively associated with one another.

This hypothesis received mixed support. For the entire data set these three constructs were positively and significantly related. In the clear majority of moderating conditions, management-by-exception active, management-by-exception passive, and laissez-faire leadership covaried positively and significantly.

As regards H2, the procedure was modified as previously discussed, since the results were uninterpretable based on the original analysis. With the updated procedure, results followed theoretical precepts and are discussed next.

H2. The nine leadership factors, how their a priori structure is specified among its factors to freely covary, and how they predict the dependent measure, will fit the data as determined by various fit indices.

Based on the results of the original analysis, as documented in the Appendixes, this hypothesis was clearly supported for the entire data set and all moderating conditions using the factor structure invariance test.

$H2_a$ The paths of the five transformational leadership factors to the criterion variable will be positive and significant as measured by the unstandardized regression coefficients.

Based on the new procedure whereby the independent variables were individually modeled as predictors of the outcome measure, this hypothesis was clearly supported under all moderating conditions and for the entire data set. Specifically, the paths of the five transformational constructs to the "Effectiveness" scale of the MLQ were always positive and significant.

$H2_b$ The path of contingent reward to the criterion variable will be positive and significant as measured by the unstandardized regression coefficient.

This hypothesis was clearly supported for the entire data set and under all moderating conditions. Specifically, the path of contingent reward to the "Effectiveness" scale of the MLQ was always positive and significant.

$H2_c$ The paths of management-by-exception active, management-by-exception passive and laissez-faire leadership to the criterion variable will be negative and significant as measured by the unstandardized regression coefficients.

This hypothesis received mixed support. The path of management-by-exception passive and laissez-faire leadership to the "Effectiveness" scale for the entire data set and under all moderating conditions was always negative and significant. The path of management-by-exception active varied, and was either positively or negatively related to effectiveness, or was not related depending on moderating conditions.

Summary

This section tested the hypotheses based on the procedures indicated in the previous chapter. Results were clear in terms of either accepting or rejecting the hypotheses tested. A discussion of the results, and the manner in which they can inform the problem investigated and answer the research questions, will be established in the final chapter of this dissertation. Conclusions regarding the scope of the findings and their generalizability will be discussed, as will implications for scholars, practitioners, and policy makers.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

Introduction

In this section the problem investigated and study's purposes are discussed as they relate to the findings. The objectives of the final chapter were to determine whether

1. there are conclusive answers to the problem investigated,
2. the purposes of the inquiry were met,
3. the results can be explained in theoretical terms, and
4. the results are internally and externally valid and hence generalizable.

Conclusions and implications for theory, research, policy and practice are discussed. In following with the tradition of Walden University Ph.D. dissertations, implications for social change are also presented vis-à-vis the theoretical framework of the full-range-of-leadership model. Lastly, limitations regarding the findings are explored, and final conclusions are made.

Summary of Findings

This dissertation advances the understanding of transformational, transactional, and laissez-faire theory by providing a comprehensive evaluation of the validity of the MLQ 5X survey across a variety of moderating conditions. This research attempted to address the conflicting results that have been reported concerning the most appropriate model to represent the MLQ, and indirectly the full-range model of leadership. The conflicting results that emerged in prior tests of the MLQ have several possible explanations including (a) the use of exploratory statistical methods for testing the structure of the MLQ model when confirmatory methods were required, (b) inadequate sample sizes in both exploratory and confirmatory studies, (c) failure to use all the MLQ scales or items of scales, and (d), the use of nonhomogenous samples to test the construct validity of the full-range model. This last reason is of critical importance since this study established that the fit of structural equation models was negatively affected under conditions where the units of a sample were nonhomogenous.

This study established that the leadership model measured by the MLQ may be affected by the context in which it is observed. Consequently, using nonhomogenous samples to test the multidimensionality of the MLQ may result in inconsistent findings. Leadership measured as a behavior can be highly contextualized; thus, the factor structure of the MLQ may vary to some degree across different settings or with different leaders and raters. These boundary conditions of the theory may determine the pattern of relationships among the constructs, thus affecting the stability of the MLQ's construct validity. Baron and Kenny (1986) noted that the discovery of moderators can "integrate seemingly irreconcilable theoretical positions" (p. 1173) and that moderators may affect the way a relation holds in different subpopulations, as was the case in this study.

Based on the results of this research, it is clear that the MLQ 5X measures the nine factors it was designed to measure that constitute the full-range-of-leadership model—the nine-factor transformational, transactional, and laissez-faire leadership model—proposed by Bass (1998) and Bass and Avolio (1997). This model appears to hold up across a number of moderating conditions. Since independent samples were grouped in various moderating conditions that were theoretically interpretable, the generalizability of the constructs representing the full-range-of-leadership model is enhanced as a result of this study. Also, because construct validity is in part a function of whether constructs behave as expected—especially across independent groups—further evidence is provided to support the validity of the model.

Although the results of the criterion validity tests should be viewed with caution for the reasons discussed in the previous chapter, the results are theoretically interpretable and follow the propositions of Bass (1998) and Bass and Avolio (1994, 1997). The way in which the MLQ factors are related, and their relationship to effectiveness—albeit in independent structural models—confirm the results found in the literature and the propositions of the theory.

Thus, based on the evidence provided, it can be concluded that the nine-factor model underlying the MLQ 5X should be retained for future leadership research. The following sections expand this discussion on the validity of the theory and the instrument.

Conclusions About the Purpose and Research Problem

This study had three purposes:

1. To ascertain whether the MLQ's factors exhibit a reliable and consistent pattern of relationships across samples, as characterized by the theory.

2. To establish the validity of the MLQ in determining organizational or follower effectiveness measures across samples, as predicted by the theory.

3. To examine variations in the properties of the instrument and model for different moderating conditions, and to determine whether the validity and reliability of the MLQ varied across these conditions.

It is clear that two of the three purposes of this dissertation were fully realized. The MLQ's factors appear to exhibit a reliable and consistent pattern of relationships across samples as characterized by the theory. However, the pattern of results did vary somewhat depending on situational variables. Given the limitations of using same-source data and the high intercorrelations among the MLQ factors, the second objective was partially met. As a result of using a modified procedure to test the criterion validity of the leadership constructs independently, it appears that the results of the present study confirm earlier results reported in the literature. Given that the MLQ variables were entered individually, this finding must be viewed with caution since it is limited to estimating a population parameter by analyzing a bivariate relationship across samples, similar to using correlations within meta-analysis.

This study's findings may be summarized as follows:

1. The relationship of the MLQ factors was found to be invariant across samples.

2. The factors of the MLQ were found to be reliably related to a dependent criterion.

3. The reliability and validity of the MLQ was moderated to some degree by situational variables.

Conclusions about the Hypotheses

Based on the findings presented in chapter 4, it can be concluded that the relations between the MLQ constructs, and its measurement model, are equivalent across samples in moderated conditions, providing support for the construct validity of the MLQ. The hypotheses allow the following conclusions to be drawn:

1. The full nine-factor model best represented the data for the entire sample for

the test of the factor structure invariance of the MLQ, and that under conditions of strict factorial invariance an eight-factor model best represented the data.

2. The full nine-factor model best represented the data when studies were grouped under moderated conditions. The nine-factor model best represented the data under conditions of strict factorial invariance or factor structure invariance, suggesting that the factor structure and measurement model of the MLQ was invariant across independent homogenous groups.

3. The five transformational leadership factors were positively and significantly related to one another for the entire data set and also under the moderated conditions.

4. The five transformational leadership factors were positively and significantly related to contingent reward for the entire data set and also under the moderated conditions.

5. The five transformational leadership factors were negatively and significantly related to management-by-exception passive and laissez-faire leadership for the entire data set and also under the moderated conditions.

6. The relationship between the five transformational leadership factors and management-by-exception active was generally positive and significant, or insignificant for the entire data set. Under moderated conditions, the relationship between the five transformational leadership factors and management-by-exception active was either positive or negative and significant, or insignificant, depending on moderator categories.

7. Contingent reward was found to be negatively and significantly related to

management-by-exception passive and laissez-faire leadership for the entire data set. Under the moderated conditions, this relationship was also negative and significant for the majority of cases.

8. Contingent reward was found to be positively and significantly related to management-by-exception active for the entire data set. In the majority of moderating conditions, this same relationship was also prevalent.

9. Management-by-exception active, management-by-exception passive, and laissez-faire leadership were positively and significantly related to one another for the entire data set. Under moderated conditions the relationship occurred for the vast majority of cases.

10. The nine-factor model represented the data best when used to predict a dependent outcome for the factor structure invariance test when using the entire data set or under all moderating conditions.

11. The paths of the five transformational leadership factors to the dependent criterion were positive significant for the entire data set, and also under all moderating conditions when used independently in a multisample SEM.

12. The path of contingent reward to the dependent criterion was positive and significant for the entire data set, and also under all moderating conditions when used independently in a multisample SEM.

13. The path of management-by-exception active to the dependent criterion was positive but not significant for the entire data set when used independently in a multisample SEM. This relationship varied as a function of moderating conditions. The

path was positive or negative and significant, or positive but insignificant, depending on circumstances.

14. The path of management-by-exception passive and laissez-faire leadership to the criterion measure was negative and significant for the entire data set, and also under moderated conditions when used independently in a multisample SEM.

The above findings provide support for the hierarchical relationship of MLQ factors, as Avolio et al. (1995) reported, but with a notable difference regarding the way management-by-exception active relates to the other constructs. Also, the hierarchical relationship of the leadership constructs with effectiveness was also supported, again with the exclusion of management-by-exception active, whose relationship with the outcome measure varied according to situational moderators.

The next section will specifically address the conditions that need to be satisfied so that a psychometric instrument can be labeled as being valid and reliable.

The Validity and Reliability of the MLQ

Since distinct patterns of relationships emerged among the constructs, and since these patterns were generally predicted or explained by a theoretical framework, one can draw certain conclusions about the validity and reliability of the MLQ.

Validity refers to whether an instrument measures what it purports to measure, that is, its accuracy. Validity represents construct and predictive validity. The former refers to the interrelationship of the constructs; if the constructs "behave" as expected, this has a positive bearing on the instrument's construct validity. The structural model of the MLQ appears to satisfy the requirement for a validated instrument as indicated by the model fit and how it compared to the other models. As regards the measurement model of the instrument, the fact that the structural model is valid has direct implications for its measurement model. Specifically, the factors comprising the model cannot relate to each other in a consistent manner if the measurement model is not valid. Also, the instrument's testing under conditions of strict factorial invariance, where the loadings of the constructs and the residual variances were constrained to equality across groups, has direct bearing on the measurement model of the MLQ, even though no information was available at the item level.

Current results do not support firm conclusions about the instrument's criterion validity since the independent variables were analyzed separately and the dependent measure was collected at the same time as the independent measure and from the same source. Nevertheless, based on what was reported above, the MLQ constructs related to the criterion measure in line with the full-range theory and with results of previous research. Transformational and contingent reward leadership were positively related to perceived effectiveness, while passive-avoidant leadership were negatively related. Where results were not as expected (e.g., concerning management-by-exception active), they were clearly explained by the theory, were logical, and were supported by other empirical research for those moderating conditions. Based on the results of this study pertaining to the construct validity of the MLQ, it is possible to conclude that the instrument does adequately represent the full-range theory.

Reliability is concerned with replicating the results of a measurement instrument. It also bears measurement model's internal consistency, that is, the consistent interrelationship of the items among each other. Whether or not the right construct is being tapped is not of issue, but rather whether the same construct is being consistently measured. Since information on the item level was not available in this study, tests of strict factorial invariance were used to test the model's consistency. Based on those sets of results, it can be concluded that the MLQ is measuring the same constructs across groups and is therefore reliable. This is because the fit of the nine-factor model was acceptable across samples while constraining the measurement model to equality across groups, which implies that the instrument must be measuring its constructs reliably across those groups considering sampling error.

Discussion

The central support of this study's results is the fact that hypotheses were tested under homogenous sample conditions. As has been previously established, the validity and reliability of the MLQ is a function of sample homogeneity under conditions of strict factorial invariance. Since this is the most conservative invariance test, and given the wide use and popularity of the MLQ, it is important to focus on these results even though under conditions of factor structure invariance the nine-factor model was found to be valid for the entire data set. If the factor structure invariance tests were taken at face value, there would have been no need to test for moderators.

How moderators were identified, how the factor structure behaved under different moderating conditions, and how the factors related to a criterion measure require discussion. As noted in chapter 4, the different samples used in each moderator condition were similar enough to be grouped into a particular category. This is important in terms of interpreting the results of this study, since if the categories were not interpretable, interpreting the results of the moderator analyses would not be feasible.

Full Data Set

For the entire data set, the interrelationships among the leadership factors were as expected. The transformational and contingent reward constructs were positively related, and management-by-exception active and the passive constructs were positively related. Bass and Avolio (1994, 1997) have argued that the active constructs are interrelated and reinforcing, and that the transformational constructs are built on top of, and augment, contingent reward leadership. The corrective transactional and laissez-faire leadership constructs are also reinforcing given that they do not represent proactive leadership, are focused on failure, and are reactive or avoidant all together. The only result here that went contrary to the study's main hypotheses pertained to management-by-exception active, which was positively related to contingent reward and at times positively related to some of the transformational constructs. It appears that in some sample conditions management-by-exception active would be a necessary element in effective management. Thus, conclusive interpretations cannot be drawn here since in some instances management-by-exception active is clearly necessary, while in other instances it is not as effective, as was seen in the literature review.

As regards the criterion tests, the results generally supported the main hypotheses, namely, that the transformational constructs and contingent reward were positively related with effectiveness, and that management-by-exception passive and laissez-faire leadership were negatively related. Management-by-exception active was found to be insignificantly related. The pattern of results suggested the possibility of moderating conditions.

Normal Low-Risk Business Conditions

Only data obtained in normal low-risk business conditions were included for analysis in this study, and all samples that appeared to be labeled as business firms were utilized. Under these conditions, the results were generally as predicted, namely, that the transformational constructs were positively related to each other and to contingent reward. Active and passive corrective transactional leadership were positively associated with each other and with laissez-faire leadership, and transformational and contingent reward leadership were negatively related to active and passive management-by-exception and laissez-faire leadership. One result that went contrary to theory was the positive relationship between active management-by-exception and contingent reward. This result is however, evident in the literature. For example, results reported by Howell and Avolio (1993) in a bank setting, and Den Hartog et al. (1997) in a variety of Dutch organizations were similar to those reported in the current study. Management-by-exception and contingent reward may be related to a greater degree than originally expected, especially since this relationship held under most moderating conditions, and for the entire data set. Perhaps the difference lies in how management-by-exception is operationalized by leaders is where the difference may lie. A leader could give feedback to highlight mistakes for developmental purposes and goal setting, and hence ensure the avoidance of those mistakes in the future. In fact, one could argue that knowledge of mistakes is essential for developing individuals' skills and creating goals to develop followers for the future. What would leaders focus on developing if they had no knowledge of where their followers went wrong? This may explain why the two constructs were positively related.

The avoidance of failure can also affect the psychological success followers may receive from accomplishing tasks, when viewed in terms of path-goal theory. It is possible that in certain instances, management-by-exception is vital for success and is linked to contingent reward since the leader is compensating for certain conditions that are not helping followers meet their goals. On the other hand, leaders who use management-by-exception active simply to focus on mistakes and who do not use that feedback to help develop followers and avoid those mistakes in the future may create conditions that foster stress, anxiety, and risk aversiveness in followers. This is what Bass (1998) referred to as "the kiss of death" (p. 88) for organizations. This behavior may be especially prevalent under conditions when the consequences are not dire and when safety is not an issue. In those instances, it may be good to allow people to make mistakes and to help then learn from those mistakes, without being overtly critical in the feedback.

The positive relationship between management-by-exception and contingent reward was found for seven of the nine moderating conditions, thus lending support to the notion that contingent reward and management-by-exception active are positively associated contrary to the original theoretical propositions and to the results found by Avolio et al. (1995).

Results of the criterion test generally followed theoretical propositions, namely, that the transformational constructs and contingent reward would be positively related, while management-by-exception passive and laissez-faire leadership would be negatively related to effectiveness. The exception to this was management-by-exception active, which was not related to effectiveness.

Normal Low-Risk Academic Conditions

In normal low-risk academic and/or middle-level leader conditions, only data gathered from academic organizations were utilized. The results mirrored the normal low-risk conditions in most instances. An interesting finding here was the nonsignificant relationship between contingent reward and the passive constructs, where a negative and significant result was expected. Since the result was not significant, further analysis cannot be made. Relating the level of leadership to the results in this case is difficult. The discussion below on the low-level leader results will perhaps shed some light on this.

High-Risk/Unstable Conditions

As regards high-risk/unstable conditions, only organizational types that posed risks and danger were included, for example, the military platoon and fire departments samples. Here the main difference in the results as compared to the other two conditions was that management-by-exception active was positively associated with the active leadership constructs, that is, the transformational constructs and contingent reward. As noted by Avolio (1999), Bass (1998), and Bycio et al. (1995), active management-by-exception may be necessary in situations where risks and danger are prevalent. Failure to reach standards in such instances may have negative ramifications and a high cost for followers, the leader, and/or the organization. Avoiding failure to reach standards may be actively required, hence the positive conditions under which management-by-exception active can be utilized.

The data from this condition clearly supported the notion that active corrective leadership may be necessary in these circumstances, and that followers perceive it as such. It is unfortunate that this could not be corroborated by the results of the criterion validity test, given that the "Effectiveness" scale was only collected in one of the samples. However as a test of this proposition, the "Extra Effort" scale was utilized since data for this outcome measure was available from both samples. As expected, these post-hoc results indicated that the unstandardized regression path to the outcome variable was found to be positive and significant ($\beta = .367$; SE = .066; CR = 5.587; $p < .001$), thus supporting the notion that management-by-exception is necessary in such conditions. Another interesting finding here is the nonsignificant relationship between contingent reward and the passive constructs, where a negative and significant result was expected. Although the sign of the relationship was in the proposed direction, the nonsignificant result could be perhaps attributed to sampling error and the comparatively small sample size, as previously discussed.

High Bureaucratic Conditions

In the bureaucratic condition, organizations that were public and could be assumed to be bureaucratic, and organizations that required an elaborate organizational structure within stable operating conditions were included. Here the results followed those of the normal low-risk business condition, with one exception: management-by-exception active was always negatively and significantly related to the transformational constructs and was insignificantly related to contingent reward. The other findings were the same, namely, that the transformational constructs were positively related to each other and to contingent reward. Active and passive corrective transactional leadership were positively associated with each other and with laissez-faire leadership. Transformational and contingent reward leadership were negatively related to active and passive management-by-exception and laissez-faire leadership. As mentioned previously, Lowe et al. (1996) found more transformational leadership in public organizations, which are generally assumed to be more bureaucratic and mechanistic, compared to private organizations, which are generally more organic. It is plausible that in bureaucracies followers have so many rules and regulations to follow ingrained in the corporate culture that they become discontented. As a consequence, when a leader displays rule-based behaviors in a bureaucratic setting, followers eschew those behaviors in favor of transformational behaviors. This possibility is also supported by the criterion test, where the path from management-by-exception active to the criterion measure was negative and significant, the only time this occurred in all moderating conditions. Bass's (1985, 1998) contention that a bureaucratic organization would not support the emergence of transformational leader may be incorrect.

Majority Male Leaders/Raters Condition

As regards the majority male leaders/raters category, only samples that clearly indicated a majority of males were utilized. The results here were expected to be similar to those of the high-risk/unstable conditions set, given that two of the samples were from that category. The transformational factors were positively related with each other, with contingent reward, and with management-by-exception active. The transformational factors and contingent reward were negatively related to management-by-exception passive and laissez-faire leadership. Management-by-exception passive and laissez-faire leadership were positively related to each other and to management-by-exception active. The positive management-by-exception active relationship with the transformational constructs and with contingent reward, and the positive path to the outcome measure have several possible explanations. First, the sample did include what were high-risk and also comparatively dangerous conditions, for example, military platoon, fire department, and gas exploration, which may oblige a leader to use management-by-exception active behaviors. Also, based on the literature reviewed, male leaders tend to display less transformational behaviors than women do, which by extension may mean more management-by-exception behaviors. In further support of this notion, the unstandardized path of management-by-exception active to the criterion variable indicated a positive and significant relationship.

Majority Female Leaders/Raters Condition

For the majority female leaders/raters category, only samples that clearly had a majority of female leaders/raters were used. These results were similar to the normal low-risk academic conditions results, which is not surprising given that both of the female leader samples were included in the normal low-risk academic category. The results indicated that transformational constructs and contingent reward were positively related, as were management-by-exception active and passive and laissez-faire leadership. The transformational constructs were negatively related to management-by-exception passive and laissez-faire leadership. Management-by-exception active was on the whole negatively and significantly related to the passive constructs, and was also positively and significantly related to contingent reward. An unclear result was the nonsignificant relationships between contingent reward and management-by-exception passive and laissez-faire leadership, which may be attributed to the comparatively small sample size. However, most of these covariances were negative and significant and therefore should be dropped from further consideration. No criterion tests could be conducted because only one sample had the "Effectiveness" measure.

Low-Level Leaders Condition

In the low-level leaders condition, only leaders who were clearly in a supervisory role and directly supervised followers were utilized. Common occupations in this case were military platoon, gas exploration, perioperative nurses, and hospitality/retail. Apart from using low-level leaders, the samples had another element in common: They all included conditions under which a sense of urgency is important and where the need for adherence to standards is required. This is obviously prevalent in the military platoon, gas exploration, and perioperative nurses samples. However, it is also prevalent in the hospitality/retail sample, where the need to deliver and produce tailor-made services and products in a labor-intensive system that includes the customer in the process creates a sense of urgency, adherence to standards, and a desire to avoid mistakes (Cullen, 1996; Kavanaugh & Ninemeier, 1995; Morrison, 1989).

As a consequence of the moderating conditions, the results in this case were relatively straightforward. The transformational constructs were positively related to contingent reward and to management-by-exception active. Contingent reward and management-by-exception active were themselves positively related. Management-by-exception passive and laissez-faire leadership were positively related to one another and negatively related to contingent reward and the transformational constructs. An interesting result was the negative and significant relationship between management-by-exception active and passive, and between management-by-exception active and laissez-faire leadership, which is explained below. In the criterion test the results were as expected for the transformational constructs and contingent reward, which were positively related to effectiveness, and management-by-exception passive and laissez-faire leadership, which were negatively related.

Management-by-exception active was positively related to the dependent measure. The critical ratio of this result was also extremely high, much higher than that of the majority male leaders' condition, suggesting that it was highly significant and important in determining the outcome measure. Thus, it appears that for low-level leaders, management-by-exception active in such moderating conditions is an integral part of effective leadership. This is logical in that dealing with low-level followers in such conditions necessitates that the leader be focused on ensuring that standards are met since the conditions are demanding in terms of task requirements, and they require a sense of urgency. Since at low levels management-by-exception active is vital and positively related with effectiveness, it seems to be afforded a status similar to the transformational and contingent reward factors, namely, that it is an active form of leadership that is required so that failure is avoided. Since management-by-exception passive and laissez-faire leadership are passive-avoidant styles, it appears logical that in such conditions management-by-exception may be negatively related to them, explaining the interesting result noted above.

Middle-Level Leaders Condition

As regards the middle-level leaders (1) moderating condition, only leaders who appeared to be at a middle level and in nonacademic, bureaucratic conditions were utilized. Indeed, this condition was a subset of the bureaucratized sample and produced similar results. As has mostly been the case, the transformational constructs were positively related to each other and to contingent reward. The relationship between the transformational constructs and management-by-exception active was either negative or nonsignificant. Management-by-exception passive and laissez-faire leadership were positively related to one another and negatively related to contingent reward and the transformational constructs. Management-by-exception active was positively related to management-by-exception passive but was insignificantly related to laissez-faire leadership, which was unexpected. Also, it was insignificantly related to contingent reward. Again, perhaps the small sample size contributed to nonsignificant results. Alternatively, perhaps management-by-exception active does not play a prominent role in this case. After all, these samples came from stable conditions where the same sense of urgency is not required that were bureaucratized. As noted above, in bureaucratized conditions management-by-exception was negatively related to the transformational constructs and to contingent reward.

Concluding Remarks

It appears that in most circumstances the data were explainable based on the theoretical frameworks explored earlier. On the whole it appears that how moderating conditions were specified, the resulting interpretations of the MLQ's factor structure, and how factors were related to the criterion measure was consistent with the full-range model of leadership. That conditions moderated the factor structure of the MLQ lends support to the notion that leadership behavior will vary and may be a function of environmental contingencies.

Transformational constructs were always positively related with each other and with contingent reward, which is logically deduced from the theory. The five transformational constructs were always negatively related to management-by-exception passive and laissez-faire leadership, which again is a logical theoretical deduction. Contingent reward was negatively related to management-by-exception passive and laissez-faire leadership in the majority of cases, as one would expect. Management-by-exception active was positively related to contingent reward in the majority of cases, which goes against conventional theory. Management-by-exception active, management-by-exception passive, and laissez-faire leadership were positively related in the majority of cases, as would be expected.

As far as the criterion validity test is concerned, even though the test was weak, results followed the theoretical propositions regarding the transformational constructs and contingent reward, which were always positively related to effectiveness, while management-by-exception passive and laissez-faire leadership were always negatively related. Management-by-exception active was either positively or negatively related, or insignificant, depending on circumstances.

This study also suggests several reasons why conflicting results were found regarding the MLQ's construct validity. The limitations of using exploratory techniques were discussed previously. Also, many studies used older versions of the MLQ, whose results would be difficult to generalize to the MLQ 5X. This discussion will therefore focus on studies that used confirmatory techniques by way of suggesting why the MLQ was not validated by other researchers. Where relevant, results from testing other versions of the MLQ will be discussed.

Avolio et al. (1999a) used samples from 14 studies to test the MLQ's factor structure, and, after aggregating the data, found support for a six-factor model. The studies involved various organizational types and environmental conditions and may have included mixed-gender leader/rater samples and levels of leaders. Thus, even though Avolio et al. (1999a) may or may not have attempted to validate their nine-factor model, the fact that the sample was nonhomogenous may have made it difficult to validate the nine-factor model. For example, using the same data as Avolio et al. (1999a) with listwise deletion and the multiple groups technique of SEM, the same nine leadership models that were tested in this study were tested on this data set. Since one study did not include data on all nine factors, the procedure recommended by Wothke (2000) for multisample analyses was utilized. The results of this test are summarized in Appendix G. It is clear that the best representation of the data in this case is Model 8. For purposes of comparison, the same procedure was used on the nine samples of the original validation of the MLQ (Avolio et al., 1995), the results of which are reported in Appendix H. In this case the nine-factor model was the best representation of the data; however, two fit indices (NFI & RFI) were below the cut-off points recommended by the literature. Given that the original validation sample also included data sets from various organizational types and environmental conditions and may have included mixed-gender leader/rater samples and levels of leaders, the fit could have been negatively affected, as in the results of Avolio et al. (1999a).

Moreover, in the event that certain subsamples were larger than others—for instance the gas exploration or military platoon sample—the results may have been disproportionately affected by conditions unique to these samples. It appears Avolio et al. (1999a) did not test the nine-factor model; had they tested it, their results would have mirrored the findings presented here. Thus it does appear that their intentions were merely to confirm that the MLQ did not lack in discriminant validity and that Bass's (1985) original propositions about a six-factor model were unfairly criticized.

The Avolio et al. (1999b) study was not an attempt to test the multidimensionality of the MLQ, and therefore is not relevant to include in this section.

Bycio et al. (1995), who found support for a two-factor active-passive model, used an older version of the MLQ that included different items and factors. A substantive comparison cannot be made to MLQ 5X results. Nonetheless, based on the findings of this dissertation, it appears that their results may be flawed for two reasons. First, the nurses in their study either reported to a head nurse or a physician, which represent different hierarchical levels. Based on the results of this dissertation, mixing hierarchical levels may influence the factor structure of the MLQ since the behaviors exhibited by leaders at different levels may be different, as suggested by Bycio et al. Second, it can be assumed that most of the nurses were female, whereas most of the physicians were male. As noted above, same-gender leaders should be used together in confirmatory factor analyses, since mixing genders of leaders can influence the factor structure of the MLQ. Finally, a two-factor active-passive model that was tested in this dissertation under all conditions was not found to be tenable.

Carless (1998a) tested the MLQ 5X, but a limitation is evident that flaws her results. Data were not gathered on idealized influence (behavior) or inspirational motivation. Attempting to determine the construct validity of an instrument while omitting scales, then finding that the remaining three transformational scales are best represented by a second-order factor, is a suspect way to conduct research. Failure to test the entire factor structure leaves open the possibility that the transformational leadership model was best represented by five single-order factors in addition to the transactional factors and laissez-faire leadership. To explore the unlikely possibility that Carless is correct, her proposition that three of the transformational scales are best represented by a higher-order factor was put to the test with the data sets used in this dissertation. A freely correlating model comprising of six single-order factors representing idealized influence (behavior), inspirational motivation, contingent reward, management-by-exception active, management-by-exception passive, and laissez-faire leadership, was correlated with a higher order factor representing the idealized influence (attributed), intellectual stimulation, and individualized consideration factors. These results were compared to those of the nine-factor model, the results of which are summarized in Appendix I. These results show that Carless's proposition that the three aforementioned transformational factors are best represented by a higher order factor is not tenable for the entire data set and for all moderating conditions.

The Geyer and Steyrer (1998) study used an older version of the MLQ that included different factors. Their sample included different levels of leaders, who may have displayed different combinations of behaviors, thus affecting the factor structure of the MLQ. Furthermore demographic information on the gender of leaders/followers was not reported. The genders may have been mixed, which could have affected the results.

Howell and Avolio (1993) confirmed six factors of an older version of the MLQ that only consisted of six factors. The leader sample was predominantly male (97%), and the leaders are all senior executives representing the top four levels of management in a banking institution. No information was available on the followers. The homogeneity of their sample regarding leader gender and hierarchical level was the probably positive influence on the pattern of their results.

Tepper and Percy's (1994) first sample consisted of students, the slight majority of which were males who completed an older version of the MLQ. It is unclear whom the students were rating; however, it was reported that they all had part-time jobs, meaning that they either rated their supervisor/manager or themselves. An obvious limitation is that if they were rating their managers, all 290 students probably did not work in similar organizational types. Furthermore, there is a strong possibility that the leaders' gender and hierarchical level was not homogenous. In the event that the subjects were rating themselves, given their mean age (22.86 years), it is questionable whether many had the opportunity to exhibit the full-range of leadership behaviors. Also, the fact that Tepper and Percy did not include all the items in their analysis limits their results. Since their second study was based on the results of the first, and given the limitations of the first study, further discussion of their results is not warranted.

Tracey and Hinkin (1998) used a 1990 version of the MLQ to confirm a one-factor model of transformational leadership. The leaders that were rated ranged from supervisors to vice-presidents. Given the limitations of mixing samples, it is likely that results depended on the hierarchical levels included in the sample.

Implications

The recommendations of this study have implications for theory, future research, policy and practice, and finally social change. The point of this section is to deduce the consequences of this study and make appropriate recommendations as they relate to the four areas, so that the leadership field can move forward to provide new knowledge for society.

Implications for Theory

A theory is set of constructs that are interrelated in some way and bounded by certain conditions. Theories can offer valuable insights and are useful for providing a general understanding of phenomena for predictive purposes. The framework of a theory, and the way its constructs are ordered and measured must represent accurately what occurs in reality in order for the theory to be useful. As noted by Lewin (1945), "nothing is as practical as a good theory" (p. 129).

Apart from validating a nine-factor model of leadership, this study makes important contributions to understanding the theory of transformational, transactional, and laissez-faire leadership and how it works in reality. The theory appears to be accurately specified, with evidence provided here for structural and measurement model invariance. However, the theory's measurement model and the way its constructs interrelate are not invariant across nonhomogenous conditions. The constructs and how they are operationalized appear to be equivalent, but the way the constructs interrelate, and how they are related to outcome measures are bounded by certain conditions. The boundaries included various environmental and organizational conditions, organizational types and structures, leader gender, and the hierarchical level of the leader. These results are in part supported by the meta-analytic results by Lowe et al. (1996), who found organizational type and leader level as moderators.

Several specific findings must also be included in future theoretical frameworks:

1. Since the nine-factor model was consistently the best fitting model, it should be used in its entirety when testing propositions.

2. The relationship among constructs will depend on the conditions under which the model is tested.

3. The relationship of the constructs to criterion measures will likely depend on the conditions under which the model will be tested.

Another point that must be taken into account is whether the theory includes all possible constructs in explaining a phenomenon. Because of the complex nature of the world, scientists are limited in understanding phenomena since they are not aware of all possible constructs and/or causal process that have been included in a theoretical explanation (Pettigrew, 1996). In the case of the MLQ model analyzed, it is possible that other constructs should be included in the model but have yet to be discovered. For instance, following Shashkin (1988) and Westley and Mintzberg (1988), visionary leadership could perhaps be viewed independently of charisma's effect although strongly related to it. Similarly, the leader's ethical and moral orientation could be untangled from charisma, as could the leader's social responsibility and utilitarianism.

Another possibility that could be further investigated is how management-by-exception active has been operationalized since it also appears to be the weakest measure based on results provided by Avolio et al. (1995). Leaders may operationalize this factor in one of two ways depending on how they use and give feedback. For want of a better term, perhaps the following two factors can be proposed to replace the single factor: management-by-exception active-constructive, and management-by-exception active-aversive. Since so many positive relationships were noted between management-by-exception active and contingent reward, and given the arguments regarding operationalizing the construct, it may be that current indicants of management-by-exception active may actually capture two distinct but complementary constructs. It is thus proposed that management-by-exception active-constructive may be positively related to contingent reward since developmental goals are based on deviations from norms. This construct should also be related to the transformational constructs and to individualized consideration in particular under most conditions since the leader is using feedback to help and develop the follower, which is an important element of individualized consideration. On the other hand, management-by-exception active-aversive may be negatively related to contingent reward and to the transformational constructs under most conditions. Indicators could perhaps operationalize management-by-exception active constructive to include focusing on errors to provide learning opportunities, intervening and assisting when things go wrong, correcting mistakes but not punishing mistakes, and so forth. On a theoretical level, these behaviors are management-by-exception; that is, when exceptions occur from standards that have been set, the leader intervenes. They are clearly active, and the feedback they give is clearly positive and, on a theoretical level, related to individualized consideration and contingent reward. This differs from the current indicators of management-by-exception active. Contrary to management-by-exception active-constructive leadership, a leader could be management-by-exception active-aversive by pointing out mistakes, intervening when standards are not met, informing followers when things go wrong, acting on mistakes and deviations from standards, and so forth. Theoretically these behaviors are management-by-exception active, but here the leader is not providing any positive feedback—precisely as the construct was originally proposed. Based on the proposed indicators of management-by-exception active aversive, it would be expected to relate negatively to contingent reward and the transformational constructs, and positively to management-by-exception passive and laissez-faire leadership, as was originally intended.

Another element that should be investigated is the emergence of transformational leadership in various organizational conditions. This study found that transformational leadership was indeed prevalent in bureaucratic environments, as noted by Lowe et al. (1996). In the present study transactional leadership elements, especially management-by-exception active, did not play as important a role as Bass (1998) believed, as evidenced by the relationship of this construct to the transformational factors, contingent reward, and the effectiveness criterion measure. Thus, this study suggests that transformational leadership behaviors can emerge in all types of environmental conditions, and are important requisites of effective leadership.

Implications for Future Research

This study shows that social and behavioral scientists can safely use the MLQ 5X in future research and can evaluate studies based on this psychometric instrument with the knowledge that it accurately represents the model upon which it was developed. This study also suggests that further scrutiny of the MLQ's psychometric validity should be done in homogenous conditions.

Researchers are encouraged to utilize the full-nine factor model when collecting and reporting data. Researchers should report the factor (scale) means, factor (scale) standard deviations, scale reliabilities, and interfactor correlations. In this way integrative research studies, such as this one or meta-analytic methods, can move the field forward by establishing the conditions under which the theory is moderated, and by establishing the extent of predictive effect under such conditions. Moderators are increasingly seen as an important element to be included in leadership research, and should be understood to better explain the workings and boundaries of theoretical frameworks (e.g., Howell, Dorfman, & Kerr, 1986; Pawar & Eastman, 1997; Shamir & Howell, 1999).

Researchers are also encouraged to gather data on effectiveness measures that may be linked to leadership. These effectiveness measures could include subjective measures, for example, employee satisfaction and commitment, or the outcome measures in the MLQ, which include leaders effectiveness, satisfaction with the leader, and extra effort. Apart from the MLQ's outcome measures, objectively determined measures should also be sought to further determine the relationship of the construct to dependent variables. These measures could include unit performance, financial indicators, or other organizationally determined effectiveness measures. This can perhaps occur only at the single study level since gathering dependent measures that are conceptually and metrically equivalent across samples would be difficult, unless a study had multiple homogenous business units or there were a coordinated effort among independent researchers to achieve that condition. By using homogenous data sets, the criterion validity of the MLQ can be closely scrutinized. Where data cannot be gathered on objective outcome measures, the MLQ dependent factors should be utilized; however, to eliminate the impact of common methods variance the measures should be collected at different times or from a different source, as recommended in the literature.

Some recommendations can be made regarding the type of future research that should be conducted. It appears from the results of this study that gender plays a role in determining the factor structure of the MLQ. However, the results do not conclusively point to gender only since in some instances it may have been environmental or organizational factors that affected the MLQ's factor structure, independent of gender. It would be interesting to conduct studies where the sample is split according to gender and where environmental or organizational conditions play a role in determining leader behavior. These conditions should be in traditional domains for certain genders, for example, military combat units, nurses, and so forth. Researchers should also gather data in the types of moderating conditions identified in this study to test the propositions made regarding how the factor structure operates in those conditions. Furthermore, researchers should test the implications and effects of the full-range-of-leadership model in other kinds of organizational conditions where leadership is in operation but in a less obvious manner, for instance, in the classroom (Antonakis, 1999). What is also required is data from samples in other cultural settings. The universality of the MLQ, and indeed leadership in general, can only be analyzed in this way, especially when using multiple group SEMs that test for conceptual and metric equivalence (Usunier, 1998).

Apart from the quantitative research that should be undertaken, future research should also focus on improving the theory. As mentioned by Conger (1998), qualitative methods must be used to better understand a phenomenon as complex as leadership. In this way it may be possible to discover other constructs that affect the model and dependent measures but that have heretofore been elusive. As House (1988) noted, qualitative research gives the environment an opportunity "to teach us because we do not have an adequate framework, we do not have hypotheses, we do not have a clear idea as to what the critical variables are, and we have little ability to measure them" (pp. 258-259). Although the full-range-of-leadership model provides an understanding of how leadership works, and may indeed be the best alternative, it still should be viewed cautiously, as should any theoretical model (Russell, 1935/1997). Also, the use of experimental designs should be investigated since they can shed some light on the workings of the theory, control independent variables, and establish causal relationships (Brown & Lord, 1999; Wofford, 1999).

The long-term impact of leadership, and the effectiveness of leaders in varied temporal and contextual settings should also be further investigated. Apart from Yammarino et al. (1993), longitudinal research using the full range model is sparse. Additional longitudinal research should be conducted, over a medium time frame of perhaps 4 to 5 years, to ascertain precisely if leaders are consistently effective in similar or different contexts, and whether leadership style is constant or varies in those contexts. Only through such methods can the consequences of leadership be determined by tracking leaders and their behaviors in different settings to determine whether the effect of leadership is real or, following Strand (1988), simply a result of circumstance.

Apart from investigating the impact of a leader on a team of individuals, or from determining the aggregate response of individuals in various teams that report to the same leader, research should be conducted to determine whether leaders who supervise a multitude of teams have the same impact on those teams. Given that the results of this study indicated that leadership styles are contextually driven, it would be interesting to determine if leaders can accommodate their styles in different contexts with different groups of individuals and supervise them effectively.

Finally, the antecedents of successful leadership, not just leadership behaviors, must be better understood so that way leaders operationalize their behaviors and use information to make correct decisions is better understood. Although preliminary work has been done in this area—for instance linking intelligence and experience to leader effectiveness (Fiedler, 1993)—what effective leaders know is often difficult to determine. As Schön (1983) noted, competent practitioners "exhibit a kind of knowing-in-practice, most of which is tacit" (p. viii). Tacit knowledge is seen as part of practical intelligence, which is referred to as a "common sense" procedural type of knowledge distinct from conventional notions of intelligence that has been found to be related to effective leadership (Sternberg, Forsythe, Hedlund, Horvath, Wagner, Williams, Snook, & Grigorenko, 2000). Other elements that have been extensively researched, but not linked to the leadership dimensions discussed in this study, include learning abilities of leaders, how they communicate in organizational settings, and how they manage different kinds of relationships (Argyris, 1976, 1994). Future research should focus on understanding what makes leaders *tick* and how this can be linked to effective leadership behaviors.

An important methodological implication for leadership research and other domains is the generalizability and invariance of an instrument's psychometric validity. The MLQ is valid only under conditions of sample and situational homogeneity, which may also be the case with other kinds of psychometric instruments both in leadership and management or other domains, for example consumer behavior or education. This proposition must be taken into consideration before research efforts are planned, and especially when examining behavioral measures.

Implications for Policy and Practice

Dubin (1976) noted that "the contribution of theory to practice is to provide reliable predictions about what will happen to the system on which the practitioner is working" (p. 37). Based on this study, and others where data have been gathered in real or simulated conditions, it can be concluded that leadership, and in particular transformational leadership, has an impact on organizational effectiveness, and its dimensions can predict organizational outcomes.

An important implication for practitioners is that leadership behaviors should vary according to environmental requirements. As established in this study, leaders should increase or decrease the amount of management-by-exception active behaviors they display depending on the requirements of the goal at hand and circumstances in general. For instance, in dangerous conditions, management-by-exception active behaviors are a necessary requisite to effective leadership. As regards the full set of behaviors that should be used, it was determined from the results of this study that transformational and contingent reward leadership should be used most often, and passive-avoidant leadership least often. Consequently, using the wrong set of behaviors in certain situations may negatively affect performance.

It is thus imperative for organizations to develop their leadership capabilities so that they become more effective and in the process have more satisfied and committed employees. It is important, therefore, to hire or promote individuals with good leadership profiles, as established by the MLQ. Another alternative is to teach individuals to be better leaders. Bass (1998) and Avolio (1999) argued that transformational leadership can be taught, and according to the results of empirical research it is possible to improve the leadership capacities of individuals (Avolio & Bass, 1998; Barling et al., 1996; Bass, 1990b; Bass & Avolio, 1999; Dvir et al., 1999). "Clearly, the answer to the question, can transformational leadership be effectively taught and learned is affirmative" (Bass, 1998, p. 114). Also, Gardner (1990) noted,

> Many dismiss the subject with the confident assertion that 'leaders are born not made.' Nonsense! Most of what leaders have that enables them to lead is learned. Leadership is not a mysterious activity. . . . And the capacity to perform those tasks is widely distributed in the population. (p. xv)

Even charisma, which has been described as "a manifestation of personal charm unworthy of serious attention or as an elusive even too impressionistic to be captured" (Conger & Kanugo, 1988a, p. 2), can be studied scientifically to train individuals to exhibit its behaviors (Conger & Kanugo, 1988b; Shashkin, 1988). Avolio and Gibbons (1988) stated that charismatic/transformational leadership can be viewed "as a developmental process that unfolds across the life span" (p. 303) and that custom-designed training interventions could alter leadership behavior. Pondy (1978) noted that leadership involves communicating a meaning clearly and simply. The capacity for creating meaning is limitless and is a function of our language capability, which of course can be developed. As Pondy noted, "The real power of Martin Luther King was not that he had a dream, but that he could describe it" (p. 95). Since meaning and symbolism are integral parts of charisma, then teaching and training individuals to better communicate their visions can improve this part of charisma.

Training individuals is not simple; it depends on many factors including the quality of the trainer and the training program (Bass & Avolio, 1999; Conger, 1992). It is dismaying to see the number of training programs that rely on untested, unscientific training methods, and on theories or models of dubious quality. However, the theory and research behind the full-range-of-leadership model, its instrument for gauging leadership style, and its method for training individuals to be leaders appear to be firmly rooted in practice. Another difficulty of promoting authentic leadership may be training leaders to be more ethical and moral. Leaders are role models to their followers and may influence their behaviors accordingly (Bass, 1998), but training individuals to be ethical and moral may be difficult.

Since this study has established that the MLQ 5X instrument validly gauges the full-range of leadership behaviors, the recommendation to policy makers and practitioners is simple: support leadership research efforts, sponsor research efforts, commit to ongoing leadership training, and fund continued testing of the MLQ and the full-range model of leadership.

Implications for Social Change

> There are few problems of interest to behavioral scientists with as much apparent relevance to the problems of society as the study of leadership [The] effective functioning of social systems . . . is assumed to be dependent on the quality of their leadership. (Vroom, 1976, p. 1527)

Argyris (1980) argued that research must make a difference to society by providing it with liberating alternatives and increasing the quality of life of its citizens. According to Lewin (1948/1997), "Research that produces nothing but books will not suffice" (p. 144). As is the core value of Walden, research should create or explain social change that is beneficial. Unfortunately, scanning the literature reveals how often resources are wasted in conducting research that will make absolutely no difference to anyone. The litmus test that all studies must thus pass is what is commonly heard: "So what? Who cares? And of what value is it to society?"

This study has made a contribution to understanding and fostering positive social change by independently validating an instrument that gauges the full-range-of-leadership model. This model and how it can affect positive social change has been repeatedly discussed in this dissertation. Furthermore, this model takes into account the social implications of leadership and promotes authentic leadership that has a strong moral and ethical platform. The ethical and moral dimensions of leadership have now achieved an important status in the study of leadership (Bass & Steidlmeier, 1999; Carlson & Perrewe, 1995; Drouillard & Kleiner, 1996; Gardner, 1990; Grundstein-Amado, 1999; House, 1977; Howell & Avolio 1992; Zaleznik, 1989). These ethical and moral implications have even been afforded the label of the "Holy Grail of leadership" by some (Avolio, 1999, personal communication).

Transformational leaders have the power to see and alter the shortcomings of the status quo, and induce followers to accept a vision of a better future. Transformational leaders can change the values and beliefs of others, develop them, and inspire them to go beyond their self-interest for the good of the group and society at large. Transformational leaders care about the moral and ethical implications of their actions and how these affect their followers, and other social systems. Since it has been established that the MLQ is a valid and reliable instrument, and since leadership training can alter the behaviors of individuals, this dissertation has helped build a solid foundation for the promotion of positive social change.

The importance of leadership to society has been summed by Gardner (1990), who introduced his book by stating:

> Why do we not have better leadership? The question is asked over and over. . . . When we ask a question countless times and arrive at no answer, it is possible that we are asking the wrong question—or that we have misconceived the terms of the query. Another possibility is that it is not a question at all but simply convenient shorthand to express deep and complex anxieties. It would strike most of our contemporaries as old-fashioned to cry out, 'What shall we do to be saved?' And it would be time-consuming to express fully our concerns about the social disintegration, the moral disorientation, and the spinning compass needle of our time. So we cry out for leadership. (p. xi)

Limitations

This results and conclusions of this study are limited as discussed in chapter 1 and 3. Another limitation is the use of structural equation modeling failed attempts to disconfirm a model. Although every effort was made to reject the implied model by using as many competing theoretical models as possible, the results will always indicate a failed attempt to reject a model but will never actually confirm the implied nine-factor model. As Popper (1962/1971) noted, theory can only establish itself, and then only tentatively, when it has been subject to public criticism in an attempt to refute it. As a result of the possibility of falsification of a theory, nothing is ever certain, and only through the process of attempted refutation can a theory be tentatively validated. Similarly, it has not yet been established if an unknown model may be a better representative of the data than the nine-factor model is. Also, it may be possible that this unknown model's measurement and structural model is invariant across nonhomogenous samples. Thus, a challenge goes out to other researchers to disconfirm the validity of these results. Furthermore, as noted by Kuhn (1962), the nature of science, its rules, logic, and way of identifying and solving is a function of the scientific paradigm to which the body of knowledge subscribes. In other words, the world-view of science and what it attempts to explain is but merely an extension of the theory-laden boundaries that actually define values and attitudes, what is to be observed, and the tools and processes necessary to solve scientific problems. This phenomenon of bounding science with distinct canons is what Kuhn refers to as paradigms, which are "universally recognized scientific achievements that *for a time* provide model problems and solutions to a community of practitioners" [italics added] (p. x). The full-range-of-leadership model and the results of this study are a function of the times and can only be tentatively accepted. It is thus hoped that new knowledge will eventually build on or displace the results of this study so that our scientific methodology and understanding of leadership advances. However, for the time being, and as far as the results of this study are concerned, the preponderance of evidence indicates that the MLQ 5X of Bass and Avolio (1995) is a valid and reliable instrument.

Conclusion

Hunt (1991) quoted an unknown author: "Once I was active in the leadership field. Then I left it for about ten years. When I returned it was as if I had been gone only ten minutes" (p. 1). That statement may have read true a couple of decades ago, when the field of leadership was admittedly in disarray. Now, however, we are closer than ever to discovering the elusive concept of leadership, its multidimensional elements, and their respective impact on individuals and social systems.

As evidenced by the results of this study, the MLQ appears to be a valid and reliable instrument that can adequately measure what has been labeled as transformational, transactional, and laissez-faire leadership. This theoretical framework and its nine single-order factors have been found to prevail in a diverse array of conditions, albeit in slightly different factor structures, depending on sample conditions. Transformational and contingent reward leadership were found to be positively related to outcome measures, while laissez-faire and management-by-exception passive leadership was found to be negatively related. The relationship of management-by-exception active to dependent outcomes and to the other factors was a function of situational conditions. This suggests that universal behavioral approaches of leadership may not be valid, and that leaders should vary elements of their behaviors based on situational moderators that could affect goal attainment, or require a modification in previously established objectives.

Much research is currently being conducted so that we can better learn what leadership is and how we can train individuals to be better leaders. With the MLQ, we are closer than ever before to measuring leadership, and understanding its antecedent and consequent conditions. Although this instrument cannot possibly account for all leadership dimensions, it is a solid basis from which to conduct further research and expand the full-range behaviors to better gauge reality. It is hoped that this dissertation will help build towards this reality and germinate some new knowledge for the benefit of society; new knowledge will be used for the greater good, and make our world more livable and humane.

REFERENCES

Adler, N. (1997). International dimensions of organizational behavior. (3rd ed.). Cincinnati, OH: South-Western College Publishing.

Anthony, L. V. L. (1994). The relationship between transformational and transactional leadership and organizational culture, employee performance, and employee attrition. Dissertation Abstracts International, (University Microfilms No. 9426863).

Akaike, H. (1987). Factor analysis and AIC. Psychometrika 52(3), 317-332.

Antonakis, J. (1999). Transformational leadership and perceived instructor effectiveness: An exploratory study. Unpublished manuscript, Walden University, Minneapolis.

Ansoff, I., & McDonnell, E. (1990). Implanting strategic management. New York: Prentice Hall.

Aquino, K., Grover, S. L., Bradfield, M., & Allen, D. G. (1999). The effects of negative affectivity, hierarchical status, and self-determination on workplace victimization. Academy of Management Journal 42(3), 260-272.

Arbuckle, J. L. (1994). AMOS: Analysis of moment structures. Psychometrika 59(1), 135-137.

Arbuckle, J. L., & Wothke, W. (1999). Amos 4.0 user's guide. Chicago: Smallwaters Corporation.

Argyris, C. (1957). Personality and organization: The conflict between system and individual. New York: Harper & Row.

Argyris, C. (1964). Integrating the individual and the organization. New York: John Wiley & Sons.

Argyris, C. (1976). Increasing leadership effectiveness. New York: John Wiley & Sons.

Argyris, C. (1980). Inner contradictions of rigorous research. New York: Academic Press.

Argyris, C. (1994). On organizational learning. Oxford: Blackwell Publishers

Atwater, D. C., & Bass, B. M. (1994). Transformational leadership in teams. In B. M. Bass, & B. J. Avolio (Eds.), Improving organizational effectiveness through transformational leadership (pp. 48-83). Thousand Oaks, CA: Sage Publications.

Atwater, L. E., & Yammarino, F. J. (1992). Does self-other agreement on leadership perceptions moderate the validity of leadership and performance predictions? Personnel Psychology 45(1), 141-164.

Atwater, L. E., & Atwater D. C. (1994). Organizational transformation. In B. M. Bass, & B. J. Avolio (Eds.), Improving organizational effectiveness through transformational leadership (pp. 146-172). Thousand Oaks, CA: Sage Publications.

Avolio, B. J. (1994). The alliance of total quality and the full range of leadership. In B. M. Bass, & B. J. Avolio (Eds.), Improving organizational effectiveness through transformational leadership (pp. 121-145). Thousand Oaks, CA: Sage Publications.

Avolio, B. J. (1999). Full leadership development: Building the vital forces in organizations. Thousand Oaks, CA: Sage Publications.

Avolio, B. J., & Bass, B. M. (1995). Individual consideration viewed at multiple levels of analysis: A multi-level framework for examining the diffusion of transformational leadership. Leadership Quarterly 6(2), 199-218.

Avolio, B. J., & Bass, B. M. (1998). You can drag a horse to water but you can't make it drink unless it is thirsty. The Journal of Leadership Studies 5(1), 4-17.

Avolio, B. J., Bass, B. M., & Jung, D. I. (1995). MLQ Multifactor leadership questionnaire: Technical Report. Redwood City, CA: Mindgarden.

Avolio, B. J., Bass, B. M., & Jung, D. I. (1999a). Re-examining the components of transformational and transactional leadership using the Multifactor Leadership Questionnaire. Journal of Occupational and Organizational Psychology 72, 441-462.

Avolio, B. J., & Gibbons, T. C. (1988). Developing transformational leaders: A life span approach. In J. A. Conger, & R. N. Kanugo (Eds.), Charismatic leadership: The elusive factor in organizational effectiveness (pp. 276-308). San Francisco: Jossey-Bass Publishers.

Avolio, B. J., Howell, J. M., & Sosik, J. J. (1999b). A funny thing happened on the way to the bottom line: Humor as a moderator of leadership style effects. Academy of Management Journal 42(2), 219-227.

Avolio, B. J., Waldman, D. A., & Einstein, W. O. (1988). Transformational leadership in a management game simulation: Impacting the bottom line. Group and Organization Studies 13(1), 59-80.

Avolio, B. J., & Yammarino, F. J. (1990). Operationalizing charismatic leadership using a levels-of-analysis framework. Leadership Quarterly 1(3), 193-208.

Avolio, B. J., Yammarino, F. J., & Bass, B. M. (1991). Identifying common methods variance with data collected from a single source: An unresolved sticky issue. Journal of Management 17(3), 571-587.

Bacharach, S. B. (1989). Organizational theories: Some criteria for evaluation. Academy of Management Review 14(4), 496-515.

Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models. Academy of Marketing Science 16(1), 79-94.

Barge, J. K., & Schlueter, D. W. (1991). Leadership as organizing: A critique of leadership instruments. Management Communication Quarterly 4(4), 541-570.

Barling, J, Weber, T, & Kelloway, E. K. (1996). Effects of transformational leadership training on attitudinal and financial outcomes: A field experiment. Journal of Applied Psychology 81(6), 827-832.

Barnard, C. I. (1968). The functions of the executive. Cambridge, MA: Harvard University Press.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. Journal of Personality and Social Psychology 51(6), 1173-1182.

Bass, B. M. (1985). Leadership and performance beyond expectations. New York: The Free Press.

Bass, B. M. (1990a). Bass & Stogdill's handbook of leadership (3rd ed.). New York: The Free Press.

Bass, B. M. (1990b). From transactional to transformational leadership: Learning to share the vision. Organizational Dynamics 19(3), 13 pages. [On-line]. Available EBSCOhost WEB ISSN: 0090-2616.

Bass, B. M. (1994). Transformational leadership and team and organizational decision making. In B. M. Bass, & B. J. Avolio (Eds.), Improving organizational effectiveness through transformational leadership (pp. 104-120). Thousand Oaks, CA: Sage Publications.

Bass, B. M. (1996). Is there universality in the full range model of leadership? International Journal of Public Administration 19(6), 73-761.

Bass, B. M. (1997). Does the transactional-transformational leadership paradigm transcend organizational boundaries? American Psychologist 52(2), 130-139.

Bass, B. M. (1998). Transformational leadership: Industrial, military, and educational impact. Mahwah, NJ: Lawrence Erlbaum Associates.

Bass, B. M., & Avolio, B. J. (1993). Transformational leadership: A response to critiques. In M. M. Chemers, & R. Ayman (Eds.), Leadership theory and research: Perspectives and directions (pp. 49-80). San Diego: Academic Press.

Bass, B. M., & Avolio, B. J. (Eds.). (1994). Improving organizational effectiveness through transformational leadership. Thousand Oaks, CA: Sage Publications.

Bass, B. M., & Avolio, B. J. (1995). MLQ Multifactor leadership questionnaire for research: Permission set. Redwood City, CA: Mindgarden.

Bass, B. M., & Avolio, B. J. (1997). Full range leadership development: Manual for the multifactor leadership questionnaire. Palo Alto, CA: Mindgarden.

Bass, B. M., & Avolio, B. J. (1999). Training full range leadership. Redwood City, CA: Mindgarden.

Bass, B. M., Avolio, B. J., & Atwater, L. (1996). The transformational and transactional leadership of men and women. Applied Psychology: An International Review 45(1), 5-34.

Bass, B. M., Cascio, W. F., & O'Connor, E. J. (1974). Magnitude estimations of expressions of frequency and amount. Journal of Applied Psychology 59(3), 313-320.

Bass, B. M., & Steidlmeier, P. (1999). Ethics, character, and authentic transformational leadership behavior. Leadership Quarterly 10(2), 181-217.

Bass, B. M., & Stogdill, R. M. (1981). Stogdill's handbook of leadership (2nd ed.). New York: Macmillan Publishing

Bass, B. M., Waldman, D. A., Avolio, B. J., & Bebb, M. (1987). Transformational leadership and the falling dominoes effect. Group and Organization Studies 12(1), 73-87.

Bennis, W. (1989). Why leaders can't lead: The unconscious conspiracy continues. Los Angeles: Jossey-Bass Publishers.

Bentler, P. M. (1990). Comparative fit indices in structural models. Psychological Bulletin 107(2), 238-246.

Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. Psychological Bulletin 88(3), 588-606.

Bessai, F. (1995). Review of the multifactor leadership questionnaire. In J. C. Conoley, J. C. Impara (Eds.), The twelfth mental measurement yearbook (pp. 650-654). Lincoln, NB: Buros Institute of Mental Measurements of the University of Nebraska-Lincoln.

Binning, J. F., Zaba, A. J., & Whattam, J. C. (1986). Explaining the biasing effects of performance cues in terms of cognitive categorization. Academy of Management Journal 29(3), 521-535.

Bjerke, B. (1999). Business leadership and culture: National management styles in the global economy. Cheltenham, UK: Edward Elgar Publishing.

Blank, W., Weitzel, J. R., & Green, S. G. (1990). A test of the situational leadership theory. Personnel Psychology 43(3), 579-597.

Bochner, S., & Hesketh, B. (1994). Power distance, individualism/collectivism, and job-related attitudes in a culturally diverse work group. Journal of Cross-Cultural Psychology 25(2), 233-257.

Bollen, K. A. (1986). Sample size and Bentler and Bonett's Nonnormed Fit Index. Psychometrika 51(3), 375-377.

Bollen, K. A. (1989). Structural equations with latent variables. New York: John Wiley & Sons.

Bollen, K. A., & Long, J. S. (1993). Introduction. In K. A. Bollen, & J. S. Scott (Eds.), Testing structural equation models (pp. 1-9). Thousand Oaks, CA: Sage Publications.

Boulding, K. E. (1985). The world as a total system. Beverly Hills, CA: Sage Publications.

Brady, M. K., & Robertson, C. J. (1999). An exploratory study of service value in the USA and Ecuador. International Journal of Service Industry Management 10(5), 469-486. [On-line]. Available: MCB University Press ISSN: 0956-4233.

Breckler, S. J. (1990). Applications of covariance structure modeling in psychology: Cause for concern? Psychological Bulletin 107(2), 260-273.

Brown, D. J., & Lord, R. G. (1999). The utility of experimental research in the study of transformational/charismatic leadership. Leadership Quarterly 10(4), 531-539.

Browne, M. W., & Cudeck, R. (1989). Single sample cross-validation indices for covariance structures. Multivariate Behavioral Research 24(4), 445-455.

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen, & J. S. Long (Eds.), Testing structural equation models (pp. 136-162). Newbury Park, CA: Sage Publications.

Bryman, A. (1992). Charisma and leadership in organizations. London: Sage Publications.

Burns, J. M. (1978). Leadership. New York: Harper & Row.

Bycio, P., Hackett, R. D., & Allen, J. S. (1995). Further assessments of Bass's (1985) conceptualization of transactional and transformational leadership. Journal of Applied Psychology 80(4), 468-478.

Byrne, B. M. (1994). Structural equation modeling with EQS and EQS/Windows: Basic concepts, applications and programming. Thousand Oaks, CA: Sage Publications.

Byrne, B. M. (1995). One application of structural equation modeling from two perspectives: Exploring the EQS and LISREL strategies. In R. H. Hoyle (Ed.), Structural equation modeling: Concepts, issues, and applications (pp. 138-157). Thousand Oaks, CA: Sage Publications.

Cairns, T. D, Hollenback, J., Preziosi, R. C., & Snow, W. A. (1998). Technical note: a study of Hersey and Blanchard's situational leadership theory. Leadership and Organization Development Journal 19(2), 4 pages. [On-line]. Available: MCB University Press ISSN: 0143-7739.

Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. Psychological Bulletin 56(2), 81-105.

Carless, S. A. (1998a). Assessing the discriminant validity of transformational leader behavior as measured by the MLQ. Journal of Occupational and Organizational Psychology 71(4), 353-358.

Carless, S. A. (1998b). Gender differences in transformational leadership: An examination of superior leader, and subordinate perspectives. Sex Roles 39(11/12), 887-902.

Carlson, D. S., & Perrewe, P. L. (1995). Institutionalization of organizational ethics through transformational leadership. Journal of Business Ethics 14(10), 829-838.

Carmines, E. G., & Zeller, R. A. (1979). Reliability and validity assessment. Newbury Park, CA: Sage Publications.

Carnegie, D. (1998). First line supervisors in the offshore oil and gas industry. The British Library, (British Thesis Service No. DX193281).

Caruana, A. (1999). An assessment of the dimensions and the stability of items in the MARKOR scale. Marketing Intelligence and Planning 17(5), 248-253. [On-line]. Available: MCB University Press ISSN: 0263-4503.

Chemers, M. M. (1993). An integrative theory of leadership. In M. M. Chemers, & R. Ayman (Eds.), Leadership theory and research: Perspectives and directions (pp. 293-319). San Diego: Academic Press.

Cheung, G. W., & Rensvold, R. B. (1999). Assessing extreme and acquiescence response sets in cross-cultural research using structural equations modeling. Journal of Cross-Cultural Psychology 31(2), 187-212.

Chou, C., & Bentler, P. M. (1995). Estimates and tests in structural equation modeling. In R. H. Hoyle (Ed.), Structural equation modeling: Concepts, issues, and applications (pp. 37-55). Thousand Oaks, CA: Sage Publications.

Chin, W. W. (1998). The partial least squares approach to structural equation modeling. In G. A. Marcoulides (Ed.), Modern methods for business research (pp. 295-336). Mahwah, NJ: Lawrence Erlbaum Associates.

Cliff, N. (1983). Some cautions concerning the application of causal modeling methods. Multivariate Behavioral Research 18, 115-126.

Coad, A. F., & Berry, A. J. (1998). Transformational leadership and learning orientation. Leadership and Organization Development Journal 19(4), 164-172. [On-line]. Available: MCB University Press ISSN:0143-7739.

Colyar, M. R. (1994). Leader behavior, timing, type, and faculty acceptance of changes initiated by nurse education executives. Dissertation Abstracts International, (University Microfilms No. 9512253).

Conger, J. A. (1989). The charismatic leader: Behind the mystique of exceptional leadership. San Francisco: Jossey-Bass Publishers.

Conger, J. A. (1992). Learning to lead: The art of transforming managers into leaders. San Francisco: Jossey-Bass Publishers.

Conger, J. A. (1998). Qualitative research as the cornerstone methodology for understanding leadership. Leadership Quarterly 9(1), 107-121.

Conger, J. A. (1999). Charismatic and transformational leadership in organizations: An insider's perspective on these developing streams of research. Leadership Quarterly 10(2), 145-179.

Conger, J. A., & Hunt, J. G. (1999). Overview charismatic and transformational leadership: Taking stock of the present and future (Part II). Leadership Quarterly 10(2), 121-127.

Conger, J. A., & Kanugo, R. N. (1988a). Introduction: Problems and prospects in understanding charismatic leadership. In J. A. Conger, & R. N. Kanugo (Eds.), Charismatic leadership: The elusive factor in organizational effectiveness (pp. 1-11). San Francisco: Jossey-Bass Publishers.

Conger, J. A., & Kanugo, R. N. (1988b). Training charismatic leadership: A risky and critical task. In J. A. Conger, & R. N. Kanugo (Eds.), Charismatic leadership: The elusive factor in organizational effectiveness (pp. 309-323). San Francisco: Jossey-Bass Publishers.

Converse, J. M., & Presser, S. (1986). Survey questions: Handcrafting the standardized questionnaire. Thousand Oaks, CA: Sage Publications.

Cooper, W. H. (1981). Ubiquitous halo. Psychological Bulletin 90(2), 218.244.

Cudeck, R. (1989). Analysis of correlation matrixes using covariance structure models. Psychological Bulletin 105(2), 317-327.

Cullen, N. C. (1996). The world of culinary supervision, training, and management. Englewood Cliffs, NJ: Prentice-Hall.

Daughtry, L. H. (1995). Vocational administrator leadership effectiveness as a function of gender and leadership style. Dissertation Abstracts International, (University Microfilms No. 9611275).

Deming, W. E. (1986). Out of the crisis. Boston: MIT.

Den Hartog, D. N., House, R. J., Hanges, P. J., Ruiz-Quintanilla, S. A., & Dorfmann, P. W. (1999). Culture specific and cross-cultural generalizable implicit leadership theories: Are attributes of charismatic/transformational leadership universally endorsed? Leadership Quarterly 10(2), 219-256.

Den Hartog, D. N., Van Muijen, J. J., & Koopman, P. L. (1997). Transactional versus transformational leadership: An analysis of the MLQ. Journal of Occupational and Organizational Psychology 70(1), 19-34.

Dorfman, P. W., Howell, J. P., Hibino, S., Lee, J. K, Tate, U., & Bautista, A. (1997). Leadership in western and Asian countries: Commonalties and differences in effective leadership processes across cultures. Leadership Quarterly 8(3), 233-274.

Downton, J. V. (1973). Rebel leadership: Commitment and charisma in the revolutionary process. New York: The Free Press.

Drouillard, S. E., & Kleiner, B. H. (1996). "Good" leadership. Management Development Review 9(5), 30-33. [On-line]. Available: MCB University Press ISSN: 0962-2519.

Drucker, P. F. (1955). The practice of management. London: William Heinemann.

Druskat, V. U. (1994). Gender and leadership style: Transformational and transactional leadership in the Roman Catholic Church. Leadership Quarterly 5(2), 99-119.

Dubin, R. (1976). Theory building in applied areas. In M. D. Dunnette (Ed.), Handbook of industrial and organizational psychology (pp. 17-39). Chicago: Rand McNally.

Dvir, T., Eden, D., Avolio, B. J., & Shamir, B. (1999). Impact of transformational leadership training on follower development and performance: A field experiment. Paper presented at the 14th Annual Meeting of the Society for Industrial and Organizational Psychology, Atlanta.

Eriksson, K., Majkgård, A., & Sharma, D. D. (1999). Service quality by relationships in the international market. Journal of Services Marketing 13(4/5), 361-375. [On-line]. Available: MCB University Press ISSN: 0887-6045.

Etzioni, A. (1961). A comparative analysis of complex organizations. New York: The Free Press.

Etzioni, A. (1964). Modern organizations. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.

Falk, R. F., & Miller, N. B. (1992). A primer for soft modeling. Akron, OH: The University of Akron Press.

Fernandez, C. F & Vecchio, R. P. (1997). Situational leadership theory revisited: A test of an across-jobs perspective. Leadership Quarterly 8(1), 67-84.

Fiedler, F. E. (1967). A theory of leadership effectiveness. New York: McGraw-Hill.

Fiedler, F. E. (1971). Leadership. Morristown, NJ: General Learning Press.

Fiedler, F. E. (1993). The leadership situation and the black box in contingency theories. In M. M. Chemers, & R. Ayman (Eds.), Leadership theory and research: Perspectives and directions (pp. 1-28). San Diego: Academic Press.

Fisicaro, S. A., & Vance, R. J. (1994). Comments on the measurement of halo. Educational and Psychological Measurement 54(2), 366-371.

Fleishman, E. A. (1957). A leader behavior description for industry. In R. M. Stogdill, & A. E. Coons (Eds.), Leader behavior: Its description and measurement (pp. 103-119). Research Monograph Number 88, Ohio State University Bureau of Business Research.

Fornell, C. (1982). A second generation of multivariate analysis: An overview. In C. Fornell (Ed.), A second generation of multivariate analysis (pp. 1-21). New York: Praeger Publishers.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. Journal of Marketing Research 18, 39-50.

Gardner, J. W. (1990). On leadership. New York: The Free Press.

Gardner, W. L., & Avolio, B. J. (1998). The charismatic relationship: A dramaturgical perspective. Academy of Management Review 23(1), 32-58.

Garratt, R. (1987). The learning organization. Glasgow: William Collins Sons & Co.

Gemmill, G., & Oakley, J. (1996). Leadership: An alienating social myth. In R. M. Steers, L. W. Porter, & G. A. Bigley, (Eds.), Motivation and leadership at work (pp. 260-273). New York: McGraw-Hill.

Gerstner, C. R., & Day, D. V. (1994). Cross-cultural comparison of leadership prototypes. Leadership Quarterly 5(2), 121-134.

Geyer, A. L. J., & Steyrer, J. M. (1998). Transformational leadership and objective performance in banks. Applied Psychology: An International Review 47(3), 397-420.

Gibson, C. B., & Marcoulides, G. A. (1995). The invariance of leadership styles across four countries. Journal of Managerial Issues 7(2), 176-193.

Goodson, J. R., McGee, G. W., & Cashmann, J. F. (1989). Situational leadership theory: A test of leadership prescriptions. Group and Organization Studies 14(4), 446-461.

Graeff, C. L. (1997). Evolution of situational leadership theory: A critical review. Leadership Quarterly 8(2), 153-170.

Grundstein-Amado, R. (1999). Bilateral transformational leadership: An approach for fostering ethical conduct in public service organizations. Administration and Society 31(2), 247-260.

Hackman, J. R., & Oldham, G. R. (1975). Development of the job diagnostic survey. Journal of Applied Psychology 69(2), 15-170.

Hall, E. T. (1976). Beyond culture. Garden City, NY: Anchor Press/Doubleday.

Harzing, A. W., & Hofstede, G. (1996). Planned change in organizations: The influence of national culture. Research in the Sociology of Organizations 14, 297-340.

Hater, J. J., & Bass, B. M. (1988). Superiors' evaluations and subordinates' perceptions of transformational and transactional leadership. Journal of Applied Psychology 73(4), 695-702.

Hattrup, K., Schmitt, & N., Landis, R. (1992). Equivalence of constructs measured by job-specific and commercially available aptitude tests. Journal of Applied Psychology 77(3), 298-308.

Heck, R. H. (1998). Factor analysis: Exploratory and confirmatory approaches. In G. A. Marcoulides (Ed.), Modern methods for business research (pp. 177-215). Mahwah, New Jersey: Lawrence Erlbaum Associates.

Hersey, P. (1975). Situational leadership: Some aspects of its influence on organizational development. Dissertation Abstracts International, (University Microfilms No. 7614691).

Hickson, D. J., & Pugh, D. S. (1995). Management worldwide: The impact of societal culture on organizations around the globe. London: Penguin Books.

Hinkin, T. R., Tracey, J. B., & Enz, C. A. (1997). Scale construction: Developing reliable and valid measurement instruments. Journal of Hospitality and Tourism Research 21(1), 100-120.

Hofmann, D., Mathieu, J. E., & Jacobs, R. (1990). A multiple group confirmatory factor analysis evaluation of teachers' work-related perceptions and reactions. Educational and Psychological Measurement 50(4), 943-955.

Hofstede, G. (1980). Culture's consequences: International differences in work-related values. Beverly Hills, CA: Sage Publications.

Hofstede, G. (1991). Cultures and organizations: Software of the mind. Berkshire, England: McGraw-Hill Book Company.

Hopeman, R. J. (1969). Systems analysis and operations management. Columbus, Ohio: Charles E. Merrill Publishing Co.

Horner, M. (1997). Leadership theory: Past present and future. Team Performance Management 3(4), 270-287. [On-line]. Available: MCB University Press ISSN: 1352-7592.

House, R. J. (1971). A path-goal theory of leadership effectiveness, Administrative Science Quarterly 16, 321-328.

House, R. J. (1977). A 1976 theory of charismatic leadership. In J. G. Hunt, & L. L. Larson (Eds.), Leadership: The cutting edge (pp. 189-207). Carbondale: Southern Illinois University Press.

House, R. J. (1988) Leadership research: Some forgotten, ignored, or overlooked findings. In J. G. Hunt, B. R. Baliga, H. P. Dachler, & C. A. Schriesheim, (Eds.), Emerging leadership vistas (pp. 245-260). New York: McGraw-Hill. Lexington, MA: Lexington Books.

Howell, J. M., & Avolio, B. J. (1992). The ethics of charismatic leadership: Submission or liberation? The Academy of Management Executive 6(2), 43-53.

Howell, J. M., & Avolio, B. J. (1993). Transformational leadership, transactional leadership, locus of control, and support for innovation: Key predictors of consolidated-business-unit performance. Journal of Applied Psychology 78(6), 891-902.

Howell, J. M., & Frost, P. J. (1989). A laboratory study of charismatic leadership. Organizational Behavior and Human Decision Processes 43, 243-269.

Howell, J. M., & Higgins, C. A. (1990). Champions of technological innovation. Administrative Science Quarterly 35(2), 317-341.

Howell, J. P., Dorfman, P. W., & Kerr, S. (1986). Moderator variables in leadership research. Academy of Management Review 11(1), 88-102.

Hox, J. J. (1995). AMOS, EQS and LISREL for Windows: A comparative review. Structural equation modeling 2(1), 79-91.

Hoyle, R. H. (1995). The structural equation modeling approach: Basic concepts and fundamental issues. In R. H. Hoyle (Ed.), Structural equation modeling: Concepts, issues, and applications (pp. 1-15). Thousand Oaks, CA: Sage Publications.

Hu, L. T., & Bentler, P. M. (1995). Evaluating model fit. In R. H. Hoyle (Ed.), Structural equation modeling: Concepts, issues, and applications (pp. 76-99). Thousand Oaks, CA: Sage Publications.

Hunt, J. G. (1991). Leadership: A new synthesis. Newbury Park, CA: Sage Publications.

Hunt, J. G. (1999). Transformational/charismatic leadership's transformation of the field: An historical essay. Leadership Quarterly 10(2), 129-144.

Hunt, J. G., Baliga, B. R., Dachler, H. P., & Schriesheim, C. A. (1988). Emerging leadership vistas: An introduction. In J. G. Hunt, B. R. Baliga, H. P. Dachler, & C. A. Schriesheim, (Eds.), Emerging leadership vistas (pp. 1-3). New York: McGraw-Hill. Lexington, MA: Lexington Books.

Hunt, J. G., & Conger, J. A. (1999). From where we sit: An assessment of transformational and charismatic leadership research. Leadership Quarterly 10(3), 335-343.

Jöreskog, K. G. (1971). Simultaneous factor analysis in several populations. Psychometrika 36(4), 409-426.

Jöreskog, K. G. (1974). Analyzing psychological data by structural analysis of covariance matrices. In D. H. Krantz, R. C. Atkinson, R. D. Luce, & P. Suppes (Eds.), Contemporary developments in mathematical psychology: Volume II measurement, psychophysics, and neural information processing (pp. 1-56). San Francisco: W. H. Freeman and Company.

Jöreskog, K. G., & Sörbom, D. (1996). LISREL 8: User's reference guide. Chicago: Scientific Software International.

Jung, D. I., & Avolio, B. J. (1999). Effects of leadership style and followers' cultural orientation on performance in group and individual task conditions. Academy of Management Review 42(2), 208-28.

Katz, D., & Kahn, R. L. (1978). The social psychology of organizations. New York: John Wiley & Sons.

Katz, D., Maccoby, N., Gurin G., & Floor, L. G. (1951). Productivity, supervision and morale among railroad workers. Ann Arbor, Michigan: Survey Research Center, Institute for Social Research (University of Michigan).

Kavanaugh, R. R., & Ninemeier, J. D. (1995). Supervision in the hospitality industry. East Lansing, MI: American Hotel & Motel Association.

Keeley, M. (1995). The trouble with transformational leadership: Toward a federalist ethic for organizations. Business Ethics Quarterly 5(1), 67-96.

Keller, R. T. (1992). Transformational leadership and the performance of research and development project groups. Journal of Management 18(3), 489-501.

Kerlinger, F. N. (1986). Foundations of behavioral research (3rd ed.). New York: Holt, Rinehart and Winston, Inc.

Kessler, T. G. The relationship between transformational, transactional, and laissez-faire leadership behaviors and job satisfaction in a research environment. Dissertation Abstracts International, (University Microfilms No. 9335053).

Kets de Vries, M. (1988). Origins of charisma: Ties that bind the leader and the led. In J. A. Conger, & R. N. Kanugo (Eds.), Charismatic leadership: The elusive factor in organizational effectiveness (pp. 237-252). San Francisco: Jossey-Bass Publishers.

Kilker, M. J. (1994). Transformational and transactional leadership styles: An empirical investigation of Roger's principle of integrality. Dissertation Abstracts International, (University Microfilms No. 9432597).

Kim, J., & Mueller, C. W. (1978). Factor analysis: Statistical methods and practical issues. Newbury Park, CA: Sage Publications.

King, L. M., Hunter, J. E., & Schmidt, F. L. (1980). Halo in multidimensional forced-choice performance evaluation scale. Journal of Applied Psychology 65(5), 507-516.

Kirnan, J. P. (1995). Review of the multifactor leadership questionnaire. In J. C. Conoley, J. C. Impara (Eds.), The twelfth mental measurement yearbook (pp. 650-654). Lincoln, NB: Buros Institute of Mental Measurements of the University of Nebraska-Lincoln.

Kline, R. B. (1998a). Software programs for structural equation modeling: Amos, EQS, and LISREL. Journal of Psychoeducational Assessment 16, 343-364.

Kline, R. B. (1998b). Principles and practice of structural equation modeling. New York: The Guilford Press.

Koh, W. L., Steers, R. M., & Terborg, J. R. (1995). The effects of transformational leadership on teacher attitudes and student performance in Singapore. Journal of Organizational Behavior 16(4), 319-333.

Komives, S. R. (1991). The relationship of same- and cross-gender work pairs to staff performance and supervisor leadership in residence hall units. Sex Roles 24(5/6), 355-363.

Koontz, H., & Weihrich, H. (1988). Management (9th ed.). New York: McGraw-Hill Book Company.

Kotter, J. (1988). The leadership factor. New York: The Free Press.

Kroeck, K. G. (1994). Corporate Reorganization and transformations in human resource management. In B. M. Bass, & B. J. Avolio (Eds.), Improving organizational effectiveness through transformational leadership (pp. 173-201). Thousand Oaks, CA: Sage Publications.

Kuhn, T. S. (1962). The structure of scientific revolutions. Chicago: The University of Chicago Press.

Kuhnert, K. W. (1994). Transforming leadership: Developing people through delegation. In B. M. Bass, & B. J. Avolio (Eds.), Improving organizational effectiveness through transformational leadership (pp. 10-25). Thousand Oaks, CA: Sage Publications.

Lee, L. P., & Lam, Y. R. (1988). Confirmatory factor analyses of the Wechsler intelligence scale for children-revised and the Hong Kong-Wechler intelligence scale for children. Educational and Psychological Measurement 48(4), 895-903.

Lewin, K. (1945). The research center for group dynamics at Massachusetts Institute of Technology. Sociometry 8(2), 126-136.

Lewin, K. (1997). Resolving social conflicts. Washington, DC: American Psychological Association. (Original work published 1948).

Lokar, T. G. (1995). A social cognitive perspective on the transformational leadership process. Dissertation Abstracts International, (University Microfilms No. 9536306).

Long, J. S. (1983). Confirmatory factor analysis. Newbury Park, CA: Sage Publications.

Lord, R. G., Binning, J. F., Rush, M. C., & Thomas, J. C. (1978). The effect of performance cues and leader behavior on questionnaire ratings of leadership behavior. Organizational Behavior and Human Performance 21(1), 27-39.

Lowe, K. B., Kroeck, K. G., & Sivasubramaniam, N. (1996). Effectiveness correlates of transformational and transactional leadership: A meta-analytic review of the literature. Leadership Quarterly 7(3), 385-425.

MacCallum, R. C. (1995). Model specification: Procedures, strategies, and related issues. In R. H. Hoyle (Ed.), Structural equation modeling: Concepts, issues, and applications (pp. 16-36). Thousand Oaks, CA: Sage Publications.

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. Psychological Methods 1(2), 130-149.

Machiavelli, N. (1952). The Prince (E. R. P. Vincent, Trans.). New York: Mentor Group (Original work published circa 1538).

Maher, K. J. (1997). Gender-related stereotypes of transformational and transactional leadership. Sex Roles 37(3/4), 209-225.

Marcoulides, G. A., & Hershberger, S. L. (1997). Multivariate statistical methods: A first course. Mahwah, NJ: Lawrence Erlbaum Associates.

Marcoulides, G. A., & Schumacker, R. E. (1996). Advanced structural equation modeling: Issues and techniques. Mahwah, NJ: Lawrence Erlbaum Associates.

Marsh, H. W., Balla, J. R., & Hau, K. (1996). An evaluation of incremental fit indices: A clarification of mathematical and empirical properties. In G. A. Marcoulides, & R. E. Schumacker (Eds.), Advanced structural equation modeling: Issues and techniques (pp. 315-353). Mahwah, NJ: Lawrence Erlbaum Associates.

Marsh, H. W., Balla, J. R., & McDonald, R. P. (1988). Goodness-of-fit indices in confirmatory factor analysis: The effect of sample size. Psychological Bulletin 103(3), 391-410.

Maruyama, G. M. (1998). Basics of structural equation modeling. Thousand Oaks, CA: Sage Publications.

Masi, R. J. (1994). Transformational leadership and its roles in empowerment, productivity, and commitment to quality. Dissertation Abstracts International, (University Microfilms No. 9506499).

Maslow, A. H. (1998). Maslow on management. (D. C. Stephens & G. Heil, Eds.) New York: John Wiley & Sons, Inc. (Based on Maslow's Eupsychian Management).

McElroy, J. C., & Hunger, J. D. (1988). Leadership theory as causal attributions of performance. In J. G. Hunt, B. R. Baliga, H. P. Dachler, & C. A. Schriesheim (Eds.), Emerging leadership vistas (pp. 168-182). Lexington, MA: Lexington Books.

McGregor, D. (1985). The human side of enterprise. McGraw-Hill. (Original work published 1960).

Meindl, J. R., & Ehrlich, S. B. (1987). The romance of leadership and the evaluation of organizational performance. Academy of Management Journal 30(1), 91-109.

Miles, J. N. V., & Shevlin, M. E. (1998). Multiple software review: Drawing path diagrams. Structural equation modeling 5(1), 95-103.

Morrison, A. M. (1989). Hospitality and travel marketing. Albany, NY: Delmar Publishers.

Morrison, E. W., & Phelps, C. C. (1999). Taking charge at work: Extrarole efforts to initiate workplace change. Academy of Management Journal 42(4), 403-419.

Murphy, K. R., & Reynolds, D. H. (1988). Does true halo affect observed halo? Journal of Applied Psychology 73(2), 235-238.

Nanus, B. (1992). Visionary leadership. San Francisco: Jossey-Bass Publishers.

Noronha, C. (1999). Confirmation of a four-variable quality management model. Managerial Auditing Journal 14(1/2), 12-19. [On-line]. Available: MCB University Press ISSN: 0268-6902.

Norris, W. R., & Vecchio, R. P. (1992). Situational leadership theory: A replication. Group and Organization Management 17(3), 331-342.

Nunnally, J., & Bernstein, I. H. (1994). Psychometric theory (3rd ed.). New York: McGraw-Hill.

Offermann, L. R., & Hellmann, P. S. (1997). Culture's consequences for leadership behavior: National values in action. Journal of Cross-Cultural Psychology 28(3), 342-351.

Pavett, C., & Morris, T. (1995). Management styles within a multinational corporation: A five country comparative study. Human Relations 48(10), 1171-1191.

Pawar, B. S., & Eastman, K. K. (1997). The nature and implications of contextual influences on transformational leadership: A conceptual examination. Academy of Management Review 22(1), 80-109.

Peters, T., & Austin, N. (1985). A passion for excellence. New York: Warner Books.

Peters, T. J. (1997). Transactional and transformational leadership: Predictors of employee satisfaction, commitment, and productivity. Dissertation Abstracts International, (University Microfilms No. 9825395).

Pettigrew, T. F. (1996). How to think like a social scientist. New York: HarperCollins.

Podsakoff, P. M., & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects. Journal of Management 12(4), 531-544.

Pondy, L. R. (1978). Leadership is a language game. In M. W. McCall & M. M. Lombardo (Eds.), Leadership: Where else can we go? (pp. 87-99). Durham, NC: Duke University Press.

Popper, K. P. (1971). The open society and its enemies. Princeton, NJ: Princeton University Press. (Original work published 1962).

Pulakos, E. D., Schmitt, N., & Ostroff, C. (1986). A warning about the use of a standard deviation across dimensions within ratees to measure halo. Journal of Applied Psychology 71(1), 29-32.

Rigdon, E. E. (1998). Structural equation modeling. In G. A. Marcoulides (Ed.), Modern methods for business research (pp. 251-294). Mahwah, NJ: Lawrence Erlbaum Associates.

Ristow, A. M., Amos, T. L., & Staude, G. E. (1999). Transformational leadership and organisational effectiveness in the administration of cricket in South Africa. South African Journal of Business Management 30(1), 1-5.

Robbins, S. P. (1996). Organizational behavior (7th ed.). Upper Saddle River, NJ: Prentice Hall Inc.

Robbins, S. P. (1998). Organizational behavior (8th ed.). Upper Saddle River, NJ: Prentice Hall Inc.

Rosenthal, R. (1979). The "file drawer problem" and tolerance for null results. Psychological Bulletin 86(3), 638-641.

Ross, S. M., & Offermann, L. R. (1997). Transformational leaders: Measurement of personality attributes and work group performance. Personality and Social Psychology Bulletin 23(10), 1078-1086.

Russell, B. (1997). Religion and Science. New York: Oxford University Press. (Original work published 1935).

Sarachek, B. (1968). Greek concepts of leadership. Academy of Management Journal 11, 39-48.

Schien, E. H. (1992). Organizational culture and leadership (2nd ed.). San Francisco: Jossey-Bass Publishers.

Schön, D. A. (1983). The reflective practitioner: How professionals think in action. New York: Basic Books.

Schriesheim, C. A., & Kerr, S. (1977). Theories and measures of leadership: A critical appraisal of current and future directions. In J. G. Hunt, & L. L. Larson (Eds.), Leadership: The cutting edge (pp. 9-56). Carbondale: Southern Illinois University Press.

Schriesheim, C. A., Scandura, T. A., Gardiner, C. C., & Lankau, M. J. (1993). Book Review: Bass & Stogdill's handbook of leadership: Theory, research & managerial applications by Bernard Bass. Leadership Quarterly 4(1), 103-113.

Schriesheim, C. A., Tepper, B. J., & Tetrault, L. A. (1994). Least preferred co-worker score, situational control, and leadership effectiveness: A meta-analysis of contingency model performance predictions. Journal of Applied Psychology 70(4), 561-573.

Schwartz, S. M. (1999). Transformational, transactional and laissez-faire leadership: An investigation of Bass's (1985) theory in the perioperative environment. Dissertation Abstracts International, (University Microfilms No. 9938888).

Scott, W. R. (1992). Organizations: Rational, natural, and open systems. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.

Seltzer, J., & Bass, B. M. (1990). Transformational leadership: Beyond initiation and consideration. Journal of Management 16(4), 693-703.

Senge, P. M. (1990). The fifth discipline: The art and practice of the learning organization. New York: Doubleday/Currency.

Shamir, B. & Howell, J. M. (1999). Organizational and contextual influences on the emergence and effectiveness of charismatic leadership. Leadership Quarterly 19(2), 257-283.

Shashkin, M. (1988). The visionary leader. In J. A. Conger, & R. N. Kanugo (Eds.), Charismatic leadership: The elusive factor in organizational effectiveness (pp. 122-160). San Francisco: Jossey-Bass Publishers.

Shea, C. M., & Howell, J. M. (1999). Charismatic leadership and task feedback: A laboratory study of their effects on self-efficacy and task performance. Leadership Quarterly 10(3), 375-396.

Singer, M. S., & Singer, A. E. (1990). Situational constraints on transformational versus transactional leadership behavior, subordinates' leadership preference, and satisfaction. The Journal of Social Psychology 130(3), 385-396.

Skinner, B. F. (1976). About behaviorism. New York: Random House, Inc.

Smith, R. L., Ager, J. W., & Williams, D. L. (1992). Suppressor variables in multiple regression/correlation. Educational and Psychological Measurements 52, 17-29.

Southwick, R. B. (1998). Antecedents of transformational, transactional, and laissez-faire leadership. Unpublished doctoral dissertation, University of Georgia, Georgia.

Sosik, J. J. (1997). Effects of transformational leadership and anonymity on idea generation in computer-mediated groups. Group and Organization Management 22(4), 460-487.

Sosik, J. J., Kahai, S. S., & Avolio, B. J. (1998). Transformational leadership and dimensions of creativity: Motivating idea generation in computer-mediated groups. Creativity Research Journal 11(2), 111-121.

Steers, R. M., Porter, L. W., & Bigley, G. A. (Eds.). (1996). Motivation and leadership at work. New York: McGraw-Hill.

Stepp, P. L., Cho, H., & Chung, S. (n.d.). Perceived differences in leadership styles of people of color: Transformational or transactional? Unpublished manuscript, Cornell University, Ithaca.

Sternberg, R. J., Forsythe, G. B., Hedlund, J., Horvath, J. A., Wagner, R. K., Williams, W. M., Snook, S. A., & Grigorenko, E. L. (2000). Practical intelligence in everyday life. New York: Cambridge University Press.

Stogdill, R. M., & Coons, A. E. (Eds.). (1957). Leader behavior: Its description and measurement. Research Monograph Number 88, Ohio State University Bureau of Business Research.

Strand, T. (1988). On extending leadership theory: Leadership attributions and beyond. In J. G. Hunt, B. R. Baliga, H. P. Dachler, & C. A. Schriesheim (Eds.), Emerging leadership vistas (pp. 228-234). Lexington, MA: Lexington Books.

Tanaka, J. S. (1993). Multifaceted conceptions of fit in structural equation models. In K. A. Bollen, & J. S. Scott (Eds.), Testing structural equation models (pp. 10-39). Thousand Oaks, CA: Sage

Tannenbaum, R., & Schmidt, W. H. (1991). How to choose a leadership pattern. In Business Classics: Fifteen key concepts for managerial success (pp. 115-124). Boston: Harvard Business School Publishing Corp. (Original work published 1973).

Taylor, F. W. (1998). The principles of scientific management. Mineola, NY: Dover Publications. (Original work published 1911).

Tepper, B. J., & Percy, P. M. (1994). Structural validity of the multifactor leadership questionnaire. Educational and Psychological Measurement 54(3), 11 pages. [On-line]. Available EBSCOhost WEB ISSN: 0013-1644.

The Chinese Culture Connection (1987). Chinese values and the search for culture-free dimensions of culture. Journal of Cross-Cultural Psychology 18(2), 143-164.

Thorndike, E. L. (1920). A constant error in psychological ratings. Journal of Applied Psychology 4(1), 25-29.

Tichy, N. M., & Devanna, M. E. (1990). The transformational leader: The key to global competitiveness. New York: John Wiley & Sons.

Tracey, J. B., & Hinkin, T. R. (1998). Transformational leadership or effective managerial practices? Group and Organization Management 23(3), 220-236.

Triandis, H. C. (1993). The contingency model in cross-cultural perspective. In M. M. Chemers, & R. Ayman (Eds.), Leadership theory and research: Perspectives and directions (pp. 167-188). San Diego: Academic Press.

Trompenaars, F. (1998). Riding the waves of culture. New York: McGraw-Hill.

Tucker, L. R., & Lewis, C. (1973). A reliability coefficient for maximum likelihood factor analysis. Psychometrika 38(1), 1-10.

Tzelgov, J., & Henik, A. (1991). Suppression situations in psychological research: Definitions, implications, and applications. Psychological Bulletin 109(3), 524-536.

Usunier, J. C. (1998). International and cross-cultural management research. London: Sage Publications.

Vaill, P. B. Toward a behavioral description of high-performing systems. In M. W. McCall & M. M. Lombardo (Eds.), Leadership: Where else can we go? (pp. 103-125). Durham, NC: Duke University Press.

van Muijen, J. J, & Koopman, P. L. (1994). The influence of national culture on organizational culture: A comparative study between 10 countries. European Work and Organizational Psychologist 4(4), 367-380.

van Velsor, & E., Leslie, B. (1991). Feedback to managers, Volume II: A review and comparison of sixteen multi-rater feedback instruments. (Report No. CCL-R-150). Greensboro, NC: Center for Creative Leadership. (ERIC Document Reproduction Service No. ED351 391).

Vroom, V. H. (1976). Leadership. In M. D. Dunnette (Ed.), Handbook of industrial and organizational psychology (pp. 1527-1551). Chicago: Rand McNally.

Waldman, D. A. (1994). Transformational leadership in multifunctional teams. In B. M. Bass, & B. J. Avolio (Eds.), Improving organizational effectiveness through transformational leadership (pp. 84-103). Thousand Oaks, CA: Sage Publications.

Weber, M. (1947). The theory of social and economic organization (T. Parsons, Trans.). New York: The Free Press. (Original work published 1924).

Weber, M. (1968). Max Weber on charisma and institutional building. (S. N. Eisenstadt, Ed.). Chicago: The University of Chicago Press.

Weick, K. E. (1978). The spines of leaders. In M. W. McCall & M. M. Lombardo (Eds.), Leadership: Where else can we go? (pp. 37-61). Durham, NC: Duke University Press.

Weisbord, M. R. (1978). Organizational Diagnosis: A Workbook of Theory and Practice. Reading, MA: Addison-Wesley.

Westley, F. R., & Mintzberg, H. (1988). Profiles of strategic vision: Levesque and Iacocca. In J. A. Conger, & R. N. Kanugo (Eds.), Charismatic leadership: The elusive factor in organizational effectiveness (pp. 161-212). San Francisco: Jossey-Bass Publishers.

Widaman, K. F., & Reise, S. (1997). Exploring the measurement invariance of psychological instruments: Applications in the substance use domain. In K. J. Bryant, M. Windle, & S. G. West (Eds.), The science of prevention: Methodological advances from alcohol and substance abuse research (pp. 281-324). Washington, DC: American Psychological Association.

Williams, F. (1992). Reasoning with statistics (4th ed.). Fort Worth, TX: Harcourt Brace Jovanovich College Publishers.

Williams, J. H., Ayers, C. D., Abbott, R. D., Hawkins, J. D., & Catalano, R. F. (1996). Structural equivalence of involvement in problem behavior by adolescents across racial groups using multiple group confirmatory factor analysis. Social Work Research 20(3), 168-177.

Wofford, J. C. (1999). Laboratory research on charismatic leadership: Fruitful or futile? Leadership Quarterly 10(4), 523-529.

Wothke, W. (2000). Longitudinal and multigroup modeling with missing data. In T. D. Little, K. U. Schnabel, & J. Baumert (Eds.), Modeling longitudinal and multilevel data (pp. 219-240). Mahwah, NJ: Lawrence Erlbaum Associates.

Wold, H. (1982). Systems under indirect observation using PLS. In C. Fornell (Ed.), A second generation of multivariate analysis (pp. 325-347). New York: Praeger Publishers.

Wold, H. (1985). Systems analysis by partial least squares. In P. Nijkamp, H. Leitner, & N. Wrigley (Eds.), Measuring the unmeasurable (pp. 221-251). Dordrecht, The Netherlands: Martinus Nijhoff Publishers.

Yammarino, F. J. (1994). Indirect Leadership: Transformational leadership at a distance. In B. M. Bass, & B. J. Avolio (Eds.), Improving organizational effectiveness through transformational leadership (pp. 26-47). Thousand Oaks, CA: Sage Publications.

Yammarino, F. J., & Bass, B. M. (1990). Transformational leadership and multiple levels of analysis. Human Relations 43(10), 975-995.

Yammarino, F. J., & Dubinsky, A. J. (1994). Transformational leadership theory: Using levels of analysis to determine boundary conditions. Personnel Psychology 47(4), 787-811.

Yammarino, F. J., Dubinsky, A. J., Comer, L. B., Jolson, M. A. (1997). Women and transformational and contingent reward leadership: A multiple-levels-of-analysis perspective. Academy of Management Journal 40(1), 205-222.

Yammarino, F. J., Spangler, W. D., & Bass, B. M. (1993). Transformational leadership and performance: A longitudinal investigation. Leadership Quarterly 4(1), 81-108.

York, R. O. (1996). Adherence to situational leadership theory among social workers. The Clinical Supervisor 14(2), 5-24.

York, R. O., & Hastings, T. (1985). Worker maturity and supervisory leadership behavior. Administration in Social Work 9(4), 37-47.

Yukl, G. (1998). Leadership in organizations (4th ed.). Englewood Cliffs, NJ: Prentice Hall.

Yukl, G. (1999). An evaluation of conceptual weaknesses in transformational and charismatic leadership theories. Leadership Quarterly 10(2), 285-305.

Zaleznik, A. (1989). The managerial mystique: Restoring leadership in business. New York: Harper & Row.

APPENDIXES

Appendix A: Goodness-of-Fit Results for Model of Paths of Leadership Factors to Subordinate Perceived Effectiveness for Entire Data Set

Model	χ^2	Df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	110819.63	582	-2.095	-1.633	-2.130	-1.656	.000	.212	110865.628	26.247
Model 2. Two factors	32741.43	569	.085	.204	.087	.207	.089	.116	32813.434	7.768
Model 3. Three factors	45722.13	555	-.277	-.139	-.282	-.141	.000	.139	45822.139	10.848
Model 4: Three factors	23732.85	555	.337	.409	.342	.414	.344	.099	23832.851	5.642
Model 5. Six factors	7871.55	497	.780	.781	.791	.792	.791	.059	8087.554	1.915
Model 6. Seven factors	6775.98	479	.811	.804	.822	.816	.822	.056	7027.978	1.664
Model 7. Eight factors	5050.21	450	.859	.845	.870	.857	.870	.049	5360.206	1.269
Model 8: Eight factors	3963.17	450	.889	.878	.901	.891	.900	.043	4273.166	1.012
Model 9: Full nine factors	3001.19	450	**.916**	**.908**	**.928**	**.921**	**.928**	**.037**	**3311.188**	**.784**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	Lowest value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 4,235). The following groups were included in the analysis: various firms, gas exploration, nurse educators, business firms (2), political organization, fire departments, not-for-profit agency, government research organization (2), perioperative nurses, hospitality/retail, and government research organization (2) self evaluations.

Appendix B: Goodness-of-Fit Results for Model of Paths of Leadership Factors to Subordinate Perceived Effectiveness for Entire Data Set Excluding Self Evaluations Data Sets

Model	χ^2	Df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	104257.68	529	-1.981	-1.536	-2.012	-1.556	.000	.222	104299.678	26.101
Model 2. Two factors	29121.23	517	.167	.275	.170	.279	.171	.118	29187.320	7.304
Model 3. Three factors	41475.91	504	-.186	-.059	-.189	-.060	.000	.143	41567.914	10.402
Model 4: Three factors	20486.30	504	.414	.477	.420	.483	.421	.100	20578.034	5.150
Model 5. Six factors	6990.20	450	.800	.800	.811	.811	.811	.060	7190.201	1.799
Model 6. Seven factors	6042.40	433	.827	.820	.838	.831	.837	.057	6276.399	1.571
Model 7. Eight factors	4545.93	406	.870	.856	.880	.867	.880	.051	4833.930	1.210
Model 8: Eight factors	3621.08	406	896	.885	.907	.897	.907	.045	3909.084	.978
Model 9: Full nine factors	2797.44	405	**.920**	**.911**	**.931**	**.923**	**.931**	**.038**	**3087.438**	**.773**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	lowest value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 4,006). The following groups were included in the analysis: various firms, gas exploration, nurse educators, business firms (2), political organization, fire departments, not-for-profit agency, government research organization (2), perioperative nurses, and hospitality/retail.

Appendix C: Goodness-of-Fit Results for Model of Paths of Leadership Factors to Subordinate Perceived Effectiveness for Normal Business Conditions Data Sets

Model	χ^2	Df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	8319.48	105	-2.162	-1.710	-2.252	-1.771	.000	.457	8329.481	22.212
Model 2. Two factors	2466.06	101	.063	.165	.065	.171	.069	.250	2484.059	6.624
Model 3. Three factors	3410.67	96	-.296	-.215	-.307	-.223	.000	.303	3438.672	9.170
Model 4: Three factors	8155.31	96	.240	.288	.242	.290	.243	.266	8183.309	6.883
Model 5. Six factors	539.29	74	.795	.751	.818	.777	.817	.129	611.296	1.630
Model 6. Seven factors	420.47	65	.840	.779	.861	.806	.860	.121	510.466	1.361
Model 7. Eight factors	213.70	54	.919	.865	.938	.895	.937	.089	325.704	.869
Model 8: Eight factors	228.23	54	.913	.855	.932	.886	.931	.093	340.231	.907
Model 9: Full nine factors	132.52	45	**.950**	.899	**.966**	**.931**	**.966**	.072[a]	**262.524**	**.700**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	lowest value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 377). The following groups were included in the analysis: various firms, and business firms (2).

[a] Did not surpass the recommended value as the upper confidence interval for RMSEA was .086.

Appendix D: Goodness-of-Fit Results for Model of Paths of Leadership Factors to Subordinate Perceived Effectiveness for High Bureaucratic Conditions Data Sets

Model	χ^2	Df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	20473.93	105	-2.477	-1.980	-2.522	-2.011	.000	.505	20483.931	26.880
Model 2. Two factors	6819.36	101	-1.58	-.032	-.161	-.032	.000	.295	6837.358	8.973
Model 3. Three factors	8677.18	96	-.474	-.381	-.481	-.387	.000	.342	8705.183	11.424
Model 4: Three factors	5005.40	96	.150	.203	.152	.206	.153	.259	5033.395	6.606
Model 5. Six factors	1301.33	74	.779	.731	.789	.743	.788	.148	1373.327	1.802
Model 6. Seven factors	1122.84	65	.809	.736	.818	.747	.818	.146	1212.844	1.592
Model 7. Eight factors	732.34	54	.876	.793	.884	.805	.883	.128	844.338	1.108
Model 8: Eight factors	347.07	54	.941	.902	.950	.916	.949	.084	459.066	.602
Model 9: Full nine factors	162.71	45	**.972**	**.945**	**.980**	**.959**	**.980**	**.059**	**292.709**	**.384**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	lowest value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 764). The following groups were included in the analysis: not-for-profit agency, and government research organization (2).

Appendix E: Goodness-of-Fit Results for Model of Paths of Leadership Factors to Subordinate Perceived Effectiveness for Majority Male Leaders Data Sets

Model	χ^2	Df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	9719.75	105	-1.339	-1.005	-1.374	-1.027	.000	.475	9729.745	24.024
Model 2. Two factors	2483.77	101	.402	.467	.412	.478	.414	.241	2501.774	6.177
Model 3. Three factors	2841.24	96	.316	.359	.324	.367	.325	.266	2869.241	7.085
Model 4: Three factors	1130.59	96	.728	.745	.745	.761	.746	.163	1158.591	2.861
Model 5. Six factors	1009.17	74	.916	.897	.921	.904	.921	.116	1081.174	1.153
Model 6. Seven factors	310.84	65	.925	.896	.940	.916	.940	.097	400.838	.990
Model 7. Eight factors	215.13	54	.948	.914	.961	.934	.960	.086	327.134	.808
Model 8: Eight factors	237.77	54	.943	.905	.955	.925	.955	.092	349.768	.864
Model 9: Full nine factors	129.03	45	**.969**	**.938**	**.980**	**.959**	**.979**	.068[a]	**259.027**	**.640**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	lowest value	Lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 407). The following groups were included in the analysis: gas exploration, and fire departments.

[a] Did not surpass the recommended value as the upper confidence interval for RMSEA was .082.

Appendix F: Goodness-of-Fit Results for Model of Paths of Leadership Factors to Subordinate Perceived Effectiveness for Low-Level Leader Data Sets

Model	χ^2	Df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	19027.68	105	-1.155	-.847	-1.169	-.856	.000	.497	19037.679	26.115
Model 2. Two factors	2651.22	101	.700	.732	.708	.740	.708	.186	2669.215	3.661
Model 3. Three factors	7849.83	96	.111	.167	.112	.168	.113	.333	7877.827	10.806
Model 4: Three factors	2272.57	96	.743	.759	.751	.767	.751	.176	2300.568	3.156
Model 5. Six factors	947.22	74	.893	.870	.900	.878	.900	.127	1019.218	1.398
Model 6. Seven factors	717.63	65	.919	.887	.926	.897	.925	.117	807.630	1.108
Model 7. Eight factors	472.25	54	.947	.911	.952	.920	.952	.103	584.253	.801
Model 8: Eight factors	434.62	54	.951	.918	.957	.927	.956	.098	546.615	.750
Model 9: Full nine factors	185.95	45	.979	**.958**	**.984**	**.968**	**.984**	**.066**	**315.945**	**.433**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	Lowest Value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 731). The following groups were included in the analysis: gas exploration, and perioperative nurses.

Appendix G: Goodness-of-Fit Results for Avolio et al. (1999a) Data Sets

Model	χ^2	Df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	4658.62	474	.819	.811	.834	.826	.834	.049	4952.624	1.344
Model 2. Two factors	3249.04	461	.874	.864	.890	.881	.890	.041	3569.035	.969
Model 3. Three factors	4703.96	459	.817	.802	.832	.818	.832	.050	5027.961	1.365
Model 4: Three factors	2983.25	446	.884	.871	.900	.888	.899	.039	3333.248	.905
Model 5. Six factors	2673.33	451	.896	.886	.912	.903	.912	.037	3013.332	.818
Model 6. Seven factors	2801.22	459	.891	.882	.907	.900	.907	.037	3125.223	.848
Model 7. Eight factors	3340.20	475	.888	.874	.902	.890	.902	.038	3722.195	.871
Model 8: Eight factors	2517.37	442	**.902**	.890	**.918**	**.908**	**.918**	**.036**	**2875.374**	**.781**
Model 9: Full nine factors	2633.76	460	.898	.890	.914	.907	.914	**.036**	2955.764	.802
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	Lowest Value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n = 3,698).

Appendix H: Goodness-of-Fit Results for Avolio et al. (1995) Data Sets

Model	χ^2	Df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Model 1. One factor	2050.87	299	.849	.840	.868	.860	.868	.054	2244.868	1.113
Model 2. Two factors	1704.33	291	.874	.864	.894	.884	.893	.049	1914.331	.949
Model 3. Three factors	2290.89	289	.831	.815	.849	.835	.849	.059	2504.887	1.242
Model 4: Three factors[a]										
Model 5. Six factors	1531.51	281	.887	.873	.906	.894	.906	.047	1761.512	.873
Model 6. Seven factors	1552.89	284	.886	.873	.904	.893	.904	.047	1776.890	.881
Model 7. Eight factors	1493.18	271	.890	.872	.908	.892	.908	.047	1743.178	.864
Model 8: Eight factors	1403.99	272	.896	.880	.915	.901	.915	.045[b]	1651.992	.819
Model 9: Full nine factors	1406.05	280	896	.883	**.915**	**.904**	**.915**	**.045**	**1638.047**	**.812**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	Lowest Value	lowest value

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n =2,026).

[a]Failed to converge after 500 iterations. [b]The upper and lower value of the confidence interval was higher than that of Model 9.

Appendix I: Goodness-of-Fit Results Comparing Carless's (1998a) Model to Nine-Factor Model for Test of Full Factorial Invariance Under All Conditions

Model	χ^2	Df	NFI	RFI	IFI	TLI	CFI	RMSEA	AIC	ECVI
Carless—condition 1	5881.00	677	.886	.879	.898	.891	.898	.034	6327.000	.973
Model 9—condition 1	5437.38	684	.895	.889	**.907**	**.902**	**.907**	**.033**	**5869.379**	**.902**
Carless—condition 2	5384.61	203	.893	.886	.904	.898	.904	.036	5790.611	.937
Model 9—condition 2	4924.73	612	**.902**	.897	**.914**	**.908**	**.913**	**.034**	**5320.729**	**.861**
Carless—condition 3	652.54	117	.935	.920	.946	.933	.946	.061	778.536	.630
Model 9—condition 3	473.27	108	**.953**	**.937**	**.963**	**.951**	**.963**	**.052**	**617.268**	**.499**
Carless—condition 4	277.45	82	.938	.918	.955	.941	.955	.057	383.245	.519
Model 9—condition 4	209.09	72	**.953**	**.930**	**.969**	**.953**	**.968**	**.051**	**335.093**	**.454**
Carless—condition 5	190.14	47	.959	.938	.969	.952	.969	.078	276.139	.552
Model 9—condition 5	75.24	36	**.984**	**.968**	**.992**	**.983**	**.991**	**.047**	**183.242**	**.366**
Carless—condition 6	1002.08	152	.926	.913	.937	.925	.937	.059	1148.075	.724
Model 9—condition 6	865.32	144	**.936**	**.920**	**.946**	**.933**	**.946**	**.056**	**1027.322**	**.648**
Carless—condition 7	643.95	117	.928	.912	.941	.927	.940	.071	769.947	.854
Model 9—condition 7	485.74	108	**.946**	**.928**	**.957**	**.943**	**.957**	**.062**	**629.740**	**.698**
Carless—condition 8	116.75	47	.946	.917	.967	.949	.966	.056	202.745	.423
Model 9—condition 8	69.89	36	**.968**	**.935**	**.984**	**.967**	**.984**	**.044**	**177.893**	**.371**
Carless—condition 9	1132.55	117	.934	.919	.941	.927	.940	.068	1258.549	.668
Model 9—condition 9	860.08	108	**.950**	**.933**	**.956**	**.941**	**.956**	**.061**	**1004.079**	**.533**
Carless—condition 10	190.96	43	.955	.932	.966	.947	.966	.091	276.955	.751
Model 9—condition 10	69.06[a]	36	**.984**	**.968**	**.992**	**.984**	**.992**	**.050**	**177.064**	**.480**
Recommended values	n/a	n/a	>.900	>.900	>.900	>.900	>.900	<.080	Lowest Value	lowest value

(table continues)

Note. NFI = normed fit index; RFI = Relative Fit Index; IFI = incremental fit index; TLI = Tucker Lewis index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criteria; ECVI = expected cross-validation index. Bold numbers indicate values that have surpassed the recommended values, and that are the best results from the options available according to the models tested. For the case of the AIC and ECVI, bold numbers indicate that the values were the lowest from the options available according to the models tested. All χ^2 results were significant at $p < .001$. (n =2,026). Model 9 refers to the MLQ full nine-factor model. The Carless model refers to the seven factor model that consists of one higher order transformational factor representing idealized influence (attributed), intellectual stimulation, individualized consideration, and six single-order factors each representing idealized influence (behavior), inspirational motivation, contingent reward, management-by-exception active, management-by-exception passive, and laissez-faire leadership. Condition 1 = entire sample (n = 6,525); condition 2 = entire sample less self evaluations (n = 6,195); condition 3 = normal low-risk business conditions (n = 1,240); condition 4 = normal low-risk academic conditions, and/or middle level leaders (2) (n = 741); condition 5 = high-risk/unstable conditions (n = 502); condition 6 = high bureaucratic conditions (1,591); condition 7 = majority male leaders, and/or male raters (n = 906); condition 8 = majority female leaders, and/or female raters (n = 481); condition 9 = low-level leaders (n = 1,887); condition 10 = middle-level leaders (1) (n = 371).

[a]$p < 0.005$.

CURRICULUM VITAE

John Antonakis
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Employment

From Mar '01	**Postdoctoral Research Associate**, Yale University, Department of Psychology. New Haven, CT, U.S.A.
Aug '00 to Feb '01	**Academic Director**, University Center "César Ritz" (UCCR). Brig, Switzerland.
Dec '99 to Feb '01	**Member of the Executive Committee**, "César Ritz" Colleges. Switzerland.
July '99 to Aug '00	**Program Director/Lecturer**, Master of Science Degree, UCCR.
April '98 to Aug '00	**Program Director**, Higher Diploma, UCCR.
April '98 to Feb '01	**Member of the Executive Committee**, UCCR.
May '97 to April '98	**Director of Studies and Operations/Lecturer,** Alpine Center. Athens, Greece.
June '96 to May '97	**Director of Studies/Lecturer**, Alpine Center.
Oct. '95 - Oct. '96	**Vice-President of International Markets** (1-year part-time appointment to the board). ECOINVEST Financial Services S.A. Athens, Greece.
June '95 - June '96	**Academic Coordinator/Lecturer,** Alpine Center.
Oct. '93 - June '96	**Head of Catering Management Studies/Lecturer,** Alpine Center.
April '93 - Oct. '93	**General Manager,** Aneroussa Beach Hotel. Andros, Greece.
Sept. '91 - March '93	**Graduate Assistant**, Office of the Dean, Graduate School Johnson & Wales University. Providence, RI, U.S.A.

Education

Feb '01	**Ph.D.** Applied Management and Decision Sciences, Walden University. Minneapolis, MN, U.S.A.
March '93	**MBA** International Business, Summa Cum Laude, Johnson & Wales University. Providence, RI, U.S.A.
Aug. '91	**BS** Hospitality Management, Summa Cum Laude, Johnson & Wales University. Providence, RI, U.S.A.

Awards

Dec. '99	**HOTECONSULT "Cesar Ritz" Award** for successfully leading validation of the MSc Program at University Center "César Ritz".

Nov. '95	**Faculty Award** in for the pursuit of excellence in education, Alpine Center for Hotel & Tourism Management Studies, Athens, Greece.
April '92	**National Honor Society** of Alpha Beta Kappa for Academic Excellence, Johnson & Wales University, Providence, USA.
Aug. '91	**Silver Key Honor Society** for Academic Excellence, Johnson & Wales University, Providence, USA.
May '91	**Academic Performance Award** for Academic Excellence, Johnson & Wales University, Providence, USA.
Oct. '89	**"Cesar Ritz Award"** for Academic and Professional Excellence, Institut Hôtelier "César Ritz", Le Bouveret, Switzerland.

Courses taught

Organizational Behavior/HRM, graduate (master's) and undergraduate level.
Strategic Management, graduate (master's) and undergraduate level.
Management Seminar, undergraduate level.
Research Methods, graduate (master's) level and undergraduate level.

Research Supervision

Dissertation supervisor, graduate (master's) level.

Publications

Antonakis, J. (2000). *Igniting innovation through transformational leadership.* Paper presented at the European Congress in Maastricht, The Netherlands.