

3-10-2010

The Development of a Tactical-Level Full Range Leadership Measurement Instrument

Rebecca Thurrell

Follow this and additional works at: <https://scholar.afit.edu/etd>

 Part of the [Leadership Studies Commons](#)

Recommended Citation

Thurrell, Rebecca, "The Development of a Tactical-Level Full Range Leadership Measurement Instrument" (2010). *Theses and Dissertations*. 2123.

<https://scholar.afit.edu/etd/2123>

This Thesis is brought to you for free and open access by the Student Graduate Works at AFIT Scholar. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of AFIT Scholar. For more information, please contact richard.mansfield@afit.edu.



**THE DEVELOPMENT OF A TACTICAL-
LEVEL FULL RANGE LEADERSHIP
MEASUREMENT INSTRUMENT**

THESIS

Rebecca Thurrell, 1st Lieutenant, USAF

AFIT/GEM/ENV/10-M12

**DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY**

AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED

The views expressed in this thesis are those of the author and do not reflect the official policy or position of the United States Air Force, Department of Defense, or the United States Government.

AFIT/GEM/ENV/10-M12

THE DEVELOPMENT OF A TACTICAL-LEVEL FULL RANGE
LEADERSHIP MEASUREMENT INSTRUMENT

THESIS

Presented to the Faculty

Department of Systems and Engineering Management

Graduate School of Engineering and Management

Air Force Institute of Technology

Air University

Air Education and Training Command

In Partial Fulfillment of the Requirements for the
Degree of Master of Science in Engineering Management

Rebecca Thurrell, BS

1st Lieutenant, USAF

March 2010

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED.

THE DEVELOPMENT OF A TACTICAL-LEVEL FULL RANGE
LEADERSHIP MEASUREMENT INSTRUMENT

Rebecca Thurrell, B.S.
1st Lieutenant, USAF

Approved:

- SIGNED -

25 Feb 10

Alexander J. Barelka, Lt Col, USAF (Chairman)

Date

- SIGNED -

25 Feb 10

Daniel T. Holt, Lt Col, USAF (Member)

Date

- SIGNED -

25 Feb 10

John J. Elshaw, Lt Col, USAF (Member)

Date

Abstract

Since the emergence of transformational and charismatic leadership models in the mid-1980s, full range leadership theory has become established as the predominant and most widely researched theory on leadership. The most commonly used survey instrument to assess full range leadership theory is the Multifactor Leadership Questionnaire, originally developed by Bass in 1985. Although much research has supported the strength of the psychometric properties of the Multifactor Leadership Questionnaire, some researchers have suggested that contextual factors such as a leader's hierarchical level can lead to conflicting results. This research effort involved an extensive review of existing literature to develop a new full range leadership theory measurement instrument that effectively targets low- to mid-level supervisors, or *tactical-level leaders*.

Results indicate that the newly developed Leadership Profile Measure scales have stronger internal consistency reliability (Cronbach's α) than the Multifactor Leadership Questionnaire. The Leadership Profile Measure also demonstrated better model fit (evaluated by confirmatory factor analysis). Correlations between the Leadership Profile Measure and performance evaluations conducted by trained raters were low, although many were significant.

Acknowledgments

I would like to thank my family, classmates, and committee, without whom this thesis would not have been possible.

Rebecca Thurrell

Table of Contents

	Page
<i>Abstract</i>	<i>iv</i>
<i>Acknowledgments</i>	<i>v</i>
<i>Table of Contents</i>	<i>vi</i>
<i>List of Figures</i>	<i>viii</i>
<i>List of Tables</i>	<i>iv</i>
<i>I. Introduction</i>	<i>1</i>
Research Objectives	3
Methodology	3
Implications.....	4
<i>II. Literature Review</i>	<i>6</i>
Origins of the New Leadership Genre.....	7
Analytic Strategy.....	13
A Typology of New Leadership Genre Instruments	16
Summary of the Facet Analysis	30
<i>III. Methods</i>	<i>35</i>
Participants and Procedures	35
Measures.....	35
<i>IV. Analysis and Results</i>	<i>40</i>
Initial Item Reduction.....	39
Confirmatory Factor Analysis.....	41
Descriptive Statistics and Reliability	45
Convergent and Divergent Analysis	46
Predictive Validity.....	50
<i>V. Discussion and Conclusions</i>	<i>52</i>
Discussion	52
Implications.....	53

	Page
Limitations	54
Future research	55
<i>Appendix A: Initial Pool of Survey Items for Classes 09E, F & G</i>	57
<i>References</i>	60
<i>SF 298</i>	66

List of Figures

	Page
Figure 1. The Full Range Leadership Model.....	10
Figure 2. Leadership Profile Measure Confirmatory Factor Analysis Model with Factor Loadings	42
Figure 3. Multifactor Leadership Questionnaire Confirmatory Factor Analysis Model with Factor Loadings	43

List of Tables

	Page
Table 1. Facets Used to Describe, Compare, and Contrast New Leadership Instruments	15
Table 2. Facet Analysis of the Instruments Focusing on Charismatic Leadership	17
Table 3. Facet Analysis of the Instruments Focusing on Transformational Leadership	20
Table 4. Facet Analysis of the Instruments Focusing on Full Range Leadership	26
Table 5. Instrument Ratings and a Summary of the Reliability and Validity Evidence for each of the Instruments Reviewed.....	32
Table 6. Comparison of Existing Instruments with the Full Range Leadership Model.....	34
Table 7. Summary of Confirmatory Factor Analysis Results.....	44
Table 8. Descriptive Statistics and Reliability.....	46
Table 9. Correlations among the Multifactor Leadership Questionnaire and Leadership Profile Measure Factors.....	47
Table 10. Correlations among the Leadership Profile Measure Factors.....	49
Table 11. Correlations among the Multifactor Leadership Questionnaire Factors.....	50
Table 12. Leadership Profile Measure and Multifactor Leadership Questionnaire Correlations with Performance Outcomes	51

THE DEVELOPMENT OF A TACTICAL-LEVEL FULL RANGE LEADERSHIP MEASUREMENT INSTRUMENT

I. Introduction

Burns (1978) was the first to identify and distinguish between the transactional and transformational styles of leadership which he viewed as two ends of a spectrum. A transactional leader relies on contingent exchanges (e.g. rewards or praise) to motivate subordinates whereas a transformational leader elevates subordinates to higher levels of performance by inspiring them to place the goals of the group ahead of their own. Bass (1985) later reconceptualized the two styles as complementary constructs forming the basis of what is now full range leadership theory. Full range leadership theory has evolved based on the results of extensive research, and now comprises five transformational leadership factors (idealized influence (attributed), idealized influence (behavior), inspirational motivation, intellectual stimulation, and individualized consideration), three transactional leadership factors (contingent reward, management-by-exception active, and management-by-exception passive), and one nonleadership factor (laissez-faire leadership).

Since the emergence of transformational and charismatic leadership models in the mid-1980s, full range leadership theory has become established as the predominant and most widely researched theory on leadership (Northouse, 2007). The most commonly used survey instrument to assess full range leadership theory is the Multifactor

Leadership Questionnaire, developed by Bass in 1985 and subsequently refined by Bass and Avolio (Antonakis et al., 2003). Bass (1985) originally developed the Multifactor Leadership Questionnaire to measure transformational and transactional leadership and it has since evolved in parallel with full range leadership theory. The current version of the questionnaire (Form 5X) consists of four items for each of the nine factors as well as nine items that provide a subjective measure of leadership effectiveness. While the Multifactor Leadership Questionnaire has been shown to have high internal consistency and factor loadings on average (Avolio et al., 1999; Lowe et al., 1996), research has sometimes produced mixed results.

One concern with the Multifactor Leadership Questionnaire is a potential bias created by item wording, particularly within the transactional leadership scales. Hinkin (1998) highlights the importance of item wording and cautions against the use of leading questions because of the tendency to bias responses. Some items within the Multifactor Leadership Questionnaire such as, “I fail to interfere until problems become serious,” convey a pejorative connotation and may bias the predicted relationships with leadership outcomes.

Another concern is the role of contextual factors such as organization type and leader hierarchical level established in a meta-analysis by Lowe et al. (1996) as moderators between the various Multifactor Leadership Questionnaire factors and outcome variables. Subsequent research has shown that the range of typical leadership behaviors may vary depending on the organizational level of the leader (Den Hartog et al., 1997). Antonakis et al. (2003) contend that context influences the types of leadership behaviors that are considered effective.

In addition to moderating the type of leader behavior observed, Lowe et al. (1996) revealed that leader level moderated the frequency of behaviors demonstrated. Antonakis et al. (2003) took this further to show that contextual factors affect the relationships among the full range leadership factors themselves. House (1997) argues that context should be factored into the theoretical model and measure.

The purpose of this research, therefore, is to develop a full range leadership model measurement instrument that effectively, and without bias, targets low- to mid- level managers whose primary concern is supervisory management as opposed to the more strategic focus of upper-level management. Individuals at this organizational level will be referred to as *tactical-level leaders*. This leads to the problem statement of this research:

The development of a targeted survey instrument to measure full range leadership of tactical-level leaders with high validity and reliability.

Research Objectives

The objectives of this research effort are to (1) develop a full range leadership survey instrument that targets tactical-level leaders without biased item wording, (2) establish the construct validity and reliability of the instrument, and (3) determine the instrument's predictive validity with respect to leadership performance.

Methodology

The first step in measure development (following the procedure outlined by Hinkin, 1998) is generation of an initial set of items. Items were selected based on a theoretical foundation and a thorough review of the relevant literature. Once items were

generated, the questionnaire was administered along with the Multifactor Leadership Questionnaire to 1,264 United States Air Force officers attending a leadership development training program. These officers had between four and seven years of experience as leaders in the Air Force. Following data collection, exploratory factor analysis and assessment of internal consistency reliability were used to reduce and refine the items included in the final questionnaire and to evaluate the ultimate fit to the full range leadership model. Confirmatory factor analysis and an evaluation of convergent and divergent validity (through comparison with the Multifactor Leadership Questionnaire) were also used to assess the resulting questionnaire. Finally, a correlation analysis with performance data collected throughout the training program was used to establish the predictive validity of the new instrument.

Implications

The development of a targeted survey instrument to measure full range leadership has implications for both theory and practice. This research provides further confirmation of the nine-factor full range leadership theory in a unique military context. It also provides insight into the impact of context on the predictive validity of the Multifactor Leadership Questionnaire as well as its reliability and construct validity. In addition, this study raises questions about item wording bias that could influence the relationships among factors as well as the predictive validity of the Multifactor Leadership Questionnaire.

A targeted measurement instrument provides a more relevant basis for leadership development training tailored to the appropriate hierarchical level of the leader. Each

item provides a source from which to coach leaders on specific behaviors to develop their leadership potential. This research also contributes to the refinement of selection procedures for low-level leaders. Selection interviews or assessments could evaluate a candidate's potential for transformational leadership rather than merely their technical expertise.

II. Literature Review

Since the early 1900's, social scientists have strived to determine the mechanisms by which a leader is able to effectively influence followers to achieve some goal or level of performance. Various leadership theories have attempted to examine this process with respect to the leader's traits, skills, or behavioral style. Other theories have focused on characteristics of the situation or some combination of these aspects. Over that last two decades a *new leadership genre* comprising charismatic, transformational, and visionary leadership theories has emerged and dominated the field of leadership study. In a recent meta-analysis, Judge and Piccolo (2004) found that there were more studies on transformational and charismatic leadership from 1990 to 2003 than all other theories of leadership combined.

The expansive nature of new leadership research has led to a wide variety of interpretations regarding the underlying influence processes. Not surprisingly, there is a correspondingly diverse selection of new leadership measurement instruments. A review of this genre of leadership literature was conducted to identify existing measures of charismatic, transformational, and visionary leadership as well as studies that evaluated those measures. First, this chapter addresses the origins and growth of the new leadership genres. Next, a strategy is outlined for analyzing the existing measurement instruments. Finally, the instruments are compared based on their content and psychometric properties.

Origins of the New Leadership Genre

German sociologist, Max Weber (1948), formed the foundation of the new leadership genre. Weber, who was concerned primarily with politics, classified authority into three types: traditional, rational-legal, and charismatic. In reference to a charismatic leader, he stated that, “Men do not obey him by virtue of tradition or statute, but because they believe in him” (Weber, 1948:79). Weber viewed emotional appeal as the core of charisma and believed that followers attributed extraordinary qualities to charismatic leaders.

Downton (1973) was the first to use the term “transformational leadership” and to distinguish it from the more traditional, transactional leadership. He viewed transactional leadership as an economic exchange process that was important in the development of trust. Transformational or charismatic leadership, on the other hand, caused followers to identify with the leader and his or her ideals. He also identified a third category, inspirational leadership, which encouraged followers to make sacrifices by giving them a sense of purpose and creating meaning for their actions.

Up to this point in time, the discussion about charisma was entirely hypothetical, but House (1976) developed an integrated framework and introduced propositions that could be tested empirically and was the first to use the concept of charisma in contemporary organizational research (Judge & Piccolo, 2004). House held that a charismatic leader articulates ideological goals, creates the impression of competence and success, communicates high expectations of, and confidence in, followers, arouses motives relevant to mission accomplishment, and role models a value system. Followers

respond by trusting and emulating the leader. Their loyalty to the leader and self-esteem increase and performance is improved.

At the same time, Burns (1978) was advancing theory on transformational leadership. Like Weber, Burns focused on political leadership. His major work, *Leadership*, divided leaders similarly to Downton, into two types, transactional or transforming. Transactional leaders relied on the exchange of valued items and focused on promoting the self-interest of followers. Transforming leaders, on the other hand, caused followers to transcend their own self-interest for the greater good (Antonakis & House, 2002). Burns (1978:20) described transformational leadership as occurring when “one or more persons engage with others in such a way that leaders and followers raise one another to higher levels of motivation and morality.”

Burns laid the groundwork for Bass’s (1985) full range leadership theory. Unlike Burns, Bass did not view transformational and transactional leadership as opposite ends of a continuum (Sashkin, 2004). Instead, he suggested that any leader could display both transformational and transactional leadership to varying degrees. According to Bass (1985), transformational leadership involves raising followers’ consciousness about the importance and value of overarching goals through compelling presentation of a vision and the development of emotional relationships. Bass agreed with Burns (1978) that transformational leadership caused followers to transcend their own self-interest for the good of the group or organization. In contrast, transactional leadership involves clarification of roles and task requirements as well as reward or punishment based on performance. Setting objectives and monitoring performance are the basis of this type of leadership. Bass believed that transactional leadership was a necessary precondition for

transformational leadership to be effective. Transactional leadership was critical to the development of a relationship between the leader and follower and to provide necessary direction and focus.

Bass's Full Range Leadership Model was developed inductively based on interviews with senior executives. The executives were asked to describe a leader who had influenced what was important to them in their roles as leaders. They were also asked how the best leaders were able to get others to go beyond self-interest for the good of a group. From these interviews, Bass developed a questionnaire that he administered to United States Army Field Grade Officers who rated their superior officers. Factor analysis was used to extract relevant scales (Avolio et al., 1999). The structure that emerged was a hierarchy of transformational and transactional leader behaviors. The transformational leader behaviors were seen as most effective. The structure of the hierarchy can be seen in Figure 1.

At the top of the hierarchy was charisma (later renamed *idealized influence*) which described a quality of a leader that fostered trust from followers and caused them to identify with and to emulate him or her. Role modeling and providing a vision as well as confidence, morality, and ethics were all important parts of this construct. Charisma was a necessary, and the most influential, component of transformational leadership, but Bass believed that charisma alone was not sufficient. He argued that a leader could be charismatic without being transformational (Bass, 1985). Next in the hierarchy came *inspirational motivation* which included a leader's emotional appeals as well as high expectations and confidence in followers. This factor was originally combined with

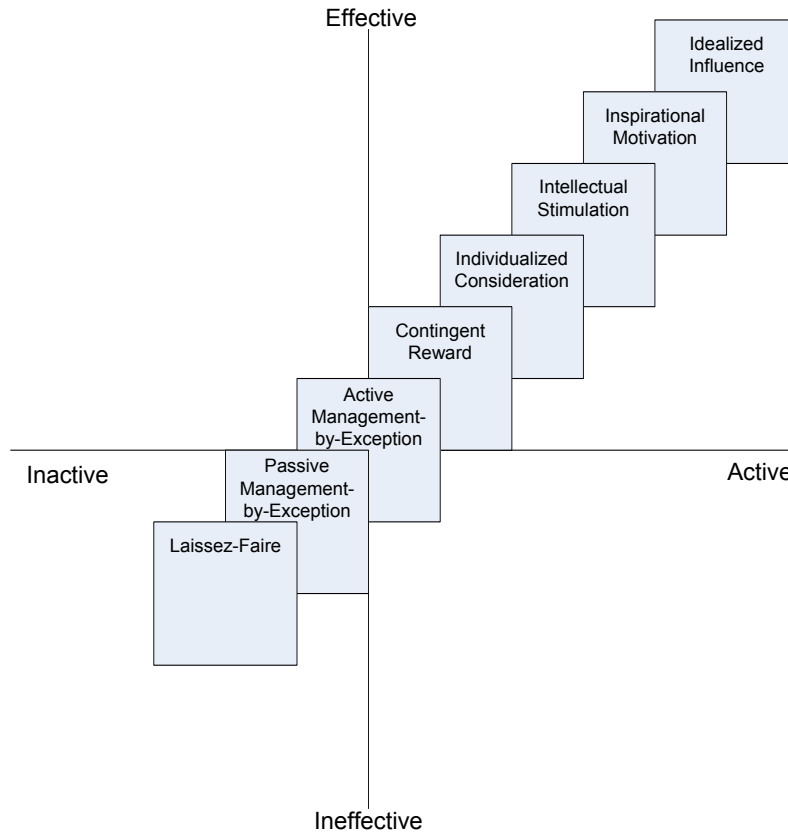


Figure 1. The Full Range Leadership Model (Bass & Riggio, 2006)

idealized influence in the charisma factor, but was later separated (Hater & Bass, 1988). *Intellectual stimulation* was the third dimension in the hierarchy and it described a leader’s behaviors that encouraged problem solving, creativity, and innovation. This dimension involved challenging followers’ beliefs, values, and assumptions. The fourth dimension in the hierarchy was *individualized consideration* which described the behaviors of a leader who acted as a coach or advisor to develop and empower subordinates. A leader who fosters a supportive climate and listens to the needs of followers displays individualized consideration. These four factors (idealized influence,

inspirational motivation, intellectual stimulation, and individualized consideration) combined to form the composite transformational leadership factor.

Below the transformational factors were the transactional. First among these was *contingent reward* which, true to its title, involved the exchange of rewards for performance. Next was *management-by-exception* which was originally a single factor, but was later divided into active and passive components (Hater & Bass, 1988). Active management-by-exception entailed watching for mistakes and taking corrective action immediately whereas passive management-by-exception characterized intervention only after standards had not been met and problems had arisen. Finally, a nonleadership factor was added to the hierarchy. *Laissez-faire leadership* indicated an abdication of responsibility and a lack of feedback or exchange with followers. Delaying or avoiding decisions are typical laissez-faire behaviors.

One of the reasons that full range leadership theory has been able to maintain its position as the predominant and most widely researched theory on leadership is its frequent refinement and modification by Bass and his colleagues to overcome shortcomings and criticisms. These modifications, including the addition of laissez-faire leadership at the bottom of the hierarchy, have caused full range leadership theory to evolve and improve over time.

Kouzes and Posner (1987) took a similar inductive approach to their theory of transformational leadership, but did not include transactional or nonleadership factors in their analysis. They began with a qualitative approach, asking managers to describe the experience that would qualify as their “personal best as a leader” (Kouzes & Posner, 1988). They followed up with surveys and in-depth interviews which were then content

analyzed to develop five basic categories of effective leadership practices. The first of these practices, *challenge the process*, entailed searching for opportunities, experimenting, and taking risks. *Inspiring a shared vision* required envisioning the future and enlisting the support of others. *Enabling others to act* involved fostering collaboration and strengthening others. *Modeling the way* meant setting the example and planning for small wins. Finally, *encouraging the heart* required leaders to recognize the contributions and celebrate the accomplishments of their followers.

Other researchers have followed more closely in the footsteps of House (1976) and have focused exclusively on the charismatic component of leadership. Among these are Conger and Kanungo (1987). Conger and Kanungo developed a theory that matched behavioral components of charismatic leadership to three distinct stages of activity within organizations. During the first stage, or environmental assessment, charismatic leaders focus on followers' needs and on opportunities to challenge the status quo. Stage two, or direction formulation, involves conveying a vision in an inspirational manner. Finally, stage three (membership alignment and implementation) is marked by the use of unconventional means as well as self-sacrifice and the assumption of personal risk by the leader to align commitment from followers and empower them to act (Conger et al., 1997). The three stages overlap and repeat continually.

Like Conger and Kanungo, Shamir and his associates (1993) focused exclusively on the charismatic component of leadership. They sought to explain the process by which charismatic leader behaviors caused transformational effects on followers. Their charismatic leadership theory proposed that certain leader behaviors affect followers' self-concepts through a variety of motivational mechanisms. In turn, effects on the self-

concept lead to further effects on motivation and performance. The key behaviors in this model are: providing ideological explanations, emphasizing collective identities, referencing history, referencing followers' worth and efficacy, referencing collective efficacy, and expressing confidence in followers.

While each theory within the new leadership genre provides its own unique contribution to explanations and predictions of effective leadership, they do share a common set of core propositions. All of these theories attempt to explain how some leaders are able to elicit performance beyond expectations through the development of emotional attachment, respect, and trust (Avolio & Yammarino, 2002). The emphasis is on intrinsic motivation and higher motive development (Rowold & Heinritz, 2007). Critical behaviors include role modeling, displaying competence, articulating goals, communicating high expectations, and exhibiting confidence in followers. Effects on followers include an increased sense of competence or self-efficacy, increased trust, acceptance, and identification with the leader, greater emotional involvement and willingness to sacrifice, commitment to more difficult objectives, and improved performance.

Analytic Strategy

Given the many theories, it is not surprising that several instruments have been developed to measure the salient dimensions. A comprehensive search of the leadership literature identified over 15 unique instruments designed to measure charismatic, transformational, or full range leadership. Several relevant facets of each instrument were examined to describe and classify them.

Selection of Instruments for Facet Analysis.

The decision to include instruments in the facet analysis was based on their purpose and response format. Instruments were included if they were designed to measure some aspect of a leader's charismatic or transformational leadership. Full range leadership measurement instruments which included a transactional component in addition to transformational were also included. It was also important to evaluate the psychometric properties of the instruments, so they had to include close-ended items with a response format that allowed assessment of their reliability or validity (Holt et al., 2007). Thirteen instruments remained after filtering based on these criteria.

Facet Theory.

Facet analysis is a method that allows for the systematic integration and comparison of unique streams of research within a given domain (McGrath, 1968). Each facet describes a particular dimension or property that is relevant to all of the objects to be compared. Holt and his colleagues (2007), for example, used this technique to review and compare instruments designed to measure readiness for change.

Facets of Analysis.

The facets addressed in this analysis (and their elements) are summarized in Table 1. First, the instruments were compared based on their scope. Some instruments addressed only charismatic leadership while others widened to encompass transformational leadership, and others full range leadership. Second, the process used for instrument development was classified as either inductive (emerged from a qualitative analysis) or deductive (developed based on a theoretical framework). Following this, the sample used to create and test the instrument was identified as well as the population

(strategic and/or tactical) that the items targeted. Content validity, criterion validity, construct validity, and reliability were then the facets used to compare the psychometric properties of the instruments. Finally, the constructs measured by each instrument and studies that analyzed psychometric properties of the instruments were compared. Key studies were compiled using topic and title searches by instrument and author name.

Table 1. Facets Used to Describe, Compare, and Contrast New Leadership Instruments

Facet of Analysis	Description	Elements
1. Scope	Perspective from which the instrument evaluates leadership	Charismatic Leadership (see Table 2)
		Transformational Leadership (see Table 3)
		Full Range Leadership (see Table 4)
2. Item development	Method used to develop items for instrument	Deductive
		Inductive
3. Sample Characteristics	Sample used to develop instrument	Instrument specific
4. Target Population	Population at which items are directed	Strategic
		Tactical
5. Content validity analysis	Instrument's items are a proper representation of the domain they assess	Expert Judges
		Content Analysis
		Q-Sort
6. Criterion validity	Ability of instrument's constructs to predict relevant outcome variables	Postdictive
		Concurrent
		Predictive
7. Construct validity analysis	Instrument's items measure distinguishable constructs that are systematically related to other relevant topics	Convergent validity
		Discriminant validity
		Exploratory Factor Analysis (EFA)
		Confirmatory Factor Analysis (CFA)
8. Reliability analysis	Instrument's items are consistent and dependable	Coefficient alpha
		Test/Re-test
9. Scales	Constructs that the instrument assesses	Instrument specific
10. Key citations	Studies that have explored the instrument's psychometric properties	Instrument specific

A Typology of New Leadership Genre Instruments

Examination of the 13 leadership instruments revealed that they varied in the scope within which they measured leadership. Content of the instruments indicated either a narrow focus on only charismatic leadership, a broader view of transformational leadership, or an even more expansive picture of full range leadership that incorporated transactional leadership. If an instrument did not explicitly define the domain of analysis, a determination was made based on the scales and items it contained.

Instruments Assessing Charismatic Leadership.

Table 2 lists the instruments that assess charismatic leadership. These instruments suggest that the critical leadership behaviors or qualities that produce positive follower and performance outcomes can all be described as charismatic. The first instrument designed to measure the behavioral dimensions of charismatic leaders within organizational settings was the Conger-Kanungo Scale (Conger & Kanungo, 1992). According to Conger and Kanungo (1994:442), “Charismatic leaders differ from other leaders by their ability to formulate and articulate an inspirational vision and by behaviors and actions that foster an impression that they and their mission are extraordinary.” Looking at each facet individually for this first scale, I will begin with item development. Conger and Kanungo took a deductive approach whereby they established a theoretical framework which they used to develop items for a questionnaire. The sample they used to validate their questionnaire comprised part-time MBA students who also held jobs, mostly in the private sector. The items in their survey target a mix of strategic and tactical-level leaders. For example, the item “Provides inspiring strategic

Table 2. Facet Analysis of the Instruments Focusing on Charismatic Leadership

	Conger-Kanungo Scale	Shamir et al. Scale
1. Source of Instrument	Conger & Kanungo, 1992/1997	Shamir et al., 1993/1998
2. Item development	Deductive	Deductive
3. Sample Characteristics	Part-time MBA students, 72% held private sector jobs	Israel Defense Forces company commanders
4. Target Population	Mixed	Tactical
5. Content validity analysis	None provided	None provided
6. Criterion validity	Concurrent, Predictive	Postdictive, Concurrent
7. Construct validity analysis	Convergent, Discriminant, EFA, CFA	EFA, CFA
8. Reliability analysis	Cronbach α ; Test-Retest	Cronbach α
9. Scales	Strategic Vision and Articulation ($\alpha=.87$); Sensitivity to the Environment ($\alpha=.77$); Sensitivity to Member Needs ($\alpha=.84$); Personal Risk Behavior ($\alpha=.85$); Unconventional Behavior ($\alpha=.74$)	Exemplary Behavior ($\alpha=.92$); Ideological Emphasis ($\alpha=.90$); Emphasizing Collective Identity ($\alpha=.88$)
10. Key citations	Conger & Kanungo, 1994; Conger et al., 2000; Rowold & Heinitz, 2007	None

and organizational goals” is targeted more toward a strategic-level leader whereas “Recognizes the abilities and skills of other members of the organization” may apply to a leader at any level in the organization. No analysis of content validity was described in their research. Predictive and construct validity of his scale were examined in two other studies by Conger and his colleagues (Conger & Kanungo, 1994; Conger et al., 2000) as well as a study by Rowold and Heinitz (2007) that compared it with the Multifactor Leadership Questionnaire. Conger and his associates (2000) found that charismatic

leadership behavior was positively related to followers' sense of reverence for their leader, sense of collective identity, and perceptions of group task performance. This provided evidence of concurrent validity. Rowold and Heinitz (2007) also found that charismatic leadership (measured by the Conger-Kanungo Scale) was positively correlated to subjective performance outcomes. Furthermore, charismatic leadership explained additional variance in subjective performance when compared to transactional leadership. Rowold and Heinitz also looked at predictive validity by correlating questionnaire results with year-end financial performance, although their findings were not significant. All three studies established convergent and discriminant validity through comparison with other recognized questionnaires, including the Multifactor Leadership Questionnaire. Conger and Kanungo (1994) conducted an exploratory factor analysis to evaluate their initial pool of items and later ran a confirmatory factor analysis on their final questionnaire with a new sample. They evaluated internal consistency reliability using Cronbach's alpha and also reported test-retest reliability. As reported in Table 2, the scales and reliabilities for the Conger-Kanungo Scale are as follows: Strategic Vision and Articulation ($\alpha=.87$), Sensitivity to the Environment ($\alpha=.77$), Sensitivity to Member Needs ($\alpha=.84$), Personal Risk ($\alpha=.85$), and Unconventional Behavior ($\alpha=.74$).

Conger and Kanungo were followed closely by Shamir and his colleagues (1993; 1998) who developed a questionnaire to measure the ways that charismatic leaders "increase the intrinsic value of efforts and goals by linking them to valued aspects of the follower's self-concept" through role modeling and frame alignment (Shamir et al., 1993:584). The results of their 1998 study revealed that all three leader behaviors were

correlated with followers' trust in and identification with the leader and two of the three behaviors (but not displaying exemplary behavior) were correlated with heightened motivation and willingness to sacrifice. All of the correlations, however, were weak. Shamir and his colleagues (1998) concluded that their self-concept-based theory did not receive much support.

Instruments Assessing Transformational Leadership.

Table 3 contains the instruments designed to assess transformational leadership, a construct somewhat broader in scope than charismatic leadership.

In 1988, Kouzes and Posner's qualitative assessment of leadership resulted in the identification of the five leadership practices discussed earlier (Challenging the Process, Inspiring a Shared Vision, Enabling Others to Act, Modeling the Way, and Encouraging the Heart). The Leadership Practices Inventory consisted of items designed to measure the frequency of behaviors that fell into each of the five categories (e.g. "I treat others with dignity and respect"). Factor analysis, construct validation, and tests of reliability resulted in a 30-item instrument (six items for each leadership practice). Regression analysis revealed that the leadership practices explained 55% of the variance in subordinates' assessments of their leaders' effectiveness (Posner & Kouzes, 1988). Posner and Kouzes (1988) also found that Leadership Practices Inventory results could distinguish between high and low performing managers. Subsequent analyses of the psychometric properties of the Leadership Practices Inventory confirmed the factor structure, reliability, and validity of the scale (Posner & Kouzes, 1993; Fields & Herold, 1997; Carless, 2001).

Table 3. Facet Analysis of the Instruments Focusing on Transformational Leadership

	Leadership Practices Inventory	Transformational Leadership Inventory	Attributes of Leader Behavior Questionnaire	Transformational Leadership Questionnaire	Global Transformational Leadership Scale	Rafferty Scale
1. Source of Instrument	Posner & Kouzes, 1988	Podsakoff et al., 1990	Behling & McFillen, 1996	Alimo-Metcalfe & Alban-Metcalfe, 2001	Carless et al., 2000	Rafferty & Griffin, 2004
2. Item development	Inductive	Deductive	Deductive	Inductive	Deductive	Deductive
3. Sample Characteristics	Public/private sector mgrs at mgt development seminars	Low/mid/upper-level mgrs and non-mgrs at petrochemical company	MBA/MOD students; undergraduate business students	UK public sector managers	Australian retail bank branch managers	Australian public sector workers
4. Target Population	Mixed	Mixed	Mixed	Mixed	Mixed	Mixed
5. Content validity analysis	Content analysis	Q-Sort	Expert Judges	Content analysis	NA	NA
6. Criterion validity	Concurrent	Concurrent	Concurrent	Concurrent	Concurrent	Concurrent
7. Construct validity analysis	Convergent, Discriminant, EFA, CFA	Convergent, Discriminant, CFA	Convergent, Discriminant, EFA	Convergent, Discriminant, EFA, CFA	Convergent, Discriminant, EFA, CFA	Discriminant, CFA
8. Reliability analysis	Cronbach α ; Test-Retest	Cronbach α	Cronbach α	Cronbach α	Cronbach α	Cronbach α

Table 3. (Continued)

	Leadership Practices Inventory	Transformational Leadership Inventory	Attributes of Leader Behavior Questionnaire	Transformational Leadership Questionnaire	Global Transformational Leadership Scale	Rafferty Scale
9. Scales	Challenging the Process ($\alpha=.80$); Inspiring a Shared Vision ($\alpha=.87$); Enabling Others to Act ($\alpha=.85$); Modeling the Way ($\alpha=.81$); Encouraging the Heart ($\alpha=.91$)	Articulating a Vision ($\alpha=.87$); Providing an Appropriate Model ($\alpha=.84$); Fostering the Acceptance of Group Goals ($\alpha=.89$); High Performance Expectations ($\alpha=.80$); Individualized Support ($\alpha=.90$); Intellectual Stimulation ($\alpha=.82$)	Displays Empathy ($\alpha=.75$); Dramatizes the Mission ($\alpha=.75$); Projects Self-Assurance ($\alpha=.83$); Enhances the Leader's Image ($\alpha=.71$); Assures Followers of Their Competency ($\alpha=.86$); Provides Opportunities to Experience Success ($\alpha=.79$)	Genuine Concern for Others ($\alpha=.95$); Decisiveness, Determination, Self-confidence ($\alpha=.84$); Integrity, Trustworthy, Honest and Open ($\alpha=.88$); Empowers, Develops Potential ($\alpha=.91$); Inspirational Networker and Promoter ($\alpha=.84$); Accessibility, Approachability ($\alpha=.78$); Clarifies Boundaries ($\alpha=.77$); Encourages Critical and Strategic Thinking ($\alpha=.85$)	Transformational Leadership ($\alpha=.93$)	Articulating a Vision ($\alpha=.82$); Inspirational Communication ($\alpha=.88$); Intellectual Stimulation ($\alpha=.84$); Supportive Leadership ($\alpha=.95$); Personal Recognition ($\alpha=.96$)
10. Key citations	Tourangeau & McGilton, 2004; Carless, 2001; Fields & Herold, 1997; Posner & Kouzes, 1993	Podsakoff et al., 1996	McCann et al., 2006	Alban-Metcalfé & Alimo-Metcalfé, 2000	None	None

Through a review of the existing literature, Podsakoff and his colleagues (1990) identified six key behaviors (Identifying and Articulating a Vision, Providing an Appropriate Model, Fostering the Acceptance of Group Goals, High Performance Expectations, Providing Individualized Support, and Intellectual Stimulation) common to most theories of transformational leadership. Next, they developed items by pooling previous operationalizations of the transformational leadership constructs and by creating new items. Content experts conducted a Q-Sort of the items to evaluate their fit to the conceptual definitions. Once the items were finalized, Podsakoff and his colleagues (1990) administered their Transformational Leadership Inventory so that they could examine its psychometric properties. Confirmatory factor analyses were used to evaluate the factor structure as well as the convergent and discriminant validities of the constructs. Another study examining the Transformational Leadership Inventory confirmed that the six factor model was a good fit and that scale reliability was high (Podsakoff et al., 1996). This study also found that the transformational leadership behaviors accounted for variance in follower trust, satisfaction, courtesy, and performance. A third study (Pillai & Williams, 2004) found that transformational leadership (measured by the Transformational Leadership Inventory) was related to self-efficacy, cohesiveness, commitment, and perceptions of unit performance.

Similar to Podsakoff's approach, Behling and McFillen (1996) combined ideas from the charismatic and transformational leadership literature. Behaviors were included in their instrument if they appeared consistently among the existing theories. Like Podsakoff and his associates, they identified six key behaviors (Displays Empathy, Dramatizes the Mission, Projects Self-Assurance, Enhances the Leader's Image, Assures

Followers of Their Competency, and Provides Followers with Opportunities to Experience Success). Items were prepared for each of the six behaviors and a panel of judges sorted the items into the behavior categories to ensure consistency. Once respondents completed the questionnaire, the reliability, factor structure, and construct validity (convergent and divergent validity) of the scales were assessed. The anticipated factor structure was only found in one of three studies although this may be due to characteristics of the sample. A subsequent analysis of Behling and McFillen's model (McCann et al., 2006) reproduced the anticipated factor structure using exploratory factor analysis and confirmed the reliability of the scale. However, the predicted relationships between the leader behaviors and follower effort, commitment, and willingness to take risks (mediated by follower inspiration, awe, and empowerment) were only partially supported (affective commitment was the only follower response effected and the behavior, *enhances image*, had no effect on any of the outcomes).

The Transformational Leadership Questionnaire (Alimo-Metcalfe & Alban-Metcalfe, 2001) was developed in the United Kingdom through content analysis of interviews with managers. Constructs were grouped based on underlying dimensions of leadership to develop a pilot questionnaire. Exploratory factor analysis resulted in a nine-factor structure which was subsequently confirmed through confirmatory factor analysis and assessed for reliability and convergent validity. A second study (Alban-Metcalfe & Alimo-Metcalfe, 2000) confirmed the reliability and discriminant and convergent validity of the scale although there has not been any evidence of the scale's concurrent or predictive validity.

Carless and her colleagues (2000) sought to develop a short instrument to measure transformational leadership. They used the summary produced by Podsakoff et al. (1990) but modified the behaviors slightly and added an additional dimension for a total of seven. One item was created to measure each of the seven behaviors and these seven items combined to form the Global Transformational Leadership scale. The Global Transformational Leadership scale was then administered along with the Leadership Practices Inventory, Multifactor Leadership Questionnaire, and additional outcome measures. Both exploratory factor analysis and confirmatory factor analysis were used to assess the factor structure of the Global Transformational Leadership scale and both confirmed that the items assessed a single underlying dimension of leadership (Carless et al., 2000). Comparing the Multifactor Leadership Questionnaire and Leadership Practices Inventory provided evidence of convergent validity. The Global Transformational Leadership scale was able to discriminate between high and poor performing managers. The scale reliability was high. No other studies have assessed the Global Transformational Leadership scale.

The final transformational scale was developed by Rafferty and Griffin (2004) using a theoretical approach. They examined the model developed by Bass (1985) to identify five subdimensions of transformational leadership. Items were adapted from existing measures. Confirmatory factor analysis was conducted to assess the measurement properties of the items and then the discriminant validity of the factors was examined through correlations with outcome measures. The study found that inspirational communication had a positive relationship with affective commitment and intellectual stimulation was positively related to continuance commitment. However,

personal recognition and vision were negatively associated with continuance commitment. There have not been any additional studies to assess Rafferty and Griffin's scale.

Instruments Assessing Full Range Leadership.

Table 4 lists the instruments that assess full range leadership. The primary instrument in this category is the Multifactor Leadership Questionnaire (Bass, 1985), but several authors have presented adaptations of the Multifactor Leadership Questionnaire. The original Multifactor Leadership Questionnaire, developed based on a factor analysis of inductively derived items, consisted of three transformational factors (charismatic leadership, inspirational leadership, and intellectual stimulation) and two transactional factors (contingent reward and management-by-exception). Many studies were conducted using the Multifactor Leadership Questionnaire and Bass and his colleagues used criticisms that it received to modify and improve its factor structure and psychometric properties. In 1988, the management-by-exception scale was divided into two components, active management-by-exception and passive management-by-exception (Hater & Bass) and in 1990, Bass and Avolio differentiated attributed from behavioral charismatic leadership (Bass & Avolio, 1990). An additional factor, *laissez-faire*, was also added to measure nonleadership. The Multifactor Leadership Questionnaire has been, by far, the most frequently used measure of transformational leadership (Dumdum et al., 2002). Since its introduction, there have been two meta-analyses conducted that specifically selected studies that had used the Multifactor Leadership Questionnaire. Although the Lowe et al. (1996) meta-analysis used the older, five-factor, version of the Multifactor Leadership Questionnaire it found significant

Table 4. Facet Analysis of the Instruments Focusing on Full Range Leadership

	Multifactor Leadership Questionnaire	Goodwin Scale (MLQ)	Antonakis Scale (MLQ)	Heinitz Scale (MLQ)
1. Source of Instrument	Bass, 1985	Goodwin et al., 2001	Antonakis & House, 2004	Heinitz et al., 2005
2. Item development	Inductive	MLQ	Deductive	MLQ
3. Sample Characteristics	Private sector senior executives; US Army Field Grade Officers	Public sector engineering services agency managers	Students in a Swiss international MBA class; European public sector business leaders	German public administration workers
4. Target Population	Mixed	Mixed	Mixed	Mixed
5. Content validity analysis	Content analysis	NA	NA	NA
5. Criterion validity	Concurrent, Predictive	Concurrent	Concurrent	Concurrent
7. Construct validity analysis	Convergent, Discriminant, EFA, CFA	CFA	Discriminant, CFA	EFA, CFA, Parallel analysis
8. Reliability analysis	Cronbach α	Cronbach α	Cronbach α	Cronbach α

Table 4. (Continued)

	Multifactor Leadership Questionnaire	Goodwin Scale (MLQ)	Antonakis Scale (MLQ)	Heinitz Scale (MLQ)
9. Scales	<p>Transformational Leadership ($\alpha=.93$) includes: Charisma ($\alpha=.92$) (includes Attributed Charisma ($\alpha=.82$) and Idealized Influence ($\alpha=.72$)), Individualized Consideration ($\alpha=.88$), and Intellectual Stimulation ($\alpha=.86$);</p> <p>Transactional Leadership ($\alpha=.87$) includes: Contingent Reward ($\alpha=.82$), Management-by-Exception ($\alpha=.65$) (includes Active Management-by-Exception ($\alpha=.75$) and Passive Management-by-Exception ($\alpha=.69$));</p> <p>Nonleadership includes: Laissez Faire ($\alpha=.76$)</p>	<p>Transformational Leadership includes: Ascribed charisma($\alpha=.88$), Inspirational Leadership ($\alpha=.87$), Individualized Consideration ($\alpha=.90$), and Implicit Psychological Contract ($\alpha=.72$);</p> <p>Transactional Leadership includes: Explicit Psychological contract ($\alpha=.75$), Active Management-by-Exception ($\alpha=.77$), and Passive Management-by-Exception ($\alpha=.83$)</p>	<p>Transformational Leadership includes: Attributed idealized influence ($\alpha=.80$), Behavioral idealized influence ($\alpha=.65$), Inspirational motivation ($\alpha=.78$), Intellectual Stimulation ($\alpha=.86$), and Individualized consideration ($\alpha=.74$);</p> <p>Contingent Reward ($\alpha=.71$); Active Management-by-Exception ($\alpha=.80$);</p> <p>Passive-avoidant Leadership includes: Passive management-by-exception ($\alpha=.81$) and Laissez-faire ($\alpha=.72$);</p> <p>Strategic Leadership includes: Environmental monitoring ($\alpha=.70$) and Strategy formulation and implementation ($\alpha=.74$); Follower Work Facilitation includes: Path-goal facilitation ($\alpha=.80$) and Outcome monitoring ($\alpha=.84$)</p>	<p>Charismatic goal orientation ($\alpha=.86$);</p> <p>Passive-avoidant leadership ($\alpha=.85$);</p> <p>Management-by-exception ($\alpha=.60$)</p>
10. Key citations	Dumdum et al., 2002; Tejada et al., 2001; Avolio et al., 1999; Carless, 1998; Lowe et al., 1996; Bycio et al., 1995	None	None	None

relationships between the three transformational scales and effectiveness. A similar, but smaller, positive relationship between contingent reward and effectiveness also emerged while management-by-exception (single factor) had low or negative correlations. With the exception of management-by-exception (.65) all of the scales had sufficient internal consistency reliability. A more recent extension of the Lowe et al. meta-analysis found similar results with a few exceptions (Dumdum et al., 2002). The correlation of the overall transformational scale with performance outcomes was very close to the correlation between contingent reward and outcomes (.46 and .51, respectively). Correlations for both transformational leadership and contingent reward were stronger with satisfaction outcomes than effectiveness. Active management-by-exception had small positive correlations with outcomes and passive management-by-exception had small negative correlations. Laissez-faire leadership had a strong negative correlation with both outcomes. Recent analyses of the Multifactor Leadership Questionnaire have criticized aspects of the factor structure suggesting that contingent reward or particular items from the contingent reward scale should be classified as transformational behaviors (Hinkin & Schriesheim, 2008; Avolio et al., 1999). Others have suggested that passive management-by-exception should be classified with laissez-faire leadership as a single passive leadership factor (Avolio et al., 1999). Tejada et al. (2001) recommended that the scales be reduced to three items each in order to improve reliability and factor structure. Yukl (1999:289) criticized the active management-by-exception items saying that they emphasize “intrusive, controlling forms of monitoring” rather than performance monitoring that might support transformational leadership. He suggests that the content of the items may affect the factor structure that is found.

Three other studies have analyzed modified versions of the Multifactor Leadership Questionnaire with new factor structures. These studies can be seen as additional critiques to the standard Multifactor Leadership Questionnaire, but they do offer some interesting perspectives of their own. First, Goodwin et al. (2001) used confirmatory factor analysis to test a model that split the contingent reward factor into implicit psychological contract and explicit psychological contract. Implicit psychological contract, which involved inherent expectations of rewards based on performance, was aligned with transformational leadership. Explicit psychological contract, which involved overt negotiation of rewards for performance and established obligations, aligned with transactional leadership. The confirmatory factor analysis indicated a good fit for a two-factor contingent reward, but in the higher-order confirmatory factor analysis, explicit psychological contract did not load on the transactional factor (although implicit psychological contract did load on transformational). Furthermore, the transformational factor (with implicit psychological contract) was positively correlated with both organizational citizenship behavior and performance.

Next, Antonakis and House (2004) concluded that the full range leadership model should be extended to include instrumental leadership. They developed items to measure the four dimensions of instrumental leadership (environmental monitoring, strategy formulation, outcome monitoring, and path-goal facilitation) which they pilot tested to assess psychometric properties. A confirmatory factor analysis of the modified Multifactor Leadership Questionnaire revealed a good fit and nested structural equation model analysis provided evidence of discriminant validity. Reliability was good as well

with the exception of behavioral idealized influence (formerly charisma) from the transformational scale (.65). Antonakis and House (2004) found significant positive correlations between the instrumental, transformational, contingent reward, and active management-by-exception scales and effectiveness. A series of hierarchical regression models indicated that the instrumental leader scales added incremental variation beyond the Multifactor Leadership Questionnaire scales in predicting effectiveness.

Finally, Heinitz et al. (2005) recommended a reduced, three-factor model based on a parallel analysis. Exploratory factor analysis supported the proposed three-factor model. The first factor, charismatic goal orientation, contained items from the original idealized influence, inspirational motivation, and contingent reward. The second factor, passive-avoidant leadership, contained passive management-by-exception and laissez-faire items. The third factor contained only active management-by-exception items and was renamed management-by-exception. Next these results were confirmed using confirmatory factor analysis. Reliability was satisfactory with the exception of management-by-exception. A structural equation approach to hierarchical regression revealed that charismatic goal orientation provided significant additional explanation of variance beyond management-by-exception and passive-avoidant leadership. However, total variance explained by the model was reduced by about 20 percent from the original Multifactor Leadership Questionnaire model.

Summary of the Facet Analysis

Review of these new leadership instruments revealed many commonalities among the various approaches. At the least, all of these models share a common core of charisma. In *Transformational and Charismatic Leadership: The Road Ahead*,

Antonakis and House (2002) make some recommendations for extensions to full range leadership theory. They looked at integrating missing components that are present in some of the other theories. For example, they suggest that sensitivity to the environment from the Conger-Kanungo scale, strategic functions from The Leadership Inventory, and instrumental leadership from Antonakis and House (2001) could be incorporated to make the Multifactor Leadership Questionnaire more complete.

Table 5 lists all of the instruments that were reviewed in chronological order and summarizes the reliability and validity evidence found for each. The results of a comprehensive literature search revealed that only four of the 13 instruments included in the analysis were assessed for validity and reliability by researchers other than the original developer of the instrument. These instruments are Bass's (1985) Multifactor Leadership Questionnaire, Posner and Kouzes' (1988) Leader Practices Inventory, the Conger-Kanungo Scale (Conger & Kanungo, 1992), and Behling and McFillen's (1996) Attributes of Leader Behavior Questionnaire. It is interesting to note that only six of the instruments provide evidence of content validity. Also, each of the instruments presents some form of concurrent validity, but only three go beyond that to provide either predictive or postdictive analysis. Internal consistency reliability was presented for all of the instruments, although only two presented evidence of test-retest reliability. Construct validity tests were performed across all of the instruments, although some were more rigorous than others (e.g. those that used a secondary sample to run a confirmatory factor analysis) and some produced stronger results than others.

Since the purpose of the current research is the development of a leadership measurement instrument that targets tactical-level leaders, it is important to note that all

Table 5. Instrument Ratings and a Summary of the Reliability and Validity Evidence for each of the Instruments Reviewed

Instrument	Overall Instrument	Instrument Focus	Validity Evidence			Reliability Analysis
			Content	Criterion	Construct	
Bass, 1985	7	Full Range	Content analysis	Concurrent, Predictive	Convergent, Discriminant, EFA, CFA	Cronbach α
Posner & Kouzes, 1988	6	Transformational	Content analysis	Concurrent	Convergent, Discriminant, EFA, CFA	Cronbach α ; Test-Retest
Podsakoff et al., 1990	5	Transformational	Q-Sort	Concurrent	Convergent, Discriminant, CFA	Cronbach α
Conger & Kanungo, 1992/1997	7	Charismatic	NA	Postdictive, Concurrent, Predictive	Convergent, Discriminant, EFA, CFA	Cronbach α ; Test-Retest
Behling & McFillen, 1996	5	Transformational	Expert Judges	Concurrent	Convergent, Discriminant, EFA	Cronbach α
Shamir et al., 1993/1998	3	Charismatic	NA	Postdictive, Concurrent	EFA, CFA	Cronbach α
Alimo-Metcalfé & Alban-Metcalfé, 2001	4	Transformational	Content analysis	Concurrent	Convergent, Discriminant, EFA, CFA	Cronbach α
Carless et al., 2000	4	Transformational	NA	Concurrent	Convergent, Discriminant, EFA, CFA	Cronbach α
Goodwin et al., 2001	2	Full Range	NA	Concurrent	CFA	Cronbach α
Rafferty & Griffin, 2004	3	Transformational	NA	Concurrent	Discriminant, CFA	Cronbach α
Antonakis & House, 2004	3	Full Range	NA	Concurrent	Discriminant, CFA	Cronbach α
Heinitz et al., 2005	3	Full Range	NA	Concurrent	EFA, CFA	Cronbach α

but one of the 13 instruments included in this analysis included items that were either irrelevant or only marginally relevant to leaders at all but the highest levels within an organization. These items generally addressed behaviors such as developing and articulating the strategic vision for an organization. The only instrument that targeted tactical-level leaders exclusively, Shamir et al.'s (1998) measure, was so narrowly focused on a military combat and combat training environment that it would be impossible to generalize beyond that setting. Example items include: "Talks with soldiers about nonmilitary issues on the news" and "During trips and navigation exercises devotes a lot of time to teaching the history and geography of the land."

Following the example set by Holt et al.'s (2007) facet analysis, an overall instrument rating was calculated based on a nine-point checklist where one point was received each for evidence that the content had been evaluated by (1) expert judges and (2) quantitatively; for evidence of reliability: (3) internal consistency and (4) test-retest; for evidence of construct validity: (5) predictive (6) convergent or discriminant (7) exploratory factor analysis (8) confirmatory factor analysis; and (9) replication using multiple samples. Out of a possible nine points, scores ranged from three to seven with an average of just over four.

After completing the facet analysis, the items from each new leadership genre measurement instrument were evaluated for inclusion in the item pool for development of the new Leadership Profile Measure. In order to be included, items had to align with one of the eight dimensions of the full range leadership model and they had to be relevant to a low- to mid-level leader. With the exception of the Multifactor Leadership Questionnaire, none of the other instruments included the management-by-exception or

laissez-faire scales, so new items were developed based on the established definitions of those constructs. Table 6 shows the instruments from which questions were drawn and the alignment of their dimensions with the full range leadership model.

Table 6. Comparison of Existing Instruments with the Full Range Leadership Model

Full Range Leadership Components	Rafferty Scale	Global Transformational Leadership Scale	Transformational Leadership Inventory
	Rafferty & Griffin (2004)	Carless et al. (2000)	Podsakoff et al. (1990)
Idealized Influence	Vision	Vision; Leads by Example; Charisma	Articulating a Vision; Provide Appropriate Model
Inspirational Motivation	Inspirational Communication	Empowerment	Articulating a Vision; Foster Acceptable Goals; High Performance Expectations
Intellectual Stimulation	Inspirational Communication	Innovative Thinking	Intellectual Stimulation
Individual Consideration	Supportive Leadership	Staff Development; Supportive Leadership	Individual Support
Contingent Reward	Personal Recognition	Supportive Leadership	Contingent Reward

III. Method

Participants and Procedures

A total of 1,264 people participated in this study. Participants were predominantly Air Force officers with four to seven years of Air Force service who were attending a five-week leadership development course (Squadron Officer School) which 80 percent of all Air Force officers attend. Active duty military participants made up 90 percent of the sample, with government civil service employees, members of the Air Force Reserve, and members of the Air National Guard making up the remaining 10 percent. Eighty-one percent of participants were male (19 percent female). Two percent of the sample had earned doctorate degrees, 33 percent had earned a Master's, and the remaining 65 percent had Bachelor's degrees. This group represented a broad range of job specialties, from pilots and air traffic controllers to developmental engineers and physicians' assistants. Consistent with the definition of tactical-level leaders presented earlier, these students are primarily low- to mid-level managers.

Students arriving at Squadron Officer School were provided a link to a web-based survey which they were given two days to complete. This ensured that the survey was completed prior to the instruction and allowed individual feedback to be provided following the instruction.

Measures

Two types of data were collected. Independent variables, which comprised the leadership dimensions of the full range leadership model, were measured using a survey

instrument that students completed at the beginning of the training program. Dependent variables (individual performance) were evaluated by trained raters at the completion of the program.

Independent Variables.

Leadership behavior was measured using a survey that included the 45-item Multifactor Leadership Questionnaire. The remaining items were drawn from the existing literature in an effort to target the full range leadership behaviors of tactical-level leaders. Items from the Rafferty & Griffin (2004) Scale, the Global Transformational Leadership Scale (Carless et al., 2000), and the Transformational Leadership Inventory (Podsakoff et al., 1990) that aligned with any dimension of the full range leadership model and were appropriate for a tactical-level leader formed the initial item pool for the new survey instrument. The complete list of these items can be found in Appendix A. In some cases, particularly with the transactional and nonleadership scales, new items were not available in the extant literature. In the case of active management-by-exception, three new items were created. All leadership items were measured using a five-point Likert scale where 1 represented *not at all* and 5 represented *frequently, if not always*. Participants were asked to evaluate their own leadership behavior. Each of the leadership dimensions of the full range leadership model were defined in Chapter 2. Below are example items for each dimension from the Leadership Profile Measure.

Idealized Influence (10 items).

- “I lead by example”

Inspirational Motivation (5 items).

- “I foster involvement and cooperation among team members”

Intellectual Stimulation (7 items).

- “I challenge others to think about old problems in new ways”

Individual Consideration (5 items).

- “I show respect for the personal feelings of others”

Contingent Reward (7 items).

- “I give others positive feedback when they perform well”

Active Management-by-Exception (3 items).

- “I draw attention to missed opportunities”

Dependent Variables.

Participants were rated on seven dimensions of performance by trained evaluators at the end of the five-week program. These evaluators completed a 14-week training program themselves and comprised a representative cross-section of the Air Force population.

Each performance dimension was measured as a single-item. Items were evaluated on a five-point Likert scale where 1 represented *strongly disagree* and 5 represented *strongly agree*. The performance dimensions were evaluated as a level of agreement regarding a student’s conformity to the definition provided in the Air Force’s doctrine document on leadership and force development (AFDD 1-1, 2006). Ratings were designed to provide a global measure of each student’s performance on the entire set of activities completed during the five-week program. The definitions for each performance dimension are provided below.

Adapt and perform under pressure. This includes the ability to personally manage change and maintain continuity for self and others when mission requirements,

work tasks, or processes change. It also involves maintaining composure and continuing to work constructively and resourcefully under pressure

Assess self. This includes understanding how personal leadership style and skill impact decisions and relationships with others. It also involves creating a personal leadership development plan that incorporates personal strengths, weaknesses, performance preferences, and learning style.

Exercise sound judgment. This includes developing and applying broad knowledge and expertise in a disciplined manner when making decisions. It involves taking all critical information into account and considering interrelationships between issues and the implications for other stakeholders.

Foster effective communication. This includes ensuring a free flow of information and communication by actively listening and encouraging the open expression of ideas and opinions. It involves expressing ideas clearly, concisely, and with impact.

Inspires trust. This includes maintaining high standards of integrity; establishing open, candid, and trusting relationships; and treating all individuals fairly and with respect. It also involves putting mission success ahead of personal gain and demonstrating loyalty to the team.

Lead courageously. This includes displaying both moral and physical courage by showing willingness to take risks, act independently, and take personal responsibility for actions. It involves persisting with focus and intensity even when faced with adversity and projecting confidence, credibility, and poise when challenged.

Promote collaboration and teamwork. This includes facilitating and encouraging cooperation among team members, recognizing and sharing credit for success, and working with peers and subordinates to establish a group identity through mutual goals, common team practices, and structure.

IV. Analysis and Results

Initial Item Reduction.

First, the internal consistency reliability of the initial pool of items was analyzed for each scale using Cronbach's alpha and items that significantly reduced the reliability of a scale were evaluated for removal (consistent with guidance from Field, 2009). At this step, only one item was removed because it was determined that a grammatical error in the item wording was a probable cause of the poor reliability. The item read "I commend others when *I* do a better than average job" rather than "I commend others when *they* do a better than average job"). Next, a separate exploratory factor analysis was run on each dimension of the full range leadership model. Principal component analysis was conducted and no rotation was necessary because each set of items loaded on a single factor. For each dimension, the four items with the highest factor loadings were retained for further analysis. Reduction to four items per scale created a more concise instrument that was readily evaluated against the similarly structured Multifactor Leadership Questionnaire and was consistent with guidance from Hinkin (1998) to maintain the ability to test item homogeneity and ensure parsimony. The resulting Leadership Profile Measure consisted of five factors (idealized influence, inspirational motivation, intellectual stimulation, individualized consideration, and contingent reward) with four items each and a sixth factor (active management-by-exception) with only three items.

Confirmatory Factor Analysis.

Confirmatory factor analyses with maximum likelihood estimation were conducted on both the Multifactor Leadership Questionnaire and the Leadership Profile Measure to test the fit to the hypothesized factor structure. This analysis was performed using the AMOS software package. Since the Leadership Profile Measure did not include any items to measure passive management-by-exception or laissez-faire leadership, these factors were excluded from the analysis of the Multifactor Leadership Questionnaire as well. Modification indices were evaluated for the presence of significant factor cross-loadings and error covariances. Although no significant factor cross-loadings were found in either model, there were error covariances. Each covariance was closely evaluated to determine whether or not it had substantive meaning within the model. In two cases, items within the Leadership Profile Measure had a high degree of overlap, therefore, consistent with guidance from Byrne (2010), the model was respecified to include correlation between these error terms. Figures 2 and 3 show the confirmatory factor analysis models that were evaluated for the Leadership Profile Measure and the Multifactor Leadership Questionnaire, respectively. The factor loadings for each item are also shown in the figures. The summary of confirmatory factor analysis results can be seen in Table 7. In addition to the χ^2 test, several other measures of model fit are presented. Because the χ^2 test is highly sensitive to sample size (it is almost always close to zero for large sample sizes), the other measures provide a more interpretable indication of model fit. Byrne (2010) provides the following descriptions of model goodness-of-fit statistics. χ^2 represents the discrepancy between the unrestricted sample covariance matrix and the restricted covariance matrix. The higher the probability

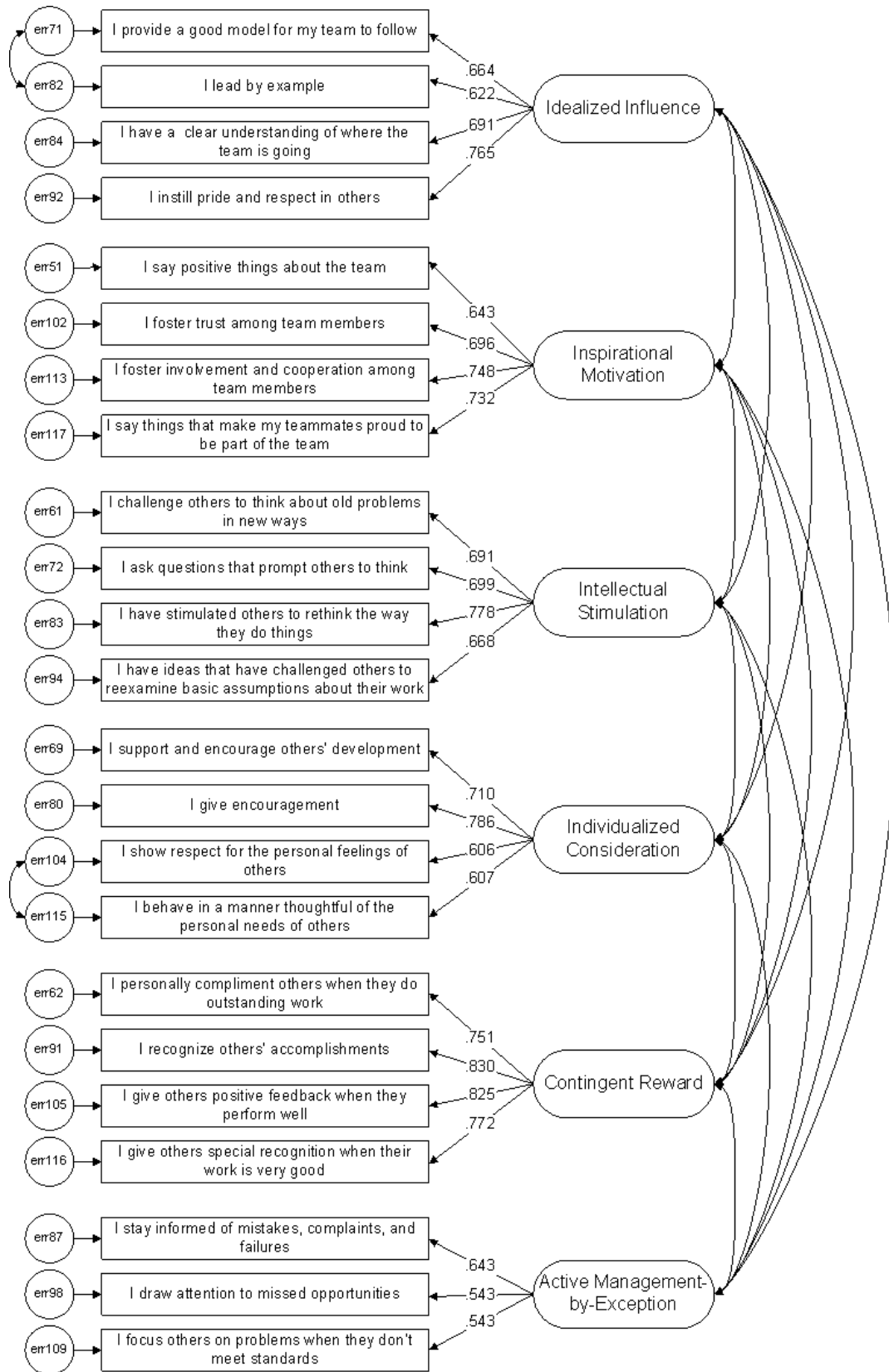


Figure 2. Leadership Profile Measure Confirmatory Factor Analysis Model with Factor Loadings

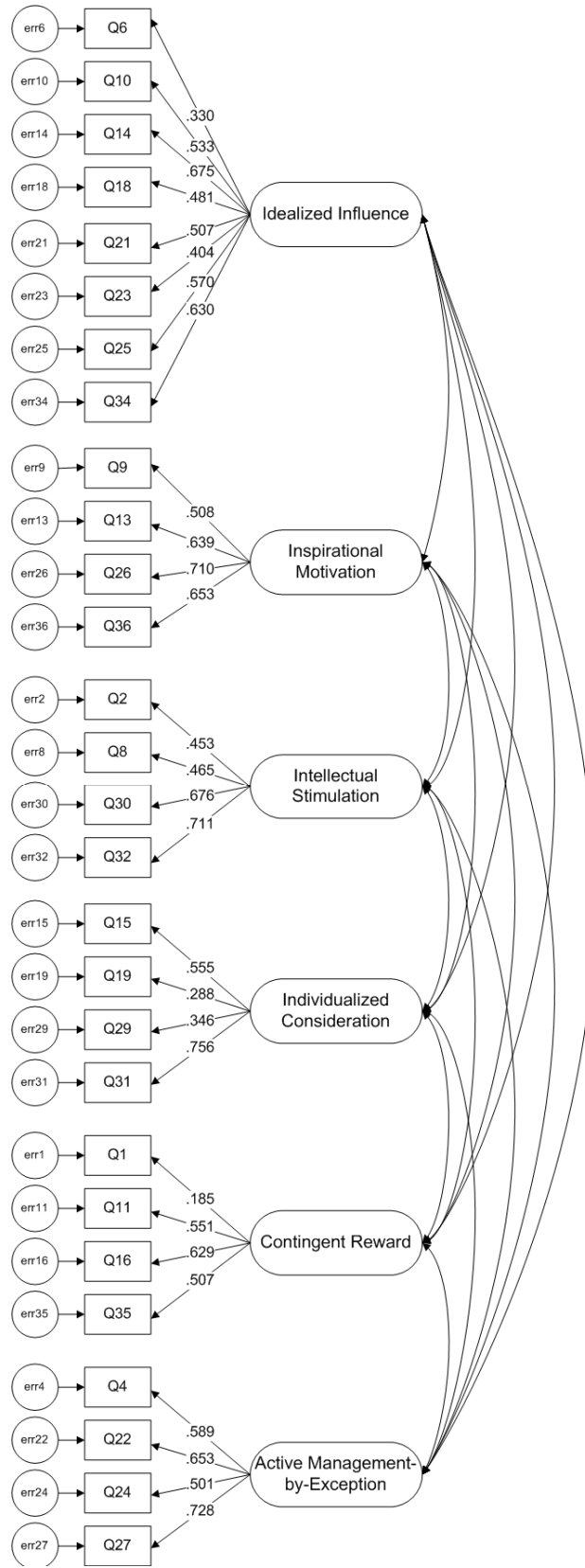


Figure 3. Multifactor Leadership Questionnaire Confirmatory Factor Analysis Model with Factor Loadings

Table 7. Summary of Confirmatory Factor Analysis Results

Model	χ^2	χ^2/DF	GFI	AGFI	CFI	TLI	RMSEA
Leadership Profile Measure	993	4.66	0.934	0.915	0.944	0.934	0.054
Multifactor Leadership Questionnaire	1662	4.96	0.909	0.890	0.860	0.842	0.056
DF = Degrees of Freedom							
GFI = Goodness-of-Fit Index							
AGFI = Adjusted Goodness-of-Fit Index							
CFI = Comparative Fit Index							
TLI = Tucker-Lewis Index							
RMSEA = Root Mean Squared Error of Approximation							

associated with χ^2 , the closer the fit of the hypothesized model approaches a perfect fit. The closer χ^2 divided by the degrees of freedom is to one, the better the fit. The Goodness-of-Fit Index and the Adjusted Goodness-of-Fit Index compare the fit of the hypothesized model with that of no model at all. The Adjusted Goodness-of-Fit Index adjusts the Goodness-of-Fit Index for the number of degrees of freedom in the model. Values close to one indicate a good fit. The Comparative Fit Index compares the fit of the hypothesized model to the independence or null model and takes into account the sample size. Values above .90 are generally acceptable although a value close to .95 is desired. The Tucker-Lewis Index is a similar index with values close to .95 indicating good fit (Hu & Bentler, 1995).

As shown in Table 7, the confirmatory factor analysis models for the Multifactor Leadership Questionnaire and Leadership Profile Measure instruments had similar fit as measured by the Root Mean Squared Error of Approximation (0.056 and 0.054, respectively); however, the Goodness-of-Fit Index (0.934 compared to 0.909), Adjusted

Goodness-of-Fit Index (0.915 compared to 0.890), Comparative Fit Index (0.944 compared to 0.860), and Tucker-Lewis Index (0.934 compared to 0.842) were all stronger for the Leadership Profile Measure. To some extent, this was because the elimination of items based on the exploratory factor analysis improved the factor structure prior to the confirmatory factor analysis. The poor fit of the Multifactor Leadership Questionnaire was surprising given its developers' claims that the factor structure is consistent regardless of sample characteristics (Avolio & Yammarino, 2002). They report overall fit statistics for United States samples as greater than 0.9 for the Goodness-of-Fit Index, the Adjusted Goodness-of-Fit Index, and the Comparative Fit Index. These results provided evidence that the Multifactor Leadership Questionnaire may not be an appropriate instrument to measure the full range leadership behaviors of tactical-level leaders.

Descriptive Statistics and Reliability.

Cronbach's coefficient alpha was used to estimate the internal consistency reliability of each of the scales. The results of this analysis, along with the descriptive statistics for each scale, can be found in Table 8. The difference in reliability between the scales of the Leadership Profile Measure and the Multifactor Leadership Questionnaire was noteworthy. Although the Multifactor Leadership Questionnaire is a well-established measurement instrument, only three of its six scales meet the minimum reliability of .70 required for a newly-developed instrument (Nunnally, 1978). The reliability for the Leadership Profile Measure is much better for every scale, with the exception of the active management-by-exception scale which had fewer items.

Table 8. Descriptive Statistics and Reliability

Scale	Leadership Profile Measure			Multifactor Leadership Questionnaire		
	Mean	Standard Deviation	Reliability (α)	Mean	Standard Deviation	Reliability (α)
Idealized Influence	4.24	0.513	0.801	3.93	0.468	0.742
Inspirational Motivation	4.19	0.517	0.795	3.97	0.556	0.727
Intellectual Stimulation	3.83	0.598	0.802	3.90	0.524	0.663
Individualized Consideration	4.25	0.546	0.799	4.00	0.511	0.520
Contingent Reward	4.38	0.564	0.872	3.92	0.528	0.474
Active Management-by-Exception	3.59	0.625	0.606	3.00	0.740	0.707

Convergent and Discriminant Analysis.

Using correlational analysis, the relationships among the transformational and transactional factors of the Leadership Profile Measure and Multifactor Leadership Questionnaire were examined. This analysis was similar to that conducted by Rowold and Heinitz (2007) in a comparison of the Conger-Kanungo Scale and the Multifactor Leadership Questionnaire. Table 9 shows the correlations between the factors. Steiger's Z-test was used to test the significance of the differences between the correlations as recommended by Meng et al. (1992). This test uses a Z-score to evaluate the significance of the difference between two dependent correlations, termed *correlated correlations*. Correlated correlations share a common factor that is then correlated to two different factors within the same sample.

Table 9. Correlations among the Multifactor Leadership Questionnaire and Leadership Profile Measure Factors.

		Leadership Profile Measure					
		II	IM	IS	IC	CR	MBEA
Multifactor Leadership Questionnaire	II	.666**	.631**	.556**	.507**	.436**	.360**
	IM	.577**	.612**	.485**	.496**	.431**	.262**
	IS	.464**	.469**	.618**	.401**	.342**	.305**
	IC	.506**	.498**	.458**	.481**	.398**	.274**
	CR	.474**	.476**	.425**	.387**	.455**	.357**
	MBEA	.104**	.068*	.123**	.005	-.005	.520**
**. Correlation is significant at the 0.01 level (2-tailed).							
*. Correlation is significant at the 0.05 level (2-tailed).							
II = Idealized Influence							
IM = Inspirational Motivation							
IS = Intellectual Stimulation							
IC = Individualized Consideration							
CR = Contingent Reward							
MBEA = Active Management-by-Exception							

Convergent Validity.

The correlation between each Leadership Profile Measure factor and the corresponding factor from the Multifactor Leadership Questionnaire was compared with the correlation between the same Leadership Profile Measure factor and the other Multifactor Leadership factors. The results were mixed. The convergent validity of the Leadership Profile Measure idealized influence, intellectual stimulation, and active management-by-exception scales was supported. That is, the correlation with the corresponding scale from the Multifactor Leadership Scale was significantly higher than correlations with other factors within the Multifactor Leadership Scale (e.g. $r_{LPMII,MLQII} (.666) > r_{LPMII,MLQIM} (.577)$, $Z = 5.58$, $p < .01$). However, for the other three scales, inspirational motivation, individualized consideration, and contingent reward, the

correlation with the corresponding scale was not significantly higher than the correlation with at least one other scale.

These results are not particularly surprising given the high intercorrelations among the transformational leadership factors and contingent reward that have been established in the literature (Rafferty & Griffin, 2004; Antonakis et al., 2003; Tejada et al., 2001; Avolio et al., 1999; Lowe et. al, 1996).

Discriminant Validity.

Although the correlations between the Leadership Profile Measure active management-by-exception factor and the Multifactor Leadership Questionnaire transformational factors were significant and relatively high ($.262 < r < .360$), they were still significantly lower than the correlations between the Leadership Profile Measure transformational factors and the Multifactor Leadership Questionnaire transformational factors (e.g. $r_{LPMMBEA,MLQIS} (.305) < r_{LPMIC,MLQIS} (.401)$, $Z = 3.07$, $p < .01$). The fact that the correlations between the transactional factor and the transformational factors were significantly lower than any other correlations provided some evidence of discriminant validity.

Factor Intercorrelations.

Tables 10 and 11 show the correlations among the Leadership Profile Measure factors and among the Multifactor Leadership Questionnaire factors, respectively. Overall, the patterns are similar, although the correlations are somewhat higher among the Leadership Profile Measure factors (r from $.244 > r > .741$ compared to $.072 > r > .711$). Consistent with previous research (Rafferty & Griffin, 2004; Antonakis et al., 2003; Tejada et al., 2001; Avolio et al., 1999; Lowe et. al, 1996), correlations among the

transformational factors and contingent reward were high ($r > .357$ for the Leadership Profile Measure and $r > .471$ for the Multifactor Leadership Questionnaire). Also, the transformational factors were more highly correlated with the active management-by-exception factor for the Leadership Profile Measure ($r = .257$ to $.415$) than for the Multifactor Leadership Questionnaire ($r = .072$ to $.198$). This may indicate that the active management-by-exception items on the Leadership Profile Measure are less pejorative than those on the Multifactor Leadership Questionnaire, and therefore measure behaviors that were more likely to be exhibited by the same individual who displays the transformational behaviors.

Table 10. Correlations among the Leadership Profile Measure Factors

	Idealized Influence	Inspirational Motivation	Intellectual Stimulation	Individualized Consideration	Contingent Reward
Idealized Influence	1				
Inspirational Motivation	.741**	1			
Intellectual Stimulation	.600**	.546**	1		
Individualized Consideration	.633**	.715**	.415**	1	
Contingent Reward	.594**	.691**	.357**	.687**	1
Active Management-by-Exception	.403**	.336**	.415**	.257**	.244**
**. Correlation is significant at the 0.01 level (2-tailed).					
*. Correlation is significant at the 0.05 level (2-tailed).					

Table 11. Correlations among the Multifactor Leadership Questionnaire Factors

	Idealized Influence	Inspirational Motivation	Intellectual Stimulation	Individualized Consideration	Contingent Reward
Idealized Influence	1				
Inspirational Motivation	.711**	1			
Intellectual Stimulation	.567**	.471**	1		
Individualized Consideration	.582**	.471**	.530**	1	
Contingent Reward	.579**	.491**	.478**	.498**	1
Active Management by-Exception	.198**	.072*	.152**	.108**	.184**
**. Correlation is significant at the 0.01 level (2-tailed).					
*. Correlation is significant at the 0.05 level (2-tailed).					

Predictive Validity.

Correlational analysis was used to evaluate the extent to which the Leadership Profile Measure and Multifactor Leadership Questionnaire were able to predict performance. Table 12 shows the correlations among the full range leadership model dimensions and rated performance outcomes for the Leadership Profile Measure and Multifactor Leadership Questionnaire. The significant correlations were small for both instruments (.057 to .106 for the Leadership Profile Measure and .059 to .126 for the Multifactor Leadership Questionnaire); however, there were more significant correlations between the Multifactor Leadership Questionnaire and the leadership performance ratings. Neither the reliability nor validity of the rater evaluations has been established, so it is possible that these evaluations (rather than the Multifactor Leadership Questionnaire or Leadership Profile Measure) are not good assessments of actual leadership ability.

Table. 12. Leadership Profile Measure and Multifactor Leadership Questionnaire Correlations with Performance Outcomes

		Exercise Sound Judgment	Adapt and Perform Under Pressure	Inspires Trust	Lead Courageously	Assess Self	Foster Effective Communication	Promote Collaboration and Teamwork
Leadership Profile Measure	II	0.088**	0.075**	0.093**	0.106**	0.058*	0.061*	0.087**
	IM	0.015	0.006	0.051	0.040	0.005	0.026	0.045
	IS	0.068*	0.046	0.021	0.078**	0.033	0.056	0.041
	IC	-0.026	-0.043	0.025	-0.031	-0.001	0.001	0.000
	CR	-0.003	-0.003	0.013	0.008	-0.004	-0.006	0.007
	MBEA	0.075**	0.088**	0.057*	0.101**	0.066*	0.025	0.049
Multifactor Leadership Questionnaire	II	0.089**	0.068*	0.109**	0.124**	0.093**	0.079**	0.126**
	IM	0.072*	0.032	0.098**	0.098**	0.083**	0.066*	0.113**
	IS	0.066*	0.059*	0.061*	0.076**	0.051	0.077**	0.035
	IC	0.055	0.032	0.075**	0.075**	0.060*	0.064*	0.080**
	CR	0.083**	0.074**	0.069*	0.132**	0.075**	0.048	0.046
	MBEA	0.028	0.014	0.019	0.029	0.027	0.005	-0.010
**. Correlation is significant at the 0.01 level (2-tailed).								
*. Correlation is significant at the 0.05 level (2-tailed).								
II = Idealized Influence								
IM = Inspirational Motivation								
IS = Intellectual Stimulation								
IC = Individualized Consideration								
CR = Contingent Reward								
MBEA = Active Management-by-Exception								

V. Discussion and Conclusions

Discussion

Several researchers have indicated that the Multifactor Leadership Questionnaire is influenced by contextual factors such as organization type (e.g., Lowe et al., 1996). Moreover, research has demonstrated that the range of typical leadership behaviors may vary depending on the organizational level of the leader (Den Hartog et al., 1997). Accordingly, this effort was designed to develop a full range leadership model measurement instrument that targets low- to mid-level managers whose primary concern is supervisory management as opposed to the more strategic focus of upper-level management, termed *tactical-level leaders*. The Leadership Profile Measure is presented and its psychometric properties are tested.

Through exploratory and confirmatory factor analyses, the Leadership Profile Measure appeared to measure each of the factors of the full range leadership model. Goodness-of-fit statistics were found to meet the requirements established in the literature for good model fit. Both the model fit and scale reliability were stronger for the Leadership Profile Measure than for the Multifactor Leadership Questionnaire.

Despite these promising findings, the ability of the Leadership Profile measure to effectively predict performance was somewhat lacking. The self reported scores were correlated with independent measures of performance taken at the end of a five week training course. Although there were several significant correlations, these correlations were low. There is reason to believe, however, that the questionable validity and reliability of the performance measures were the cause of these results.

The poor scale reliability and questionable model fit of the Multifactor Leadership Questionnaire provided evidence to support the contention that its items do not adequately assess the full range leadership behaviors of tactical-level leaders. Although the reliability and factor structure of the Multifactor Leadership Questionnaire have been analyzed in a variety of studies using samples with leaders at mixed hierarchical levels, this study indicates that the measure may not be as robust as previously thought. The Leadership Profile measure had better reliability and model fit, although there may be other limitations that will be discussed.

Although this study only scratched the surface of the issue, there is also a concern that the wording of items within the Multifactor Leadership Questionnaire may artificially bias results to produce the hypothesized hierarchical nature of the full range leadership model. This may be the case because items designed to measure behaviors lower on the hierarchy (*laissez-faire*, *management-by-exception*, or *contingent reward*) have a pejorative tone whereas items that measure the transformational leadership factors are more positive. Indeed, the correlations between the transactional factors and the transformational factors tended to be much higher for the Leadership Profile Measure than for the Multifactor Leadership Questionnaire. Item wording may have contributed to this difference.

Implications

This research has implications for the appropriate use of the Multifactor Leadership Questionnaire. The results suggest that at least one contextual element, leader organizational level, can significantly impact the reliability and factor structure of the

instrument. Practitioners should use caution when administering the Multifactor Leadership Questionnaire to samples containing low- to mid-level *tactical* leaders.

The development of the Leadership Profile Measure creates an instrument that addresses the concerns with the Multifactor Leadership Questionnaire. Items are targeted toward the tactical-level leader. The new measure, therefore, is an excellent tool for use in leadership development. Each item represents a behavior that can contribute to a leader's repertoire. Leadership development programs can use the questionnaire to provide feedback and training to tactical-level leaders.

In addition to leadership development programs, this tool could easily be adapted for use as an on-the-job feedback tool, completed by subordinates, peers, and/or superiors. The result would be continual leadership development.

Finally, the Leadership Profile Measure could be used as a human resources tool (if completed by subordinates, peers, or superiors), particularly for in-house job progression or pay-for-performance programs.

Limitations

The first limitation of this study concerns the sample characteristics. Since a military sample was used, the ability to generalize results to the private sector may be compromised. However, the fact that a wide variety of career field and job specialties was represented makes this less of a concern.

Another limitation is the exclusive collection of self-report survey data. It is possible that students may misrepresent their actual behaviors either deliberately or unintentionally for a variety of reasons, including belief that the results might influence

their performance evaluation. This survey did not contain any questions designed to test the truthfulness of individuals' responses.

A third concern is that the items drawn from the existing literature to represent the full range leadership behaviors of tactical-level leaders in the Leadership Profile Measure may not adequately reflect the entire content domain of the full range leadership theory. Strong reliability and good model fit are not enough to verify the content validity of the measure. It is possible that the selected items capture only a portion of the content domain that they are meant to represent. This may explain why the Multifactor Leadership Questionnaire factors have more significant correlations with performance outcomes than the Leadership Profile Measure factors despite lower reliability.

The validity of the performance ratings is even more questionable. The performance categories represented broad ranges of characteristics and behaviors, yet raters evaluated students on each category with a single item. No attempt has been made to establish the reliability of validity of these measures.

A final limitation is that it was impossible to analyze the entire eight-factor structure of the full range leadership model because no items were created to measure the passive management-by-exception or laissez-faire dimensions.

Future Research

This study should be expanded to include additional instruments as well as original items created to capture the entire content domain of full range leadership theory. Items should be included from the Conger-Kanungo Scale (1992) as well as the Attributes of Leader Behavior Questionnaire (Behling & McFillen, 1996). Since the management-by-exception and laissez-faire dimensions were not adequately represented

in this study, items should be included to ensure representation of each of the eight full range leadership dimensions (idealized influence, inspirational motivation, intellectual stimulation, individualized consideration, contingent reward, active management-by-exception, passive management-by-exception, and laissez-faire leadership). New items should be worded carefully in a neutral tone to avoid biasing results. Also, in order to address concerns with content validity, expert judges and q-sorting technique should be used to evaluate items prior to inclusion in the survey instrument. This will ensure a wider item variety that more accurately represents the full range leadership model than the limited items available in the existing literature.

Varied samples (to include non-military personnel) should be used to analyze the survey and subordinates should evaluate the leadership behaviors of their superiors if possible. Also, separate samples (split sampling) should be used for selection of items and evaluation of the final instrument. The predictive validity of the measure should be examined using well-established performance measures or objective performance outcomes.

Appendix A: Initial Pool of Survey Items for Classes 09E, F & G

MLQ Dimension	Original Instrument	Original Dimension	Item
Idealized Influence	Global Transformational Leadership Scale	Vision	I communicate a clear and positive vision of the future.
Idealized Influence	Global Transformational Leadership Scale	Leads by Example	I am clear about my values
Idealized Influence	Global Transformational Leadership Scale	Leads by Example	I practice what I preach
Idealized Influence	Global Transformational Leadership Scale	Charisma	I instill pride and respect in others
Idealized Influence	Global Transformational Leadership Scale	Charisma	I inspire others with my competence
Idealized Influence	Transformational Leadership Inventory	Articulating a Vision	I inspire others with my plans for the future
Idealized Influence	Transformational Leadership Inventory	Provide Appropriate Model	I lead by "doing," rather than simply by "telling"
Idealized Influence	Transformational Leadership Inventory	Provide Appropriate Model	I provide a good model for my team to follow
Idealized Influence	Transformational Leadership Inventory	Provide Appropriate Model	I lead by example
Idealized Influence	Rafferty Scale	Vision	I have a clear understanding of where the team is going
Idealized Influence	Rafferty Scale	Vision	I have a clear sense of where I want the team to be when I leave
Inspirational Motivation	Global Transformational Leadership Scale	Empowerment	I foster trust among team members
Inspirational Motivation	Global Transformational Leadership Scale	Empowerment	I foster involvement and cooperation among team members
Inspirational Motivation	Transformational Leadership Inventory	Articulating a Vision	I am able to get others committed to his/her my dream

Inspirational Motivation	Rafferty Scale	Inspirational communication	I say things that make my teammates proud to be a part of the team
Inspirational Motivation	Rafferty Scale	Inspirational communication	I say positive things about the team.
Intellectual Stimulation	Global Transformational Leadership Scale	Innovative Thinking	I encourage thinking about problems in new ways
Intellectual Stimulation	Global Transformational Leadership Scale	Innovative Thinking	I encourage others to question assumptions
Intellectual Stimulation	Transformational Leadership Inventory	Intellectual Stimulation	I challenge others to think about old problems in new ways
Intellectual Stimulation	Transformational Leadership Inventory	Intellectual Stimulation	I ask questions that prompt others to think
Intellectual Stimulation	Transformational Leadership Inventory	Intellectual Stimulation	I have stimulated others to rethink the way they do things
Intellectual Stimulation	Transformational Leadership Inventory	Intellectual Stimulation	I have ideas that have challenged others to reexamine some of basic assumptions about their work
Intellectual Stimulation	Rafferty Scale	Inspirational communication	I encourage people to see changing environments as situations full of opportunities
Individualized Consideration	Global Transformational Leadership Scale	Staff Development	I treat others as individuals
Individualized Consideration	Global Transformational Leadership Scale	Staff Development	I support and encourage others' development
Individualized Consideration	Global Transformational Leadership Scale	Supportive Leadership	I give encouragement
Individualized Consideration	Transformational Leadership Inventory	Individual Support	I show respect for the personal feelings of others
Individualized Consideration	Transformational Leadership Inventory	Individual Support	I behave in a manner thoughtful of the personal needs of others

Contingent Reward	Global Transformational Leadership Scale	Supportive Leadership	I recognize others' accomplishments
Contingent Reward	Transformational Leadership Inventory	Contingent Reward	I always give others positive feedback when they perform well
Contingent Reward	Transformational Leadership Inventory	Contingent Reward	I give others special recognition when their work is very good
Contingent Reward	Transformational Leadership Inventory	Contingent Reward	I commend others when † they do a better than average job
Contingent Reward	Transformational Leadership Inventory	Contingent Reward	I personally compliment others when they do outstanding work
Contingent Reward	Barelka		I explain what incentives others can expect in exchange for their effort
Contingent Reward	Barelka		I make clear what rewards one can expect to receive when performance goals are achieved
Active Management-by-Exception	Barelka		I stay informed of mistakes, complaints, and failures
Active Management-by-Exception	Barelka		I draw attention to missed opportunities
Active Management-by-Exception	Barelka		I focus others on problems when they don't meet standards
Passive Management-by-Exception	Barelka		I do not act until problems need attention

References

- Alban-Metcalf, Robert J. and Beverly Alimo-Metcalf. "An Analysis of the Convergent and Discriminant Validity of the Transformational Leadership Questionnaire," *International Journal of Selection and Assessment*, 8: 158-175 (2000).
- Alimo-Metcalf, Beverly and Robert J. Alban-Metcalf. "The development of a new Transformational Leadership Questionnaire," *Journal of Occupational and Organizational Psychology*, 74: 1-27 (2001).
- Antonakis, John, Bruce J. Avolio, and Nagaraj Sivasubramaniam. "Context and leadership: an examination of the nine-factor full-range leadership theory using the Multifactor Leadership Questionnaire," *The Leadership Quarterly*, 14: 261-295 (2003).
- Antonakis, John and Robert J. House. "The Full-Range Leadership Theory: The Way Forward," in *Transformational and Charismatic Leadership: The Road Ahead*. Ed. Bruce J. Avolio and Francis J. Yammarino. Oxford, UK: Elsevier Science Ltd., 2002.
- Antonakis, John A. and Robert J. House. "On Instrumental Leadership: Beyond Transactions and Transformations," Paper presented at the UNL Gallup Leadership Institute Summit, Omaha, June 2004.
- Avolio, Bruce J., Bernard M. Bass, and Dong I. Jung. "Re-examining the components of transformational and transactional leadership using the Multifactor Leadership Questionnaire," *Journal of Occupational and Organizational Psychology*, 72: 441-462 (1999).
- Avolio, Bruce J. and Francis J. Yammarino. "Reflections, Closing Thoughts, and Future Directions," in *Transformational and Charismatic Leadership: The Road Ahead*. Ed. Bruce J. Avolio and Francis J. Yammarino. Oxford, UK: Elsevier Science Ltd., 2002.
- Bass, Bernard M. *Leadership and Performance Beyond Expectations*. New York: Free Press, 1985.
- Bass, Bernard M. and Bruce J. Avolio. "Developing transformational leadership: 1992 and beyond," *Journal of European Industrial Training*, 14: 21-37 (1990).
- Bass, Bernard M. and Ronald E. Riggio. *Transformational Leadership (2nd Ed)*. Mahwah, NJ: Lawrence Erlbaum Associates, Publishers, 2006.

- Behling, Orlando and James M. McFillen. "A Syncretical Model of Charismatic/Transformational Leadership," *Group & Organization Management*, 21:163-191 (June 1996).
- Burns, James M. *Leadership*. New York: Harper & Row, 1978.
- Bycio, Peter, Rick D. Hackett, and Joyce S. Allen. "Further Assessments of Bass's (1985) Conceptualization of Transactional and Transformational Leadership," *Journal of Applied Psychology*, 80: 468-478 (1995).
- Byrne, Barbara M. *Structural Equation Modeling with AMOS*. New York: Routledge, 2010.
- Carless, Sally A. "Assessing the discriminant validity of transformational leader behavior as measured by the MLQ," *Journal of Occupational and Organizational Psychology*, 71: 353-358 (1998).
- Carless, Sally A. "Assessing the discriminant validity of the Leadership Practices Inventory," *Journal of Occupational and Organizational Psychology*, 74: 233-239 (2001).
- Carless, Sally A., Alexander J. Wearing, and Leon Mann. "A Short Measure of Transformational Leadership," *Journal of Business and Psychology*, 14: 389-405 (2000).
- Conger, Jay A. and Rabindra N. Kanungo. "Toward a Behavioral Theory of Charismatic Leadership in Organizational Settings," *Academy of Management Review*, 12: 637-647 (1987).
- Conger, Jay A. and Rabindra N. Kanungo. "Perceived Behavioural Attributes of Charismatic Leadership," *Canadian Journal of Behavioural Science*, 24: 86-102 (1992).
- Conger, Jay A. and Rabindra N. Kanungo. "Charismatic leadership in organizations: perceived behavioral attributes and their measurement," *Journal of Organizational Behavior*, 15: 439-452 (1994).
- Conger, Jay A., Rabindra N. Kanungo, and Sanjay T. Menon. "Charismatic leadership and follower effects," *Journal of Organizational Behavior*, 21: 747-767 (2000).

- Conger, Jay A., Rabindra N. Kanungo, Sanjay T. Menon, and Purnima Mathur. "Measuring Charisma: Dimensionality and Validity of the Conger-Kanungo Scale of Charismatic Leadership," *Canadian Journal of Administrative Sciences*, 14: 290-302 (1997).
- Den Hartog, Deanne N., Jaap J. Van Muijen, and Paul L. Koopman. "Transactional versus transformational leadership: An analysis of the MLQ," *Journal of Occupational and Organizational Psychology*, 70: 19-34 (1997).
- Department of the Air Force. *Leadership and Force Development*. Air Force Doctrine Document 1-1. Washington: HQ USAF, 18 February 2006.
- Downton, James V. *Rebel Leadership: Commitment and Charisma in the Revolutionary Process*. New York: Free Press, 1973.
- Dumdum, Uldarico Rex, Kevin B. Lowe and Bruce J. Avolio. "A Meta-Analysis of Transformational and Transactional Leadership Correlates of Effectiveness and Satisfaction: An Update and Extension," in *Transformational and Charismatic Leadership: The Road Ahead*. Ed. Bruce J. Avolio and Francis J. Yammarino. Oxford, UK: Elsevier Science Ltd., 2002.
- Field, Andy. *Discovering Statistics Using SPSS*. Thousand Oaks, CA: Sage Publications Inc., 2009.
- Fields, Dail L. and David M. Herold. "Using the Leadership Practices Inventory to Measure Transformational and Transactional Leadership," *Educational and Psychological Measurement*, 57: 569-579 (1997).
- Goodwin, Vicki L., J.C. Wofford, and J. Lee Whittington. "A theoretical and empirical extension to the transformational leadership construct," *Journal of Organizational Behavior*, 22: 759-774 (2001).
- Hater, John J. and Bernard M. Bass. "Superiors' Evaluations and Subordinates' Perceptions of Transformational and Transactional Leadership," *Journal of Applied Psychology*, 73: 695-702 (1988).
- Heinitz, Kathrin, Detlev Liepmann, and Jorg Felfe. "Examining the Factor Structure of the MLQ: Recommendation for a Reduced Set of Factors," *European Journal of Psychological Assessment*, 21: 182-190 (2005).
- Hinkin, Timothy R. "A Brief Tutorial on the Development of Measures for Use in Survey Questionnaires," *Organizational Research Methods*, 1: 104-121 (1998).

- Hinkin, Timothy R. and Schriesheim, Chester A. "A theoretical and empirical examination of the transactional and non-leadership dimensions of the Multifactor Leadership Questionnaire (MLQ)," *The Leadership Quarterly*, 19:501-513 (2008).
- Holt, Daniel T., Armenakis, Achilles A., Harris, Stanley G. and Field, Hubert S. "Toward a Comprehensive Definition of Readiness for Change: A Review of Research and Instrumentation," in *Research in Organizational Change and Development*, Volume 16. Eds. William A. Pasmore and Richard W. Woodman. Bingley, UK: Emerald Group Publishing Limited, 2007.
- House, Robert J. "A 1976 Theory of Charismatic Leadership," Paper presented at the Southern Illinois University Fourth Biennial Leadership Symposium, Carbondale, Illinois, 26 October 1976.
- House, Robert J. and Ram N. Aditya. "The Social Scientific Study of Leadership: Quo Vadis?," *Journal of Management*, 23: 409-473 (1997).
- Hu, L-T., and Peter M. Bentler. "Evaluating model fit," in *Structural Equation Modeling: Concepts, Issues, and Applications*. Ed. R. H. Hoyle. Thousand Oaks, CA: Sage Publications, 1995.
- Judge, Timothy A. and Ronald R. Piccolo. "Transformational and Transactional Leadership: A Meta-Analytic Test of Their Relative Validity," *Journal of Applied Psychology*, 89: 755-768 (2004).
- Kouzes, James M. and Barry Z. Posner. *The Leadership Challenge*. John Wiley & Sons, 1987.
- Lowe, Kevin B., K. Galen Kroeck, and Nagaraj Sivasubramaniam. "Effectiveness Correlates of Transformational and Transactional Leadership: A Meta-Analytic Review of the MLQ Literature," *Leadership Quarterly*, 7: 385-425 (1996).
- McCann, John A., Peter H. Langford, and Robert M. Rawlings. "Testing Behling and McFillen's Syncretical Model of Charismatic Transformational Leadership," *Group & Organization Management*, 31: 237-263 (2006).
- McGrath, Joseph E. "A multifacet approach to classification of individual, group and organization concepts," in *People, Groups and Organizations*. Eds. Indik, B. Berrien, K. New York: Teachers College Press, 1968.
- Meng, X. L., R. Rosenthal, and D. B. Rubin. "Comparing correlated correlation coefficients," *Psychological Bulletin*, 111: 172-175 (1992).

- Northouse, Peter G. *Leadership Theory and Practice*. Thousand Oaks, CA: Sage Publications, 2007.
- Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York: McGraw-Hill.
- Pillai, Rajnandini and Ethlyn A. Williams. "Transformational leadership, self-efficacy, group cohesiveness, commitment, and performance," *Journal of Organizational Change Management*, 17: 144-159 (2004).
- Podsakoff, Philip M., Scott B. MacKenzie, Robert H. Moorman, and Richard Fetter. "Transformational Leader Behaviors and Their Effects on Followers' Trust in Leader, Satisfaction, and Organizational Citizenship Behaviors," *Leadership Quarterly*, 1: 107-142 (1990).
- Podsakoff, Philip M., Scott B. MacKenzie, and William H. Bommer. "Transformational Leader Behaviors and Substitutes for Leadership as Determinants of Employee Satisfaction, commitment, Trust, and Organizational Citizenship Behaviors," *Journal of Management*, 22: 259-298 (1996).
- Posner, Barry Z. and James M. Kouzes. "Development and Validation of the Leadership Practices Inventory," *Educational and Psychological Measurement*, 48: 483-496 (1988).
- Posner, Barry Z. and James M. Kouzes. "Psychometric Properties of the Leadership Practices Inventory-Updated," *Educational and Psychological Measurement*, 53: 191-199 (1993).
- Rafferty, Alannah E. and Mark A. Griffin. "Dimensions of transformational leadership: Conceptual and empirical extensions," *The Leadership Quarterly*, 15: 329-354 (2004).
- Rowold, Jens and Kathrin Heinitz. "Transformational and charismatic leadership: Assessing the convergent, divergent and criterion validity of the MLQ and the CKS," *The Leadership Quarterly*, 18:121-133 (2007).
- Sashkin, Marshall. "Transformational Leadership Approaches," in *The Nature of Leadership*. Eds. Antonakis, J., Cianciolo, A.T. and Sternberg, R.J. CA: Sage Publications, 2004.
- Shamir, Boas, Robert J. House, and Michael B. Arthur. "The Motivational Effects of Charismatic Leadership: A Self-Concept Based Theory," *Organization Science*, 4: 577-594 (November 1993).

- Shamir, Boas, Eliav Zakay, and Micha Popper. "Correlates of Charismatic Leader Behavior in Military Units: Subordinates' Attitudes, Unit Characteristics, and Superiors' Appraisals of Leader Performance," *Academy of Management Journal*, 41: 387-409 (1998).
- Tejeda, Manuel J., Terri A. Scandura, and Rajnandini Pillai. "The MLQ revisited: Psychometric properties and recommendations," *The Leadership Quarterly*, 12: 31-52 (2001).
- Tourangeau, Ann E. and Katherine McGilton. "Measuring Leadership Practices of Nurses Using the Leadership Practices Inventory," *Nursing Research*, 53: 182-189 (May/June 2004).
- Weber, Max. *Essays in Sociology*. Oxford University Press, 1948.
- Yukl, Gary. "An Evaluation of Conceptual Weaknesses in Transformational and Charismatic Leadership Theories," *Leadership Quarterly*, 10: 285-305 (1999).

SF 298

REPORT DOCUMENTATION PAGE				Form Approved OMB No. 074-0188	
The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.					
1. REPORT DATE (DD-MM-YYYY) 25-03-2010		2. REPORT TYPE Master's Thesis		3. DATES COVERED (From – To) September 2008 - March 2010	
4. TITLE AND SUBTITLE The Development of a Tactical-Level Full Range Leadership Measurement Instrument				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) Thurrell, Rebecca, First Lieutenant, USAF				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAMES(S) AND ADDRESS(S) Air Force Institute of Technology Graduate School of Engineering and Management (AFIT/EN) 2950 Hobson Way WPAFB OH 45433-7765				8. PERFORMING ORGANIZATION REPORT NUMBER AFIT/GEM/ENV/10-M12	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) intentionally left blank				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT Since the emergence of transformational and charismatic leadership models in the mid-1980s, full range leadership theory has become established as the predominant and most widely researched theory on leadership. The most commonly used survey instrument to assess full range leadership theory is the Multifactor Leadership Questionnaire, originally developed by Bass in 1985. Although much research has supported the strength of the psychometric properties of the Multifactor Leadership Questionnaire, some researchers have suggested that contextual factors such as a leader's hierarchical level can lead to conflicting results. This research effort involved an extensive review of existing literature to develop a new full range leadership theory measurement instrument that effectively targets low- to mid-level supervisors, or tactical-level leaders. Results indicate that the newly developed Leadership Profile Measure scales have stronger internal consistency reliability (Cronbach's α) than the Multifactor Leadership Questionnaire. The Leadership Profile Measure also demonstrated better model fit (evaluated by confirmatory factor analysis). Correlations between the Leadership Profile Measure and performance evaluations conducted by trained raters were low, although many were significant.					
15. SUBJECT TERMS Full Range Leadership, Transformational Leadership, Measure Development, Multifactor Leadership Questionnaire, Leadership Measurement Instrument					
16. SECURITY CLASSIFICATION OF:		17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON	
a. REPORT	b. ABSTRACT			Alexander J. Barelka, Lt Col, USAF (ENV)	
U	U	UU	76	19b. TELEPHONE NUMBER (Include area code) (937) 255-3636, ext. 7404	
				Standard Form 298 (Rev. 8-98) Prescribed by ANSI Std. Z39-18	
				Form Approved OMB No. 074-0188	

