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ANALYSIS OF LEADERSHIP BEHAVIORS AMONG TOP COMMISSIONED AND TOP  
NONCOMMISSIONED OFFICERS IN KEY LEADERSHIP POSITIONS

A DISSERTATION  
SUBMITTED TO THE GRADUATE FACULTY  
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By

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## **ABSTRACT**

Since the inception of the USAF leadership, unit level leadership has been function of officers, particularly senior commissioned officers in the rank of lieutenant colonel (Lt Col.) and colonel (Col.). The NCO corps was considered the working unit responsible for carrying out the orders of their commissioned officers. Today's USAF is transitioning increasingly towards leadership decisions made by senior noncommissioned officers in the rank of senior master sergeants (SMSgt) and chief master sergeants (CMSgt). A sample of N=56 top commissioned and noncommissioned active duty officers responded to mailed surveys at a European fighter wing command. This study compared the perceived leadership behavior factors of individuals in key leadership positions using the Multifactor Leadership Questionnaire (MLQ) 5X--Short. Multiple Analysis of Variance (MANOVA) found no significant difference in the leadership behaviors between commissioned and noncommissioned officers. The data did reveal a high degree of transformational leadership and transactional leadership styles with both groups. Age, time in service, or educational level was not significant factors in having a transformational leadership perspective. This may be as a consequence of the uniformity of USAF leadership training between the grades or an indicator that noncommissioned officers could provide leadership in capacities that traditionally the US Air Force has not previously employed them.

## **CHAPTER I**

### **INTRODUCTION**

The United States Air Force (USAF) has sought to define its leadership structure to maximize oversight efficiencies by using not only senior commissioned officers in key leadership positions but also senior noncommissioned officers to meet mission objectives. In general, the military has a view that every commissioned officer is a leader and the noncommissioned officers are taught their leadership skills from them (Utecht & Heier, 1976). Leaders do not have to be great men or women by being intellectual geniuses or omniscient prophets to succeed, but they do need to have the “right stuff”. Leadership is a demanding, unrelenting job with enormous pressures and grave responsibilities, ...it takes a special kind of person to master the challenges of opportunity (Kirkpatrick & Locke, 1991, p. 56).

The measure of leadership is often defined by those leadership behaviors observed in military members. This research refines that view of leadership in the USAF. How to define and qualify military leadership has been a subject of consideration in the military complex for a long time. The USAF, like its sister services, has sought to better understand what a leader is, as well as how best to employ its contingent to manage its work force into a coherent, viable organization to meet the demands of its wartime roles and missions.

The USAF leadership concepts have evolved since its inception in 1949 as a separate force from the U.S. Army and as a distinct military flying unit from the U.S. Navy, U.S.

Marine Corps or the U.S. Coast Guard, all of which have a flying component in their organizational structure. The task of creating the proper commissioned officer (CO) to noncommissioned (NCO) structure to influence subordinates is under constant scrutiny by the Air Force, Congress, and civilian oversight groups. The force structure as mandated by Congress ("National Defense Authorization Act 2009," 2009) reflects a mandated total number of commissioned and noncommissioned personnel. The force structure ratio of noncommissioned and commissioned leadership reflects this oversight at the USAF level and the wing-level.

Commissioned and noncommissioned leadership throughout an Air Force unit is focused on maximizing the least amount of leadership to the maximum amount of subordinate personnel. As a practical matter, leadership bureaucracy is at the expense of the working force (subordinate personnel)—the military members who put the planes in the air. The Air Force defines this as the “tooth-to-tail” ratio—workers who directly contribute to the “taking the fight to the foe” - the tooth, as opposed to the administrators, who are in support of the workers—the tail.

The commissioned leadership forces, then, represent a higher cost of that support than do noncommissioned leaders from not only to the tooth-to-tail ratio at the expense of the total force manpower budget, but from the annual dollar cost budget of doing Air Force business since commissioned leaders cost more on an annual basis than noncommissioned personnel. In all pay years of service categories lieutenant colonels (O5) and colonels (O6) are paid twice (or more) the basic pay salary of senior master sergeants (E8) and chief master sergeants (E9) respectively per month (Defense Finance and Accounting Service, 2009). As a result, there is a larger pay disparity at time of

retirement which further contributes to the expense of senior field grade officers versus senior grade NCOs. It is imperative that the Air Force structure reflect the optimal, most efficient mix of doing business both from the structural cost and dollar cost of the equation assuming that there is a leadership synergism in the mix.

### **Problem Statement**

Since the inception of the USAF leadership, unit level leadership has been a function of officers, particularly senior commissioned officers in the rank of lieutenant colonel and colonel. The NCO corps was considered the working unit responsible for carrying out the orders of their commissioned officers. Today's USAF is transitioning increasingly towards having decisions and leadership decisions made by senior noncommissioned officers in the rank of senior master sergeants and chief master sergeants. The parameters of those decisions are not exactly known or pre-defined. Certainly, because of the current restrained economic environment in the United States of America, pay differential between these CO and NCO groups of leaders is a significant decision factor in task management. Yet seemingly inherent in that economic decision, it appears that the USAF is implying that all leadership is the same. It is unlikely that these two groups of leaders are comparable. Are there, in fact, distinguishing features between these two groups of leaders? Does a CO lead more effectively than an NCO? If there are no differences in their leadership behaviors, then it would be more cost effective to have senior noncommissioned officers provide that leadership. This leadership research investigates these questions.

## **Significance of the Research**

When assigning military officers, minimal thought is given to matching leadership behaviors to positions within the force since the general military assumption is that officers are leaders and can be relied upon to lead and supervise others in an outstanding manner (Utecht & Heier, 1976). The total end strength of officers and enlisted personnel as mandated by Congress in February 2009 was 316, 771 officers and enlisted personnel ("National Defense Authorization Act 2009," 2009). In 2007 the USAF enlisted force constituted roughly 80% of the total force structure as of 2007, i.e., 264,424 enlisted members from a total active duty strength of 334,200. These numbers have been reduced as a result of Congressional end strength number restriction and budget considerations. The USAF end strength numbers have been reduced from a high of about 970,000 in 1953 (Korean War) to the 2009 (War on Terror) current numbers of less than 317,000 officer and enlisted personnel (U. S. Department of Defense, 2007).

Increasingly, the senior noncommissioned officer corps is being directed to accept traditional "officers only" leadership roles. Commissioned officers have traditionally been tasked as the leaders in combat, but the NCO corps is now being asked to accept this role, taking their leadership training directly into combat (Scales, 2008). Determining if the senior noncommissioned officer displays the same leadership behaviors as senior commissioned officers is crucial to formulating the proper mix of leadership balance (commissioned officer versus noncommissioned officer) within the USAF work force structure.

With an understanding of the leadership realm of commissioned and noncommissioned officers, a better determination can be made regarding an effective



force structure. This understanding of leadership behaviors prevalent in either the CO or NCO corps can greatly assist the USAF in making force structure adjustments accordingly. By ensuring the proper force structure the USAF can better defend its manpower force structure numbers (tooth-to-tail ratio) and better structure its leadership instruction to the various professional military education institutions for their top leadership training. As an additional benefit, you will have a more efficient force in that you will have the right people doing the right leadership job—matching behaviors with the job situation. Appreciating these differences will allow a better understanding of whether a commissioned or noncommissioned officer is better suited for employment in various wing-level organizational situations.

### **Purpose of the Research**

The purpose of this study is to delineate the leadership behaviors of the top commissioned officers in key leadership positions. This research will compare commissioned officers, lieutenant colonels and colonels, in key wing-level leadership positions such as commanders, deputy commander, major staff officer billets, and organizational division heads with the leadership behaviors of senior noncommissioned officers in key leadership positions within the wing structure, such as flight chiefs, branch chiefs, top enlisted managers, and first sergeants. This linking will define the behaviors to determine similarities and differences between them with the hope that the results can be applied to make other organizational structures within the USAF more efficient by using an appropriate leadership mix of COs and NCOs in their top leadership positions. This will allow leadership positions to be filled in a way they are currently not. Optimization of leaders in key leadership positions will allow better employment of

increasingly scarce and costly manpower resources within a wing-level Air Force organization.

Specifically, the commissioned, noncommissioned officer behavior comparison examines the continuum of transformational through transactional leadership behavioral factors as described by Bass (1985) as to where commissioned officer and noncommissioned officer leadership behaviors fall along the continuum. This research examines the question: do leaders lead differently? This research explores whether commissioned officers in top leadership positions exhibit more transformational leadership behaviors than senior noncommissioned officers in top leadership positions.

Although modern leadership thinking reflects the fact that trait-based leadership views are not in the mainstream of leadership thought, the USAF still maintains vestiges of that thinking. The USAF general tenant is that commissioned officers lead people because of education and ability and, therefore, must be in command of leadership positions requiring outward focus, whereas, noncommissioned leaders lead in a different fashion. Noncommissioned officers are focused more inwardly on the organization's administration and upkeep and carry out the orders of the commissioned officers appointed over them.

The results of this research impacts the view of which leader is better suited for various levels of leadership in an Air Force wing-level military organization. This commissioned/ noncommissioned leadership mix will shed significant light on force structure and personnel allocations within the USAF, especially at the wing-level. Additionally, this research will allow others to critically analyze the behavioral factors researched with the purpose of encouraging additional leadership training to amplify the

leadership behaviors for application of different leadership opportunities within USAF wing-level organizations.

## **CHAPTER II**

### **REVIEW OF THE LITERATURE**

Though leadership is a critical factor in military success, little research appears to have been done regarding leadership behavior factors between top commissioned and noncommissioned officers. Military leadership from the past evolved from the concept of privilege, i.e., an officer and a gentleman. From America's War of Independence, leadership was drawn from the gentry from whom great men were called to meet the challenge. During the Revolutionary War the military evolved into a more professional undertaking. The United States Military Academy at West Point, was created in 1802, to train and commission officers to meet the expectations, criterion, and training of professional military personnel in the "art and science" of war (Wikimedia Foundation, 2010). In the past, the general military view of leadership consisted of "the great man theory" which has been disproved in landmark studies such as the Ohio studies and Michigan State studies which stated that leadership was a relational event of the leader and followers (Stogdill, 1948). Further, the views of leadership over time have evolved to recognize that different leadership behaviors are different in different organizations. Over the past two hundred and fifty years, military leadership evolved from an endowment of behaviors of a single individual, to specific personalities that could be defined in many individuals, to behaviors that could be taught to any individual.

Prior to and during the early twentieth century the view of leadership was trait-based leadership. Trait-based leadership was a function of traits possessed by a person that made that individual a leader. The view was that leadership was a characteristic

possessed by only a few individuals who stood out well beyond their peers. The general consensus was these characteristics created “greatness” that separated followers from the great leader – that “there is evidence that effective leaders are different from other people in certain ...key leader traits” (Kirkpatrick & Locke, 1991, p. 48).

In trait-based leadership studies, Borgatta, Bales, and Couch (1954) surmised, “Much psychological research, assuming the great man theory, has been oriented to the problems of selecting persons who are best fitted for a top position of leadership” (p. 76). It was generally assumed that people with certain personality characteristics were naturally born to be great. The great leaders of the past that were said to possess the “great man” trait were Alexander the Great, Winston Churchill, and George Washington, among a long list of others. The great man is described as, “An individual who demonstrated the most common traits identified - physical/constitutional factors (height, weight, physique, and appearance), intelligence, self-confidence, sociability, initiative/persistence/ambition, dominance, and surgency (talkativeness, enthusiasm, alertness, and originality) would become natural leaders” (Geier, 1967, p. 316).

In a review using validity generalization techniques of Stogdill’s repudiation of the trait-based leadership conclusion, Lord, De Vader, and Alliger (1986) found strong evidence that there were strong correlations of traits that influenced perceptions of leadership. Their study found, “Personality traits are associated with leadership perceptions to a higher degree and more consistently than the popular literature indicates” (p. 407). Their meta-analysis found that dominance, intelligence, and masculinity-femininity traits were strongly correlated with perceptions of leadership, unlike Stogdill’s findings. They further concluded that intelligence, usually in combination with other

traits, was a key characteristic in predicting leadership perceptions. They argued strongly that intelligence and other personality traits were strongly predictive of leadership perceptions and thus, leadership in relation to group performance. In their view “being perceived as a leader allows one to exert greater influence in business or government. . .” (p.408). They concluded their analysis stating that personality *may* consistently predict performance as well as leadership perception (p. 407).

Throughout all previous leadership studies there has been a general inability to determine a consistent set of traits that are common in all leadership situations. One of the earliest studies to confirm this was Barnlund (1962) in his research study of freshmen (N=25) at Northwest University. He found, with a correlation factor of .64 ( $\alpha=.64$ ), that leadership was not a consistently identifiable trait, but varied with circumstances and member composition. Trait-based leadership research, in general, could not predict leaders in all situations and leaders in one situation were not necessarily leaders in another situation.

It should be noted, too, that researchers in the mid-twentieth century, including Jenkins (1947), had also concluded that, “No single trait or group of characteristics has been isolated which sets off the leader from the members of his group. . .they have also pointed out the existence of wide individual differences within a given group as well as between group” (p. 74). For the dedicated trait-based researchers, it was generally felt that since there were not a consistent set of traits identified, then trait-based leadership theories simply had not identified the correct traits (Kenny & Zaccaro, 1983). Twenty-first century researchers are still in pursuit of trait-based leadership; however, this

inability of trait-based leadership research to consistently identify a leadership trait(s) in all situations caused a migration in leadership research for a more comprehensive result.

In the mid-twentieth century, behavior-based leadership evolved as a distinct variant from trait-based leadership. The pioneers of leadership behavior (as opposed to traits) in the mega research review, “Personal factors associated with leadership: a survey of the literature”, were Stogdill and Shartle (1948) who questioned the prevailing view of what-made-a-leader wisdom with their critical analyses of the trait-based theory and led them to conclude that trait-based leadership was not universal, i.e., a leader in one situation was not necessarily a leader in another situation. As cited by Northouse (2003), Stogdill further concluded from his Ohio State studies that leadership was not a trait, but a relationship between people in a social situations. Stogdill and Shartle (1948) assumed that, “Three concepts [of leadership] are implied...The first concept is that leadership resides in specific persons; the second is that leadership is an aspect of group organization, and the third is that leadership is concerned with attaining objectives” (p. 286). “The Ohio State studies led to his [Stogdill] initiating structure [task type activities] and consideration [relationship behaviors] which he saw as two distinct and independent behaviors” (Northouse, 2003, p. 65). In his review, Northouse (2003) wrote that concurrent studies took place at The University of Michigan and followed a different logic, but ultimately concluded that leadership was relational. Their research investigated two types of leadership – “employee orientation” [relational] and “production orientation” [task] (p. 68). Both studies failed to provide a universal leadership theory in all situations; however, their research spurred additional behavioral leadership studies.

The best known and first systematic approach in organizational level research was the Managerial (leadership) Grid developed in the mid-1960s by Blake and Mouton (1965). Their instrument measured the seven varying degrees of concern [relationships] by leaders for their people and for obtaining results [production]. The Managerial Grid provides a model to illustrate the process with which to make a more desirable leader, i.e., one with great concern for people and high organizational results, and is still used as a measuring stick for leadership training (Blake, Carlson, McKee, Sorensen, & Yaeger, 2000). The Managerial Grid was one of the first tools to investigate situational leadership behavior.

Another tool used in the development of leaders was the Situational Leadership Model developed by Hersey and Blanchard in 1969, which measured supportive leadership styles against development levels of subordinates. This was a prescriptive framework depicting four leadership style relationships. This model also assessed the willingness and ability (readiness) of participants in leadership behavior styles (Northouse, 2003).

Hersey, Blanchard, and Johnson (2001) stated, "According to Situational Leadership Model, there is no one best way to influence people. The leadership style depends on the readiness level of the followers the leader is attempting to influence" (p.202). "Effective leaders adapt their leader behavior to meet the needs of their followers and the particular environment" (Hersey et al., 2001, p. 124). Situational Leadership Model was based on the leader-centric assessment of the situation and environmental status [readiness] of his followers. In Hersey's theory, followers did not make any adjustments to attain the leader's goals; they were passive in the sense they could become better followers through



training in order to be more competent; they had no action in goal attainment other than raw performance.

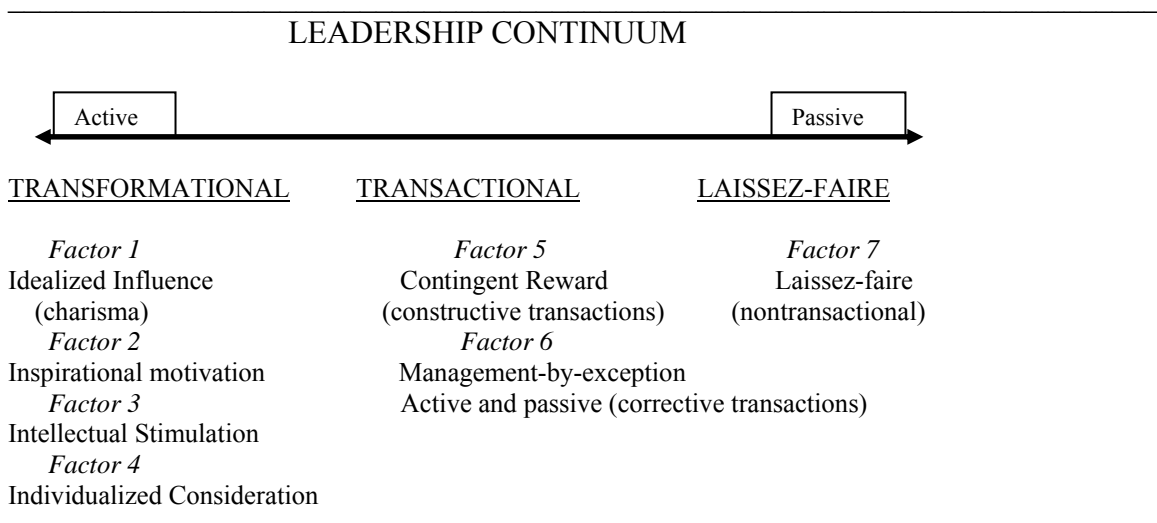
Throughout the 1970s, leaders' ability to influence followers was being closely linked to followers' motivation and needs. House and Mitchell (1974) linked leadership as a function of follower's needs in their Path-Goal theory of leadership. Their view of a leader was one who could meld the motives of his followers with the goal of the leader; and that the goals and motives were inseparable. To the degree that leaders remove impediments to subordinate goal attainment, to include environmental and personal needs, then subordinates will be motivated to achieve leadership's goals. House's theory, in contrast to Situational Leadership Model, assumed a more active role of the follower. The follower was viewed as intrinsically a goal achiever who had impediments in their path of achievement. It was the leader's role to identify and mitigate those impediments so the followers could achieve the leader's goals. Both the leader and follower transacted goal achievement.

In the late 1970s and into the 1980s researchers focused on organizational behaviors influencing the leader and follower relationship. This re-focus was based upon an earlier works of Max Weber (1924) in which he described leaders as endowed with a personality characteristic called "charisma" and its corresponding effect on followers. This concept evolved throughout this period by several researchers. Burns (1978) defined a continuum of leadership from charismatic leadership on one end to no leadership on the other end; he illustrated his continuum as going from transformational leadership to transactional leadership to laissez-faire leadership. Bass (1985) refined and expanded Burn's

leadership continuum by defining the major headings [transformational, transactional, and laissez-faire] into “seven subfactors.”

In the context of Bass’ original leadership theory, the leadership continuum included four subfactors measuring transformational leadership-idealized influence, inspirational motivation, intellectual stimulation, individualized consideration; two subfactors measuring transactional leadership-contingent reward and management by exception; and laissez-faire which was considered no leadership.

Figure 1. Leadership Continuum



Source: Northouse, P. G. Leadership: Theory and practice, (p.175). Thousand Oaks: SAGE Publications.

In the subsequent review of multifactor leadership questionnaire (MLQ) behavior factors (Avolio, Bass, & Jung, 1999), a reassessment of the subfactors was analyzed by the researchers. The MLQ 5X reflected a division of Bass’ original charisma behavior into components of idealized attributes (those charismatic traits assigned by others) and behaviors (those charismatic behaviors displayed by the leader). Reaffirmed in this study and noted by others, contingent reward behavior was considered and statistically aligned

with transactional leadership from transformational. The full range leadership theory model now consists of five transformational subfactors, three transactional leadership subfactors, and laissez-faire. The subfactors are defined as follows:

1. Transformational leadership
  - a. Idealized Influence (Attributed)-socialized charisma of the leader.
  - b. Idealized Influence (Behavior)-charismatic actions of the leader centered on values beliefs and sense of mission.
  - c. Inspirational motivation-ways leaders energize their followers by viewing the future with optimism, stressing ambitious goals, projecting idealized vision and communicating to followers that the vision is achievable.
  - d. Intellectual stimulation-leader actions that appeal to followers' sense of logic and analysis by challenging followers to think creatively and find solutions to difficult problems.
2. Transactional Leadership
  - a. Contingent reward-leadership behaviors focus on clarifying role and task requirements and providing followers with material or psychological rewards contingent on the fulfillment of contractual obligation.
  - b. Management-by-exception (active)-active vigilance of a leader whose goal is to ensure that standards are met.
  - c. Management-by-exception (passive)-intervention only after noncompliance has occurred or when mistakes have already happened.
3. Laissez-faire-absence of leadership where the leader avoids making decisions, abdicates responsibility, and does not use their authority.

According to Yukl and Van Fleet, as cited by Bono and Judge, (2004), “neocharismatic leadership theories are a hybrid approach to leadership and include elements of many other theoretical approaches to leadership (e.g., traits, behaviors, attributions, and situations) (p. 901).” It can be viewed that transformational leadership is extra-organizational and transactional leadership is intra-organizational.

### **Synthesis of the Literature**

The acceptance and implementation of current trends in leadership theory by the USAF has not evolved universally. Some theories are readily adopted while some concepts linger virtually unchallenged through time. In the early U.S. Air Corp days (1909 – 1949), IQ and spatial orientation tests were the dominant tests to determine leadership for flying duty. If you could fly, then you could lead anybody or any organization. The USAF still endorses this great-man-trait of leadership with all things related to flying by only allowing officers to fly manned or unmanned aircraft under the theory that only an officer pilot has the ability to do so. The U.S. Army uses noncommissioned or warrant officers for the same unmanned flight duties. Yet, the USAF readily adopts participative leadership by senior noncommissioned officers in other career fields such as chiefs of maintenance of aircraft maintenance organizations.

Trait-based leadership dominated leadership thinking in the Army Air Corps and early Air Force days. In the late 1950s and 1960s tests evolved such as the Myers Briggs Type Indicator Test developed in 1962, which the USAF relied on heavily to identify possessed traits and characteristics thought essential for leadership in certain career fields.

In the Borgatta, et al. (1954) great man theory research project for selecting persons who are best fitted for a top position of leadership using enlisted USAF personnel concluded: “The evidence is quite clear that those groups containing a great man have higher product-rates of giving suggestions and agreements. . . Thus, it may be said that great men tend to make “great groups” in the sense that both major factors of group performance- productivity and satisfaction of the members-are simultaneously increased.” (p.759).

Trait-based thinking, the dominate factor in establishing USAF leadership positions for commissioned and noncommissioned positions, changed very little throughout the 1970s and 1980s even though many studies concluded there was no universal set of traits on which to base leadership decisions in all situations.

In 1948 Stogdill and Shartle’s studies for the US Navy office of Naval Research concluded that, “Leadership resides in individuals, but only by virtue of their interaction with other persons. Leadership must, therefore, be studied as a relationship between persons and as an aspect of organizational activities, structures and goals” (1948, p. 286). This study investigated top line and staff positions in six levels of U.S. Navy Command Staff. Each officer (N=26) was rated on his sociometric working relationships among the various members of the staff. A RAD index (responsibility score, authority score, delegation score) measured interrelated patterns of responsibilities. It was found that there was a significant correlation with interpersonal, interrelationship of inspection, planning and coordination. At about the same time, the University of Michigan studies, though following a different logic, concluded the same concept– leadership was a relationship between leader and follower depending upon the situation in question.

Hersey's et al. (2001) Situational Leadership Model developed in the late 1960s modeled the "new" Air Force leadership thinking that there were instances where different leadership styles were necessary for different situations. This relationship concept was implemented in 1992 in a force restructuring by General Merrill A. McPeak, Air Force Chief of Staff. He tasked the Air Command and Staff College to focus on "the things that must be done by officers and develop a method for placing officers where they can do them" (Cantrell & Andrews, 1993, p. 1). Though this high level force restructuring did not actually manage leadership, per se, the effect was it did place different people in different leadership situations. The followers were passive in the sense they could become better followers through training to become more competent. These ideas were based primarily on the Hersey and Blanchard concept that leaders were either task oriented or relationship oriented (Kent, Crotts, & Azizz, 2001). These studies tended to focus on didactic relations of the leader to follower.

Burns (1978) posited the concept of transformational and transactional leadership in an organizational setting. The two basic characteristics of leadership as described by Bass (1990, p. 19) are transactional, based upon transactions between manager and employees and transformational, when leaders rouse their employees to look beyond their own self-interest for the good of the group. As described by Yukl (1999), "Leaders are oriented toward change and long-term effectiveness, where as managers are oriented toward stability and short-term efficiency" (p. 35).

An important aspect of transformational and transactional leadership is organizational efficiencies. This aspect is directly employed by the USAF in its commissioned and noncommissioned officer leadership roles. Many studies have argued that leadership is

crucial to organizational effectiveness and have pointed out the various transformational and transactional roles of officers and NCOs (Hogan, Curphy, & Hogan, 1994, Jung, Chow, & Wu, 2003; Yukl, 1999). Specifically, Shamir, Zakay, Breinin, and Popper (1998) correlate charismatic leader behavior (transformational leadership) with unit effectiveness. Their study sought to better define and specify charismatic behaviors and their effect on unit performance as a function of that charismatic behavior. To assess leader behavior they used Bass' Multifactor Leadership Questionnaire (1985 version measuring only a single charisma factor versus inspirational motivation and idealized influence). In their study of Israel Defense Forces, staff members, first soldiers and second soldiers (N=353, 624, 573 respectively) found a significant correlation between unit morale, cohesiveness, and achievement potential with the level of trust that followers had in their unit's leadership and their willingness to make sacrifices on the leader's behalf. In a subsequent study by Bass et al., (2003) investigating U.S. Army unit performance and leadership, it was found that, "transformational leadership was positively correlated with transactional contingent reward leadership and negatively correlated with passive-avoidant leadership (p.211) (N=2675). Both studies positively linked charismatic leadership behaviors with predicting unit performance and values.

Conger and Kanungo (1992) assert that these behaviors are validly modeled and predictive in an organizational setting. Their study of university business students (N=121, 70% male, 30% female, with 72% from private sector) found, unlike the Shamir, et al. study, that there was a strong correlation between charismatic leadership and eight behavioral attributes (radical change agent, strives to change status quo, realistic assessment of environment, sensitivity to follower needs, idealized future vision, strong

articulation, personal risk, and unconventional behavior). They conclude charisma at the managerial level can be studied as a dimension of leadership, is empirically valid, and should be further studied. Further, Bono and Judge (2004) provide a meta-analysis illustrating the significant correlation of transformational and transactional leadership exhibited by leaders in an organization with the modified leadership behavior model of Bass, i.e., charisma, inspiration, intellectual stimulation, individualized consideration, contingent reward, management by exception further linking charisma and behaviors.

In the MLQ's original form, Bass surveyed a group of business executive (N=78) who described factors and influences of leadership of importance to themselves and asked them to describe a "best" leader. A panel of 11 judges reviewed the submissions and created a final set of 73 items from the original 142 that described a transformational leader. The resulting 73 items were field tested on 176 U.S. Army colonels (O6) (Avolio et al., 1999) to determine correlation.

Subsequent revisions of the MLQ attempted to further refine, filter, and provide alternative conceptual models for the original factors developed by Bass to determine if transformational and transactional leadership MLQ was measuring the leadership factors it was developed to assess. For instance, Avolio, et al. (1999) attempted to revalidate Bass' findings and to determine if a reworded multifactor model was positively correlated with Bass' original MLQ assumptions.

A variation of the multifactor leadership questionnaire developed by Bass (1985) will be used in this study to evaluate leadership behavior factors between lieutenant colonel and colonel commissioned officers and senior and chief master sergeant noncommissioned officers. Bass developed the first multifactor leadership questionnaire



that defined transformational and transactional leadership as including seven subfactors (charisma, inspirational, intellectual stimulation, individualized consideration, contingent reward, management-by-exception and laissez-faire).

This re-correlated version of the six-factor model is called MLQ Form 5X. Avolio et al. (1999) conducted a study involving (N=1498) individuals. Their sample consisted of individuals from U.S. business firms (N=764), political organizations (N=428), fire departments (N=325), and nonprofit agencies (N=189). Their 6 factor (and 7 factor) model represented the absolute best fit as compared to the other factor models with a chi square difference of  $p < .001$ . The six factor MLQ analysis indicated a significant correlation among its subfactors. Charisma measured a correlation factor of .92, intellectual stimulation measured .78, individualized consideration measured .78, contingent reward measured .74, management-by-exception (active) measured .64, and passive management (avoidant) measured .86. According to Avolio et al., “. . .by measuring a wider and more detailed range of leadership factors [using the MLQ 5X], it is likely to increase the chances of tapping into the actual range of leadership styles that are exhibited across different cultures and organizational settings. . .” (p. 460). Avolio et al. (1999) concluded, “by measuring a wider and more detailed range of leadership factors, it is likely to increase the chances of tapping into the actual range of leadership styles that are exhibited across. . .organizational settings” (p. 460). The essential difference in this model versus the earlier is that it measures charisma as an attributed and behavioral value of individualized influence versus a single value for charismatic leadership value. This version is called the Full Range Leadership Model™ (FRLM).

The Full Range Leadership Model™ (MLQ International, 2007) measures the full range of effective to ineffective leadership in relationship to passive and active leadership. The model shown below illustrates the optimal leadership vector which has profound impact upon others. The FRLM displays the interrelationships of the various leadership behaviors measured by the MLQ 5X.

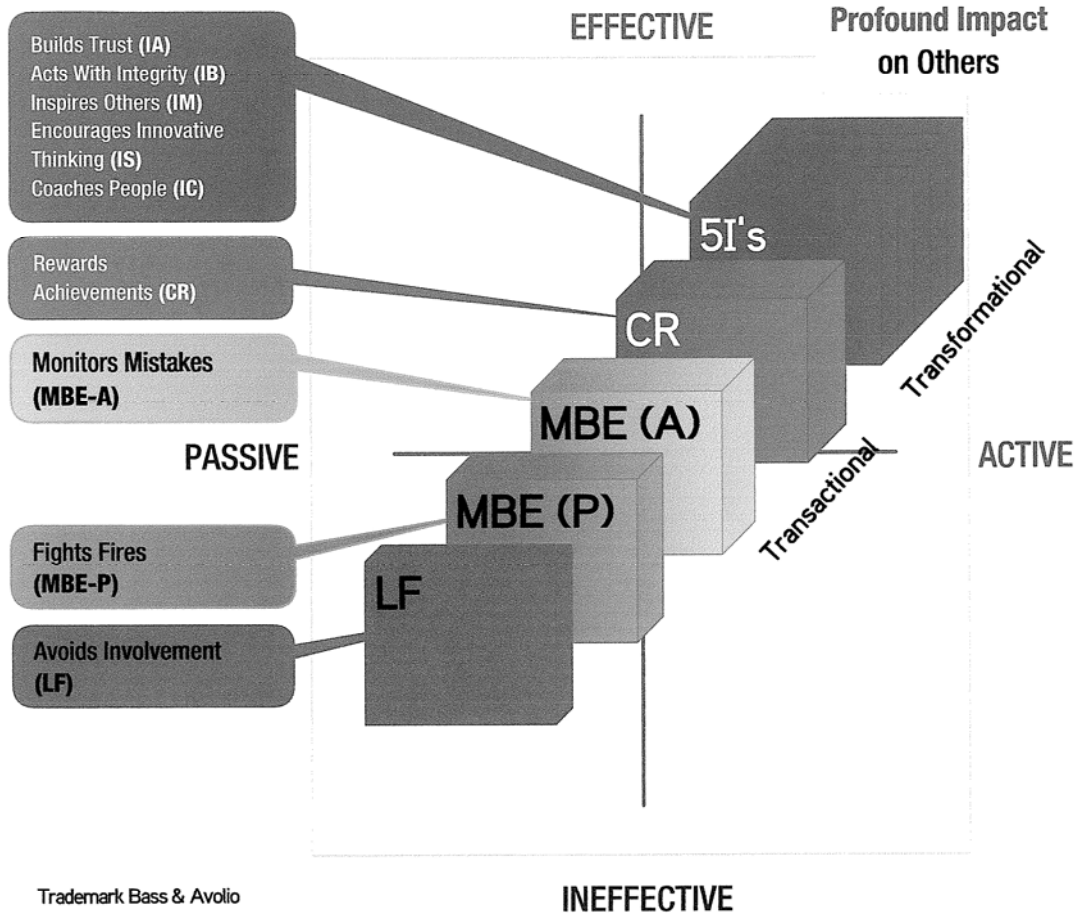
The FRLM displays suboptimal to optimal range (right to left) of leadership behaviors with regards to their impact upon others. Effectiveness is shown from top (more effective) to bottom (ineffective) with regards to the impact of leadership behaviors on others. The blocks within the FRLM display leadership behavior subfactors comprising transformational, transactional, and laissez-faire leadership behaviors. Further the FRLM illustrates the relative relationship of passive leadership behavior (laissez-faire) to active leadership behavior (transformational).

Figure 2: The Full Range Leadership Model™

# The Full Range Leadership Model™

The size of each box matters: Its volume represents the exhibited frequency of that style.

Suboptimal ————— Optimal



Source: MLQ International: Full Range Leadership Model, (XHTML flash). Melbourne. This model media property of MLQ Pty Limited; used with permission (Appendix A) and may not be copied or distributed without prior written consent of MLQ.

## **Questions Emerging from the Research**

There is general agreement that leadership, and specifically military leadership, can be measured using the MLQ; however, Wong, Bliese, and McGurk (2003) raise an interesting point: measurement of leadership is specific to the context of the level of the organization it is measuring. Wong et al.'s review of leadership literature, though written in a U.S. Army framework, raises the point that leadership must be measured from a systems organizational and direct leadership construct in the context of the external environment of critical tasks, individual capability, and organizational culture which all combine to measure organizational effectiveness (p. 661). Though he offers no proof, it raises additional questions for military leadership research. Further in their review, Wong et al. discuss the value of transformational leadership when predicting unit performance.

There has been much research on defining a leader and defining what leadership is, but one of the more important factors alluded to in the research has been the effect of leadership on organizational effectiveness. Shamir et al. (1998) found that in Israeli military forces transformational leadership positively affected unit morale and trust which in turn made for a more effective fighting force. While Bass et al. (2003) successfully proved that transformational and transactional leadership ratings of lower level leaders in the U.S. Army positively predicted unit performance.

Since 1985, when the MLQ was developed by Bass, it remains the mostly used gauge of transformational and transactional leadership by measuring subfactors. These subfactors, in general, provide a highly correlated analysis of leadership. However, the MLQ is not without issues. Avolio, Bass, and Jung (1999), in their re-examination of the

subfactors of the MLQ, expressed both concern and evidence to support “low discriminant validity among the transformational and transactional contingent reward leadership scales (p. 457)”. The issue is whether contingent reward is part of a lower order transformational leadership or is it part of the transactional leadership factor. This issue has not been resolved conclusively with any degree of certainty either way.

“On the basis of goodness-of-fit statistics to test the MLQ 5X, Carless (1998) observes, the subscales of the MLQ 5X were highly correlated with a high proportion of the variance of the subscales explicable by a higher-order construction” (p. 353). She states that the MLQ 5X does not measure distinct transformational leader behaviors, but rather just degrees of transformational leadership which renders the individual subfactor scores meaningless (p. 357). Carless and others have also stated that there is discriminant validity in that charismatic leadership is a function of perception by the subordinate rather than an explicit rated subfactor. Her assessments were based upon various models of the MLQ and not solely on the MLQ 5X model.

In a similar vein, Metcalf and Metcalf (2001) in developing their new Transformational Leadership Questionnaire (TLQ) found in their United Kingdom (UK) public service based research (N=1464), that even though there were similarities in factors, there were significant differences in the measurement of subfactors in their TLQ versus the MLQ. The TLQ found a difference in their UK measurement based upon what the UK leader does for the subordinate individuals rather than the U.S. approach of the leader being an inspirational role model. They felt that there was a problem of discriminant validity that should be further investigated either as a cultural issue or, more

probably, an issue of leadership measurement, i.e., what leadership subfactor is being measured.

In summary, the issue raised today is not unlike the issue raised years ago: how do you measure leadership? In the literature, the MLQ 5X is arguably the “golden yardstick” by which to measure leadership behavior factors. However, there is much discussion on exactly what it measures. The differences generally reflect tangentially on those measurements, for example which category of leadership should Contingent Reward leadership be placed? It is not the measure that is in question, but rather its placement. There is some concern as to how universal the measurements are, i.e., do they apply to everyone in all situations and does the instrument measure the same leadership behavior in each circumstance? As leadership measurements have evolved over the years, the MLQ will undoubtedly be refined over the years.

## **CHAPTER III**

### **METHODOLOGY**

This chapter describes the methods used to compare leadership behaviors between top commissioned and top noncommissioned officers. This chapter addresses the research design for this investigation, research questions, hypotheses, the manner in which investigated, the dependent and independent variables under study, data collection process, and the sample population characteristics at the focus of this research.

#### **Research Design**

This study is an exploratory, comparative study that examines leadership factors of top noncommissioned officers (E8, senior master sergeants and E9, chief master sergeants) and commissioned officers (O5, lieutenant colonels and O6, colonels) in key leadership positions at the 52<sup>nd</sup> Fighter Wing at Spangdahlem Air Base, Germany. The unit of analysis was groups. Additionally, leadership styles were examined to determine the extent to which there are similarities and differences in the behavioral leadership dependant variables using Avolio, Bass, and Jung's MLQ 5X (1999) to measure leadership behaviors of top commissioned and top noncommissioned officers.

#### **Research Questions**

This research investigated:

Research Question 1. What are the leadership factors of top commissioned officers? The assumption was that officers would have a more outwardly focused approach to leadership in their respective organizations and, therefore, would have broadly defined transformational leadership factors. Transformational

leaders engender a deeper sense of commitment and trust, thereby increasing organizational sustained performance during stressful times supporting mission-oriented tasks. They then are more extra-organizationally focused.

Research Question 2. What are the leadership factors of top noncommissioned officers? The assumption was that noncommissioned officers would be more inwardly focused on specific job tasks and would therefore, be transactional leaders. As defined by Bass et al. (2003), transactional leadership clarifies expectations and offers recognition when goals are achieved and is positively related to follower's commitment, satisfaction, and performance which are intra-organizationally

Research Question 3. What leadership behaviors do top commissioned and noncommissioned officers have in common? The assumption was that both COs and NCOs would have some leadership factors in common, but would predominately be either transformational or transactional leaders.

Research Question 4. What leadership behaviors differ in top commissioned officers and noncommissioned officers? The assumption was that COs and NCOs would display different leadership factors, but would be either transformational or transactional leaders.

Research Question 5. What organizational situations are more suited to which category of leader? The assumption was that different leadership behaviors would be more applicable to certain organizational situations



## **Research Hypotheses**

This study measured the leadership behaviors of two groups of fighter wing military leaders; the following questions were addressed by the study:

Hypothesis 1: Top commissioned officers are more likely to be transformational leaders than top noncommissioned officers

Hypothesis 2: Top noncommissioned officers will more likely be transactional leaders than top commissioned officers

Hypothesis 3: The higher a person's education, the more likely they will be a transformational leader

Hypothesis 4: The longer time a person has in service, the greater likelihood they will be a transformational leader

## **Specification of the Variables**

Dependent Variables. Dependent variables in this study were:

1. Transformational leadership factors “refers to the leader moving the follower beyond immediate self-interests through idealized influence (charisma), inspiration, intellectual stimulation, or individualized consideration” (Bass, 1999, p. 11). Idealized influence was measured as idealized influence (attributed) and idealized influence (behavior) as measured by the MLQ 5X-Short.
2. Transactional leadership factors “refers to the exchange relationship between leader and follower to meet their own self-interests” (Bass, 1999, p. 10). Transactional leadership in this study measured contingent reward behavior,

management by exception (active), and management by exception (passive) behavior as measured by the MLQ 5X-Short.

3. Laissez-faire leadership factors refers to “waiting for problems to arise before taking corrective action or . . . avoids taking any action” (Bass, 1999, p. 11).

This was measured by the MLQ 5X-Short.

Independent Variables. Independent variables in this study were:

1. Rank – This is depicted by lieutenant colonel (05), colonel (06) aggregated to commissioned officers, senior master sergeant (E8), and chief master sergeant (E9) aggregated to noncommissioned officers.
2. Education – This is measured by selecting from categories (a) less than high school, (b) high school, (c) some college, (d) baccalaureate degree, (e) some graduate work, (f) masters degree, (g) doctorate or equivalent, (h) other.
3. Time in Service – This is measured in years by selecting from categories (a) 10-14, (b) 15-19, (c) 20-24, (d) 25-30, (e) 31 and over.
4. Gender – This is measured by indicating either male or female.
5. Ethnicity/Race – This is measured by selecting from categories (a) African-American (Non-Hispanic), (b) Caucasian (Non-Hispanic), (c) Hispanic, (d) Asian, and (e) Other.
6. Age – This is measured in whole years.
7. Months in Current Leadership Position – This is measured by selecting from categories (a) Less than 1, (b) 1-5, (c) 6-10, (d) 11-15, (e) 16-20, and (f) 21 and over.
8. Years in the USAF – This is measured by selecting from categories (a) 10-14,

(b) 15-19, c) 20-24, (d) 25-30, and (e) 31 and over.

9. Duty Title – This is measured by selecting from categories (a) Commander, Detachment Commander, (b) Vice Commander, Deputy Commander, (c) Flight Commander, Section Commander, (d) Division Chief, Branch Chief, (e) Superintendent, NCOIC, and (f) Flight Chief, Detachment Chief.

### **Sample**

The sample for this study was taken from members of a USAF 52<sup>nd</sup> Fighter Wing in Germany. The Fighter Wing is the home of three fighter wings, a tactical radar squadron, and more than 5,500 military and civilian personnel. Approximately 140 commissioned officers (lieutenant colonel and colonel) in top leadership positions and noncommissioned officers (senior and chief master sergeants) in top organizational leadership positions were asked to participate in the research.

The sample was generated by the 52<sup>nd</sup> Fighter Base Support Squadron personnel office in accordance with the researcher's criteria, which was that participants must: (1) be active duty of O5, O6, E8, or E9 rank, (2) be attached to the Fighter Wing, (3) have a date of return from overseas (DEROS) after January 1, 2010, and (4) hold key leadership positions within the base organizations. Overall, 14 of 18 military organizations belonging to the base were part of the population surveyed.

The sample list contained information on 142 eligible names along with unit description, office symbol, duty phone, and duty title. Of the initial personnel, a total of 6 officers and noncommissioned officers were eliminated because they, though working on the air base, were not part of the 52<sup>nd</sup> Fighter Wing command authority and could not

be included in this research. The remaining 136 officers and NCOs were provided leadership questionnaires to their offices through the base mail and distribution system.

Since the voluntary questionnaire set did not require specific signed informed consent by each respondent, in its place an information sheet for consent (implied consent) to participate in a research study was provided displayed in Appendix B. Participation was voluntary and participants were informed in the information sheet that they could withdraw from participating at any time without penalty of any kind. Individual participants were unknown to the researcher.

### **Data Collection**

In this study data was collected using a commercially obtained leadership measurement instrument and a researcher created demographics questionnaire. This section discusses the data collection instrumentation, the process involved in distributing the questionnaires, and the time frame involved in the entire approval, distribution, and receipt process.

**Instrumentation.** The following instruments were used in this study:

1. MLQ 5X-Short, Leader Form. Instrumentation of this research consisted of 150 commercially purchased, copyrighted MLQ 5X-Short, Leader Form from Mind Garden, Inc. An illustration of questions is contained in Appendix C. Due to copyright provision restrictions (appendix D) only three representative questions of the 45 questions are exhibited. In this study commissioned and noncommissioned leaders' perception of leadership behaviors were measured using the commercially obtained Multifactor Leadership Questionnaire instrument for each participant to determine prevalent transformational, transactional, passive/avoidant leadership behaviors.

Specifically, the MLQ Leader Form (MLQ 5X-Short), which is a self-rating form of the MLQ 5X, was used to measure perceived leadership behaviors of transformational leadership using four leadership subfactors—individualized influence (attributed and behavioral) inspiration motivation, intellectual stimulation, and transactional leadership using two leadership subfactors—contingent reward, management-by-exception (active). Other leadership subfactors were measured but not used in this study.

The MLQ 5X-Short has been selected because it is currently the most commonly used tool in this particular area of study (Northouse, 2003). Studies indicate wide use by numerous researchers (Metcalf & Metcalfe, 2001). The MLQ measures the entire spectrum of leadership styles and behaviors, which comprise four transformational components. According to Mind Garden (2007), “. . .the MLQ 5X-measures a broad range of leadership types . . .and identifies the characteristics of a transformational leader. . .” (p. 1), as well as transactional and passive/avoidant leadership behaviors.

The MLQ 5X has two separate forms which are used to assess the self-rating leader and the other-rating leader. Both forms are identical in make-up of questions, except the self-rating leader form (MLQ 5X-Short) is written in the first person tense. The MLQ 5X-Short was used in this research. The MLQ 5X-Short questionnaire consists of 45 descriptive statements and asks the respondent to relate the frequency of that statement on a Likert scale (0=not at all, 1=once in a while, 2=sometimes, 3=fairly often, 4=frequently, if not always).

The predictive validity and reliability of the MLQ 5X has been heavily researched and found support for the productive relationships. Avolio et al., (1999) found that the MLQ 5X survey measured the leadership factors it was developed to assess. Avolio found that

the more detailed leadership factors of the MLQ 5X increased the recognition of the actual range of leadership styles that are exhibited across organizational settings.

Antonakis, Avolio, & Sivasubramaniam (2003) examined the validity of the FRLM nine-factor MLQ 5X, used in this research and found "...strong and consistent evidence that the nine-factor model best represented the factor structure underlying the MLQ (Form 5X) instrument" (p. 283). They measured a specific sample set labeled high bureaucratic conditions, i.e., organizations with high organizational structure which consisted of military recruiting units, government research organizations, public telecommunications companies, and not-for-profit agencies confirmatory factor analysis which has advantages over multivariate techniques in that it tests contextual variables and the prevalence of same factor structure among samples. Antonakis et al. measured chi-squared ( $df=144$ ,  $n=1591$ ) = 865.32,  $p>.01$ ; chi-squared/ $df$  = 6.01; CFI (comparative fit index) = .946; and RMSEA (root mean square error of approximation) = .056. In a goodness-of-fit analysis, Antonakis et al. found for groups including military platoons, for  $N = 502$ , chi-square = 75.24 ( $df = 36$ ), a CFI of .991, meaning almost a perfect correlation of measurement.

The MLQ 5X-Short is a self-reporting questionnaire normally used in a 360<sup>0</sup> environment. It is the foci of superior and subordinate raters; it reveals the rater's views of their leadership behaviors versus how their leadership is perceived by subordinates and superiors. In this research, the MLQ 5X-Short instrument was used to measure individual's perception of their leadership behaviors without higher or lower ratings.

2. Demographics Questionnaire. The demographic questionnaire was designed to elicit general information such as gender, time on station, rank, time in service,

education level, and leadership position (Appendix E). The demographic questionnaire augmented the MLQ 5X-Short Form to determine what other items maybe influencing leadership factors identified by the MLQ 5X.

Neither the demographic questionnaire nor the MLQ 5X-Short Form bore any control number or identifier so as to ensure anonymity and not identify a respondent to a questionnaire package. The researcher was the only person with access to the initial distribution and receipt of the research packets.

**Data Gathering Process.** Research packets were mailed to 136 top commissioned and noncommissioned officers selected to take part in the study to their wing office address. These research packets consisted of a cover letter, consent form, MLQ 5X questionnaire, demographic questionnaire, thank you memo (Appendix F), and a military postal service return envelope. Potential participations were asked to complete and return the questionnaire by October 16, 2009. Returned packets were submitted to the researcher by the military mail system to the researcher's personal post office box.

**Approval Process.** Since this study involved research on a military installation on military personnel, special provisions were required to obtain concurrence to do research using USAF personnel on an air base located in Germany. The research approvals pursued by this researcher took nearly one year from the time of initiating a request for approval from air base officials and the USAF to conduct research on a USAF installation using USAF personnel. The four-part approval process involved obtaining USAF approval to conduct research on USAF personnel, USAF approval to conduct research on a USAF installation, approval by the Commander of the Fighter Wing to allow research

on base specific personnel, as well as OU's Institutional Review Board (IRB) approval for human research.

The USAF approval process to allow research on human subject is defined under AF Instruction (AFI) 40-402 (AFI40-402, 2000) and requires researchers desiring to use USAF military members in human research to obtain Headquarters USAF Surgeon General's review or approval, as appropriate. The AFI 40-402 provides guidance and procedures for conducting research using human subjects in research test and ensures compliance, on AF installations, of 45 CFR 46. The AF Surgeon General's Office of Research Oversight and Compliance Division (AF/SGRC) is responsible for review of all research conducted on an Air Force installation. The AF Surgeon's office would not review or approve this research until after the University of Oklahoma's institutional review board (IRB) approval on September 16, 2009. The Surgeon General's review process was initiated May 1, 2009, but their review was not concluded until September 18, 2009 (Appendix G).

The Headquarter USAF approval process to allow research on an Air Force installation is governed under AFI 36-2601 (AFI36-2601, 1996). This AFI provides guidance on conducting attitude and opinion surveys within the Air Force. The program is managed by the Air Force Manpower and Personnel Programs (AF/MAPP) at Randolph Air Force Base, Texas. Their program is structured to ensure survey responses are kept confidential and no adverse actions will result from an individual's response to an Air Force Survey. AF/MAPP provided the following guidance and deferred concurrence to conduct research at the air base in Germany to the Commander of the 52<sup>nd</sup> Fighter Wing:



...Commanders do not need approval from HQ AFPC/DPSAS (now HQ AFMA/MAPP) to conduct or release local surveys conducted only on a single base and covering only aspects of base activities that the commander has the authority to change. It appears that your survey falls within these parameters, i.e., 1) is only conducted with personnel assigned to the 52<sup>nd</sup> FW and 2) covering the leadership style of key leadership positions within the authority of the installation commander to change. As such, a Survey Control Number is not required from the AF Survey Office. However, approval to conduct the survey is required by the . . . FW/CC...(AFI36-2601,1996, p. 3).

The Fighter Wing Commander's approval process commenced in May 2009 and concluded with his approval letter on August 14, 2009. Commander's approval, USAF Surgeon General's review, and OU IRB's approval were conducted in parallel because of administrative time considerations for obtaining multi-level, interrelated coordination approval processes. The commander required specific language to be inserted into the questionnaires and his approval letter. This revision required re-coordination at the University of Oklahoma's IRB and with the USAF Surgeon General's office. His requested caveats were included in the banner of the MLQ 5X and in his approval letter (Appendix H).

OU IRB approval was granted on September 16, 2009 (Appendix I). However, before AF/SGRC would conclude their review or provide a decision, they requested documentation from OU's IRB that all provisions of the Code of Federal Regulations had been addressed as well as USAF unique provisions had been addressed. After receiving

the OU IRB approval on September 16, 2009, AF/SGRC concluded their review on September 18, 2009. This again required review by the OU IRB to ensure no changes were incorporated which would necessitate their review. The final review, concurrence, and approval of all stakeholders allowed the researcher to proceed in ordering the questionnaires, printing and preparing research packets for distribution to senior commissioned officers and senior noncommissioned officers in key leadership positions on the base on September 21, 2009.

Obtaining personnel distribution information of the target population was illusive. The researcher's request for identifying the sample population was made in June 2009 after verbal permission to proceed was obtained from the 52<sup>nd</sup> Wing Commander; however, because there was a reluctance to release personal information, no action was taken until the researcher received the Fighter Wing Commander's approval in writing and presented it to the Base Personnel Office in September 2009. Several attempts in obtaining a distribution list were rebuffed citing Privacy Act and interagency coordination issues. Personal postal address information of Fighter Wing's personnel was not provided because of Privacy Act considerations. It was not until the base Staff Judge Advocate General intervened that action was initiated; a "for public distribution" list of the sample population was provided to the researcher on September 17, 2009.

**Time Frame.** The researcher recognized that permanent changes of station take place continuously, but since the normal tour length is at least two years for top commissioned officer and noncommissioned leaders, the researcher felt that time in position (time on the job) was not a significant factor in soliciting the individual's leadership perspective. The data was collected after the routine summer personnel rotation of target sample military

personnel (July and August). Therefore, any relative lack of experience, short time in position, or short time on station did not have any significant impact on the data collected since the MLQ measures leadership perception versus performance.

The suspense of the initial response was three weeks after the initial distribution to the base's information transfer system. The suspense date was selected by considering the average amount of time for the research packets to arrive and return from the participants' office, the Columbus Day holiday, and two weeks to complete the questionnaire. Data collection actually took place between October 16, 2009 and December 31, 2009.

Because of the real-world operational tempo of the air base two extensions of the original October 16, 2009 suspense date were allowed. The research questionnaire was originally provided to the target population through the base mail system on September 29, 2009 with a requested return date of October 16, 2009. However, because of the minimal initial response, a follow-up mailing reiterating needed participant's response was made on November 2, 2009 with a second suggested suspense date of November 17, 2009 annotated. This memo outlined the statistical imperative to have as many responses as possible because of the small sample population and urged each participant to complete and return the questionnaire immediately. The third suspense was an informal one. The researcher processed responses as they came in throughout the remaining part of December 2009. This was felt necessary, as many fighter wing and air base airmen were returning from extended deployments during this period. This extended suspense management, thought not desirable from an efficiency stand point, was practical from a

data base stand point. There was no negative impact other than on timeliness of analysis on keeping the suspense open until after the deployment period.

A planned return rate of about 53% was desired and deemed necessary to facilitate statistical significant sample size accuracy. This would have required receipt of 72 questionnaires which would have been large enough ensure equitable distribution of the sample population and protect against statistical anomalies within the data sample. In order to attempt to achieve this statistical distribution, the suspense was progressively extended from October 16 to December 31, 2009. The original questionnaire suspense of October 16, 2009 generated 33 responses. The second November suspense provided an additional 14 responses. The third informal suspense was created by the participants themselves. During the November/December time frame a significant deployment terminated and many air base's COs and NCO returned from deployment. Some asked if the researcher was still taking responses and some simply completed and mailed the original questionnaire responses. The last informal suspense resulted in receiving 10 additional questionnaires for a total cumulative response of 57.

## **CHAPTER IV**

### **RESULTS**

This section describes the data management, findings of the research. First, the demographic information is presented and discussed. Then there is a description of the pre-analytic procedures that were employed. Finally, the data analysis is explained. Research packets were processed and managed by the researcher only, thus minimizing administrative error issues and spurious mistakes. A log was kept on each research packet received; each questionnaire was annotated with a sequential receipt number by the researcher. Sequential numbering was used to track the number of returned research questionnaires. Dating of the questionnaires was for the convenience of the researcher to determine the rate of return flow of the questionnaires in comparison to real-world activities on the base which might affect questionnaire completion. As each research questionnaire was received it was reviewed for completeness and face validity of the answers by reviewing the demographic questionnaire for obvious disparities by comparing rank and duty title selected, years in service against grade of respondent.

#### **Demographics**

Fifty-seven questionnaires were returned. One questionnaire received from an NCO did not have the back half of the form completed, thus this participant was eliminated from the sample. Therefore, the final return rate for the sample of 56 was 41.2%.

The demographic information collected was nominal level and included rank, age, gender, years in service and years in current position. In order to determine whether the sample was similar to the population, frequency distributions which included number of

observations and percentages were calculated using the Statistical Package for the Social Sciences (SPSS) – version 11. Charts were prepared using Microsoft Excel.

The analysis of the population sent questionnaires versus the sample returning questionnaires (Table 1) revealed that commissioned officers represented 41.1% of the total received while the NCOs represented 58.9% of the total received. This compared to a total commissioned population of 37.5% and a total noncommissioned officer population of 62.5%, a difference of only about 3% between the population and sample for both commissioned officers and noncommissioned officers.

Table 1. Questionnaire Response Rate by Rank and Grade (N=136, n=56)

Grade	N	% N <sub>T</sub>	n	% N	% of n <sub>T</sub>
CO					
Col(O6)	12	08.8	05	41.7	08.9
LtCol(O5)	39	28.7	18	46.2	32.1
Subtotal	51	37.5	23	45.1	41.1
NCO					
CMSgt(E9)	22	16.2	10	45.5	17.9
SMSgt(E8)	63 <sup>a</sup>	46.3	23	36.5	41.1
Subtotal	85	62.5	33	38.8	58.9
Total	136	100	56	41.2	100

<sup>a</sup>one respondent did not complete the questionnaire; therefore, it was not considered for any analysis or totals

%N<sub>T</sub> = percent of total N

%n<sub>T</sub> = percent of total n

As shown in Table 1, within each group's rank the percentages of questionnaires received were consistent with the population number of questionnaires submitted. colonels represented about 8.8% of the on-base population and 8.9% were received. lieutenant colonels represented about 28.7% of the population with 32.1% received. chief master sergeants represented 16.2% of the population and 17.9% returned

questionnaires. senior master sergeants were 46.3% of the population and returned 41.1% of the questionnaires.

The USAF 2007 Handbook lists the, (total force) commissioned officer (all ranks) to enlisted (all ranks) (2007, p. 261), ratio as 19.7% compared to 79.1%. The study's population was 37.5% to 62.5%, respectively, which was different than the total force, but comparable to the study's sample with a 41.1% to 58.9%, respectively. It appears that the disparity between the total force percentage and the population and sample ratios is due to the fact that the total force numbers consider all ranks, lieutenants through general and airmen through chief master sergeant rather than just top level COs and NCOs considered in this study. However, as noted before, the comparison between population and sample is fairly similar. Therefore, for the rest of the demographic information the sample will only be considered in comparison to the population of the overseas base from which it was drawn.

**Gender.** As shown in Table 2, the gender breakdowns of male and female COs and NCOs for the sample percentages are similar to the population percentages. The percentage of the population and sample percentages are nearly identical, 90/10 versus 91/09 percent, respectively.

Table 2. Gender by Rank ( $N=136$  versus  $n=56$ )

Grade	N		%N <sub>T</sub>		n		%ofn <sub>T</sub>	
	M	F	M	F	M	F	M	F
CO								
Col(O6)	09	03	07	02	05	00	09	00
LtCol(O5)	32	07	24	05	14	04	25	7.1
NCO								
CMSgt(E9)	21	01	15	01	10	00	18	00
SMSgt(E8)	60	03	44	02	22	01	39	1.8
Total	122	14	90	10	51	05	91	09

Within each grade the percentages are consistent between the population and sample. colonels of the population were 7% male and 2% females. The sample returned 9% male with no female respondents. lieutenant colonels had 24% males and 5% females and the sample had 25% and 7.1%, respectively. E9s had a population of 15% male to 1% female and the returned sample consisted of 18% with no female respondents. The E8 population had 44% males and 2% females. The E8 sample contained 39% male and 1.8% female.

These percentages reflect closely with the USAF population described in the Air Force Handbook (2007, p. 262). The Air Force indicates that the AF population (total force) by gender is 80.3% male and 19.7% female versus the study ratio of 91% to 9%, respectively. The USAF female officer (total force) versus enlisted female (total force) ratio is 47.9 to 52.1 percent; in this study, considering top commissioned officers and top NCOs, it was 80% female commissioned officers to 20% female noncommissioned officers. The disparity in percentages is likely due to there being more females in the more junior ranks. The male Air Force (total force) officer versus male enlisted



percentage is 50.5% to 49.5% as compared to the sample percentages of 33% to 67%, respectively. Again, the difference in AF to research sample percentages is the total USAF in all ranks as compared is likely due to the fact that this study focused only on senior level COs and NCOs.

**Ethnicity.** Ethnicity of the sample group was not known. The population provided to the researcher did not contain any ethnic identifiers. The only ethnic data was contained within the demographic questionnaire (Table 3). This data revealed that ethnicity compared favorably with the USAF total force (2007, p. 263). In the total force African-Americans comprise about 14.8% as compared to almost 11% in this study. The sample population consisted of about 82% Caucasian versus the total force of about 75%. There were fewer Hispanic respondents in this study versus the total force in the Air Force (3.6% versus 8.8%). Asians and Other category comprised of 3.9% versus the Air Force's 5.3%. The USAF total force reflects all ranks in all grades; the assumption was the USAF percentages would carry through the entire rank and grade structure.

Table 3. Demographic by Ethnicity by Rank (*n*=56)

Ethnicity	% N <sub>AF</sub>	n	% of n <sub>T</sub>
African	14.8	6	10.7
Asian	02.3	0	00.0
Caucasian	74.4	46	82.1
Hispanic	08.8	2	03.6
Other	03.0	2	03.6
Total	<sup>a</sup>	56	

<sup>a</sup> total force total greater than 100% based upon multiple category responses

**Age.** As shown in Table 4, age was consistent with rank and time in service within the sample. A comparison with a USAF age by rank or grade is unavailable. However,

age is a function of time in service, i.e., the more senior a military member is, the older they will be, except in very unusual circumstances. Promotion to the next higher rank involves a variable amount of “in grade” time before the member can be considered for the next rank.

Table 4. Demographic by Age by Rank ( $n=56$ )

Grade	Mean	SD	Min	Max
CO	43.3	4.82	36	54
NCO <sup>a</sup>	41.7	3.18	37	47

<sup>a</sup> one respondent did not provide an age;

**Time in Service.** The sample group’s time in service was similar (Table 5) to each other. Time in service is a function of rank. The USAF promotion system has automatic time in grade

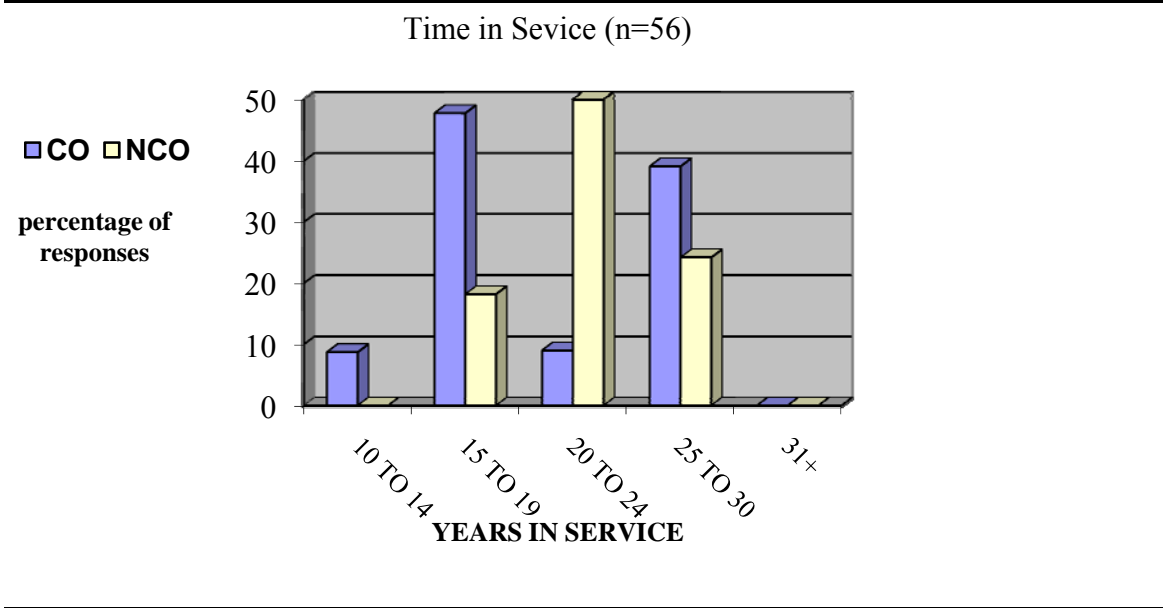
Table 5. Time in Service by Rank ( $n=56$ )

Grade	n	10-14yrs	15-19yrs	20-24yrs	25-30yrs
CO	23	02	11	09	01
%n <sub>CO</sub>		8.7	47.8	39.1	4.3
NCO	33	00	06	19	08
%n <sub>NCO</sub>		0.0	18.2	57.6	24.2

requirements for promotion to the next rank. For colonels it is around the 17 to 22 years, while for lieutenant colonels, it is between 15 and 20 years in service. Promotion for commissioned officers is based upon performance, positions held, and time in grade. For chief master sergeants, promotion is between 18 to 30 years and for senior master sergeants, 15 to 30 years. Promotion for noncommissioned officers is based upon performance, time in grade, and promotion test scores. For all CO and NCOs, retirement is at the 30 years time in service point, with very few exceptions below the general officer and CMSgt of the Air Force level. The sample population reflects that CO’s

median years in service were 15 to 19 years, whereas the NCO median years in service were 20 to 24 years as illustrated in Figure 3.

Figure 3. Time in Service by Rank



**Time in Current Leadership Position.** Months in a current leadership positions for the sample were fairly equal distributed between the commissioned and noncommissioned officers (Table 6). Time in positions is variable in the USAF because leaders are positioned as

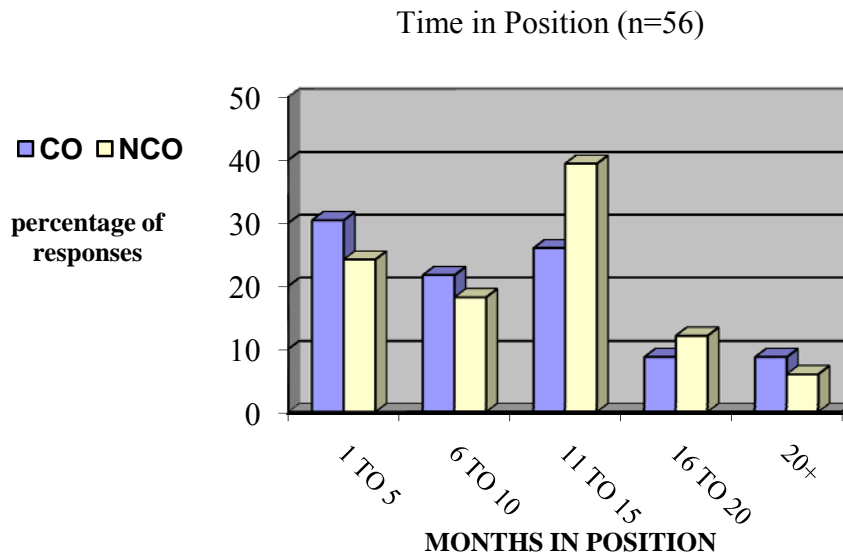
Table 6. Time (Months) in Current Leadership Position by Rank (n=56)

Grade	n	<1Mo	1 to 5Mos	6 to 10Mos	11 to 15Mos	16 to 20Mos	21+Mos
CO (n=23)	23	01	07	05	06	02	02
NCO (n=33)	33	01	07	05	13	05	02

opportunities or situations exist. Time in position is consistent with the USAF policy of reassigning top leadership personnel every two years to three years. As shown in Figure

4, sample NCOs were likely to be in their current positions slightly longer than their CO counterparts.

Figure 4. Time in Position by Rank



**Education.** Academically, this study sample reflects the Air Force population (Table7). One hundred percent of the sample had a baccalaureate degree and 100% had a master’s degree or better. The USAF has, as a minimum requirement, a bachelors degree to become a commissioned officer. Over 26% of the commissioned officers had a doctorate degree. The USAF had a total force percentage with a master’s degree percentage of 91.5%, where as the sample had 100% with a master’s degree or better. The sample noncommissioned officers collectively had 93.9% of its members with

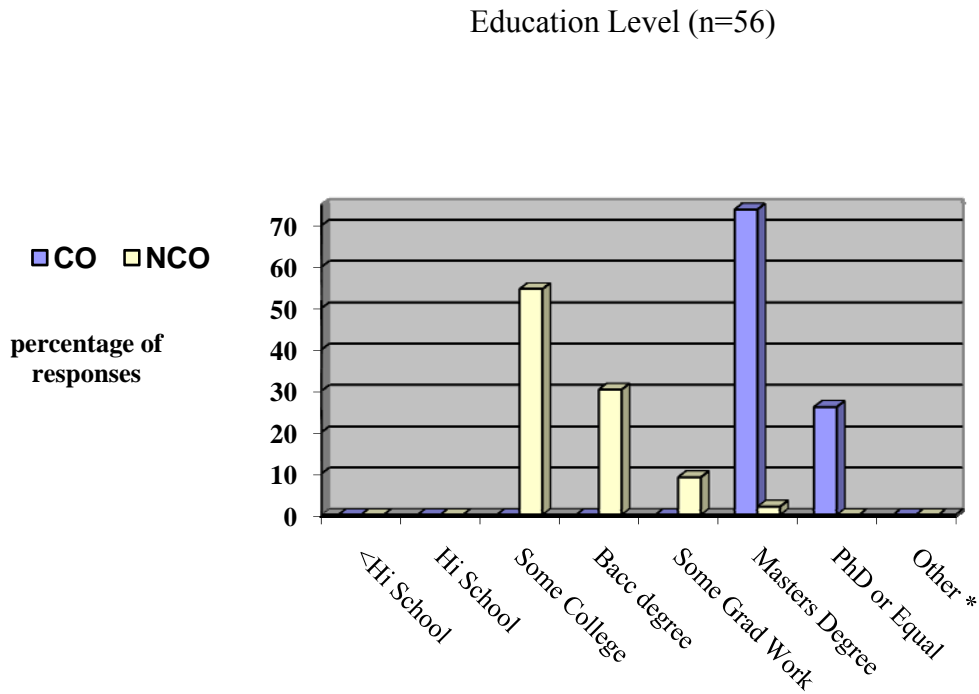
Table 7. Education Level by Rank (n=56)

Grade	n	< High School	High School	Some College	Bachelors Degree	Graduate Work	Masters Degree	Doctorate Degree
CO	23	00	00	00	00	00	17	06
%n <sub>CO</sub>		00	00	00	00	00	73.9	39.1
NCO	33	00	01	17	09	03	02	00
%n <sub>NCO</sub>		00	03	51.5	27.3	09.1	06.	00

high school through a bachelors degree compared with the AF percentage of 94.2%

(2007, p. 263). Six percent of the NCOs had a master's degree as indicated in Figure 5.

Figure 5. Education Level by Rank



\* 5 respondents annotated "other" as associate's degree; researcher moved to "Some College" for analysis

The sample was comparable in characteristics, distribution percentages of commissioned versus noncommissioned, distribution of percentages of grades within the commissioned and noncommissioned ranks, time in service, gender, race, and education to the USAF from which this sub-population is comprised. The percentages of surveys returned by grade and rank were aligned with the population, as were the gender, ethnic make-up, age, time in service, months in position, and education levels and were representative of the USAF total force. The total percentages received by grade and by rank were very reflective of the questionnaire percentage sent to the target population.

### **Data Preparation**

Scoring of each data packet was performed manually by the researcher using the Mind Spring Multifactor Leadership Questionnaire Scoring Key (5X) Short<sup>®</sup> (Avolio & Bass, 2004). Each leadership behavior was comprised of four questions. The scores of each behavior, for each respondent was averaged and recorded by hand on loose leaf paper. After all scores were tallied the scores were then transferred to a Microsoft Excel spreadsheet labeled by sequence number and each item in the leadership and demographics questionnaires for ease of statistical analysis. A group number was assigned to commissioned officers and the noncommissioned officers were assigned another group number to assist in statistical analysis. Individual entries were added as received.

Both parametric and nonparametric levels of measurement were used to assess the significant differences between commissioned and noncommissioned officers' leadership behaviors. The nonparametric data collected was nominal as it categorized two mutually exclusive groups—commissioned and noncommissioned officers. The nominal data was

described and analyzed using percentage calculations while frequency distribution observations determined the number of times each observation occurred.

### **Pre-analysis Procedures**

The dependent variables for the study were the subfactor leadership scores, idealized influence (attributed) (II (A)), idealized influence (behavioral) (II(B)), intellectual stimulation (IS), individual motivation (IM), individualized consideration (IC), contingent reward (CR), management by exception (active) (MBEA), and management by exception (passive) (MBEP). They were all Likert Scale and, therefore, interval measurement. Prior to organizing and analyzing the data preliminary screening was conducted. Missing data and methods for estimating the missing data or a decision to disregard it was made. Only seven instances of missing data were found and in only two cases was it germane. One incomplete questionnaire was received and it was excluded from any analysis. In three other questionnaires information regarding education was reassigned for the purposes of analysis. The individuals responded as “other” with associate’s degree annotated; these responses were tallied with the correct category of “some college” by the researcher. Three individuals, two commissioned and one noncommissioned officer, did not answer one question. One each commissioned and noncommissioned did not complete a question regarding leadership effort. This measure was not used in this research; therefore their lack of response was immaterial. A commissioned officer respondent failed to answer one question which consisted of four combined responses measuring management-by-exception (active) (MBEA) in which case the other three responses were averaged to determine that MBEA score average.

Additionally, one respondent did not annotate their age. Age analysis was made without that score.

The data were scanned not only for completeness but for any anomalies. Based upon a review of stem and leaf plots, there were no univariate outliers for the behavioral factor response scores. Intercorrelation matrices were calculated separately for transformational and transactional leadership subfactors to determine whether there was multicollinearity or singularity using Pearson's r method (product-moment correlation coefficient). As shown in Tables 8 and 9, there were no multicollinearity or singularity for any subfactors; therefore, each

Table 8. Multicollinearity Intercorrelations between Transformational Leadership Subfactor Scores ( $n=56$ )

Pearson's Correlation Method (product-moment correlation coefficient [r])		<b>II(A)</b>	<b>II(B)</b>	<b>IM</b>	<b>IS</b>	<b>IC</b>
<b>II(A)</b>	-----					
<b>II(B)</b>	.225	-----				
<b>IM</b>	.410(**)	.628(**)	-----			
<b>IS</b>	.334(*)	.598(**)	.571(**)	-----		
<b>IC</b>	.230	.478(**)	.473(**)	.588(**)	-----	

\*\*Correlation is significant at the .01 level (1-tailed)

\*Correlation is significant at the 0.05 level (2-tailed)

II(A) Idealized Influence (Attributed)

II(B) Idealized Influence (Behavior)

IM Inspirational Motivation

IS Intellectual Stimulation

IC Individualized Consideration

Transformational Leadership = II(A) + II(B) + IM + IS



behavior factor could be used for comparing the two groups. The lack of multicollinearity and singularity between behaviors was to be expected, because of the design of the MLQ instrument itself showed that these are separate but overlapping factors. The data were also examined to determine whether they met the assumptions for multivariate analysis. This analysis revealed that the data met the multivariate analysis assumptions of multivariate normality, homoscedasticity, linearity, and independence.

Table 9. Multicollinearity Intercorrelations between Transactional Leadership Subfactor Scores ( $n=56$ )

Pearson ' Correlation Method (product-moment correlation coefficient [r])	<b>CR</b>	<b>MBEA</b>	<b>MBEP</b>
<b>CR</b>	-----		
<b>MBEA</b>	.264(*)	-----	
<b>MBEP</b>	-.058	.030	-----

\*Correlation is significant at the .01 level (1-tailed).

\*Correlation is significant at the 0.05 level (2-tailed)

CR Contingent Reward  
 MBEA Management by Exception (Active)  
 MBEP Management by Exception (Passive)

Transactional Leadership = CR + MBEA + MBEP

### Data Analysis

The Statistical Package for Social Sciences (SPSS), Version 11.0, was used for statistical analysis. Instead of multiple t-test, two MANOVAs were calculated. Multiple

t-tests were not used to examine differences between groups, because multiple t-tests would inflate the alpha level, leading to a much greater possibility of a type 1 error. MANOVAs control the overall alpha level at  $\alpha=.05$ . The MANOVA manipulations normally work best on moderately correlated dependent variables, when dependent variables are not very high or very low, and when dependent variables are related. The MANOVA was appropriate statistical technique, since the independent variable was nominal and the dependent variables were interval level and were moderately correlated with each other. Therefore, two MANOVAs were performed to assess the significant differences between the groups with regards to transformational and transactional leadership behaviors, respectively.

A MANOVA was calculated to determine whether there was a significant difference between groups on the combined subfactors that comprise transformational leadership. The independent variable was rank (COs and NCOs). The dependent variables were idealized influence (attributed), idealized influence (behavioral), intellectual stimulation, individual motivation, and individualized consideration. Results of the overall MANOVA revealed that there were no significant differences between the groups on the combined dependent variables that compose transformational leadership (Wilks' Lambda=.929, Chi Square (5) = 3.80,  $p>.05$ ). Therefore, there was no significant difference between the COs and NCOs on the behavior subfactors of idealized influence (attributed) (II (A)), idealized influence (behavioral) (II (B)), intellectual stimulation (IS), and individual motivation (IM). Table 10 illustrates the overall MANOVA for transformational leadership behavior factors.

TABLE 10. Results of Overall MANOVA – Transformational Leadership Behavior

Subfactors

Test of Functions	Wilks' Lambda	Chi-square	df	Sig.
1	.929	3.800	5	.578

A MANOVA was calculated to determine whether there was a significant difference between groups on the combined subfactors that comprise transactional leadership. The independent variable was rank (COs and NCOs). The dependent variables were contingent reward (CR), management by exception (active) (MBEA), and management by exception (passive) (MBEP). Results of the overall MANOVA revealed that there were no significant differences between the groups on the combined dependent variables that compose transactional leadership (Wilks' Lambda=.907, Chi Square (3) = 5.131,  $p>.05$ ). Therefore, there was no significant difference between the COs and NCOs on the behavior subfactors of contingent reward (CR), management by exception (active) (MBEA), and management by exception (passive) (MBEP). Table 11 illustrates the Overall MANOVA for transactional leadership behavior factors between COs and NCOs. The result for transactional leadership, too, was not significant.

TABLE 11. Results of Overall MANOVA – Transactional Leadership Behavior Subfactors

Test of Functions	Wilks' Lambda	Chi-square	df	Sig.
1	.907	5.131	3	.162

Since the Overall MANOVAs indicated that there were no significant differences between the commissioned and noncommissioned perception of transformational or transactional leadership behaviors, no univariate analysis was appropriate because the F-

test would not be interpretable; therefore, no further additional analyses were performed. However, the univariate analyses for transformational and transactional leadership styles are shown for reference in Tables 12 and 13 respectively.

Table 12. Univariate Analysis – Transformational Leadership Behaviors

Behavior	Wilks' Lambda	F	df1	df2	Sig.
II(A)	.992	.434	1	54	.513
II(B)	.999	.057	1	54	.812
IM	.979	1.148	1	54	.289
IS	.997	.168	1	54	.683
IC	.993	.356	1	54	.553

II(A) Idealized Influence (Attributed)

II(B) Idealized Influence (Behavior)

IM Inspirational Motivation

IS Intellectual Stimulation

IC Individualized Consideration

Table 13. Univariate Analysis – Transactional Leadership Behaviors

Behavior	Wilks' Lambda	F	df1	df2	Sig.
CR	.999	.033	1	54	.856
MBEA	.921	4.658	1	54	.035
MBEP	.995	.274	1	54	.603

CR Contingent Reward

MBEA Management by Exception (Active)

MBEP Management by Exception (Passive)

## **CHAPTER V**

### **DISCUSSION**

This chapter discusses the results of this study. Additionally, the observations and implications of the findings, limitations of the research, and recommendations for future research related to comparative leadership studies are discussed.

#### **Discussion**

This study was to determine if key leaders, commissioned and noncommissioned officers, displayed different leadership behaviors and if that difference (if it existed) was correlated with either education levels or time in service. The first hypothesis expected that top commissioned officers would more likely be found to be transformational leaders as opposed to top noncommissioned officers. That was not the case. The second hypothesis expected that top noncommissioned officers would more likely be transactional leaders than top commissioned officers, but the null hypothesis prevailed. The transformationality and transactionality exhibited by both groups based upon time in service were equally unsupported by the data. Arguably, time in service would equate to experience and more experience would equate to greater exposure to leadership situations. However, there was not a significant difference in time in service between commissioned and noncommissioned officers to assess this measure.

The remaining hypotheses could be inferred from the data. The third hypothesis did not support that the higher a person's education, the greater the likelihood was that a leader would be transformational. The inference of the third hypothesis was that since behaviors were similar between commissioned officers and noncommissioned officers, education did not appear to be a factor in leadership behavior styles. Continuing

education is a promotion factor in both CO's and NCO's career. Commissioned officers and noncommissioned officers were just as likely to be transformational or transactional leaders with any level of education. Though there was significant difference in educational levels between the two groups of military members, education could not, in fact, be correlated with transformational or transactional leadership. In this sample education for commissioned officers two-thirds had at least master's degrees and nearly one-third had doctorates. The noncommissioned on the other hand had only 6% with a master's degree with nearly 45% having a baccalaureate's degree or better. Although the fighter wing sample seems to be a highly educated fighting force, education appeared to be an independent trait not bearing on leadership behavior.

The fourth hypothesis indicated that time in service will be correlated with transformational leadership. The underlying assumption of this hypothesis is that you would become more of a transformational leader with more seniority in the USAF. The group's age was a function of where they were in their USAF career and not a factor of leadership behavior. Time in service was not a predictor of leadership behavior styles.

There was no difference in leadership behaviors among the commissioned and noncommissioned groups under study. The group's leadership factors were in common and there was no differentiation in leadership behaviors with either group with regards to transformational or transactional leadership as hypothesized as can be seen in Tables 14 and 15.

Table 14. Mean Transformational Leadership Behavior Scores

Behavior Subfactor	CO n=23		NCO n=33		Normative Sample n=3,375	
	Score	SD	Score	SD	Score	SD
II(A)	3.0870	.65	3.1984	.52	2.95	.53
II(B)	3.1957	.54	3.1591	.58	2.99	.59
IM	3.1087	.63	3.2727	.51	3.04	.59
IS	3.1957	.50	3.2576	.59	2.96	.52
IC	3.3370	.56	3.2424	.60	3.16	.52

II(A) Idealized Influence (Attributed), II(B) Idealized Influence (Behavior), IM Inspirational Motivation  
IS Intellectual Stimulation, IC Individualized Consideration

$$\text{Transformational Leadership} = \text{II(A)} + \text{II(B)} + \text{IM} + \text{IS}$$

Table 15. Mean Transactional Leadership Behavior Scores

Behavior Subfactor	CO n=23		NCO n=33		Normative Sample n=3,375	
	Score	SD	Score	SD	Score	SD
CR	3.1848	.60	3.1591	.45	2.99	.53
MBEA	1.8000	.93	2.2700	.67	1.58	.79
MBEP	0.7717	.41	0.8485	.61	1.07	.62

CR Contingent Reward, MBEA Management by Exception (Active), MBEP Management by Exception (Passive)

$$\text{Transactional Leadership} = \text{CR} + \text{MBEA} + \text{MBEP}$$

Because both groups had similar leadership behaviors/ styles, a determination of which organizational situation was suited to which category of leader could not be made. It appears that either group could perform equally well in any situation calling for either a transformational or transactional style of leadership. Each of the hypotheses revealed that there was no difference in leadership behaviors, nor did education or time in service have any correlation for the two groups to display a particular leadership behavior. Both groups shared overall the same positive, effective scores on the subfactor level and the

aggregated behavior level neither dominated any subfactor or behavioral leadership level; in general each group differed minimally from each other, usually in the hundredths of a point. The exception was management by exception (active) by almost one-half point, where the noncommissioned officers could be considered more reactive to communicated issues than commissioned officers. There was no wide disparity between scores of the groups either individually or in aggregate. Further, in all instances leadership behaviors were higher than the MLQ normative score, but within one-half a standard deviation

In order to better understand and quantify the totality of transformation and transactional behaviors of commissioned and noncommissioned officers, the researcher aggregated the behavior scores by taking the respective scores of the sample groups' mean scores of their transformational subfactor behaviors and the mean of their transformational subfactor behaviors. These aggregated scores obtained from the Likert scaled response scores (from 0 to 4) from their respective behaviors were compared to the other group's transformational and transactional leadership behavior scores. The overall comparison allowed the researcher to determine which group was more transformational and transactional in their leadership behavior. With all transformational subfactor scores aggregated, the mean commissioned officers' score was 3.18 while the noncommissioned officers' score was 3.22, as shown in Table 16.

Table 16. Aggregated Leadership Behavior Scores (Averaged)

Behavior	CO n=23	NCO n=33	Normative Sample N=3,375
Transformational	3.18	3.22	3.02
Transactional	2.49	2.71	1.88

Transformational Leadership = II(A) + II(B) + IM + IS, Transactional Leadership = CR + MBEA + MBEP



This meant the noncommissioned officers were slightly more transformational than officers. Transactional subfactor aggregated scores were calculated to be 2.49 for commissioned officers and 2.71 for noncommissioned officers. Again, indicating that noncommissioned officers were slightly more transactional in their leadership behaviors than commissioned officers.

Analysis of both groups' leadership behaviors indicated that they were active and effective leaders who were equally versed in transformational as well as transactional leadership. The researcher assumed this was an indication of situational flexibility – the ability to apply the appropriate leadership style to a particular situation. The inference made by the researcher was that perhaps the noncommissioned officer was more flexible in their leadership behavior application. In general, the NCO has a greater span of control over a more diverse group of younger airman requiring more flexibility. This greater range of flexibility over a more diverse work force may over time foster more evolved leadership behaviors to get the mission accomplished than the commissioned officers who generally have management span of control over other officers or senior enlisted members. The implication of leading more mature USAF members necessitates less leadership behavior flexibility than their NCO counterparts.

Interestingly, the mean aggregated leadership subfactor scores for both transformational and transactional leadership behaviors were higher for the sample groups than the MLQ 5X, Sample Set for U.S. normative sample scores (Avolio & Bass, 2004, p.69). This was true whether looking at leadership scores individually by behaviors or aggregated to the transformational or transactional leadership behavior style level. The normative sample averages for transformational leadership behavior was 3.02

and 1.88 for transactional leadership behaviors. While behavioral leadership score differences were minimal between the commissioned and noncommissioned individuals, each subfactor group score was generally about ½ a standard deviation above the Normative Sample score. The data indicated that the USAF top commissioned and noncommissioned officers were higher in both transformational and transactional leadership behavior than the normative sample. This indicated to the researcher that the USAF leaders sample could provide more transformational or transactional leadership as the situation dictates. This further indicated that there is more leadership flexibility exhibited by the USAF leadership sample than the sample of the MLQ 5X Sample Set. This infers that the USAF has more opportunity to hone their leadership over time than the normative set and have, therefore, gained a broader leadership style.

There are many observations and implications of this study. The similarity of scores between groups suggests that this may be a function of USAF training. It may well be systemic that the USAF has a uniform manner of training commissioned and noncommissioned officers. For instance each group has parallel levels of schools, usually in-residence--senior service school for commissioned officers (O5-O6) and NCO (E7-E9) leadership school for noncommissioned officers. Prior to attaining that rank there are many equally parallel levels of leadership training which suggest the USAF grows its own leaders in a particular leadership mold. Further, the USAF selection system may be responsible for choosing a certain type of individual that has a propensity to lead in similar fashions. It may further be simply a function of life situation that allows one group an opportunity to go to college and “be qualified” to be a commissioned officer versus not going to college and becoming a noncommissioned officer. Again, the

uniformity in USAF training practices and approach may make groups equal in leadership behaviors. According to Wong et al., the military must grow its own leaders. With no lateral entry into its most senior positions, the military must ensure that leaders potential is identified and developed throughout the career of the leader (Wong et al., 2003, p. 667). USAF training may be a serendipitous consequence of military uniformity.

If there is indeed no difference in leadership behavior style between COs and NCOs, then the cost savings aspect of the USAF comes into question. Since it is less expensive to recruit and retain the noncommissioned officer cadre, should the NCOs have a greater share of leadership responsibility within a fighter wing. During critical economic considerations, it may be more cost effective to enhance NCO leadership and reduce CO leadership opportunities.

### **Limitations of the Research**

Every research study has its shortcomings. This one is no exception. Some of those limitations are captured below:

1. Geographic Location of the Sample. This study examines a USAF fighter base in Germany whose mission is to support the U.S. goals and objectives in Europe, Africa, and the Middle East. Other fighter wings in the United States and Pacific have different missions and slightly different organizational configurations. To extrapolate these findings to all fighter wings around the world may not be irrefutable. There may be biased findings given the limited geographic sample.
2. Lack of Generalizability. The participants do not represent a random sample taken from all of the USAF's fighter wings. Though the investigated fighter wing is the

largest fighter wing in Europe, it is not the largest in the USAF. Due to the limited sample size of this research sample, it cannot be assumed that these findings are applicable in a larger sense. Additionally, this is one of only three fighter bases in Europe and the only one in Germany. Fighter bases tend to develop their own identity and culture; therefore there may be unique elements of leadership at this fighter wing that does not exist at other fighter bases. The lack of randomness in fighter wing selection may not identify all the potential variance in this research. Further studies should validate these results to determine if they are or are not applicable to other leaders at other fighter wings.

3. USAF Organizational Bias. Since this is only a small segment of the entire USAF mission, it cannot be conclusively assumed that these results are applicable throughout the entire spectrum of missions and personnel of the USAF. On a much broader scale the USAF is comprised of many organizations each with a different mission. This study investigated leadership at a USAF fighter wing. There may be different leadership factors displayed in other types of flying organizations, such as cargo wings, flight training wings, reconnaissance wings, etc. Further analysis should be accomplished to determine if various types of organizations display differing leadership factors among their top commissioned and noncommissioned officers. Further, there are many nonflying organizations within the USAF. It is outside of the scope of this research to suggest these results are in consonance with this researched fighter wing findings. More research must be conducted to determine if there is in fact a direct correlation between flying and nonflying organizations.

4. Military Service Bias. It could be logically assumed that these results are homogenous among all the Army and Navy sister services; however due to differing organizational leadership structures any conclusion of this study as to applicability to them would be unfounded without considerable more research into their specific leadership factors among their top officer and NCO leaders. For instance, it would be interesting to compare top leadership factors at a U.S. Navy fighter wing with the leadership factors displayed in this study of a USAF fighter wing. Unfortunately, that investigation must be carried out by other researchers at another time.
5. Self- Reporting Bias. This research used a self reporting form. Individual's impression of their leadership behavior may be subject to social desirability. To determine a more accurate rating a 360<sup>0</sup> rating system should be employed which was impractical with this study. Also, self reporting may be a function of rating as you were taught in leadership school that a leader should be; therefore, these scores could be biased with regards to USAF training and not a true reflection of individual leadership behaviors.
6. Measurement Bias. “. . . the meaning of the questionnaire [MLQ] results showing charisma as the core component of transformational leadership is difficult to interpret. The finding that transformational leadership is prevalent among managers at all levels in most types of organizations also raises doubts about what is really being measured (Yukl, 1999, p. 37). Further, since the MLQ does not measure the leadership processes involved in an organization, the question of what is being measured arises. The MLQ provides good psychometric measures, but

does not adequately indicate how to apply the number to gauge leadership.

Though the USAF wing sample in this study indicated that the commissioned officers and noncommissioned were “more” transactional or transformational than another group, the significance of that measure has no particular meaning. The MLQ falls short in practice and the utility of it comes into question.

7. Professional Development Training. It could be that training obtained following joining the Air Force equally prepares top commissioned and top noncommissioned officers that it makes it difficult to distinguish the degree between the level of transformationality and transactionality.
8. Sample Size. The small sample size may have not shown statistical significance where it may have existed otherwise.

### **Implications for Future Research**

USAF leaders are not totally transformational or transactional. At some lower level of organizational performance transactional leadership is a necessary behavior to employ; in higher organizational levels and more critical situations, transformational leadership is a preferred behavior. Future studies should focus on a prescriptive approach to USAF organizational leadership and, more importantly, how to intertwine those leadership behaviors to elicit maximum effective leadership. In-depth research should be taken to understand the shared leadership processes involved in an organization.

Because of the similarity of leadership behavior scores at this single air base, further confirmatory studies should be conducted to determine the root cause. Leadership cannot be taken out of context to be understood. Additional research inside the wing-level could reveal and perhaps standardize organizational leadership training. Examining leadership

behaviors longitudinally from lieutenant to colonel and/or airman to chief master sergeant would provide a better perspective of what causes the similarity of leadership behaviors in senior military ranks. A longitudinal study would provide insight into USAF training to determine if professional education training within the USAF following entry into the USAF was creating similar leadership behavior responses to the MLQ, i.e., the similar leadership training backgrounds elicited similar perception responses.

The USAF should investigate leadership in a more macro involvement with regards to levels of leadership within the Air Force. In some instances an NCO is capable of providing leadership, management, and guidance where currently commissioned officers command. Perhaps in relation to downsizing the USAF leadership roles could be reexamined. A better understanding of leadership behaviors and organizational effective must be gained through research. Currently, there is a debate within the Department of Defense on who can pilot remotely piloted vehicles (RPV). In the USAF only rated officers can “fly” the RPV missions. However, in the U.S. Army NCOs and warrant officers fly them. Obviously, it is not a case of capability. Perhaps this is a role suited to the NCO which would allow COs to focus on more complicated piloted vehicles such as fighters and cargo aircraft.

From empirical experience, leadership, both good and bad, has a mirroring effect upon the success of a USAF organization. Therefore, the significant issue for future study should be, to investigate if including more transformational leadership training to top leaderships would provide them the ability to provide a more positive leadership environment to their subordinate personnel in order to achieve higher levels of success below the wing-level.

## **Lessons Learned**

The researcher learned several valuable lessons. Research within the Department of Defense was a daunting task. Because of its many levels, approval to do research is complicated and time consuming. Approval is not a singular, straight forward proposition. There are many stakeholders, each with their own perspective of how and from whom approval is obtained. In many instances, approval levels seek assurance from lateral or superior organizations before they provide their approval. Research and researchers are viewed as an inconvenience and intrusive into their already busy schedules.

In retrospect, considering these results, the researcher should have investigated the impact of higher education on leadership behaviors to determine if leadership is a function of higher education or similar training obtained within the USAF. The researcher still questions, if leaders are born to lead or are they trained to lead? Simply measuring leadership is only a first step.

## **Conclusions**

Leadership is as much of a function of the beholder as the person with the quality of “leadershipness”. Much too often leadership is perceived as the event versus the journey. It is said that great men do great things; however, the question of why or how is generally overlooked. Leadership traits are elusive and vary with circumstances; traits only endow people with the potential for leadership.

Leadership can be measured through a variety of instruments; however, effective leaders in one venue are not necessarily effective leaders in another situation. The



military leaders of one installation may not be successful at another organization even if performing in a similar position. It has been found through other studies that transformational leadership at any level within an organization will generally create a more effective, efficient unit.

Leadership behaviors are situational dependent. The USAF does not spend much time in determining a “best fit” for a position. Most selections are based upon politics, time in grade, “next up for the job”, etc. Increasingly budgets are being squeezed and the USAF is being asked to do more with less. It is becoming increasingly more apparent that some better selection criteria be employed. The old method of succeed or fail affects too many personnel, too many projects, and too many dollars.

Leadership instruments like the MLQ 5X measure the potential to lead and does not necessarily parse out that one is a leader. Measuring only the self-perception aspect of the USAF members perhaps provides a distorted view of leadership. Was leadership itself being measured or was it the members’ perception of how they should respond?

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## Appendix A: MLQ Permission to Reproduce Letter

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University of Oklahoma  
660 Parrington Oval  
Norman  
OK 73019-0390  
USA

23 January 2010

Dear Mick Harper

In our recent communications you have requested permission to reproduce an image which represents valuable intellectual property of MLQ Pty Ltd trading as MLQ International ("MLQ") in your research for non-commercial purposes. In particular you have requested permission to use a still illustration of the flash animation of the Full Range Leadership Model.

MLQ hereby grants permission for this image to be reproduced in the manner you have requested on the conditions set out below.

You agree not to reproduce or distribute any material incorporating the intellectual property specified above, except for the specific purpose you have nominated: reproduction in your dissertation and for any defence of your dissertation. Any reproduction or distribution is to identify that the material incorporates MLQ intellectual property and that it may only be copied or distributed with the prior written consent of MLQ. If you become aware that the intellectual property has been copied or distributed as a result of MLQ providing this consent to you, then you agree to notify MLQ and to provide co-operation and reasonable assistance to MLQ in remedying the situation.

Please indicate by return email that you agree to these terms.

Yours faithfully,



Ray H Elliott, MAPS, FAHRI, AIMM.



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## Appendix B: Information sheet for Consent to Participate

701-A-5

### INFORMATION SHEET FOR CONSENT TO PARTICIPATE IN A RESEARCH STUDY

My name is Mick Harper, and I am a PhD Candidate in Organizational Leadership, Department of Continuing Education at the University of the Oklahoma. I am requesting that you volunteer to participate in a research study titled Profile of Leadership: Analysis of leadership behaviors among top noncommissioned and top commissioned officers in key leadership positions. You were selected as a possible participant because. Please read this information sheet and contact me to ask any questions that you may have before agreeing to take part in this study.

**Purpose of the Research Study:** The purpose of this study is to delineate the leadership behaviors of the top commissioned officers and top noncommissioned officers in senior leadership positions.

**Procedures:** If you agree to be in this study, you will be asked to do the following things: Complete two questionnaires measuring your leadership perception and mail completed questionnaires to me for statistical analysis.

**Risks and Benefits of Being in the Study:** The study has the following risks: there are no risks in completing this research. The benefits to participation are: there are no benefits for completing this research

**Compensation:** You will not be compensated for your time and participation in this study.

**Voluntary Nature of the Study:** Participation in this study is voluntary. Your decision whether or not to participate will not result in penalty or loss of benefits to which you are otherwise entitled. If you decide to participate, you are free not to answer any question or discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled. I understand this survey is voluntary and is not mandated by the 52d Fighter Wing, USAFE, or the Air Force.

**Length of Participation:** completion of the two questionnaires will take about 10 to 15 minutes. Incomplete surveys cannot be analyzed.

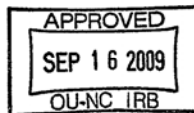
**Confidentiality:** The records of this study will be kept private and your supervisor will not have access to your responses. In published reports, there will be no information included that will make it possible to identify you as a research participant. Research records will be stored securely. Research questionnaires will be secured in a lock container and destroyed upon completion of my dissertation. The completed analysis of this information may be requested by AF/SGRC, AFMA/MAPP, or 52 FW. Only approved researchers will have access to the records.

**Contacts and Questions:** If you have concerns or complaints about the research, the researcher conducting this study can be contacted at 06561 948 634 or [m.harper@ou.edu](mailto:m.harper@ou.edu). My advisor is Dr. Catalina Herrerias, (405)601-0808 or [herrerias@ou.edu](mailto:herrerias@ou.edu). In the event of a research-related injury, contact the researcher. You are encouraged to contact the researcher if you have any questions. If you have any questions, concerns, or complaints about the research and wish to talk to someone other than the individuals on the research team, or if you cannot reach the research team, you may contact the University of Oklahoma – Norman Campus Institutional Review Board (OU-NC IRB) at (405) 325-8110 or [irb@ou.edu](mailto:irb@ou.edu).

*Please keep this information sheet for your records. By completing and returning this questionnaire, I am agreeing to participate in this study.*

Revised 11/12/2007

Page 1 of 1



## Appendix C: MLQ Form with Caveat

For use by Michael Harper only. Received from Mind Garden, Inc. on September 21, 2009

### MLQ      Multifactor Leadership Questionnaire Leader Form (5x-Short)

**PLEASE COMPLETE & MAIL THIS 2 PAGE QUESTIONNAIRE ASAP, BUT NLT 16 OCT 2009  
USE PREADDRESSED ENVELOPE VIA MPS**

In accordance with AFI 36-2601, 52 FW/CC has allowed participation of Spangdahlem personnel in this research study  
This survey is voluntary and is not mandated by the 52d Fighter Wing, USAFE, or the Air Force

This questionnaire is to describe your leadership style as you perceive it. Please answer all items on this answer sheet. **If an item is irrelevant, or if you are unsure or do not know the answer, leave the answer blank.**

Forty-five descriptive statements are listed on the following pages. Judge how frequently each statement fits you. The word "others" may mean your peers, clients, direct reports, supervisors, and/or all of these individuals.

Use the following rating scale:

Not at all	Once in a while	Sometimes	Fairly often	Frequently, if not always
0	1	2	3	4

- |    |  |   |   |   |   |   |
|----|--|---|---|---|---|---|
| 1. | I provide others with assistance in exchange for their efforts.....              | 0 | 1 | 2 | 3 | 4 |
| 2. | I re-examine critical assumptions to question whether they are appropriate ..... | 0 | 1 | 2 | 3 | 4 |
| 3. | I fail to interfere until problems become serious .....                          | 0 | 1 | 2 | 3 | 4 |

Continued =>

MLQ, © 1995 Bruce Avolio and Bernard Bass. All Rights Reserved.  
Published by Mind Garden, Inc., [www.mindgarden.com](http://www.mindgarden.com)



## Appendix D: MLQ Copyright Restrictions Letter

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For use by Michael Harper only. Received from Mind Garden, Inc. on September 21, 2009



[www.mindgarden.com](http://www.mindgarden.com)

To whom it may concern,

This letter is to grant permission for the above named person to use the following copyright material;

Instrument: *Multifactor Leadership Questionnaire*

Authors: *Bruce Avolio and Bernard Bass*

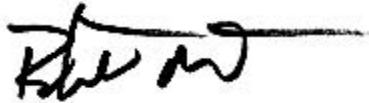
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for his/her thesis research.

Five sample items from this instrument may be reproduced for inclusion in a proposal, thesis, or dissertation.

The entire instrument may not be included or reproduced at any time in any other published material.

Sincerely,



Robert Most  
Mind Garden, Inc.  
[www.mindgarden.com](http://www.mindgarden.com)

## Appendix E: Demographic Questionnaire

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### PART II

### LEADERSHIP SURVEY

This demographic information will provide additional background useful for this study.

Please respond by **circling the letter** associated with your answer for each of the following questions or fill in the blank as appropriate:

1. What **best fits** your duty title?
  - a. Commander, Detachment Commander
  - b. Vice Commander, Deputy Commander
  - c. Flight Commander, Section Commander
  - d. Division Chief, Branch Chief
  - e. Superintendent, NCOIC
  - f. Flight Chief, Detachment Chief
  
2. What is your Rank?
  - a. Colonel
  - b. Lieutenant Colonel
  - c. Chief Master Sergeant
  - d. Senior Master Sergeant
  
3. What is your gender?
  - a. Male
  - b. Female
  
4. What is your age \_\_\_\_\_?
  
5. What is your ethnicity/race?
  - a. African-American (Non Hispanic)
  - b. Caucasian (Non Hispanic)
  - c. Hispanic
  - d. Asian
  - e. Other
  
6. How many **months** do you have in your current leadership position?
  - a. Less than 1
  - b. 1 to 5
  - c. 6 to 10
  - d. 11 to 15
  - e. 16 to 20
  - f. 21 and over

CONTINUED ON REVERSE



7. How many **years** have you been in the USAF?

- a. 10 to 14
- b. 15 to 19
- c. 20 to 24
- d. 25 to 30
- e. 31 and over

8. How much education do you have?

- a. Less than High School
- b. High School
- c. Some College
- d. Baccalaureate degree
- e. Some graduate work
- f. Masters degree
- g. Doctorate or equivalent
- h. Other

*When completed please return both of the questionnaire sheets in the pre-addressed envelope and mail (MPS) ASAP, but **NLT 16 Oct 09** for inclusion of results.*

*Thank you for your time.*

Mick Harper

Appendix F: Research Package Suspense Note

---

Dear Spangdahlem Leader,

Thank you for taking time to complete this questionnaire on your perception of leadership which will be the basis for my PhD dissertation, *“Profile of Leadership: Analysis of Leadership Behaviors Among Top Noncommissioned Officers and Top Commissioned Officers in Key Leadership Positions”*.

Each returned questionnaire is **statistically critical** to my study, so I encourage you to complete it, though your participation is completely voluntary.

I would ask the completed questionnaire be returned in the preaddressed envelope via MPS **ASAP, but NLT 16 Oct 09**, for your responses to be included in the data evaluation.

Thank you in advance for your participation.

***Michael “Mick” Harper***

Lt. Col, USAF (ret)

PhD Candidate, University of Oklahoma

## Appendix G: USAF Surgeon General of the Air Force Review

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Air Force Review: Analysis of Leadership Behaviors. . .

Page 1 of 1

### **Air Force Review: Analysis of Leadership Behaviors. . .**

Jessica.Candia@pentagon.af.mil

**Sent:** Friday, September 18, 2009 18:50

**To:** Harper, Michael C.

**Cc:** Yadack, Alberta S.; Robert.Kang@pentagon.af.mil; Malcolm.Barth.ctr@pentagon.af.mil; Kathy.Sehhat.ctr@pentagon.af.mil

Good Afternoon,

Thank you for forwarding to our office for Air Force (AF) Headquarters human research protection review your protocol, IRB# 12653, "Analysis of Leadership Behaviors among Top Noncommissioned Officers and Top Commissioned Officers in Key Leadership Positions". For tracking purposes, this has been assigned AF Protocol # FSG20090013H.

AF human research protection issues for this protocol have been resolved. Thus, our headquarters review is complete.

Please contact me with any questions.

Sincerely,

Jessica

Jessica Candia, CIV, DAF  
Program Manager  
Research Oversight and Compliance Division  
Office of the Surgeon General  
5201 Leesburg Pike, Suite 1501B  
Falls Church, VA 22041  
Phone: 703-681-6311 (DSN 761)  
Duty e-mail: jessica.candia@pentagon.af.mil

<https://exchange.ou.edu/owa/?ae=Item&t=IPM.Note&id=RgAAAABf2LGY3wIYS5c%2f...> 2/28/2010

Appendix H: 52<sup>nd</sup> Fighter Wing Commander Approval Letter

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DEPARTMENT OF THE AIR FORCE  
52D FIGHTER WING (USAFE)

AUG 14 2009

Colonel Lee T. Wight  
Commander, 52d Fighter Wing  
Unit 3680, Box 190  
APO AE 09126

Mr. Michael C. Harper  
PSC 118 Box 514  
APO AE 09137

Dear Mr. Harper

In accordance with AFI 36-2601, paragraph 3.8, I grant you permission to conduct your PhD research project using Spangdahlem Air Base personnel. However, you must include a cover page along with your questionnaire that includes the following statement:

"I understand this survey is voluntary and is not mandated by the 52d Fighter Wing, USAFE, or the Air Force."

Your dissertation must be reviewed by 52 FW/PA prior to release outside Air Force channels.

Further, in accordance with AFI 36-2601, you will take the lead in the administration of the survey while I retain overall authority of the survey. Please note, research may not proceed until you have secured approval by the AF/SGRC to conduct human testing.

Sincerely

A handwritten signature in black ink, appearing to be "L. Wight".

LEE T. WIGHT, Colonel, USAF

# Appendix I: University of Oklahoma IRB Approval



## The University of Oklahoma

OFFICE FOR HUMAN RESEARCH PARTICIPANT PROTECTION

IRB Number: 12653  
Approval Date: September 16, 2009

September 17, 2009

Michael Harper  
Continuing Education  
PSC 118 Box 514  
APO, AE 09137

**RE: Profile of Leadership: Analysis of Leadership Behaviors among Top Noncommissioned Officers and Top Commissioned Officers in Key Leadership Positions**

Dear Mr. Harper:

On behalf of the Institutional Review Board (IRB), I have reviewed and granted expedited approval of the above-referenced research study. This study meets the criteria for expedited approval category 7. It is my judgment as Chairperson of the IRB that the rights and welfare of individuals who may be asked to participate in this study will be respected; that the proposed research, including the process of obtaining informed consent, will be conducted in a manner consistent with the requirements of 45 CFR 46 as amended; and that the research involves no more than minimal risk to participants.

This letter documents approval to conduct the research as described:

Consent form - Other Dated: September 08, 2009 Information Sheet - Revised  
Survey Instrument Dated: September 08, 2009 Survey - Revised  
Other Dated: September 08, 2009 Cover Letter to Participants - Revised  
IRB Application Dated: September 08, 2009 Revised  
Other Dated: August 14, 2009 Support Letter - Dept of the Air Force  
Other Dated: July 08, 2009 Participation Postcard  
Protocol Dated: July 08, 2009

As principal investigator of this protocol, it is your responsibility to make sure that this study is conducted as approved. Any modifications to the protocol or consent form, initiated by you or by the sponsor, will require prior approval, which you may request by completing a protocol modification form. All study records, including copies of signed consent forms, must be retained for three (3) years after termination of the study.

The approval granted expires on September 15, 2010. Should you wish to maintain this protocol in an active status beyond that date, you will need to provide the IRB with an IRB Application for Continuing Review (Progress Report) summarizing study results to date. The IRB will request an IRB Application for Continuing Review from you approximately two months before the anniversary date of your current approval.

If you have questions about these procedures, or need any additional assistance from the IRB, please call the IRB office at (405) 325-8110 or send an email to [irb@ou.edu](mailto:irb@ou.edu).

Cordially,

A handwritten signature in black ink, appearing to read "Donald Baker".

Donald Baker, PhD  
Vice Chair, Institutional Review Board

660 Parrington Oval, Suite 316, Norman, Oklahoma 73019-3085 PHONE: (405) 325-8110 FAX:(405) 325-2373

Ltr\_Prot\_Fappv\_Exp

