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An investigation of the relationships between exposure to on-the-job challenges and self-reported changes in leadership behavior and characteristics

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ABSTRACT

The purpose of this study was to examine the relationship between exposure to opportunities inherent in jobs and self-perceived changes in leadership behaviors and characteristics. Qualitative research in the early 1980s pointed out the importance of work-related experiences to development as a manager and leader. Most of the follow-on quantitative research has been on the relationship of on-the-job opportunities and learning or managerial growth. However, there does not appear to be any quantitative research identifying which on-the-job developmental opportunities are related to changes in leadership and characteristics.

This study examined the relationship between exposure to on-the-job challenges and self-reported changes in leadership behavior and characteristics. This quantitative study employed a quasi-experimental, multiple time-series design to assess whether exposure to on-the-job developmental opportunities were associated with changes in leader behavior and characteristics. Additionally, the study investigated which on-the-job developmental opportunities were associated with changes in leader behavior and characteristics. On-the-job developmental opportunities were assessed using McCauley, Ohlott, & Ruderman's Job Challenge Profile (JCP). Leadership behavior and characteristics were assessed using Sashkin's The Leadership Profile (TLP).

Results revealed significant, positive relationships between level of job challenge and self-reported changes in leadership behavior and characteristics. Additionally, findings confirmed that job challenges arising from "Managing at High Levels of Responsibility," "Managing Boundaries," and "Creating Change" were associated with significant, positive

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changes in one or more of the leadership components measured by the TLP for one or more of the cohort groups involved in this longitudinal study.

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DEDICATION

This dissertation is dedicated to Ralph Stone whom, though I never had the privilege of knowing, has changed my life.

This dissertation is also dedicated to my fellow members of ELP Cohort 8 and to the faculty and staff of the Executive Leadership Program at George Washington University for creating the nurturing crucible that fostered a transformational educational experience.

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This journey would not have been possible without support, encouragement, patience, and mentoring from many friends, family, and colleagues. My deepest thanks goes to all who helped me climb this mountain.

Dr. Brad Lafferty, a friend for over 20 years, started me on what I thought was a degree program. Little did I suspect that he had charted a course that would alter my life. I greatly appreciate the support and encouragement that he and his wife, Chris, have provided over the years.

As mentioned in the Dedication, this journey would not have been possible without the aid, camaraderie, challenges, and intellectual stimulation provided by the fellow members of ELP Cohort 8. A special thanks, too, goes to the faculty who believed in me even when I wondered why in the world I had been accepted into this program. And, thank you to the ELP and GWU staff for slaying the red-tape dragon that bureaucracy occasionally became.

I am deeply indebted to my dissertation committee for their mind-expanding mentoring and never-wavering support. Marshall Sashkin, my committee chair, friend, and mentor, provided the wisdom and guidance needed to turn a good idea into a dissertation. But, even more than that, he was there throughout my entire ELP experience providing both challenge and support that expanded and deepened my thinking. A huge thanks goes to Owen Jacobs for having the patience to nurture this neophyte. Whenever we talked, I felt like I had come to sit at the feet of the master. His model of academic leadership and stewardship has inspired me. I am also very appreciative of Cindy McCauley for her long-term support and mind-wrenching,

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My deepest thanks go to my best friend, partner, and wife, May Kay Newman Thompson for her support, love, and understanding throughout this journey. Without her, this would not have been possible.

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CHAPTER 1 – INTRODUCTION

Overview

> People often ask me, "How do you grow a leader?" I must confess: I don't understand all that goes into developing leaders. ... While there is general agreement about the qualities of leadership, the question of how we grow them is moot.
>
> Warren Bennis, 1996, p. 7

Having competent and capable leaders is at the core of organizational success (Noel M. Tichy & Cohen, 1997). From an Air Force perspective, leadership develops through a combination of training, education, and experience (Drew, 1997). While previous research has focused on the impact of training and professional military education upon leadership development in the military (Lafferty, 1996, 1998; Yammarino & Bass, 1990), little research has investigated the contribution of on-the-job experiences toward leadership development.

However, since research indicates that on-the-job experiences are a very important source of both motivation for and opportunities for leadership development (Bennis, 1996; Conger, 1992; Kotter, 1990b; McCall, Lombardo, & Morrison, 1988; Vicere, 1997), the lack of similar research in a military context means that individuals and organizations might not be taking advantage of job challenges to develop leadership skills. This research project begins the investigation into which opportunities inherent in military related jobs are related to changes in leadership behaviors and characteristics. And, therefore, lays a foundation for identifying and using on-the-job experiences as a source for leadership development.

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This chapter begins with a statement of the problem to be investigated, the study's purpose, and some of the contributions this study can make to both theory and practice. These are followed by a review of salient literature that establishes a foundation for a discussion of the paper's conceptual framework. The chapter then identifies the two research questions and lays out the research design and methodology that were used to answer the research questions. This chapter closes by addressing human subjects review and ethical issues, and identifying delimitations and limitations.

Problem Statement

Though work experiences are a primary source for leadership development, the relationship between the two is still unclear. Previous reports and studies suggest that on-the-job experiences are important for leadership development (Barrett & Benson, 2002; Bennis, 1996; Bennis & Nanus, 1985; Hunt, 1991; Kotter, 1990b; Lee, 1989; Zemke, 1985). But, those reports, while suggesting a variety of on-the-job experience factors that might be related to leadership development, do not provide any quantitative test that would answer the question of whether or not one or another on-the-job experience does or does not relate to leadership development.

Other studies linked on-the-job developmental opportunities with managerial growth and learning (McCall, Lombardo, & Morrison, 1988; McCauley, Ohlott, & Ruderman, 1989; McCauley, Ohlott, Ruderman, & Morrow, 1994). These studies examined the relationship between job experiences and managerial development using cross-sectional data. Additionally, these studies focused on identifying those developmental work experiences that were related to managerial growth, rather than on identifying the specific behaviors and characteristics being developed. So, there does not appear to be any research at this time that makes a detailed

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examination of the relationships between exposure to on-the-job developmental opportunities and changes in the characteristics and behaviors associated with leadership (i.e., leadership development).

Thus, this study adds to understanding about the relationship between on-the-job experiences and leadership development in three unique ways. First, the context is different, i.e., this study clarifies the relationships between on-the-job experiences and leadership development by examining self-reported changes in leadership behaviors and characteristics in mid-career to senior government workers who have personal experiences from a wide variety of work settings. Secondly, this study provides a finer grain of analysis than previous studies by examining both leadership behaviors/characteristics and on-the job experiences rather than focusing on only either one. And, third, this study adds to our understanding about the relationship between on-the-job experiences and leadership development through the use of longitudinal rather than cross-sectional data.

Purpose of the Study

This study's purpose is to identify which opportunities inherent in jobs are related to changes in leadership behaviors and characteristics.

Significance of the Study

This study is important both in terms of theory and practice for the following reasons:

In terms of theory building, this study extends the reach of two other theories: Visionary Leadership Theory (VLT) (Sashkin, 1992, 1996a, 1996c; Sashkin & Burke, 1990) and on-the-job

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development theory (OTJD)[1] (McCauley, Ohlott, & Ruderman, 1989; McCauley, Ohlott, & Ruderman, 1999; McCauley, Ruderman, Ohlott, & Morrow, 1994). For VLT, the study extends the theory by identifying and examining factors that are associated with changes in leadership. For OTJD, this study expands its theoretical base by showing that the theory is also relevant to a military population and by revealing relationships between specific developmental job components and changes in specific leadership abilities and characteristics.

From a "real-world practice" perspective, this investigation could be useful for individuals and organizations interested in maximizing opportunities for on-the-job leadership development by providing practitioners with an improved understanding of how jobs contribute to leadership development.

Conceptual Framework

This study uses the functionalist world view (Burrell & Morgan, 1979) and the contextual setting of work environments to test the relationship between two theoretical perspectives. The first theoretical perspective, Visionary Leadership Theory (VLT) (Sashkin & Burke, 1990; Sashkin, 1992, 1996a, 1996b), defines leadership as a synergistic composite of transactional leadership behaviors, transformational leadership behaviors, and transformational leadership characteristics. The second theoretical lens is provided by McCauley, Ohlott, & Ruderman's (1989) theory of On-the-job Development. This theory postulates that jobs have developmental components that can be quantitatively assessed and, further, that those components can be used to assess the potential for development and growth in each job.

[1] OTJD is an acronym adapted by this researcher for McCauley et al's (1989) theory of On-the-job Development.

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Proposition

This research seeks to investigate the proposition that increased exposure to Job Challenges (as measured by the Job Challenge Profile) is associated with increases in aspects of Visionary Leadership Theory (as measured by The Leadership Profile).

Research Questions

This study has two primary research questions from which several sub-questions and hypotheses emerge.

1. Is exposure to on-the-job developmental opportunities, as measured by the Job Challenge Profile (JCP), associated with self-reported changes in leader behavior and characteristics, as assessed by The Leadership Profile (TLP)?

2. Exposure to which on-the-job developmental opportunities, as measured by the Job Challenge Profile (JCP), are associated with changes in leader behavior and characteristics, as assessed by The Leadership Profile? This research question peels back the onion one layer to investigate possible relationships between specific types of on-the-job challenges and development of specific leadership areas such as transactional behaviors, transformational behaviors and leadership characteristics.

Hypotheses

Hypotheses for Research Question 1:

1. H1A: The total change in Total Visionary Leadership (e.g., total TLP score) for all cohorts[2] combined into a single sample is positively and significantly associated with the level of job developmental opportunity (e.g., total JCP score).

[2] See "Sample" section for a description of the various cohorts that comprise this study.

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2. H1B: The total change in Total Visionary Leadership (e.g., total TLP score) for each individual cohort is positively and significantly associated with the level of job developmental opportunity (e.g., total JCP score).

Hypotheses for Research Question 2:

1. H2A: For all cohorts combined into a single sample, the total change in transactional leadership behavior is positively and significantly associated with the total score on the "Experiencing a Job Transition" scale.

2. H2B: For all cohorts combined into a single sample, the total change in transactional leadership behavior is positively and significantly associated with the total score on the "Managing at High Levels of Responsibility" scale.

3. H2C: For all cohorts combined into a single sample, the total change in transformational leadership behavior is positively and significantly associated with the total score on the "Creating Change" scale.

4. H2D: For all cohorts combined into a single sample, the total change in transformational leadership behavior is positively and significantly associated with the total score on the "Managing at High Levels of Responsibility" scale.

5. H2E: For all cohorts combined into a single sample, the total change in transformational leadership behavior is positively and significantly associated with the total score on the "Dealing with Diversity" scale.

6. H2F: For all cohorts combined into a single sample, the total change in transformational leadership characteristics is positively and significantly associated with the total score on the "Experiencing a Job Transition" scale.

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7. H2G: For all cohorts combined into a single sample, the total change in transformational leadership characteristics is positively and significantly associated with the total score on the "Creating Change" scale.

8. H2H: For all cohorts combined into a single sample, the total change in transformational leadership characteristics is positively and significantly associated with the total score on the "Managing at High Levels of Responsibility" scale.

9. H2I: For all cohorts combined into a single sample, the total change in transformational leadership characteristics is positively and significantly associated with the total score on the "Managing Boundaries" scale.

10. H2J: For all cohorts combined into a single sample, the total change in transformational leadership characteristics is positively and significantly associated with the total score on the "Dealing with Diversity" scale.

Methodology

The research was conducted using a quasi-experimental, multiple event-cohort, longitudinal design that provided multiple observations of the dependent variable in five different cohorts over a five-year period. The population studied consisted of U.S. graduates of the United States Air Force's (USAF) Air Command and Staff College's (ACSC) ten-month, in-residence professional military education program. This project used two survey instruments: The Leadership Profile (TLP) to assess changes in personal leadership behaviors and characteristics and the Job Challenge Profile (JCP) to ascertain the types and intensities of job developmental challenges available to study participants. No site selection was accomplished, because the sites were those naturally occurring work environments of respondents. Data used in

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this research came from two sources: archival TLP data obtained from the ACSC Leadership Database and TLP and JCP survey data submitted by respondents during the course of the dissertation.

Human Subjects Review and Ethical Issues

This study's research was approved by The George Washington University Human Subject Review prior to collection of non-archival data. Participant confidentiality was protected through the following means: no names were solicited via the password protected Internet survey site, instead respondents used a unique access code. Names were solicited on the paper-based questionnaires. However, after the paper forms had been translated into electronic format (i.e., scanned), unique identifier codes were substituted for names to protect individual identity. All questionnaires will remain in possession of the researcher. Additionally, participant names and addresses will be kept in electronic files separate from those electronic files containing survey responses and analyses. The source for 1995 through summer 2000 TLP data was archival data. TLP and JCP data have been analyzed and reported in the aggregate.

Delimitations

1. This study was not an evaluation of the Air Command and Staff College curriculum, as there was not any attempt to match training objectives with outcomes.

2. This study did not assess individual learning differences nor the degree to which individual learning abilities were related to changes in personal leadership behavior and characteristics.

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Limitations

This study has the following limitations.

1. Generalizability: This study collected data from a specific population that attended a specific ten-month, in-residence professional military education course of instruction. Findings from this study might not generalize to non-military populations or to other military populations that did not attend an in-residence, mid-career professional military education institution.

2. The sample population is composed of the top 15% of the field grade (major/lieutenant colonel) officer corps and, therefore, findings might not be generalizable to all field grade officers.

3. All TLP and JCP data used in this study has been self-reported.

4. Also, since the sample comes from the top 15% of the field grade officer corps and the TLP data provides a self-evaluation of leadership behavior and characteristics, there might be a ceiling effect in terms of TLP responses.

Definition of Terms

ACSC Academic Year: The period of time that each ACSC class attends in-residence, normally the ten-month period from Mid-August of one year through early June of the following year.

Age effects: Change produced by influences of aging/maturation (Firebaugh, 1997, p. 7).

Cohort effects: Differences that result from the common experiences or reactions of a cohort (Firebaugh, 1997, p. 7).

Cohort Study: "A study of the same group (cohort) over time, but not necessarily of the same individual members of that group" (Vogt, 1999, p. 45).

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Event Cohort: A specific group of people who experienced the same significant life event within a given period of time (Glenn, 1977; Graetz, 1987).

Panel Study: "A longitudinal study of the same group (or panel) of subjects. ... A panel study studies the same individuals at different times, whereas a cohort study samples from the same group at different times" (Vogt, 1999, p. 205).

Period effects: Change produced by influences associated with a historical era or period of time (Firebaugh, 1997, page 7; Glenn, 1977, p. 11).

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CHAPTER 2 - REVIEW OF THE LITERATURE

This review, though not exhaustive, provides a framework for understanding the roots of the two theories upon which this research is founded. The first section reviews the development of leadership theory from early beginnings through the establishment of Sashkin's contemporary Visionary Leadership Theory. The second section investigates the evolution of research into job components that lead to challenge and growth. The latter section begins with a brief overview of experiential learning theory upon which the job challenge research is based.

The Evolution of Leadership Theory

Early Beginnings.

The field of leadership study originated in "Great Man" theory (Sashkin & Burke, 1990). Much of its evolution is coupled with military theory (Rosenbach & Taylor, 1996). From this person-centered approach arose trait theory, which sought, for the most part unsuccessfully, to identify universal characteristics that leaders possessed. Stogdill (1948, 1974) concluded that there was no specified set of characteristics that reliably distinguished leaders from followers, or that could predict leader success. His and others' early studies did, however, lend credence to the existence of the trait of charisma in leaders (Stogdill, 1948). Leadership theorists (i.e., Stogdill & Coons, 1957) next turned to leader behavior. A variety of studies (e.g., Bales, 1958) led to identification of two broad categories of leader behavior: task accomplishment behavior and relationship behavior. In one experiment Bales (1958) found that individuals who exhibited high levels of both types of behaviors were reported "typically" as leaders by their peers. Those

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who showed high relationship/low task behavior were "rarely" reported as leaders by peers, but high task/low relationship behavior were "often" reported as leaders. Although this approach appeared promising at first, research results eventually demonstrated that by expressing high levels of both categories of behavior, leaders did not, in fact, attain exceptional performance outcomes (Fleishman & Harris, 1962).

Further research took the tack of attempting to identify situational factors, variables and constraints that might lead to the greater effectiveness of one or another combination of the two leadership behaviors. These situational leadership theorists (House, 1971; Hersey & Blanchard, 1969) contended that specific leadership styles are effective in certain situations. Theories such as Fiedler's (1967) Contingency Theory of Leadership Effectiveness, House's (1971, 1974) Path-Goal Theory, Hersey and Blanchard's (1969) Situational Leadership Theory and Fiedler's (1986) most recent Cognitive-Resources-Utilization Theory all attempted to show that situational contextual factors moderate the effectiveness of leadership behavior. However, as in the case with trait research and earlier behavioral studies, further investigation yielded only partial and inconclusive evidence at best (Yukl, 1998).

Transformational and Transactional Leadership.

The next evolution in leadership studies came with the publication of James MacGregor Burns's *Leadership* (1978), which laid the groundwork that established the constructs of transactional and transformational leadership. The transactional-transformational paradigm incorporates aspects of trait theory and is also a systems approach to leadership studies. Burns identified two basic types of leadership -- the transacting and the transformative. In doing so he built the framework for these two types of leadership to coexist by bringing two bodies of literature together and uniting the roles of leaders and followers in his definitions.

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This concept of transformational leadership has been defined (Burns, 1978; Bass, 1985; Tichy & Devanna, 1990) as leadership that involves change as contrasted with leadership that maintains the status quo. Burns also has defined transformational leadership as leadership that motivates subordinates to work for "higher-level" goals that transcend their self-interest. Burns (1978) describes the relations of most leaders and followers as transactional, a contractual (implied or overt) exchange of one thing for another. Further, Burns asserts that the transformational leader also,

> ...recognizes and exploits an existing demand or need of a potential follower. But, beyond that, the transformational leader looks for potential motives in followers, seeks to satisfy higher needs, and engages the full person of the follower. The result of transforming leadership is a relationship of mutual stimulation and elevation that converts followers into leaders and may convert leaders into moral agents. (p. 4)

Visionary Leadership.

Recently, the transformational leadership paradigm has undergone further evolution. Sashkin's (1998) Visionary Leadership Theory asserts that true visionary leaders are required to have three specific personal characteristics in order to carry out the leadership function: self-confidence, the pro-social need for power, and a high level of cognitive capability. Self-confidence is the belief that one controls one's own destiny, that locus of control is with the individual (Bandura, 1982, 1986). The need for power encompasses not only the requirement for a leader to possess power and influence, but the pro-social application of that power (Sashkin, Schwandt, Gorman, & Higgins, 1995). Finally, cognitive capability or vision is "...the capability of understanding complex large-scale systems in terms of cause-effect chains of events and their interactions over time" (Sashkin 1996a, 1996b). A visionary leader demonstrates a high degree

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of transformational and transactional leadership, and has the potential to construct an organizational culture that supports, sustains, and directs organizational action over time. It is that culture which enables the organization to achieve goals and maintain operational effectiveness, as opposed to authority or sanctions.

Leadership: A Definition.

As evidenced by this review, the history of leadership research is a history of searching for traits, characteristics, behaviors, and/or the right mix of those within a given situation necessary for carrying out the leadership function. Stogdill (1974) concluded, after a comprehensive review of the leadership literature, that "there are almost as many definitions of leadership as there are persons who have attempted to define the concept." Sashkin's Visionary Leadership Theory (1998) is the basis of this dissertation's conceptualization of leadership because it synthesizes the most important findings of previous leadership research. His theory provides this research with the personal characteristics and behaviors necessary to carry out the leadership function. And, what is the function of leadership? For this research, the leadership function is defined as "the process of giving purpose (meaningful direction) to collective effort, and causing willing effort to be expended to achieve purpose" (Jacobs & Jaques, 1984).

Just like there is a lack of consensus in the literature about a definition of leadership, there has also been a lack of consensus about how similar and different the concepts of management and leadership are. Some theorists see the two concepts as qualitatively different. For example, "managers are people who do things right and leaders are people who do the right thing"(Bennis & Nanus, 1985). But, this research takes the position that there is considerable overlap between the two concepts. This position is based upon Sashkin's Visionary Leadership Theory that considers management to be an essential element of leadership. "This apparent

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paradox [between management and leadership] is resolved by recognizing that effective transformational leaders use transactional, managerial roles not simply to define, assign, and accomplish tasks and achieve goals, but also to educate, empower, and ultimately transform followers. By doing so, leaders wind up transforming their organizations." (Sashkin & Rosenbach, 1998, p. 80). Thus, this research, using Sashkin's conceptualization, chose to focus on the complementary nature of management and leadership.

Now that we have an understanding of the concept of leadership, we will turn to an investigation of how it is developed.

Leadership Development

> While I don't think you can "teach" leadership, I am certain that leadership can be learned ... People learn about leadership experientially. There are two major sources of learning: the individual and the organizational setting.
>
> Warren Bennis, 1996, p. 7

Since Visionary Leadership Theory provides this study with a working understanding of the skills and personal characteristics needed to carry out the leadership function, we next need to discover what the literature tells us about how leadership is developed. Several studies have investigated this question.

McCall, et al. (1988) studied 191 successful executives to determine what experiences helped develop their leadership abilities. They found that leaders attribute most of their current success to past work experiences and that most managerial development occurred through on-the-job experiences. Also, they discovered a variety of job experiences that lead to development of executive skills. Among those developmental activities their research identified are

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challenging job assignments, job rotations, being mentored, receiving developmental feedback, exposure to a variety of bosses (both good and bad), and learning from hardships and mistakes.

Kotter (1990) surveyed 200 executives in highly successful companies and interviewed in-depth twelve individuals whom he believed demonstrated highly effective leadership. He concluded that these senior executives had opportunities to lead, take risks, and learn from their successes and failures. He identified the following as important leadership development activities: (1) challenging assignments, (2) visible leadership role models who were either very good or very bad, (3) assignments that broadened knowledge and experience, (4) task force assignments or special projects, (5) receiving mentoring or coaching from senior executives, (6) attendance at meetings outside a person's core responsibility, and (7) special development jobs (i.e., executive assistant jobs).

Conger (1992) conducted a study of a number of leadership development programs. In addition to actual participation in these programs, he conducted interviews with and surveyed program participants. He concluded that four avenues are needed for developing leadership ability. First is development through personal growth. Second is the development of conceptual understanding and development of behavioral skills. "The best we can do with training is to provide a catalyst to catch managers' attention to some important skill areas. The key is not to really develop the skills in the classroom, but to help managers appreciate them and gain awareness" (p. 49).

The third avenue identified by Conger (1992) was through providing feedback. Again, his focus is on behavioral skills; feedback is used to learn about one's strengths and weaknesses in leadership skills. The final avenue is leadership development through building specific skills.

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"Program designers identify what they perceive to be the key leadership skills that can be taught. These are formulated into modules and introduced to participants" (p. 51).

After studying CEO's, Bennis (1996) concluded that although leadership cannot be taught, it can be learned. His study identified two major sources of learning: the individual and the organization. From an individual perspective, individuals must have the ambition and motivation to become leaders. From an organizational perspective, there are four things that organizations can do to facilitate and accelerate the competencies of its leaders. These are: (1) Provide good role models. (2) Identify and reward effective coaches. (3) Rotate individuals who have the potential for leadership to a variety of roles and jobs. And, (4) provide potential leaders with experiences that will benefit them.

In sum, these studies identified activities and experiences that senior executives believe were important in the development of their leadership abilities (Bennis & Nanus, 1985; Conger, 1992; Kotter, 1990; McCall et al., 1988; Vicere, 1997; Vicere & Fulmer 1998). These studies found factors such as job rotation (Bennis, 1996), special assignments (Vicere & Fulmer, 1998), demanding assignments (McCall, et al. 1988), mentors (Conger, 1992), visible leadership role models who were either very good or very bad (Kotter, 1990), and performance feedback (Vicere 1997; Vicere & Fulmer 1998).

None of these studies identified formal leadership training programs as a critical source for developing leadership abilities. "Few, if any leaders have achieved their positions because of formal training. They see themselves as having learned from the 'school of hard knocks'" (Conger, 1992, p. 39). Instead, the primary sources for changes in personal approaches to leadership were job related. Therefore, this review must next investigate the literature about assessing the impact of job related activities upon leadership development.

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The Evolution of Job Developmental Component Research

There were several studies in the early 1980s that identified on-the-job experiences as the primary source for management learning and growth. This section reviews the salient studies by first providing some background into the theoretical foundation upon which this stream of research is based: experiential learning.

Experience as a Source for Learning.

The intellectual foundation for experience as a source of learning stretches back to John Dewey (1944). He believed that the reconstruction or reorganization of experience is an on-going process that adds to the meaning of previous experience and increases one's ability to deal with future experiences. Kurt Lewin's model of action research (1951) viewed learning as a continuous process grounded in experience and personal development as a process of adaptation to the world.

A similar perspective was advocated by Kelly (1955) who viewed learning as a theory-building process in which hypotheses about the world are formed, tested in practice, and then modified according to the results. Later, a similar perspective was advocated by Kolb (1984) who defined learning as an experience-based, four-stage cycle. The components of Kolb's learning cycle are: (1) concrete experiences, (2) reflective observation, (3) abstract conceptualization leading to creation of new ideas, and (4) active experimentation to test out those new ideas.

Argyris (1977, 1982, 1991) differentiated two types of experience-based learning by using the concepts single-loop and double-loop learning. Single-loop learning results from experiences that lead to the detection and correction of errors in theories, while double-loop learning results in the reexamination of basic principles that govern the purpose of those theories.

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Schon's (1983) concepts of reflection-in-action and knowing-in-action are also based on learning from experiences. Reflection-in-action means that the person has the ability to think and reflect about what they are doing, even as they are doing it. Knowing-in-action is being able to apply knowledge and adapt to on-going situations.

Learning from experience is a critical element of Mezirow's transformational learning (1981, 1991, 1994) theory. His theory explains how experience, learning, and meaning are related. According to Mezirow, learning may be "understood as the process of using a prior interpretation to construe a new or a revised interpretation of the meaning of one's experience in order to guide our future action (Mezirow, 1991, p. 12)."

Each of these theorists view experience and learning from experience as central to an individual's growth and adaptation. The important link between these theorists is that they identify the process through which the interaction between a person and his/her experiences are translated into learning. One's skill at using this process will impact whether or not learning actually occurs and could explain why some people do or do not learn from experience.

This paper now turns to a review of the literature to discover whether or not research has found experiential learning important to managerial growth.

Experience as a Source for Managerial Development.

A series of studies in the early 1980s revealed that on-the-job experiences were a primary source for manager learning and growth. Burgoyne and Hodgson (1983) and Kelleher, Finestone, and Lowy (1986) conducted initial studies to discover whether or not managerial learning occurred in the workplace. Burgoyne and Hodgson (1983) identified three levels of learning that occurred: (1) Specific learning incidents were occasions when something new or unexpected happened and the manager was able to generalize that to a future situation; (2)

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situations that evoked and extended personal "case law" (p.394) were those when a manager referred back to similar previous experiences and used the current situation to verify his/her 'model'; and (3) gradual changes based on the accumulation of experience.

Kelleher, et al., (1986) identified four key factors contributing to managerial on-the-job learning: demands from managing a staff, demands created by change, amount of influence a manager has, and the manager's personal style (i.e., degree of openness, learning orientation, orientation to people, and level of leadership in the organization.)

So, while these two studies laid a foundation by showing that managers did learn from experiences in the work place, the studies did not address the impact of work experiences upon long-term managerial development. That was done by other studies that discovered the importance of on-the-job learning to overall management development. For example, a six-year study at Honeywell (Broderick, 1983; Zemke, 1985) found that the basic approach to learning management skills at Honeywell was from on-the-job experiences. Based upon surveys and interviews, Zemke (1985) concluded that half of what managers learned about management at Honeywell came from job experiences, about 30 percent came from relationships with superiors and co-workers, and 20 percent from training. Studies at AT&T (Bray & Howard, 1983) (Howard & Bray, 1988) provided further empirical evidence of the importance of job experiences in developing managers.

Other studies provided additional weight to the findings that on-the-job experiences are important for learning about management. Lowy, Kelleher, and Finestine (1986) found that most managerial learning occurs informally on-the-job. Additionally, Wick in studying over 600 managers found that job experiences accounted for over 70 percent of all of the managerial related developmental experiences.

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Kotter (1990), based on interviews with 200 executives from highly successful companies, found nine categories of important leadership development activities, seven of which were related to on-the-job experiences: challenging assignments, visible leadership role models who were either very good or very bad, assignments that broadened knowledge and experience, task force assignments, attendance at meetings outside a person's core responsibility, special development jobs, and special projects.

A recent report published by The Conference Board (Barrett & Beeson, 2002) based upon a survey of CEOs, concluded that experiential learning through job assignments for development is not only "state of the art" in leadership development, but is also essential for developing leaders who can handle the challenges of the next decade.

Though these studies helped to establish that on-the-job experiences are important to managerial and leadership development, what they did not provide was a systematic study of work environments leading to establishment of a theory of on-the-job development.

Developmental Components of Jobs.

The first stage in developing a theory of on-the-job development was gaining a clearer understanding of the job related components that contribute to growth and development. By "development through job experiences," this paper means learning, growth, and personal change that managers experience as a result of their roles, responsibilities, and tasks they encounter in their jobs (McCauley & Brutus, 1998).

A major step towards developing such a theory was the work by McCall, Lombardo, and Morrison (1988) in which they interviewed 191 accomplished and high potential executives to discover key developmental events and lessons learned from those events. One of their main findings was the importance of job related challenges to managerial growth and change. Another

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factor related to managerial learning was the amount of change a manager had to cope with (Davies, 1984). Research also identified transitioning into a new job as a source for on-the-job learning and development (Stewart, 1984).

McCauley, Ohlott, and Ruderman (1989) synthesized previous research into a conceptual, holistic model for investigating on-the-job development. Their model proposed that the primary source for managerial growth and learning occurred when the manager felt challenged by the job. The model identified two broad categories of factors impacting job challenge: job transitions, and types and intensity of job demands.

Testing of the model was done using an instrument—the first generation of the Job Challenge Profile (1988)—whose content was derived from McCall et al. (1988). The sample consisted of 346 middle to upper level managers from nine Fortune 500 companies. Their study found that "the more challenge present in a job, the more developmental the job was as rated by the incumbent" (p. 155).

Further research (McCauley, Ruderman, Ohlott, & Morrow, 1994) refined the model and replaced the Job Challenge Profile with The Developmental Challenge Profile (DCP). The DCP was developed specifically for studying the developmental components of jobs. It, like the 1988 version of the JCP, was based "on the premise that on-the-job learning is most likely to occur when managers are faced with challenging job situations" (p. 544). Their 1994 study provided evidence that the DCP "measured distinct developmental components of managerial jobs" (p. 555).

In 1999, a shortened, renamed version of the DCP was introduced (McCauley, Ohlott, and Ruderman, 1999). The new version, now called the Job Challenge Profile (JCP), consisted of 50 questions instead of the DCP's 113 items (Ohlott, McCauley, & Ruderman, 1995). The

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JCP examines five broad developmental components of jobs: (1) Experiencing a Job Transition, (2) Creating Change, (3) Managing at High Levels of Responsibility, (4) Managing Boundaries, and (5) Dealing with Diversity. These are the five factors that comprise Job Challenge and provide both the motivation and opportunities for on-the-job learning and growth.

Summary

This chapter provided an examination of the three streams of literature that intersect relative to this research: leadership, leadership development, and learning through experience. The first part of the chapter provided a brief review of the evolution of leadership theory that leads to and supports Visionary Leadership Theory. Next, the chapter investigated the literature seeking to understand the ways in which leadership skills are developed. And, finally, the literature points to the importance of on-the-job learning as a source for leadership development. The end result of synthesizing the reviewed literature is the study's conceptual framework that will be detailed in Chapter 3.

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CHAPTER 3 – METHODS

This chapter explains the study's conceptual framework as well as the research design, research questions, and hypotheses. Additionally, the research procedures are explained, including a discussion of the sites, samples, and data sources, and data collection procedures. Finally, the data analysis, statistical procedures, and human subject considerations are discussed.

Conceptual Framework

This study uses the functionalist world view (Burrell & Morgan, 1979) and the setting of work environments to test the relationship between two theoretical perspectives. The first theoretical perspective, Visionary Leadership Theory (VLT) (Sashkin & Burke, 1990; Sashkin, 1992, 1996a, 1996b), defines leadership as a synergistic composite of transactional leadership behaviors, transformational leadership behaviors, and transformational leadership characteristics. VLT theory builds upon and integrates previous leadership research and theory. For example, VLT is based in part on the behavioral work accomplished by Bennis and Nanus (1985), the research on cognitive capability Jaques (1986), McClelland's (1975, 1987) research on power, and Bandura's (1982, 1986) research on self-efficacy.

This study used The Leadership Profile (TLP) (Rosenbach, Sashkin, & Harburg, 1996; Sashkin, 1994, 1996b) to provide an assessment of the components of VLT. The instrument uses ten scales to measure the VLT's three dimensions of transactional leadership, transformational leadership, and leader characteristics.

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The second theoretical lens is provided by McCauley, Ohlott, & Ruderman's (1989) theory of On-the-job Development. This theory postulates that jobs have components that can be quantitatively assessed and, further, that those components can be used to assess the potential for management development in each job. The Job Challenge Profile (JCP) (McCauley et al., 1999) is based upon that theory and is used to assess an individual's level of exposure to various on-the-job developmental opportunities. The JCP was used by this study.

Figure 1 illustrates the relationships of the various elements of this theory.

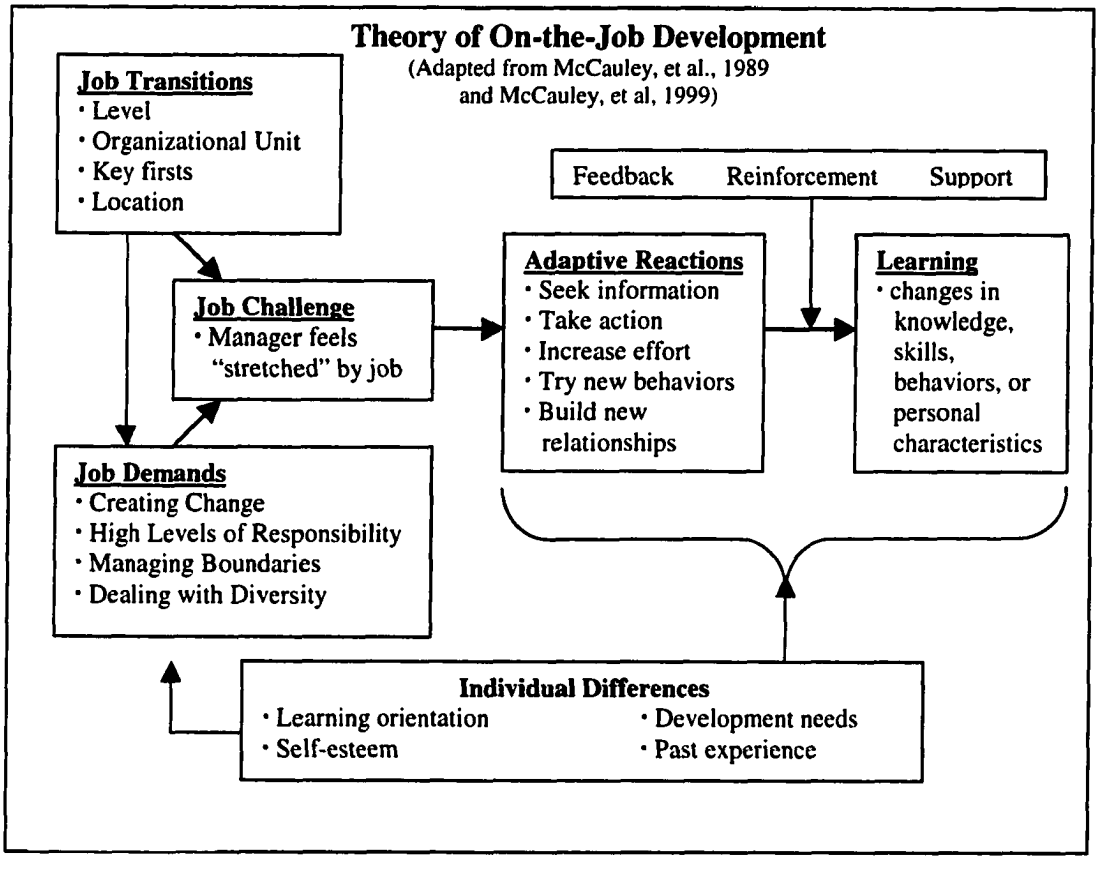

Figure 1: Theory of On-the-Job Development

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The linkage between the two theories is the construct of learning. VLT postulates that leadership can be learned. Likewise, OTJD theory postulates that some jobs provide more opportunities for managerial learning than others. For example, a job that requires the manager to deal with high levels of responsibility will provide more learning opportunities than a managerial job that has low levels of responsibility. Thus, an important piece of this research is discovering whether or not the developmental components of jobs that have been associated with managerial learning are also associated with leadership development. Additionally, this study uses the work environment as the context for investigating the interaction between these two theories. (See Figure 2.)

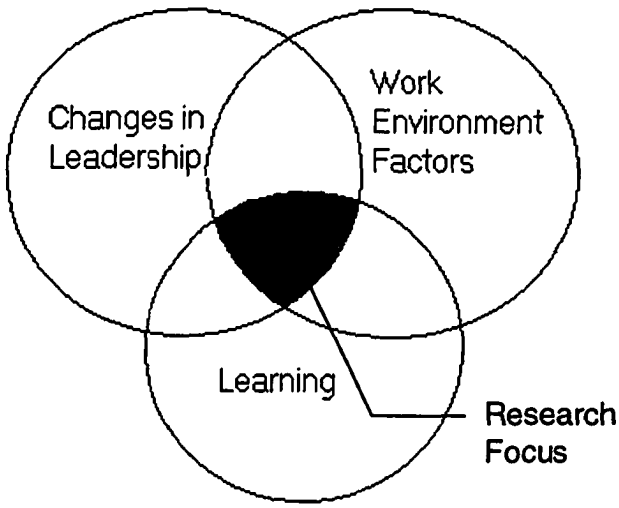

Figure 2: Area of Research Interest

Research Design

The research design for this study is derived from the data collection design (See Table 1) which is longitudinal, multiple event-cohort (Glenn, 1977; Graetz, 1987). This

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design permits multiple observations of the dependent variable in five different cohorts. As such, the design is a variation of Campbell and Stanley's (1966) "multiple time-series design" (e.g., Design #14). This study's design is similar to Campbell and Stanley's Design #14 in that membership of each event-cohort was observed using The Leadership Profile at several points in time and that the Job Challenge Profile was administered once (See Table 2).

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Table 1

TLP Data Collected (e.g., pre-test, post-test, etc.)

TLP Data	September 1995	Summer 1996	Summer 1997	Summer 1998	Summer 1999	Summer 2000
ACSC Class of 95		1 year after Graduation	2 years after Graduation	3 years after Graduation	No data available	5 years after Graduation
ACSC Class of 96	Pre-test	Post-test	1 year after Graduation	2 years after Graduation	No data available	4 years after Graduation
ACSC Class of 97		Pre-test	Post-test	1 year after Graduation	No data available	3 years after Graduation
ACSC Class of 98			Pre-test	Post-test	No data available	2 years after Graduation
ACSC Class of 99				Pre-test	Post-test	1 year after Graduation

This study's research design has three important differences from the design described by Campbell and Stanley (1966). First, this study used five cohorts instead of two. Secondly, no experimental treatment was administered to any group nor were there any control groups. And, thirdly, cohort membership was not randomly assigned. Following paragraphs discuss each of these differences in detail.

Instead of two groups, this design uses five cohorts[3] (i.e., year-groups), each at a different maturational point since graduation from Air Command and Staff College. All cohorts

[3] I have chosen to call the individual year-groups "cohorts" instead of "panels," because even though the same group members were surveyed each time the TLP was administered, the same people did not always respond.

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graduated from a ten-month in-residence professional military education program and have been tracked by TLP scores with pre-test, post-test[4] and follow-up surveys given at the same time each year (See Table 1). Additionally, all cohorts received the JCP at the same time. Thus, comparing the changes by various cohorts revealed whether or not historical or maturation influences affected the outcomes.

Another difference between this design and Design #14 is that in Design #14 only the experimental group receives the experimental treatment. However, in this study there is no unique "experimental treatment." Instead, this study investigated the historical effects of each respondent's exposure to on-the-job challenges as measured by the JCP in relationship to self-assessed leadership changes (see Table 2). So, the crucial historical effect for all cohorts was the study's independent variable (e.g., JCP scores). Since this was a naturally occurring independent variable, it could not be controlled and, instead, was assessed and, thus, accounted for.

[4] Cohort 1 did not receive either a pre-test or post-test.

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Table 2

Modified "Multiple Time-Series, Quasi-Experimental Design"

(Campbell and Stanley, Design #14)

Cohort (Academic Year)	September 1995	Summer 1996	Summer 1997	Summer 1998	From Summer 1998 to Summer 1999	From Summer 1999 to Summer 2000	Summer 2000
Cohort 1 AY 94-95		TLP one year after ACSC graduation	TLP two years after ACSC graduation	TLP three years after ACSC graduation	←	JCP →	TLP five years after ACSC graduation
			TLP [5]	←	—	JCP →	TLP
Cohort 2 AY 95-96	TLP beginning of ACSC	TLP end of ACSC	TLP one year after ACSC graduation	TLP two years after ACSC graduation	←	JCP →	TLP four years after ACSC graduation
			TLP [6]	←	—	JCP →	TLP
Cohort 3 AY 96-97		TLP beginning of ACSC	TLP end of ACSC	TLP one year after ACSC graduation	←	JCP →	TLP three years after ACSC graduation
			TLP [7]	←	—	JCP →	TLP
Cohort 4 AY 97-98			TLP beginning of ACSC	TLP end of ACSC	←	JCP →	TLP two years after ACSC graduation
Cohort 5 AY 98-99				TLP beginning of ACSC	TLP end of ACSC	← JCP →	TLP one year after ACSC graduation

[5] Indicates that some members of Cohort 1 took the TLP in 1997 and in 2000, but not in 1998.
[6] Indicates that some members of Cohort 2 that took the TLP in 1997 and in 2000, but not in 1998.
[7] Indicates that some members of Cohort 3 that took the TLP in 1997 and in 2000, but not in 1998.

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The third major difference between this design and Design #14 is that group membership in this study was not and could not have been randomly assigned. Randomization during selection was not possible because each cohort, initially, consisted of all U.S. members of a specific class at a specific military educational institution. Thus, the researcher had no control over membership selection. However, the important consideration is whether or not lack of randomization weakened the design.

Campbell and Stanley (1966) state that the more similar the groups are in terms of their recruitment and pre-test scores, the more strongly the design controls the "main effects of history, maturation, testing, and instrumentation" (p. 48). This study's design enabled an assessment of group similarity through use of descriptive statistics and a comparison of each cohort's TLP means at the beginning of the period of consideration. Thus, the design facilitated determination of whether or not lack of randomization impacted results.

In summary, this study used a quasi-experimental, longitudinal design consisting of five event cohorts. The use of five cohorts enabled an assessment of effects from cohort membership. Changes in the dependent variable were assessed over time and, thus, enabled a thorough search for maturational influences. Further, the design controlled for historical effects by observing the independent variable over three different time periods. Finally, statistics were used to determine whether or not lack of randomization in cohort membership impacted study results.

Research Questions and Hypotheses

This study has two primary research questions from which several sub-questions and hypotheses emerge.

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Research Question Number One and Hypotheses.

Is exposure to on-the-job developmental opportunities, as measured by the Job Challenge Profile (JCP), associated with self-reported changes in leader behavior and characteristics, as assessed by The Leadership Profile (TLP)?

a) H1A: The total change in Total Visionary Leadership (e.g., total TLP score) for all cohorts[8] combined into a single sample is positively and significantly associated with the level of job developmental opportunity (e.g., total JCP score).

b) H1A0: For all cohorts combined into a single sample, there is no correlation or a significant negative correlation between the total change in Total Visionary Leadership (e.g., total TLP score) and the level of job developmental opportunity (e.g., total JCP score).

c) H1B: The total change in Total Visionary Leadership (e.g., total TLP score) for each individual cohort is positively and significantly associated with the level of job developmental opportunity (e.g., total JCP score).

d) H1B0: For each individual cohort, there is no correlation or a significant negative correlation between the total change in Visionary Leadership Theory score(e.g., total TLP score) and the level of job developmental opportunity (e.g., total JCP score).

Second Research Question with Hypotheses.

Exposure to which on-the-job developmental opportunities, as measured by the Job Challenge Profile (JCP), are associated with changes in leader behavior and characteristics, as

[8] See "Sample" section for a description of the various cohorts that comprise this study.

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assessed by The Leadership Profile? This research question peels back the onion one layer to investigate possible relationships between specific types of on-the-job challenges and development of specific leadership areas such as transactional behaviors, transformational behaviors and leadership characteristics.

Hypothesis Development Process in Support of the Second Research Question

No previous research has tried to associate types of job developmental challenges with changes in Transactional Leadership, Transformational Leadership, and Transformational Leadership Characteristics. Therefore, the process the researcher used for predicting these hypotheses were rationally derived assessments instead of being deductions derived from previous research.

Specifically, the researcher compared the definition of each JCP factor with each VLT factor and then, based upon personal experience, determined the likelihood of the two factors being related. Then, if there was a likelihood that the JCP and TLP components would be associated, that potential relationship was indicated with a "+" in the matrixes of Figures 3-5. If the likelihood of a significant, positive relationship was determined to be uncertain, that uncertainness was indicated with a "?" in the matrixes of Figures 3-5. Next, a significant, positive correlation between the JCP factor and VLT dimension was predicted only whenever a JCP factor was predicted to be associated positively with two (for transactional leadership behaviors) or three (for transformation behaviors/characteristics) VLT dimensions.

Figures 3-5 use "+" and "?" to graphically show the predicted relationships between VLT and JCP components. The following paragraphs detail the process and logic for each hypothesis constructed to help answer the second research question.

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Relationship of Job Developmental Components with Changes in Transactional Leadership Behavior

This set of hypotheses address the question, "Which job developmental components are associated with changes in transactional leadership behaviors?" The predictions resulted after considering definitions of various JCP components with the components of transactional leadership behavior.

Figure 3 summarizes the predicted relationships between the JCP factors and each of the transactional leadership behavior dimensions. A significant, positive correlation is predicted whenever a JCP factor is predicted to be associated positively with both transactional leadership behavior dimensions measured by the TLP.

Transactional Leadership Behavior factors (from VLT theory) → JCP Factors ↓	Capable Management	Reward Equity
Experiencing a Job Transition	+[9]	+
Creating Change	?	?
Managing at High Levels of Responsibility	+	+
Managing Boundaries	?	?
Dealing with Diversity	?	?

Figure 3: Transactional Leadership and JCP Dimensions

[9] A "+" predicts that the two factors will be significantly and positively associated. A "?" indicates uncertainty about whether or not the two factors will be significantly and positively associated.

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The following section summarizes the hypotheses derived from Figure 3. After the summary, the process and logic for each hypothesis constructed to test relationships between JCP factors and Transactional Leadership Behavior is presented.

Summary of hypotheses predicting relationships between job developmental components and Transactional Leadership Behavior.

H2A: For all cohorts combined into a single sample, the total change in transactional leadership behavior is positively and significantly associated with the total score on the "Experiencing a Job Transition" scale.

H2A0: For all cohorts combined into a single sample, there will be no correlation or a significant negative correlation between the total change in transactional leadership behavior and the total score on the "Experiencing a Job Transition" scale.

H2B: For all cohorts combined into a single sample, the total change in transactional leadership behavior is positively and significantly associated with the total score on the "Managing at High Levels of Responsibility" scale.

H2B0: For all cohorts combined into a single sample, there will be no correlation or a significant negative correlation between the total change in transactional leadership behavior and the total score on the "Managing at High Levels of Responsibility" scale.

Experiencing a Job Transition.

The definition of "Experiencing a Job Transition" is handling "responsibilities that are new or very different from previous ones you have handled" (McCauley, Ohlott, & Ruderman, 1999, p. 9). Specific JCP questions for this factor ask about: (1) lack experience in an important aspect of this new job; (2) have to manage something new; (3) others question if you are ready;

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(4) you don't have the background expected for this job; and (5) you are doing a type of work dramatically different from what you've done before.

The "Capable Management" scale "measures how well the leader accomplishes the day-to-day basic administrative or managerial tasks that are necessary for any group or organization to function well in the short term" (Rosenbach, Sashkin, & Harburg, 1996, p. 6).

In comparing those two factors, I concluded that a person who successfully handled new responsibilities would most likely report increased managerial skill. Thus, I believed the two factors will be related.

Next, I considered "Experiencing a Job Transition" and "Reward Equity." The "Reward Equity" scale measures the degree to which goals are made clear to subordinates and subordinates are rewarded based upon accomplishing the goals (Rosenbach, Sashkin, & Harburg, 1996). In comparing those two factors, I concluded that a person who successfully handled new responsibilities would most likely report increased use of reward equity to achieve the managerial goals entailed in the new job. Thus, I predicted the two factors will be related.

Next, since I predicted both TLP scales to be related with the JCP factor, I built a hypothesis that the total change in Transactional Leadership Behavior score will be positively and significantly associated with the total score on the "Experiencing a Job Transition" scale (e.g. Hypothesis H2A).

Creating Change.

The "Creating Change" scale assesses the degree to which one's responsibilities involved taking the organization in new directions, fixing problems created by predecessors, and addressing employee resistance to change (McCauley, et al., 1999). Research on organizational change by Kotter (1996) and Yukl (2002) was considered. Neither identifies capable

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management as being necessary for creating organizational change. Likewise, neither Kotter's nor Yukl's model of change addresses using a fair exchange for what followers want in return for good performance as a way of facilitating organizational change. Therefore, I was not confident that either TLP scale would be significantly, positively related to the JCP scale of Creating Change and no relationship between this scale and Transactional Leadership Behavior was predicted.

Managing at High Levels of Responsibility.

The "Managing at High Levels of Responsibility" scale assesses the degree to which one was responsible for key decisions, high visibility projects, dealt with pressure from senior managers, and had responsibility for large organizations with multiple functions (McCauley, et al., 1999). It seemed reasonable that to meet the demands of high levels of responsibility, one would need to be a capable manager and treat subordinates fairly. Thus, I predicted that both TLP scales would be related to this JCP factor and, therefore, constructed a hypothesis that the total change in Transactional Leadership Behavior score will be positively and significantly associated with the total score on the "Managing at High Levels of Responsibility" scale (e.g. Hypothesis H2B).

Managing Boundaries.

The "Managing Boundaries" scale assesses the degree to which one's responsibilities require influencing peers, higher management or other people over whom one does not have direct influence, and important outside groups (McCauley, et al., 1999). Day-to-day management activities, as measured by the "Capable Management" scale, did not seem to be related to developing influence over people or groups for whom one does not have direct influence. Thus, a significant, positive relationship between the two could not be predicted.

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Likewise, providing what followers want in exchange for good performance, as measured by the "Reward Equity" scale, did not seem to be related to developing influence over people or groups for whom one does not have direct influence and, consequently, a significant, positive relationship between the two could not be predicted. Since no significant, positive relationship was predicted between either TLP scale and the JCP scale of "Managing Boundaries," no relationship between Transactional Leadership Behavior and that JCP scale was predicted.

Dealing with Diversity.

The "Dealing with Diversity" scale assesses the degree to which one must work with people of both genders and different ethnic backgrounds as well as from varying cultures or differing institutional perspectives (McCauley, et al., 1999). In considering possible relationships between the TLP scales of "Capable Management" and "Reward Equity" and the JCP scale of "Managing Diversity," it was not clear that those involved the same skill set. For example, an improvement in one's ability to handle day-to-day management activities, as measured by the "Capable Management" scale, might or might not be related to developing skills for dealing with a diverse workforce. Similarly, "Reward Equity" would be important no matter the degree of the workforce's diversity. Thus, a significant, positive relationship between either of these two TLP factors and the JCP factor could not be predicted and no significant, positive relationship between Transactional Leadership Behavior and the JCP scale of "Managing Diversity" was predicted.

Relationship of Job Developmental Components with Changes in Transformational Leadership Behaviors

This section provides the logic for developing the set of hypotheses that address the question, "Which job developmental components are associated with changes in transformational

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leadership behaviors?" The predicted relationships resulted after considering the implications of the definition of each JCP component with the components of Transformational Leadership Behavior.

The transformational leadership behavior dimensions assessed by the TLP are: "Communications Leadership," "Credible Leadership," "Caring Leadership," and "Creative Leadership." The "Communications Leadership" scale assesses "the ability to manage and direct the attention of others through especially clear and focused interpersonal communication" (W. E. Rosenbach, Marshall Sashkin, & F Harburg, 1996b). "Credible Leadership" assesses the respondent's perceived integrity and the degree to which they keep commitments and promises (W. E. Rosenbach et al., 1996b). "Caring Leadership" measures the degree to which the respondent perceives himself/herself demonstrating respect and concern for others (W. E. Rosenbach et al., 1996b). The "Creative Leadership" scale assesses the respondent's willingness to create opportunities for individual and organizational growth through empowerment, reasonable risk taking, and focusing on success (W. E. Rosenbach et al., 1996b).

Figure 4 predicts relationships between the JCP factors and each of the transformational leadership behavior dimensions. A significant, positive correlation was predicted whenever a JCP factor was predicted to be associated positively with at least three of the four transformational leadership behavior dimensions.

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Transformational Leadership Behavior factors (from VLT theory)➔ JCP Factors ↓	Communica-tions Leadership	Credible Leadership	Caring Leadership	Creative Leadership
Experiencing a Job Transition	?	?	?	?
Creating Change	+	+	+	+
Managing at High Levels of Responsibility	+	+	?	+
Managing Boundaries	+	+	?	?
Dealing with Diversity	+	+	+	?

Figure 4: Transformational Leadership Behaviors and JCP Dimensions

The following section summarizes the hypotheses derived from Figure 4. After the summary, the process and logic for each hypothesis constructed to test relationships between JCP factors and Transformational Leadership Behavior is presented.

Summary of hypotheses predicting relationships between job developmental components and Transformational Leadership Behavior.

H2C: For all cohorts combined into a single sample, the total change in transformational leadership behavior is positively and significantly associated with the total score on the "Creating Change" scale.

H2C0: For all cohorts combined into a single sample, there will be no correlation or a significant negative correlation between the total change in transformational leadership behavior and the total score on the "Creating Change" scale.

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H2D: For all cohorts combined into a single sample, the total change in transformational leadership behavior is positively and significantly associated with the total score on the "Managing at High Levels of Responsibility" scale.

H2D0: For all cohorts combined into a single sample, there will be no correlation or a significant negative correlation between the total change in transformational leadership behavior and the total score on the "Managing at High Levels of Responsibility" scale.

H2E: For all cohorts combined into a single sample, the total change in transformational leadership behavior is positively and significantly associated with the total score on the "Dealing with Diversity" scale.

H2E0: For all cohorts combined into a single sample, there will be no correlation or a significant negative correlation between the total change in transformational leadership behavior and the total score on the "Dealing with Diversity" scale.

Experiencing a Job Transition.

The definition of "Experiencing a Job Transition" is handling "responsibilities that are new or very different from previous ones you have handled" (McCauley, Ohlott, & Ruderman, 1999, p. 9). Specific JCP questions for this factor ask about: (1) lack experience in an important aspect of this new job; (2) have to manage something new; (3) others question if you are ready; (4) you don't have the background expected for this job; and (5) you are doing a type of work dramatically different from what you've done before. When considering the potential relationship between each of the four Transformational Leadership Behavior scales and this job developmental factor, it was not clear that being in a new job would necessarily result in improved communication skills, increased personal integrity, more highly valuing other people's feelings, nor an increase in one's ability to creatively address challenges. Since a significant,

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positive relationship between any of these TLP factors and "Experiencing a Job Transition" could not be predicted, no relationship between Transformational Leadership Behavior and this JCP scale was predicted.

Creating Change.

The "Creating Change" scale assesses the degree to which one's responsibilities involved taking the organization in new directions, fixing problems created by predecessors, and addressing employee resistance to change (McCauley, et al., 1999). In considering whether or not "Communications Leadership," "Credible Leadership," "Caring Leadership," and "Creative Leadership" might be related to the job developmental opportunities inherent in creating change, research on organizational change by Kotter (Kotter, 1996) and Yukl (G. A. Yukl, 2002) was considered.

Kotter (1996) identified an eight-step process for carrying out organizational change: establishing a sense of urgency, creating a guiding coalition, developing a vision and strategy, communicating the change vision, empowering others to act, creating short-term wins, consolidating gains and producing even more change, and institutionalizing new approaches in the future. Several of these steps provide support for predicting that the TLP factors of "Communications Leadership," "Credible Leadership," and "Creative Leadership" would increase in a job situation that required creating and implementing change.

Yukl (2002) identified lack of trust by employees as one of the reasons that organizational change efforts fail and provided several suggestions for leaders to help people prepare for and deal with change. Some of his suggestions included preparing people for the change, helping people deal with the pain of change, keeping people informed, and empowering people to implement the change. These suggestions provide support for predicting that the TLP

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factor of "Caring Leadership" will increase in a job situation that required creating and implementing change.

Given this theoretical support, I predicted that each of the TLP factors would be positively related to the job developmental opportunity of creating change. Therefore, I constructed a hypothesis that the total change in Transformational Leadership Behavior score will be positively and significantly associated with the total score on the "Creating Change" scale (e.g., Hypothesis H2C).

Managing at High Levels of Responsibility.

The "Managing at High Levels of Responsibility" scale assesses the degree to which one was responsible for key decisions, high visibility projects, dealt with pressure from senior managers, and had responsibility for large organizations with multiple functions (McCauley, et al., 1999). It seemed reasonable that to adapt to the demands of high levels of responsibility, one would need increased skill in communicating so that they could help others to understand the issues and understand the actions to be taken. Likewise, credibility and integrity would be important to performing at high levels of responsibility because followers, peers, and leaders would need to be able to trust that the high visibility projects or key decisions are in capable hands. Finally, high levels of responsibility would create opportunities for creative solutions. Thus, I predicted that the three TLP scales of "Communications Leadership," "Credible Leadership," and "Creative Leadership" would be related to this JCP factor.

However, "Caring Leadership" is not necessarily required for success in dealing with key decisions, high visibility projects, or with pressure from senior managers. In fact, one might be so focused on "getting the job done," that considerations for other people's feelings might not be

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considered. So, I did not predict that "Caring Leadership" would be related to this job developmental factor.

Since I predicted that three of the four TLP factors would be related to "Managing at High Levels of Responsibility," I constructed a hypothesis that the total change in Transformational Leadership Behavior score will be positively and significantly associated with the total score on the "Managing at High Levels of Responsibility" scale (e.g., Hypothesis H2D).

Managing Boundaries.

The "Managing Boundaries" scale assesses the degree to which one's responsibilities require influencing peers, higher management or other people over whom one does not have direct influence, and important outside groups (McCauley, et al., 1999). In considering the potential relationship between each of the four Transformational Leadership Behavior dimensions and this job developmental factor, it seemed reasonable that one would need to hone one's communications skills and demonstrate reliability and trustworthiness to persuade those over whom one does not have direct influence. However, it was not clear that being in a job that required managing boundaries would necessarily result in improved skills in caring for others nor increase one's ability to creatively address challenges.

Thus, significant, positive relationships between two of the four TLP factors and "Managing Boundaries" was predicted. And, therefore, since only two TLP/JCP relationships were predicted, no relationship between Transactional Leadership Behavior and "Managing Boundaries" was predicted.

Dealing with Diversity.

The "Dealing with Diversity" scale assesses the degree to which one must work with people of both genders and different ethnic backgrounds as well as from varying cultures or

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differing institutional perspectives (McCauley, et al., 1999). In considering possible relationships between the TLP scales of "Communications Leadership," "Credible Leadership," "Caring Leadership," and "Creative Leadership," it seemed reasonable that as the challenge of dealing with diversity increased, so would one's skills in communicating with others, frequency of demonstrating reliability and integrity, and skills in demonstrating respect and concern for others. So, a significant, positive relationship between this job developmental challenge and each of the following transformational leadership behaviors was predicted: "Communications Leadership," "Credible Leadership," and "Caring Leadership."

However, it was less clear that learning to deal with a diverse workforce would necessarily result in increased frequency with which a leader would seek creative solutions to organizational challenges. In other words, it was less clear that dealing with diversity would be related to increased creativity. Thus, no relationship between "Creative Leadership" and "Dealing with Diversity" was predicted.

Thus, significant, positive relationships between three of the four TLP factors and "Dealing with Diversity" was predicted. And, therefore, since three TLP/JCP relationships were predicted, I constructed a hypothesis that the total change in Transformational Leadership Behavior score will be positively and significantly associated with the total score on the "Dealing with Diversity" scale (e.g., Hypothesis H2E).

Relationship of Job Developmental Components with Changes in Transformational Leadership Characteristics

This section provides the logic for developing the set of hypotheses that address the question, "Which job developmental components are associated with changes in leader characteristics?" The predicted relationships resulted after considering the implications of the

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definition of each transformational leadership characteristic assessed by the TLP with each JCP job developmental component. The transformational leadership characteristics assessed by the TLP are: "Confident Leadership," "Follower-Centered Leadership," "Visionary Leadership," and "Principled Leadership."

The "Confident Leadership" scale assesses the degree to which one possesses and displays self-confidence and the degree to which one "is able to instill the same self-confidence in followers" (W. E. Rosenbach et al., 1996b). The "Follower-Centered Leadership" scale assesses the degree to which one uses power and influence for the good of others and the organization (W. E. Rosenbach et al., 1996b). The "Visionary Leadership" scale measures the respondent's ability to visualize and clearly define a future for the group or organization (W. E. Rosenbach et al., 1996b). The "Principled Leadership" scale assesses the degree to which one is aware of and supports shared values and beliefs of an organization's culture (W. E. Rosenbach et al., 1996b).

Figure 5 predicts relationships between the JCP factors and each of the transformational leadership characteristics. A significant, positive correlation between Transformational Leadership Characteristics and a JCP factor was predicted whenever that JCP factor was predicted to be associated positively with at least three of the four transformational leadership characteristic dimensions.

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Transformational Leadership Characteristic factors (from VLT theory) ➔ JCP Factors ⬇	Confident Leadership	Follower-Centered Leadership	Visionary Leadership	Principled Leadership
Experiencing a Job Transition	+	?	+	?
Creating Change	+	+	+	+
Managing at High Levels of Responsibility	+	?	+	+
Managing Boundaries	+	?	+	+
Dealing with Diversity	+	+	?	+

Figure 5: Transformational Leadership Characteristics and JCP Dimensions

The following section summarizes the hypotheses derived from Figure 5. After the summary, the process and logic for each hypothesis constructed to test relationships between JCP factors and Transformational Leadership Behavior is presented.

Summary of hypotheses predicting relationships between job developmental components and Transformational Leadership Characteristics.

H2F: For all cohorts combined into a single sample, the total change in transformational leadership characteristics is positively and significantly associated with the total score on the "Experiencing a Job Transition" scale.

H2F0: For all cohorts combined into a single sample, there will be no correlation or a significant negative correlation between the total change in transformational leadership characteristics and the total score on the "Experiencing a Job Transition" scale.

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H2G: For all cohorts combined into a single sample, the total change in transformational leadership characteristics is positively and significantly associated with the total score on the "Creating Change" scale.

H2G0: For all cohorts combined into a single sample, there will be no correlation or a significant negative correlation between the total change in transformational leadership characteristics and the total score on the "Creating Change" scale.

H2H: For all cohorts combined into a single sample, the total change in transformational leadership characteristics is positively and significantly associated with the total score on the "Managing at High Levels of Responsibility" scale.

H2H0: For all cohorts combined into a single sample, there will be no correlation or a significant negative correlation between the total change in transformational leadership characteristics and the total score on the "Managing at High Levels of Responsibility" scale.

H2I: For all cohorts combined into a single sample, the total change in transformational leadership characteristics is positively and significantly associated with the total score on the "Managing Boundaries" scale.

H2I0: For all cohorts combined into a single sample, there will be no correlation or a significant negative correlation between the total change in transformational leadership characteristics and the total score on the "Managing Boundaries" scale.

H2J: For all cohorts combined into a single sample, the total change in transformational leadership characteristics is positively and significantly associated with the total score on the "Dealing with Diversity" scale.

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H2J0: For all cohorts combined into a single sample, there will be no correlation or a significant negative correlation between the total change in transformational leadership characteristics and the total score on the "Dealing with Diversity" scale.

Experiencing a Job Transition.

In considering potential relationships between this job developmental component and each of the four transformational leadership characteristics, it seemed reasonable that being in a new job might result in improved self-confidence as well as create opportunities for cognitive growth. However, it was not clear that being in a new job would necessarily result in more focus on followers or increased pro-social use of power nor an increase in one's awareness and ability to address key values in an organization's culture. Thus, with relationships predicted between only two TLP factors and this JCP component, no relationship between Transformational Leadership Characteristics and this JCP scale was predicted.

Creating Change.

In considering whether or not "Confident Leadership," "Follower-Centered Leadership," "Visionary Leadership," and "Principled Leadership" might be related to the job developmental opportunities inherent in creating change, research on organizational change by Kotter (Kotter, 1996) and Yukl (G. A. Yukl, 2002) was considered.

Of the eight steps identified by Kotter (1996) for carrying out organizational change, several provide support for predicting that "Confident Leadership" and "Visionary Leadership" as measured by the TLP would increase in a job situation that required creating and implementing change. Similarly, Yukl's work (Yukl, 2002) lends support for predicting that skills in visionary leadership would increase as would skills needed for follower-centered leadership in a job situation that required creating and implementing change. Finally, since one

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of the elements of the definition of "Principled Leadership" is managing change (W. E. Rosenbach et al., 1996b), it seems reasonable to predict that skills related to "Principled Leadership" would increase in a job situation that required creating and implementing change.

Since each of these TLP factors was predicted to increase in job situations that required creating and implementing change, I constructed a hypothesis that the total change in Transformational Leadership Characteristics score will be positively and significantly associated with the total score on the "Creating Change" scale (e.g., Hypothesis H2G).

Managing at High Levels of Responsibility.

In considering potential relationships between this job developmental component and each of the four transformational leadership characteristics, it seemed reasonable that being in a job that required making key decisions, managing high visibility projects, and dealing with pressure from senior managers would lead to increased self-confidence, cognitive growth, and an increased awareness of the values that form an organization's culture. However, it was less clear that managing high levels of responsibility would necessarily result in more focus on followers or increased pro-social use of power.

Since I predicted that three of the four TLP factors would be related to "Managing at High Levels of Responsibility," I constructed a hypothesis that the total change in Transformational Leadership Characteristic score will be positively and significantly associated with the total score on the "Managing at High Levels of Responsibility" scale (e.g., Hypothesis H2H).

Managing Boundaries.

In considering potential relationships between this job developmental component and each of the four transformational leadership characteristics, it seemed reasonable that being in a

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job that required exercising indirect influence would lead to increased self-confidence, cognitive growth, and an increased awareness of the values that form an organization's culture. However, it was less clear that the job requirement to use indirect influence would necessarily result in more focus on followers or increased pro-social use of power.

Since I predicted that three of the four TLP factors would be related to "Managing at High Levels of Responsibility," I constructed a hypothesis that the total change in Transformational Leadership Characteristic score will be positively and significantly associated with the total score on the "Managing Boundaries" scale (e.g., Hypothesis H2I).

Dealing with Diversity.

In considering potential relationships between this job developmental component and each of the four transformational leadership characteristics, it seemed reasonable that being in a job that required dealing with a diverse population would lead to increased self-confidence, increased focus on understanding and supporting followers, and an increased awareness of the values that form an organization's culture. However, it was less clear that the job requirement to deal with the challenges of a diverse workforce would necessarily result in cognitive growth.

Thus, I predicted that three of the four TLP factors would be related to "Dealing with Diversity," and, therefore, constructed a hypothesis that the total change in Transformational Leadership Characteristic score will be positively and significantly associated with the total score on the "Dealing with Diversity" scale (e.g., Hypothesis H2J).

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Research Procedures

This section provides an overview of sites selected, a description of the sample, two theoretical perspectives, Instrumentation, Dependent and Independent Variables, Research Design, Data Collection Procedures, and Data Analysis and Presentation.

Site Selection

No site selection was accomplished. This was a random variate because the sites were those naturally occurring work environments of respondents. They included a wide range of work environments from high-level staff organizations such as found in the Pentagon to "front-line" organizations responsible for day-to-day military operations.

Sample

The focus population for this study was U.S. graduates of the United States Air Force's (USAF) Air Command and Staff College's (ACSC) ten-month, in-residence professional military education program. Annually, the USAF competitively selects the top fifteen percent of its field-grade officers (i.e., mid-career) to attend this program. Each class is composed of approximately 560 students representing all four U.S. military services and including foreign military officers. The preponderance of students are U. S. Air Force officers. Though foreign military officers are part of the student population, they have not been included in this study. Unfortunately, due to the respondent mortality that has resulted from an inability to obtain current addresses for many of ACSC graduates, the number of possible participants from earlier cohorts is less than from later cohorts. For the present study, largest possible sample size was 1,585. The total n's for each of the five ACSC classes surveyed are as follows:

- Cohort 1: ACSC Class Academic Year (AY) 94-95, graduated June 1995. This class originally consisted of 512 U.S. students. One hundred sixty-two (162) graduates

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from this cohort completed the TLP in summer of 1997; 48 graduates from this cohort completed the TLP in the summer of 1998; and 103 graduates from this cohort completed the TLP in 2000. Seventy-two (72) of the 103 graduates completing a TLP in 2000 also completed a JCP survey as part of this dissertation's research.

- Cohort 2: ACSC Class Academic Year (AY) 95-96, graduated June 1996. This class originally consisted of 518 U.S. students. One hundred fifty-six (156) graduates from this cohort completed the completed the TLP in June 1997; 70 graduates from this cohort completed the TLP in June 1998; and 112 members of this cohort completed the TLP in 2000. Eighty-three (83) of the 112 completed a JCP survey as part of this dissertation's research.
- Cohort 3: ACSC Class Academic Year (AY) 96-97, graduated June 1997. This class originally consisted of 521 U.S. students. Three hundred forty-eight (348) graduates from this cohort completed the completed the TLP in June 1997; 90 graduates from this cohort completed the TLP in June 1998; and 173 members of this cohort completed the TLP in 2000. One hundred twenty-five (125) of the 173 responding in 2000 also completed a JCP survey as part of this dissertation's research.
- Cohort 4: ACSC Class Academic Year (AY) 97-98, graduated June 1998. This class originally consisted of 521 U.S. students. Four hundred eighteen (418) graduates from this cohort completed the last administration of the TLP in June 1998. Two hundred ten (210) members of this class completed the TLP in 2000 and 158 of those completed a JCP survey as part of this dissertation's research.
- Cohort 5: ACSC Class Academic Year (AY) 98-99, graduated June 1999. This class originally consisted of 513 U.S. students. Four hundred five (405) graduates from

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this cohort completed the TLP in June 1999. One hundred ninety-one (191) members of this class completed the TLP in 2000 and one hundred thirty-three (133) completed a JCP survey as part of this dissertation's research.

Instrumentation

This project used two survey instruments: The Leadership Profile (TLP) and the Job Challenge Profile (JCP). This section provides a brief overview of both instruments.

The Leadership Profile (TLP) (Rosenbach, Sashkin, & Harburg, 1996; Sashkin, 1994, 1996b) was developed to provide a comprehensive assessment of the components of VLT, including measures of transactional leadership, transformational leadership, and leader characteristics. The instrument uses ten scales to measure the VLT's three dimensions. The first dimension, transactional leadership behavior, consists of two components: Capable Management and Reward Equity. Transformational Leadership Behavior, the second dimension of VLT, is assessed using four components: Communications Leadership, Credible Leadership, Caring Leadership, and Creative Leadership. The third dimension is Transformational Leadership Characteristics and this dimension is assessed using four components: Confident Leadership, Follower-Centered Leadership, Visionary Leadership, and Principled Leadership.

The Job Challenge Profile (JCP) (McCauley et al., 1999) is used to assess the level and types of challenges a person is exposed to in his/her current job. The instrument uses ten scales to assess five components of job challenge. The Experiencing a Job Transition component is assessed with a single scale titled Unfamiliar Responsibilities. The second component, Creating Change, consists of three measures: New Directions, Inherited Problems, and Problems with Employees. The two factors High Stakes and Scope and Scale comprise the third dimension of job challenge: Managing at High Levels of Responsibility. Managing Boundaries is the fourth

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component and consists of External Pressure and Influence Without Authority. The final constituent element of job challenge, Dealing with Diversity, is composed of Work Across Cultures and Work Group Diversity.

TLP Psychometric Properties

Each of the ten TLP scales is composed of five questions for a total of 50 questions in the entire instrument. Nine of the ten TLP scales consistently show adequate to strong internal reliability, as evidenced by Cronbach alphas ranging from .592 to .966 in several research studies such as Higgins (1998), Palmer (1999), and Stryker (2001). Cronbach alphas for nine of the ten scales from previous research on the population studied in this dissertation ranged from .468 to .948 (Lafferty, 1998).

Scale eight, "Follower-Centered Leadership," is the only scale that consistently has low Cronbach alphas as evidenced by Cronbach alphas ranging from .401 to .471 (Higgins, 1998; Palmer, 1999; Stryker, 2001). Previous research on the population studied in this dissertation resulted in Cronbach alphas for scale eight that ranged from .060 to .366 (Lafferty, 1998). According to Sashkin (Sashkin, 1998a), it appears that the scale is actually two factorially independent scales; one that assesses personal power need and another that assesses pro-social power need. Further analysis by Palmer (1999) and Stryker (2001) resulted in Cronbach alphas ranging from .611 to .788 for the Personal Power sub-scale that consists of TLP questions 8 and 18 and Cronbach alphas ranging from .673 to .739 for the Pro-Social Power sub-scale that consists of TLP questions 28, 38, and 48.

JCP Psychometric Properties

The JCP is also composed of ten scales, each with five questions for a total of 50 questions. Three samples were used to assess that the JCP provides reliable and valid measures

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of developmental job experiences (McCauley et al., 1999). The analyses provided evidence of internal consistency with high Cronbach alphas in the range of .63 to .80 and evidence of test-retest reliability with quite high correlation coefficients ranging from .78 to .86. However, correlation coefficients were not available for two scales: Work Across Cultures and Work Group Diversity.

Dependent and Independent Variables

This study has four primary dependent variables for leadership behavior and characteristics all of which are derived from TLP scores: "Total Visionary Leadership Theory" score, "Transactional Leadership Behavior" score, "Transformational Leadership Behavior" score, and "Transformational Leadership Characteristics" score.

A participant's "Total Visionary Leadership Theory" score is the total of all of his/her scores on all ten of the TLP scales (e.g., "Capable Management," "Reward Equity," "Communications Leadership," "Credible Leadership," "Caring Leadership," "Creative Leadership," "Confident Leadership," "Follower-Centered Leadership," "Visionary Leadership," and "Principled Leadership").

A "Transactional Leadership Behavior" score consists of two components: Capable Management and Reward Equity. A "Transformational Leadership Behavior" score consists of four components: "Communications Leadership," "Credible Leadership," "Caring Leadership," and "Creative Leadership." A "Transformational Leadership Characteristics" score consists of four components: "Confident Leadership," "Follower-Centered Leadership," "Visionary Leadership," and "Principled Leadership."

This study has six independent variables representing aspects of on-the-job development opportunity. Five of the independent variables are the JCP scales: "Experiencing a Job

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Transition," "Creating Change," "Managing at High Levels of Responsibility," "Managing Boundaries," and "Dealing with Diversity." Additionally, the sixth independent variable is the "Total On-the-Job Developmental Opportunity" and it is represented by the total JCP score. Figure 6 graphically portrays the hypothesized relationships of the variables investigated along with a statement of the proposition that links them.

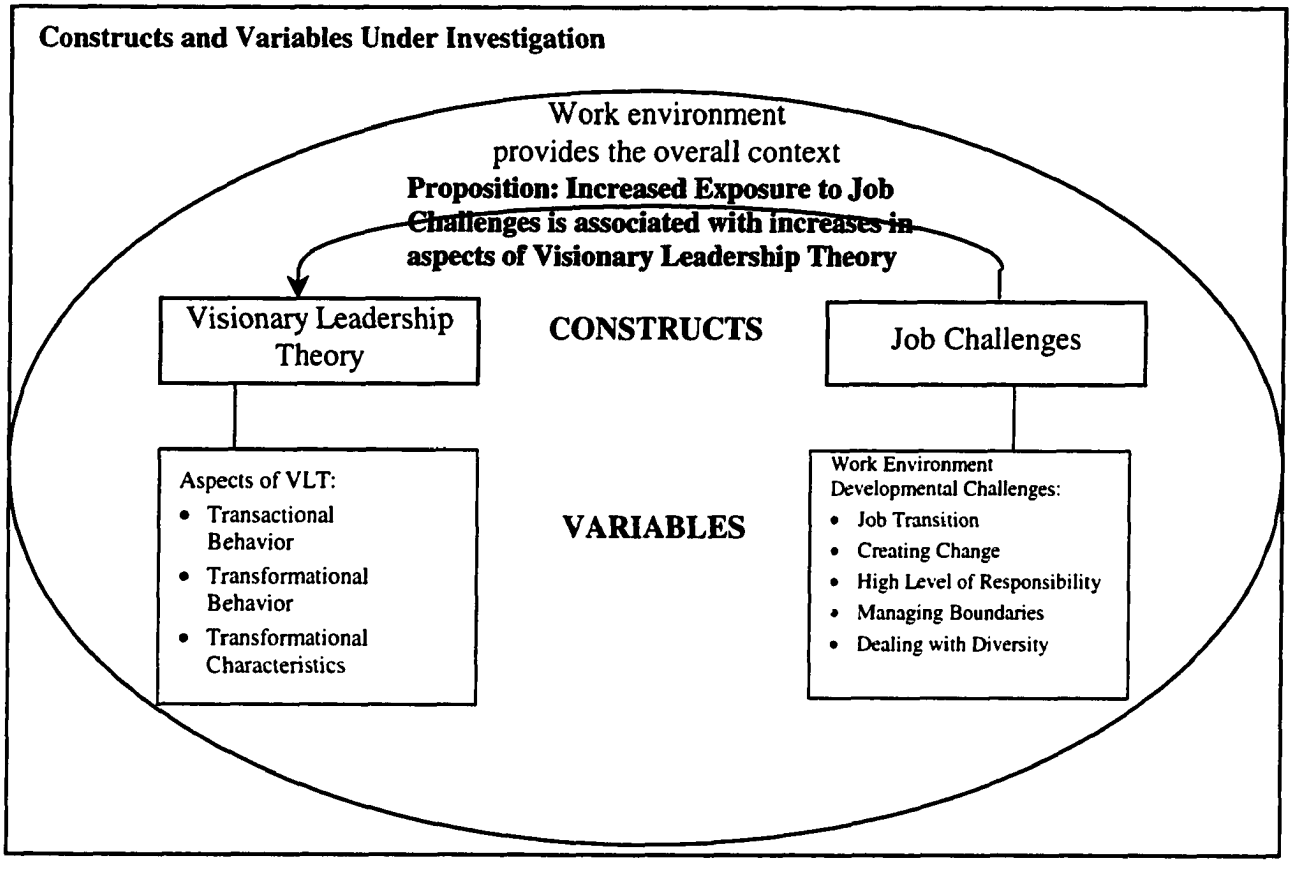

Figure 6: Constructs and Variables

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Data Sources and Collection

Data used in this research came from two sources: data obtained prior to the start of this dissertation research (i.e., archival) and data obtained during the course of the dissertation.

Archival Data: The ACSC Leadership Database

The archival data is from a research project initiated in the summer of 1996 by Lafferty (Lafferty, 1998) and continued by other researchers through the summer of 2000. During that time period the researchers obtained pre-test and post-test TLP survey data from students attending Air Command and Staff College in-residence. Table 3 identifies the TLP data that was obtained and archived. From this archival data, this research uses post-test TLP scores from the years 1997, 1998, 1999, and 2000 (see Table 3) to test the study's hypotheses.

ACSC Leadership Database data collection procedures.

Data collection procedures for the data in the ACSC Leadership Database were standardized and followed for each administration of the TLP. Pre- and post-intervention surveys were administered at Air Command and Staff College at the beginning and end of the program. Subsequent collection of one, two, three, four, and five years after the training intervention was made by mail. Each package contained a cover letter, rationale, instruction sheet, survey form, and return postage envelope.

Pre- and post-intervention surveys were hand delivered by each ACSC seminar leader to the ACSC Dean of Education's office where they were collected and stored. Those surveys sent by mail were returned to the researcher's office address. Threats to the validity stemming from the procedures used were limited. The only limitation was that, due to the frequent moves involved in being in the military, participants' addresses changed frequently and

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obtaining updated addresses was not always possible. This contributed to a lower mail-out rate and subsequently lower return rate for some of the post-ACSC mailings.

Table 3

Archived TLP Data Used for this research

TLP Data	Summer 1997	Summer 1998	Summer 1999	Summer 2000
ACSC Class of '95	n = 162 2 years after Graduation	n = 48 3 years after Graduation	No data available	n = 57 5 years after Graduation
ACSC Class of '96	n = 156 1 year after Graduation	n = 69 2 years after Graduation	No data available	n = 76 4 years after Graduation
ACSC Class of '97	n = 347 Post-test	n = 89 1 year after Graduation	No data available	n = 101 3 years after Graduation
ACSC Class of '98		N = 405 Post-test	No data available	n = 107 2 years after Graduation
ACSC Class of '99			n = 410 Post-test	n = 138 1 year after Graduation

Data Collection Procedures for the Non-Archival Data

The second source of data used in this research was survey data obtained during the course of this dissertation's research. Two waves of data collection were accomplished. First, in November 2000 all subjects who had completed a post-test TLP in 1997, 1998, 1999, or 2000 and for whom a current address could be obtained were sent a request to participate.

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Additionally, the subjects who had not completed a TLP during the summer of 2000 were requested to complete a TLP in addition to the JCP. The first mailing was followed four weeks later by a paper-based mailing to all subjects for which updated addresses were needed and could be obtained.

Two different methods were used for sending requests. First, requests were emailed to those subjects for whom the researcher had an email address. For those subjects for whom the researcher had a postal address, but not an email address, request packages were mailed via the United States Postal Service (USPS).

The email requests introduced the research project and invited potential participants to go to this study's data collection website for further information. The website's "home page" was an Informed Consent Agreement and potential participants who wanted to contribute to the research had to enter a unique password and username to continue. A sample copy of an email request and copies of the Internet site web pages are available at Appendix A, "Online Material."

Request packages sent via the USPS included the following items: a letter requesting participation; informed consent information; an information sheet about the research study; demographic information request form; survey forms; and return-addressed, postage-paid envelopes. Participants had the option of responding either via the Internet or by returning paper-based survey forms. A sample copy of the contents included in a request package is available at Appendix B, "Material Mailed to Potential Participants."

Response Rate

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Requests to participate in this research were sent to 1,522 subjects[10]: 1,012 requests were mailed using first class U.S. postage, 406 requests were emailed, and 104 requests were initially emailed, but were sent follow-up requests via the USPS. The overall response rate was 38.0% with the response rate for requests mailed via first class U.S. postage was 30.4%, the response rate for requests sent via email was 52.5%, and the response rate to requests emailed then followed up with a letter was 55.8% (see Table 4). Of the 579 surveys submitted, 324 (59.7%) were submitted via the Internet.

[10] Though 1,585 ACSC graduates were eligible to participate in this study, current addresses could only be obtained for 1,508. An additional 14 members from the Class of '99 were sent surveys because at the time of mailing it was thought they were eligible to participate.

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Table 4

Response Rates

ACSC Class and Method Request to Participate was Sent	Number of Requests to Participate in Study Sent	Number of Responses	Response rate
ACSC Class of 95	**155**	**75**	**48.4%**
Request to participate sent via first class mail	115	43	37.4%
Request to participate sent via email	36	28	77.8%
Sent via email with mail follow-up	4	4	100.0%
ACSC Class of 96	**167**	**84**	**50.3%**
Request to participate sent via first class mail	116	43	37.1%
Request to participate sent via email	44	34	77.3%
Sent via email with mail follow-up	7	7	100.0%
ACSC Class of 97	**337**	**126**	**37.4%**
Request to participate sent via first class mail	273	79	28.9%
Request to participate sent via email	58	41	70.7%
Sent via email with mail follow-up	6	6	100.0%
ACSC Class of 98	**371**	**159**	**42.9%**
Request to participate sent via first class mail	286	90	31.5%
Request to participate sent via email	70	54	77.1%
Sent via email with mail follow-up	15	15	100.0%
ACSC Class of 99	**492**	**135**	**27.4%**
Request to participate sent via first class mail	222	53	23.9%
Request to participate sent via email	198	56	28.3%
Sent via email with mail follow-up	72	26	36.1%
Sub-TOTAL sent via 1st class postage	**1012**	**308**	**30.4%**
Sub-TOTAL sent via email	**406**	**213**	**52.5%**
Sub-TOTAL via email with mail follow-up	**104**	**58**	**55.8%**
Totals	**1,522**	**579**	**38.0%**

Data Analysis and Presentation

The previous section reported that 38.0% of those surveyed responded. This section of Chapter 3 identifies the statistical procedures used in Chapter 4 to examine demographic

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variables, investigate instrument reliability, and identify changes in the dependent variables. Additionally, this section identifies the processes used to identify the survey responses that meet research criteria and will be included in hypothesis testing. And, finally, this section identifies the statistical procedures used in hypothesis testing. The statistical software program used to conduct the analyses was the Statistical Program for the Social Sciences (SPSS) version 11.0.1 (November 15, 2001).

Demographic, Instrument Internal Reliability, and Dependent Variable Trend Analyses

Descriptive statistical procedures were used to examine personal and job related demographic variables to eliminate rival hypotheses and possible confounding effects. The following personal data was collected: 1) Rank, 2) Service, 3) Source of Commission, 4) Aeronautical Rating, 5) Gender, 6) Race, 7) Marital Status, 8) Military Spouse/Service, 9) Number of Children, 10) Highest Level of Education. The following job related demographic variables was collected: 1) current job, 2) organizational level, 3) career field, and 4) command experience.

To test for internal reliability of the TLP and JCP instruments, a Cronbach's α was used. Cronbach's α statistical analysis was used because of its ability to evaluate overall validity of the instrument by estimating the reliability of scales composed of dichotomously scored items. Comparisons were made using TLP behaviors and characteristics that are compilations of the ten TLP scales. Likewise, Cronbach's α statistical analysis was conducted for each of the JCP's ten scales. Independent and paired t-tests were used to analyze the changes in the participants' perceptions of their leadership behaviors and characteristics to determine what changes, if any, occurred over time. Significance was set at the .05 level.

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Selection and Organization of Cases

Not all of the 579 responses can be included in the hypothesis testing, because cases to be included had to meet the following criteria: the participant had to have completed a post-ACSC TLP in, 1997, 1998, or 1999; the participant had to have completed both TLP and JCP survey forms during the July-to-December 2000 time period; and the participant could not have been in a full-time academic setting during the period between his/her last TLP and the TLP taken in 2000[11]. Of the 579 subjects who provided responses, only 543 cases met all three criteria. (See Table 5.) Therefore, hypothesis testing used only the responses from those 543 subjects.

Table 5

Cases included in Dissertation Sample

Total number of participants providing survey responses	579
Number of respondents whose surveys are not included in further analyses because their "job" was to be a full-time student	-12
Number of respondents whose surveys are not included in further analyses because their last TLP was taken upon starting the in-residence ACSC training program (i.e., they do not have a post-ACSC TLP in 1997, 1998, or 1999)	-18
Number of respondents who did not complete both a TLP and JCP survey during the July-August 200 time period	-6
Total number of respondents meeting the criteria	543

Hypotheses were built to examine both cohort effects and period effects. From a cohort perspective, all members of each graduating class were grouped together to form event cohorts

[11] Since the hypotheses for this study propose relationships between level and types of on-the-job challenges and self-perceived changes in leadership behavior and characteristics, the job challenges of individuals whose job was to attend a full-time academic program do no fall within the purview of this research. Therefore, their responses are not included in the analyses.

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(Graetz, 1987). Specifically, event cohorts for this study are respondents in the ACSC graduating classes of 1995, 1996, 1997, 1998, and 1999.

To examine period effects, panel sub-groups were formed based upon the date respondents last took a post-ACSC TLP. For example, members from three different cohorts last took a post-ACSC TLP in the summer of 1997 and also took the TLP in 2000 (e.g., members from the Classes of '95, '96, and '97). For hypothesis testing, these cases were labeled Sub-group 1. Likewise, members from the Classes of '95, '96, '97, and '98 who last took a post-ACSC TLP in the summer of 1998 and also took the TLP in 2000 comprised Sub-group 2. Unlike Sub-groups 1 and 2, Sub-group 3 consists only of members of the Class of '99, as no historical TLP data is available for members from the other ACSC Classes for the period of 1999-2000. (See Table 6.)

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Table 6

Grouping of Cases within Dissertation's Sample

Sub-group Number and Membership	**Summer 1997**	**Summer 1998**	**From Summer 1998 to Summer 1999**	**From Summer 1999 to Summer 2000**	**Summer 2000**
Sub-group 1: Those who last took TLP in Summer 1997 This group consists of members from: Cohort 1 (Class of 95) Cohort 2 (Class of 96) Cohort 3 (Class of 97)	TLP	←	———	— JCP → Cohort 1: n = 42 Cohort 2: n = 49 Cohort 3: n = 72 Total Sub-group 1: n = 163	TLP
Sub-group 2: Those who last took TLP in Summer 1998 This group consists of members from: Cohort 1 (Class of 95) Cohort 2 (Class of 96) Cohort 3 (Class of 97) Cohort 4 (Class of 98)		TLP	←	— JCP → Cohort 1: n = 25 Cohort 2: n = 32 Cohort 3: n = 52 Cohort 4: n = 158 Total Sub-group 2: n = 267	TLP
Sub-group 3: Those who last took TLP in Summer 1999 This group consists of Cohort 5 members (Class of 99)			TLP	— JCP → Cohort 5: n = 113 Total Sub-group 3: n = 113	TLP
				Total n = 543	

Statistical Procedures for Hypothesis Testing

For Hypothesis 1, multiple regression analyses were calculated wherein the Visionary Leadership scores in 2000 (time 2) were regressed on Job Challenge Profile Scores with Visionary Leadership scores in time 1 held constant.

For Hypothesis 2, all sub-groups were combined into a single sample and multiple regression analyses were calculated for each of the three components of Visionary Leadership

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Theory (e.g., Transactional Leadership Behaviors, Transformational Leadership Behaviors, and Transformational Leadership Characteristics). The analyses partitioned the variance in each VLT component among the independent variables (e.g., the five major components of the Job Component Profile) (Pedhazur, 1997).

Human Subjects Review and Ethical Issues

The committee on Human Use at George Washington University reviewed and approved the research proposal and protocols for this study prior to collection of any JCP data. The initial contact with the participants was made via an electronic mail (email) or via letter. The confidentiality of participants responding online was protected through the following means: no names were solicited via the password protected Internet survey site; respondents used only a unique access code for identification. Online respondents were able to access the online surveys only after reading the "Informed Consent" web page and entering their unique access code. And, to preclude the possibility of accidentally accepting a wrong code, only 1,522 codes out of a possible 167,310,000 combinations were assigned.

Though names were solicited on the paper-based questionnaires, participant confidentiality was protected by the following methods: After the paper forms were translated into electronic format (i.e., scanned), unique identifier codes were substituted for names to protect individual identity. Additionally, participant names and addresses were kept in electronic files separate from those electronic files containing survey responses and analyses. And, all questionnaires remained in possession of the researcher.

The source for 1995 through summer 2000 TLP data was archival data. TLP and JCP data were analyzed and reported in the aggregate. Minimal or no effects were expected from

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participation and projected risk to human subjects is negligible. Likewise, no negative effects were reported by any participant.

Summary

This chapter detailed the conceptual framework and methodology used to study the relationship between changes in self-reported leadership behaviors/characteristics and levels of job challenge. This was a quantitative study using a research design based upon Campbell and Stanley's (1966) "multiple time-series design." The design was compatible with the nature of the research questions and matched the longitudinal, multiple event-cohort data collection design. Instruments used included The Leadership Profile (Sashkin, 1994, 1996b) and the Job Challenge Profile (JCP) (McCauley et al., 1999).

No site selection was accomplished. Instead, the sites were those naturally occurring work environments of respondents. The total sample population was U. S. military officers and government Civil Service civilians who have graduated from Air Command and Staff College (ACSC), Air University, Maxwell Air Force Base, Alabama. ACSC is a certificated, ten-month, in-residence, professional military development college for mid-career officers. The research used archival TLP data and surveyed 1,522 ACSC graduates. The response rate was 38%.

This chapter also reviewed data sources and data collection procedures, and presented the statistical procedures used for assessing instrument reliability, conducting demographic analysis, and for hypothesis testing. Additionally, human subject and ethical considerations were discussed. The results of the current research are discussed in Chapter 4.

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CHAPTER 4 - RESULTS

Overview

Chapter Four presents the results of the study investigating the relationships between exposure to on-the-job challenges and self-reported changes in leadership behavior and characteristics of graduates from the United States Air Force's Air Command and Staff College (ACSC). The data was gathered from members in five event cohorts (e.g., members of the classes that graduated in 1995, 1996, 1997, 1998, and 1999). This chapter begins with the results of data analyses from multiple perspectives (i.e., cohort and panel) and concludes with the results from hypothesis testing.

The first part of the chapter examines both personal and job related demographic characteristics of those subjects being investigated by this dissertation. Personal demographic characteristics of current participants are then compared with those of previous respondents. Additionally, this section provides a summary of TLP and JCP results.

The chapter's next section examines several potential threats to result validity. Potential threats analyzed include potential response bias, possible demographics influences, possibility of having a non-representative sample of the ACSC population, and instrument reliability.

The third section of the chapter lays the foundation for hypothesis testing by summarizing the changes in the dependent variables over time. The section examines, both at cohort and panel levels, changes in Visionary Leadership Theory components to address cohort effects, period effects and age effects.

The final section of the chapter presents the results of the hypothesis testing.

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Demographics

Personal and job related demographic data was collected from all participants and the data was analyzed to eliminate rival hypotheses and possible confounding effects. Personal demographic data collected included: Service, source of commission, ethnic background, gender, marital status, educational level, and whether or not the respondent had been promoted before his/her peers to a higher grade/rank (a.k.a., Below-the-Zone promotion). These personal demographic variables were compared, at the group level, with those of previous respondents. Additionally, the following job related characteristics were collected from respondents: number of jobs held during the period covered by their Job Challenge Profile (JCP) survey response, organizational level at which they had been working, and whether or not they had been a supervisor or commander during the period covered by their JCP survey response, and respondent's career field.

TLP Respondents' Personal Demographics

Personal demographic data of cases in the dissertation's sample (see Table 7) were compared with the personal demographic data collected at ACSC of all students who took a TLP while at ACSC (a.k.a., the ACSC Leadership Database) (see Table 8). Comparison indicates that composition of the dissertation's sample closely matches the composition of the ACSC Leadership Database on the following factors: gender, marital status, source of commission, and ethnic background. In regard to Service composition, the dissertation sample contains a slightly higher percentage of USAF officers with a corresponding decrease in responses from Army, Navy/United States Marine Corps, and civilians. The factor showing the biggest difference is educational level. However, further analysis revealed that the cause of the difference was respondents earning advanced degrees.

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Table 7

Personal Demographics of Participants in Dissertation's Sample

Dissertation's Sample					
Service	*N*	%	**Gender**	*N*	%
USAF	466	85.8	Male	445	82.0
USA	36	6.6	Female	87	16.4
USN/USMC	29	5.4	Missing Value	11	2.0
CIVILIAN	12	2.2			
Missing Value	0		**Marital Status**		
Source of Commission			Married	459	84.6
AF Academy	88	16.2	Single	38	7.1
ROTC	225	41.4	Divorced	37	6.9
OTS/OCS	178	32.8	Missing Value	9	1.7
Other or NA	52	9.6	**Education (now)**		
Missing Value	0		Bachelors	8	1.5
Ethnicity			Masters	504	94.4
Caucasian	474	87.3	Doctorate	22	4.1
African-American	28	5.2	Missing Value	9	1.7
Asian-American	14	2.6	**Promoted Early**		
Hispanic	6	1.1	Yes	148	27.3
Other	11	2.0	No	381	70.2
Missing Value	10		Missing Value	14	2.6
Dissertation's Sample: *n*= 543					

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Table 8

Personal Demographics of Previous ACSC Respondents

Previous ACSC Respondents[a]					
Service	*N*	%[b]	**Gender**	*N*	%[b]
USAF	1,729	80.8	Male	941	85.3
USA	171	8.0	Female	162	14.7
USN/USMC	171	8.0			
CIVILIAN	70	3.3			
Source of Commission			**Marital Status**		
AF Academy	184	18.7	Married	685	85.8
ROTC	429	43.7	Single	56	7.0
OTS/OCS	324	33.0	Divorced	57	7.1
Other or NA	45	4.6			
Ethnicity			**Education**[c]		
Caucasian	986	88.9	Bachelors	161	13.7
African-American	59	5.3	Masters	996	84.6
Asian-American	17	1.5	Doctorate	21	1.0
Hispanic	16	1.4	**Promoted Early**[d]		
Other	31	2.8	Yes	*	*
			No	*	*

[a] *Note*: Population consists of every ACSC graduate from the Classes of 1995, 1996, 1997, 1998, and 1999 who has taken at least one TLP. Total possible n = 2,141

[b] *Note*: Missing values are not included in percentage computations.

[c] *Note*: This is the education level reported at the beginning of ACSC

[d] *Note*: Pre-ACSC information is not available, as this variable was not collected at ACSC

* Data Not Available

Work Related Demographics

In addition to personal demographic information, job related demographic information was collected from subjects in the dissertation's sample, including number of jobs held during the period covered by their JCP survey response, organizational level at which they had been working, and whether or not they had been a supervisor or commander during the period covered by their JCP survey response, and respondent's career field. Tables 9-12 provide the descriptive statistics for the various demographics.

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Results indicate that most of the respondents (e.g., 67.7%) held some sort of supervisory position during the period of time covered by their JCP rating. Also, the dissertation's sample was almost evenly divided between those working at a higher headquarters level and those working at the operational level (i.e., wing and below). Though there are a wide variety of career fields represented in the dissertation's sample, most of the respondents came from one of three career fields: operations, support, and logistics. Finally, there are slightly more subjects in the dissertation's sample who held more than one job during the period of time covered by their JCP rating (e.g., 59.5%) than those who held only one job during the period of time covered by their JCP rating (e.g., 39.4%).

Table 9

Supervisory Experience during JCP Evaluation Period[12]

Type of Supervisory Experience, if any	*N*	%
Subject was not a Supervisor or Commander during JCP evaluation period	175	32.2
Subject was a Supervisor, but not a Commander during JCP evaluation period	250	46.0
Subject was a Commander during JCP evaluation period	118	21.7
Total =	543	100.0

[12] Each sub-group had a different "JCP evaluation period" starting from their last post-ACSC TLP before their TLP completed in 2000. Specifically, the "JCP evaluation period" for each Sub-group is as follows: Sub-group1, from 1997-2000; Sub-group 2, from 1998-2000; and Sub-group 3, from 1999-2000.

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Table 10

Organizational Level of Respondent's Job during JCP Evaluation Period

Organizational Level	*N*	%
Working at a Higher Headquarters level	244	44.9
Joint or Combined	114	21.0
Air Staff	60	11.0
Field Operating Agency or Direct Reporting Agency	27	4.9
Major Command Headquarters	44	8.1
Working at Wing or Squadron level	250	46.0
Wing/Group	52	9.6
Squadron	197	36.3
Other	49	9.0
Total =	543	100.0

Table 11

Career Field of Subjects

Career Fields	*N*	%
Operations	250	46.0
Logistics	48	8.8
Support	128	23.3
Medical	6	1.1
Professional	19	3.5
Acquisition	82	15.1
Special Investigations	4	.7
Other	7	1.3
Total =	543	100.0

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Table 12

Respondents Holding One or More Jobs During JCP Evaluation Period

Sample Name and Job Change Demographics	*N*	%
Sub-Group 1: Those whose JCP evaluation period runs from 1997 through 2000		
One job during the period	21	12.9
More than one job during the period	139	85.3
Missing Value	3	1.8
Total for Sub-Group 1	163	100
Sub-Group 2: Those whose JCP evaluation period runs from 1998 through 2000		
One job during the period	113	42.6
More than one job during the period	152	57.4
Missing Value	2	.7
Total for Sub-Group 2	267	100
Sub-Group 3: Those whose JCP evaluation period runs from 1999 through 2000		
One job during the period	80	70.8
More than one job during the period	32	28.3
Missing Value	1	.9
Total for Sub-Group 3	113	100
Dissertation Sample		
One job during the period	214	39.4
More than one job during the period	323	59.5
Missing Value	6	1.1
Total for Combined Sample	543	100

Summary of TLP and JCP Results

Table 13 summarizes the means and standard deviations for the TLP dimensions at time 1 and time 2 and JCP dimensions at time 2.

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Table 13

Summary of TLP and JCP Scores for Time 1 and Time 2, n = 543

Instrument and Scale Name	Time 1		Time 2	
	Mean	Standard Deviation	Mean	Standard Deviation
TLP: Transactional Leadership Behavior	41.026	4.572	40.650	4.324
TLP: Transformational Leadership Behavior	83.311	7.853	84.004	7.054
TLP: Transformational Leadership Characteristics	76.138	7.109	76.063	7.369
TLP: All Scales Combined	200.475	17.874	200.716	16.967
JCP: Experiencing a Job Transition			10.783	3.740
JCP: Creating Change			34.724	11.391
JCP: Managing at High Levels of Responsibility			32.149	7.114
JCP: Managing Boundaries			32.843	7.875
JCP: Dealing with Diversity			25.860	8.712
JCP: All Scales Combined			136.359	28.614

Investigation of Threats to Result Validity

This section of Chapter Four presents the results from investigating several potential threats to result validity. These potential threats included a possible response bias induced by the method through which participants submitted survey responses, possible impact on TLP change from differing perceptions of job challenge by different demographic segments, possible non-generalizable results if the dissertation's sample was not representative of the ACSC population, and the possible threats from survey instrument reliability.

Assessment of Possible Bias Induced by Response Method

Since participants in this research could have provided their survey responses through three different media,[13] the possibility existed that the method of response might have biased the data. Therefore, this section provides the results of investigating that potentiality. Of the 543

[13] Survey responses could have been provided by (1) mailed paper survey forms, (2) completing the survey forms online at a password protected Internet site, or (3) via email.

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cases used in this dissertation, 324 were completed online[14] and 219 paper forms were returned to the researcher via mail.

Initial investigation into possible response bias revealed that though there were no differences in TLP scale scores, several of the JCP scale scores for the group that used paper surveys were significantly higher than the JCP scale scores of the group that completed the surveys online (See Appendix C, Tables C1 and C2). Further analysis revealed no significant differences in the composition of each respondent group in terms of personal and job demographics (See Appendix C, Table C3). However, one-way ANOVAs revealed significant differences on many of the scales between demographic variables (See Appendix C, Tables C4 through C9). Therefore, the researcher constructed two demographically balanced sub-groups from the groups of those who responded by mail and those who responded via the Internet. With demographically balanced sub-groups, there were no significant differences in the JCP scale scores between the sub-group that provided paper surveys and the sub-group that completed the surveys online (See Appendix C, Tables C10 and C11). Thus, the differences in scores are not attributable to a bias created by the medium used to respond. (Supporting statistical information is available at Appendix C.)

Assessment of Possible Bias Induced by Demographic Differences

As mentioned in the previous section, one-way ANOVAs revealed significant differences for several demographic variables on many of the JCP scales. As a result of that finding, further analysis was conducted to determine whether or not demographic variables would significantly affect the hypothesis testing outcomes. To test for the effects of job and personal demographic variables, multiple regression analyses were calculated wherein the Visionary Leadership scores

[14] Since only five respondents used the email approach, those responses have been aggregated with the online responses.

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in 2000 (time 2) were regressed on the Job Challenge Profile Scores and demographic variables with Visionary Leadership scores in time 1 held constant. Results revealed that, though the total JCP score was a significant predictor, none of the job or personal demographic variables were significant predictors. (Summary of the regression analysis results is available in Appendix D.)

Analysis of differences between Dissertation's sample and larger ACSC population

Even though the demographics of this research's sample is very similar to the demographics of the larger ACSC population, the possibility existed that TLP scores of the research sample might not be representative of the population's scores. Therefore, the researcher ran an independent samples t-test comparing the post-ACSC scores of subjects in the dissertation's sample against the scores of all post-ACSC respondents that same year. Table 14 shows that for 1997, 1998, 1999, and 2000, there were no significant differences between the total TLP scores of dissertation subjects and those ACSC graduates not in the dissertation's sample.

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Table 14

Independent Samples t-test of Dissertation's Sample vs. All TLP Respondents

Year TLP Administered	*N* In Dissertation?	*N* =	Mean Total TLP Score	Std Dev					
1997 TLP	Yes	239	200.096	18.154					
	No	427	202.265	18.399					
				F	Sig.	*t*	*df*	Mean Diff.	*p*<
	Equal Variances Assumed			0.002	0.969	-1.466	664	-2.168	0.143
	Equal Variances Not Assumed					-1.471	498.32	-2.168	0.142
1998 TLP	Yes	268	200.261	17.105					
	No	343	202.050	17.219					
				F	Sig.	*t*	*df*	Mean Diff.	*p*<
	Equal Variances Assumed			0.582	0.446	-1.278	609	-1.788	0.202
	Equal Variances Not Assumed					-1.279	575.52	-1.788	0.202
1999 TLP	Yes	113	202.345	17.150					
	No	299	202.161	18.114					
				F	Sig.	*t*	*df*	Mean Diff.	*p*<
	Equal Variances Assumed			0.007	0.932	0.094	410	0.185	0.925
	Equal Variances Not Assumed					0.096	212.17	0.185	0.924
2000 TLP	Yes	543	200.716	16.967					
	No	246	201.264	17.735					
				F	Sig.	*t*	*df*	Mean Diff.	*p*<
	Equal Variances Assumed			2.134	0.144	-0.414	787	-0.548	0.679
	Equal Variances Not Assumed					-0.407	454.95	-0.548	0.684

Assessment of Survey Instruments

TLP Reliability

Cronbach's α (Cronbach & Furby, 1970) was used to determine the scale reliabilities for each of the ten TLP scales for time 1 and time 2 for administrations of the TLP instrument for each of the dissertation's sub-groups and the dissertation's entire sample.

The results for Sub-group 1 were consistent with previous findings (Lafferty, 1998; Sashkin, 1998; and Stryker, 2001) and showed adequate to excellent item-scale reliabilities

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(Table 15) ranging from .586 to .806 on Scales 1 through 7 and Scales 9 and 10. Consistent with previous research findings, the α for Scale 8 was lower at .368. Sashkin (1998) states that this consistently lower α is because Scale 8 is actually composed of two factorially independent sub-scales, one that assesses personal power need and another that assesses pro-social power need.

Cronbach α results for Sub-groups 2 and 3 are consistent with previous research and Sub-group 1 for Scales 1 through 8: Scales 1 through 7 showed adequate to excellent item-scale reliabilities (Table 15) ranging from .639 to .840 and Scale 8's alphas were lower (e.g., ranging from .089 to .351). However, alphas for the sub-scales of Scale 8 were much better, ranging from .424 to .627.

The alphas on Scale 9 for Sub-groups 2 and 3 ranged from .478 to .580, which are consistent with previous research findings (Lafferty, 1998). Likewise, for Scale 10, the time 1 alphas for Sub-groups 2 and 3 were consistent with previous research findings. However, the Scale 10 time 2 alphas for Sub-groups 2 and 3 (e.g., .351 and .306) were somewhat lower than in previous TLP samples. To determine if any item was depressing the Scale 10 time 2 alphas for Sub-groups 2 and 3, item analyses were conducted. Results showed that if question 40 were removed from Scale 10, the Scale 10 time 2 alphas for Sub-groups 2 and 3 would rise to .388 and .376, respectively. Exclusion of any other individual item did not improve the reliability of Scale 10 for either sub-group.

The Cronbach α results for the dissertation's entire sample as a whole are consistent with previous research for all scales including the lower alpha of .307 for Scale 8. The results for the two Scale 8 sub-scales that assess personal power need and pro-social power need are also consistent with previous research. Though the α results for the dissertation's entire sample as a whole are consistent with previous research, item analyses were conducted for the scales with the

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lowest alphas (e.g., Scales 3, 9, and 10) to determine whether any individual item was depressing the alphas of those scales. For Scales 3 and 10, exclusion of any individual item did not improve either scale's reliability. However, for Scale 9, exclusion of question 19 improved the scale reliability from .569 to .665.

Table 15

TLP Cronbach alphas

Scale Name	Sub-Group 1		Sub-Group 2		Sub-Group 3		Total Sample
	1997	2000	1998	2000	1999	2000	2000
Scale 1: Capable Management	.780	.753	.758	.696	.751	.751	.730
Scale 2: Reward Equity	.853	.806	.840	.767	.746	.773	.781
Scale 3: Communication Leadership	.634	.646	.663	.562	.637	.562	.590
Scale 4: Credible Leadership (trust)	.840	.800	.824	.804	.821	.774	.798
Scale 5: Caring Leadership (respect)	.816	.761	.798	.747	.785	.684	.740
Scale 6: Creative Leadership (creating empowering opportunities)	.814	.803	.773	.733	.802	.742	.759
Scale 7: Confident Leadership (self-efficacy/internal locus of control)	.751	.801	.741	.710	.735	.639	.734
Scale 8: Follower-Centered Leadership (power need and direction)	.302	.368	.179	.351	.319	.089	.307
Sub-scale (Questions 8 + 18)	.398	.445	.580	.426	.446	.507	.451
Sub-scale (Questions 28 + 38 + 48)	.616	.546	.606	.627	.627	.488	.576
Scale 9: Visionary Leadership	.514	.578	.506	.580	.478	.532	.569
Scale 10: Principle-Centered Leadership (culture building)	.575	.586	.540	.351	.675	.306	.429
Total of all Scales	.946	.936	.930	.914	.938	.915	.922

Notes: See Table 6 for explanation of sub-group membership
Sub-Group 1: n = 163 Sub-Group 2: n = 267
Sub-Group 3: n = 113 Total Sample: n = 543

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JCP Reliability

Cronbach's α was also used to determine the inter-item scale reliabilities for each of the ten JCP scales for each of the dissertation's sub-groups and the dissertation's entire sample. The results for all Sub-groups and the entire sample, ranging from .597 to .922, showed adequate to excellent item-scale reliabilities (Table 16). In the development of the JCP McCauley et al. (1999) computed alphas using a sample that consisted of 1,143 managers from a variety of companies and from different organizational levels. Alpha results from this administration of the JCP are consistent with previous findings.

Table 16

JCP Cronbach alphas

Scale Name	JCP Sample [a]	Sub-Group 1	Sub-Group 2	Sub-Group 3	Entire Sample
Scale 1: Unfamiliar Responsibilities	.70	.690	.614	.597	.641
Scale 2: New Directions	.71	.813	.806	.755	.805
Scale 3: Inherited Problems	.80	.847	.859	.800	.847
Scale 4: Problems with Employees	.78	.758	.735	.706	.744
Scale 5: High Stakes	.68	.640	.597	.645	.629
Scale 6: Scope and Scale of Responsibilities	.63	.667	.740	.654	.707
Scale 7: External Pressure	.65	.741	.760	.773	.759
Scale 8: Influence without Authority	.69	.700	.715	.699	.709
Scale 9: Work Across Cultures	.71	.852	.854	.806	.844
Scale 10: Work Group Diversity	.72	.794	.793	.744	.787
Total of all JCP Scales	*	.919	.925	.905	.922

Notes: See Table 6 for explanation of sub-group membership
* Data not available
[a] Sample used in the development of the JCP instrument, n = 1,143 (McCauley et al., 1999)
Sub-Group 1: n = 163 Sub-Group 2: n = 267
Sub-Group 3: n = 113 Entire Sample: n = 543

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Changes in the Dependent Variables Over Time

This section of the dissertation presents results necessary for identifying and understanding patterns of change over time and, thus, eliminating rival hypotheses. Menard (1991) states that longitudinal investigations require consideration of the effects from being in a cohort, effects from periods of time (i.e., period effect), and effects of aging (i.e., maturation effect).

The section begins with investigation into the possibility of cohort effects by analyzing each ACSC Class to determine each one's pattern of change. Next, this section searches for period effects by determining the amount of change in the dissertation's sample's sub-groups. And, the section's final part presents the results from comparing respondents' age groups. This section's goal is to determine whether or not effects from cohort, time period, or maturation need to be considered in hypothesis testing.

For this study, the term cohort is same synonymous with the term event-cohort (Glenn, 1977; Graetz, 1987) and refers to an individual ACSC class. The term is appropriate because each ACSC class is a specific group of people who experienced the same significant life event (i.e., ACSC in-residence) within a given period of time (Firebaugh, 1997; Glenn, 1977; Graetz, 1987). This section provides the findings of investigating each of those effects.

Changes by Cohort

This section presents the results from examining the longitudinal TLP data for each ACSC Class in search of changes over time in TLP components: Transactional Leadership Behavior, Transformational Leadership Behavior, Transformational Leadership Characteristics, and Total TLP score.

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ACSC Graduating Class of 1995

Graduates of the ACSC class of 1995 first took the TLP one year after graduation (e.g., in the summer of 1996). Subsequently, various members of this class also took the TLP in 1997, 1998, and 2000. (See Table 17)

Changes during the period from one-year to two-years after graduation (i.e., from 1996 to 1997) reveal significant, positive changes in Transformational Leadership Behavior, Transformational Leadership Characteristics, and total Visionary Leadership Theory scores. There were no significant changes in the period from two to three years after graduation (i.e., 1997 to 1998) nor in the period from three to five years after graduation (i.e., 1998 to 2000). However, the n's for both of those time periods were very small (i.e., 36 and 31).

During the four-year period from one year after graduation from ACSC to five years after graduation, this cohort showed significant positive changes in Transformational Leadership Behavior scores.

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Table 17

Paired t-tests for Class of 1995

TLP Component	*N*	Mean		Mean Diff.	SD Dif	*df*	*t*	*p<*
Transactional Behavior	119	1Yr Post: 2Yr Post:	39.866 40.613	0.748	3.504	118	2.329	0.022*
Transformational Behavior	119	1Yr Post: 2Yr Post:	83.118 84.109	0.992	5.859	118	1.846	0.067
Transformational Characteristics	119	1Yr Post: 2Yr Post:	75.067 76.336	1.269	5.890	118	2.338	0.020*
Total TLP Score	119	1Yr Post: 2Yr Post:	198.050 201.059	3.008	13.085	118	5.384	0.014*
Transactional Behavior	36	2Yr Post: 3Yr Post:	40.472 39.722	-0.750	2.941	35	-1.530	0.135
Transformational Behavior	36	2Yr Post: 3Yr Post:	82.972 82.833	-0.139	5.535	35	-0.151	0.881
Transformational Characteristics	36	2Yr Post: 3Yr Post:	20.187 20.458	0.056	4.922	35	0.068	0.946
Total TLP Score	36	2Yr Post: 3Yr Post:	199.889 199.056	-0.833	10.982	35	-0.455	0.652
Transactional Behavior	31	3Yr Post: 5Yr Post:	38.645 39.839	1.194	3.701	30	1.796	0.083
Transformational Behavior	31	3Yr Post: 5Yr Post:	81.097 82.000	0.903	7.391	30	0.680	0.501
Transformational Characteristics	31	3Yr Post: 5Yr Post:	74.871 74.065	-0.806	4.700	30	-0.955	0.347
Total TLP Score	31	3Yr Post: 5Yr Post:	194.613 195.903	1.290	13.722	30	0.524	0.604
Transactional Behavior	87	1Yr Post: 5Yr Post:	39.235 40.138	0.885	4.004	86	2.062	0.042*
Transformational Behavior	87	1Yr Post: 5Yr Post:	82.069 82.782	0.713	7.587	86	0.876	0.383
Transformational Characteristics	87	1Yr Post: 5Yr Post:	73.954 75.264	1.310	6.868	86	1.780	0.079
Total TLP Score	87	1Yr Post: 5Yr Post:	195.276 198.184	2.908	16.378	86	1.656	0.101

* Significant at the .05 level ** Significant at the .01 level

ACSC Graduating Class of 1996

Members of the ACSC class of 1996 first took the TLP at ACSC near the beginning of their ten-month, in-residence educational program. Subsequently, members of this class took the

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TLP upon graduation from ACSC, at one-year after graduation (1997), two years after graduation (1998), and four years after graduation (2000). A TLP was not administered to members of this class in 1999. Table 18 presents the paired t-test results.

Two-hundred sixty one (261) members of the class who took the TLP at the beginning of ACSC also took the TLP upon graduation. Results show significant, positive increases on all three TLP components and on the total VLT score. During the period from graduation through one year later, results show that this cohort had a significant drop in Transactional Leadership Behavior scores, but no change in the scores of the other VLT components.

In the period from one to two years after graduation (i.e., 1997 to 1998), there were no significant changes in TLP scores. However, during the 1998-2000 timeframe (i.e., from two to four years after graduation), the cohort showed significant, positive changes in Transactional Leadership Behavior, Transformational Leadership Behavior, and total Visionary Leadership Theory scores.

The paired t-tests for those members of this Class who completed a TLP both upon graduation from ACSC and four years later showed no significant changes in scores on any component of VLT.

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Table 18

Paired t-tests for Class of 1996

TLP Component	*N*	Mean	Mean Diff.	SD Dif	*df*	*t*	*p<*
Transactional Behavior	261	ACSC Pre-Test: 40.291 ACSC Post-Test: 41.276	0.985	4.595	260	3.462	0.001**
Transformational Behavior	261	ACSC Pre-Test: 81.912 ACSC Pos-Test: 83.670	1.759	8.130	260	3.495	0.001**
Transformational Characteristics	261	ACSC Pre-Test: 74.456 ACSC Post-Test: 76.211	1.755	7.092	260	3.997	0.000**
Total TLP Score	261	ACSC Pre-Test: 196.659 ACSC Post-Test: 201.157	4.498	17.976	260	4.042	0.000*
Transactional Behavior	112	Post-Test: 41.214 1Yr Post: 40.098	-1.116	4.845	111	-2.438	0.016*
Transformational Behavior	112	Post-Test: 83.473 1Yr Post: 83.455	-0.719	8.386	111	-0.023	0.982
Transformational Characteristics	112	Post-Test: 76.929 1Yr Post: 76.786	-0.143	6.826	111	-0.221	0.825
Total TLP Score	112	Post-Test: 201.616 1Yr Post: 200.339	-1.277	18.242	111	-0.741	0.460
Transactional Behavior	38	1Yr Post: 40.474 2Yr Post: 39.632	-0.842	4.971	37	-1.275	0.210
Transformational Behavior	38	1Yr Post: 82.790 2Yr Post: 82.237	-0.553	7.650	37	-0.445	0.659
Transformational Characteristics	38	1Yr Post: 75.868 2Yr Post: 76.632	0.763	6.627	37	0.710	0.482
Total TLP Score	38	1Yr Post: 198.500 2Yr Post: 199.132	-0.632	15.639	37	-0.249	0.805
Transactional Behavior	46	2Yr Post: 39.109 4Yr Post: 41.391	2.283	5.269	45	2.938	0.005**
Transformational Behavior	46	2Yr Post: 81.174 4Yr Post: 84.609	3.435	8.186	45	2.846	0.007**
Transformational Characteristics	46	2Yr Post: 76.109 4Yr Post: 76.283	0.174	5.919	45	0.199	0.843
Total TLP Score	46	2Yr Post: 196.391 4Yr Post: 202.283	5.891	16.765	45	2.383	0.021*
Transactional Behavior	79	Post-Test: 40.646 4Yr Post: 40.317	-.0.329	5.509	78	-0.531	0.597
Transformational Behavior	79	Post-Test: 82.506 4Yr Post: 83.076	0.570	8.360	78	0.606	0.547
Transformational Characteristics	79	Post-Test: 76.124 4Yr Post: 76.266	0.127	7.703	78	0.146	0.884
Total TLP Score	79	Post-Test: 199.291 4Yr Post: 199.658	0.367	19.677	78	0.166	0.869

* Significant at the .05 level ** Significant at the .01 level

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ACSC Graduating Class of 1997

Members of the ACSC class of 1997 first took the TLP at ACSC near the beginning of their ten-month, in-residence educational program. Subsequently, members of this class took the TLP upon graduation from ACSC, at one-year after graduation (1998), and three years after graduation (2000). A TLP was not administered to members of this class in 1999. Table 19 presents the paired t-test results.

Two hundred one (201) members of the class who took the TLP at the beginning of ACSC also took the TLP upon graduation. Results show significant, positive increases on all three TLP components and on the total VLT score. During the period from graduation through one year later, results show that this cohort had a significant drop in Transactional Leadership Behavior scores, but no change in the scores of the other VLT components. In the period from one to three years after graduation (i.e., 1998 to 2000), there were no significant changes in TLP scores.

One hundred forty-six (146) members of the class completed a TLP both upon graduation from ACSC and three years later. For this three-year period after graduation from ACSC, their paired t-tests showed a significant drop in Transactional Leadership Behavior scores, but no significant changes in scores on any other component of VLT.

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Table 19

Paired t-tests for Class of 1997

TLP Component	*N*	Mean	Mean Diff.	SD Dif	*df*	*t*	*p*<
Transactional Behavior	201	ACSC Pre-Test: 39.876 ACSC Post-Test: 41.577	1.702	4.502	200	5.358	0.000**
Transformational Behavior	201	ACSC Pre-Test: 81.050 ACSC Pos-Test: 83.945	2.900	8.143	200	5.041	0.000**
Transformational Characteristics	201	ACSC Pre-Test: 73.915 ACSC Post-Test: 75.587	1.672	6.996	200	3.388	0.001**
Total TLP Score	201	ACSC Pre-Test: 194.841 ACSC Post-Test: 201.110	6.269	17.937	200	4.955	0.000*
Transactional Behavior	66	Post-Test: 42.167 1Yr Post: 40.364	-1.893	4.507	65	-3.250	0.002**
Transformational Behavior	66	Post-Test: 85.091 1Yr Post: 83.939	-1.152	6.940	65	-1.348	0.182
Transformational Characteristics	66	Post-Test: 76.652 1Yr Post: 77.121	0.470	6.402	65	0.596	0.553
Total TLP Score	66	Post-Test: 203.909 1Yr Post: 201.424	-2.485	15.728	65	-1.284	0.204
Transactional Behavior	62	1Yr Post: 40.645 3Yr Post: 40.984	0.339	3.841	61	0.694	0.490
Transformational Behavior	62	1Yr Post: 83.968 3Yr Post: 84.434	0.468	6.321	61	0.583	0.562
Transformational Characteristics	62	1Yr Post: 76.984 3Yr Post: 76.661	-0.323	6.348	61	-0.400	0.690
Total TLP Score	62	1Yr Post: 201.597 3Yr Post: 202.081	0.484	13.650	61	0.279	0.781
Transactional Behavior	146	Post-Test: 42.110 3Yr Post: 40.788	-1.322	4.241	145	-3.766	0.000**
Transformational Behavior	146	Post-Test: 84.079 3Yr Post: 84.343	0.274	7.220	145	0.458	0.647
Transformational Characteristics	146	Post-Test: 76.390 3Yr Post: 75.986	-0.404	7.739	145	-0.631	0.529
Total TLP Score	146	Post-Test: 202.569 3Yr Post: 201.116	-1.452	16.973	145	-1.034	0.303

* Significant at the .05 level ** Significant at the .01 level

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ACSC Graduating Class of 1998

Members of the ACSC class of 1998 first took the TLP at ACSC near the beginning of their attendance at ACSC. Subsequently, members of this class took the TLP upon graduation from ACSC and two years after graduation (2000). A TLP was not administered to members of this class in 1999. Table 20 presents the paired t-test results.

Three-hundred seventy-three (373) members of the class who took the TLP at the beginning of ACSC also took the TLP upon graduation. Results show significant, positive increases on all three TLP components and on the total VLT score. During the period from graduation through two years later, results show that this cohort had a significant drop in Transactional Leadership Behavior scores, but no change in the scores of the other VLT components.

Table 20

Paired t-tests for Class of 1998

TLP Component	*N*	Mean		Mean Diff.	SD Dif	*df*	*t*	*p*<
Transactional Behavior	373	ACSC Pre-Test: ACSC Post-Test:	40.555 41.665	1.110	4.284	372	5.004	0.000**
Transformational Behavior	373	ACSC Pre-Test: ACSC Pos-Test:	82.051 84.268	2.217	7.161	372	5.980	0.000**
Transformational Characteristics	373	ACSC Pre-Test: ACSC Post-Test:	74.137 76.276	2.139	6.631	372	6.231	0.000**
Total TLP Score	373	ACSC Pre-Test: ACSC Post-Test:	196.743 202.09	5.467	16.134	372	6.544	0.000*
Transactional Behavior	191	Post-Test: 2Yr Post:	41.686 40.922	-0.764	4.374	190	-2.415	0.017*
Transformational Behavior	191	Post-Test: 2Yr Post:	83.791 84.508	0.717	8.324	190	1.191	0.235
Transformational Characteristics	191	Post-Test: 2Yr Post:	76.173 76.236	0.063	7.041	190	0.123	0.902
Total TLP Score	191	Post-Test: 2Yr Post:	201.649 201.665	0.157	17.844	190	0.012	0.990

* Significant at the .05 level ** Significant at the .01 level

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ACSC Graduating Class of 1999

Members of the ACSC class of 1999 first took the TLP at ACSC near the beginning of their attendance at ACSC. Subsequently, members of this class took the TLP upon graduation from ACSC and one year after graduation (2000). Table 21 presents the paired t-test results.

Three-hundred ninety-one (391) members of the class who took the TLP at the beginning of ACSC also took the TLP upon graduation. Results show significant, positive increases on the Transformational Leadership Characteristics component of the TLP, but no significant changes in either the Transactional Leadership Behavior or Transformational Leadership Behavior components. During the period from graduation through one year after graduation, results show that this cohort had a significant drop in Transactional Leadership Behavior scores, but no change in the scores of the other VLT components.

Table 21

Paired t-tests for Class of 1999

TLP Component	*N*	Mean		Mean Diff.	SD Dif	*df*	*t*	*p<*
Transactional Behavior	391	ACSC Pre-Test: ACSC Post-Test:	41.453 41.514	0.614	3.821	390	0.318	0.751
Transformational Behavior	391	ACSC Pre-Test: ACSC Pos-Test:	83.918 84.320	0.402	6.774	390	1.172	0.242
Transformational Characteristics	391	ACSC Pre-Test: ACSC Post-Test:	73.957 76.865	2.908	6.840	390	8.406	0.000**
Total TLP Score	391	ACSC Pre-Test: ACSC Post-Test:	199.327 202.703	3.376	15.417	390	4.330	0.000*
Transactional Behavior	162	Post-Test: 1Yr Post:	41.395 40.241	-1.154	4.239	161	-3.466	0.001**
Transformational Behavior	162	Post-Test: 1Yr Post:	83.395 83.340	-0.056	7.646	161	-0.092	0.926
Transformational Characteristics	162	Post-Test: 1Yr Post:	76.840 76.235	-.0605	6.674	161	-1.154	0.250
Total TLP Score	162	Post-Test: 1Yr Post:	201.630 199.815	-1.815	16.427	161	-1.406	0.162

* Significant at the .05 level ** Significant at the .01 level

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Summary of Cohort Effects

To search for a pattern in cohort effects, Menard (1991) recommends first arraying the data and making a visual investigation. Table 24 summarizes results from TLP paired samples t-tests in Tables 17-21 to show similarities/differences based upon the number of years pre-ACSC and post-ACSC. Visual examination shows two important trends.

The first trend evident is that three of the four cohorts for which there are pre-and post-ACSC TLPs had significant pre-to-post ACSC changes in all TLP components: Transactional Leadership Behavior, Transformational Leadership Behavior, Transformational Leadership Characteristics, and total TLP score. The exception to this trend was the Class of '99. Even though the Class of '99 did have a significant positive increase in Transactional Leadership Behavior scores, that Class did not have significant pre-to-post ACSC changes on any other TLP measure.

The second trend evident is that four of the five cohorts had significant decreases in Transactional Leadership Behavior scores with no significant changes in other TLP measures within two years after graduation from ACSC. The one exception was the ACSC Class of '95 that showed just the opposite: significant increase in Transactional Leadership Behavior score, Transformational Leadership Characteristics score, and total TLP score.

Given the available data, there appears to not be any trend for the period from two-to-five years after graduation, as two of the cohorts (e.g., Classes of 1995 and 1997) did not have any significant changes while one of the cohorts (e.g., Class of 1996) did show significant positive increases in Transactional Behavior, Transformational Behavior, and Total TLP scores.

The finding of similarities in pre-to-post test changes and similarities in changes in the post-test to two years after graduation period shows that cohorts have a similar pattern of

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changes, at least initially. Additionally, the lack of a pattern beyond two years after graduation suggests that individual cohorts might have different results in regard to this study's research questions. Therefore, cohort effects need to be considered during hypothesis testing and when discussing findings. Hypotheses for research question #1 already address the cohort level, so no additional analyses were needed. However, since the hypotheses testing research question #2 only address the combined sample, additional post hoc analysis addressing the cohort level were needed.

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Table 22

Summary of TLP Score Changes by Cohort

Cohort	Pre-Test	Changes From Pre- to Post-Test	Changes From Post- to One-Year after Graduation	Changes From One to Two-Years after Graduation	Changes From Two to Three-Years after Graduation	Changes From Two to Four-Years after Graduation	Changes From Four to Five-Years after Graduation
ACSC Class of 95	No Survey	No Survey	First Administration of the TLP	Significant Positive Changes in Transactional Behavior, Transformational Characteristic, and Total TLP score	No significant changes	From Three years to Five Years after Graduation No significant changes	
ACSC Class of 96	First Administration of the TLP	Significant Positive Changes on all TLP components and Total TLP score	Significant Decrease in Transactional Leadership Behavior score. No Changes on other TLP components.	No significant changes	From Two years to Four Years after Graduation Significant Positive Changes in Transactional Behavior, Transformational Behavior, and Total TLP score		
ACSC Class of 97	First Administration of the TLP	Significant Positive Changes on all TLP components and Total TLP score	Significant Decrease in Transactional Leadership Behavior score. No Changes on other TLP components.	From One Year after Graduation to Three Years after Graduation No significant changes			
ACSC Class of 98	First Administration of the TLP	Significant Positive Changes on all TLP components and Total TLP score	From Graduation to Two Years after Graduation Significant Decrease in Transactional Leadership Behavior score. No Changes on other TLP components.				
ACSC Class of 99	First Administration of the TLP	Significant Positive Changes on Transformational Characteristics, and Total TLP score, but not on Transactional or Transformational Behavior scores	Significant Decrease in Transactional Leadership Behavior score. No Changes on other TLP components.				

Notes: Class of 1995 t-test results are in Table 17. Class of 1996 t-test results are in Table 18.
Class of 1997 t-test results are in Table 19 Class of 1998 t-test results are in Table 20.
Class of 1999 t-test results are in Table 21.

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Changes by Dissertation's Sample's Sub-groups

The previous section examined the potential for changes in each cohort on an annual basis. This section uses two of the three sub-groups within the dissertation's sample[15] to examine length of time's impact on changes in leadership behaviors and characteristics as reported by ACSC graduates. Sub-group 1 paired t-tests show the results of a three year period between TLP administrations and Sub-group 2 paired t-tests show the results of a two year period between TLP administrations.

Sub-Group 1: 1997 – 2000

Sub-group 1 is composed of 163 members of the Classes of 1995, 1996, and 1997 who submitted a post-ACSC TLP in 1997 (but not in 1998) and in 2000. Table 23 shows the paired t-test results of this sub-group for that three-year period in the work force. During that period, this sub-group's TLP scores remained constant and there were not any significant changes.

Table 23

Paired t-tests for Sub-group 1

TLP Component	*N*	Mean	Mean Diff.	SD Dif	*df*	*T*	*P<*
Transactional Behavior	163	1997: 40.877 2000: 40.227	-0.650	4.424	162	-1.877	0.062
Transformational Behavior	163	1997: 83.196 2000: 83.405	0.209	7.029	162	0.379	0.705
Transformational Characteristics	163	1997: 75.466 2000: 75.663	0.196	8.038	162	0.312	0.705
Total TLP Score	163	1997: 199.540 2000: 199.295	-0.45	17.249	162	2.423	0.856

* Significant at the .05 level ** Significant at the .01 level

[15] The third sub-group is the ACSC Class of 1999 and their changes were examined in the previous section.

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Sub-Group 2: 1998 – 2000

Sub-group 2 is composed of 267 members of the Classes of 1995, 1996, 1997, and 1998 who submitted a post-ACSC TLP in 1998 and in 2000. Table 24 shows the paired t-test results of this sub-group for that two-year period in the work force. During that period, this sub-group showed a significant, positive change in Transformational Leadership Behavior scores, but no change in the scores of the other VLT components.

Table 24

Paired t-tests for Sub-group 2

TLP Component	*N*	Mean	Mean Diff.	SD Dif	*df*	*T*	*p<*
Transactional Behavior	267	1998: 40.824 2000: 40.929	0.105	4.671	266	0.367	0.714
Transformational Behavior	267	1998: 83.202 2000: 84.427	1.225	7.778	266	2.162	0.011*
Transformational Characteristics	267	1998: 76.221 2000: 76.071	-0.150	6.415	266	-0.38	0.703
Total TLP Score	267	1998: 200.247 2000: 201.427	1.180	16.642	266	1.158	0.248

* Significant at the .05 level ** Significant at the .01 level

Sub-Group 3: 1999 – 2000

Since the only ACSC cohort administered a post-ACSC TLP in 1999 was the ACSC Class of 1999, the membership of this sub-group is composed only of members of the Class of 1999. Paired t-test results for the 1999-2000 period were presented in Table 21.

Summary of Period Effects

The period of time relevant to this dissertation is the period from 1997 through 2000 and the portion of the ACSC graduate population relevant to this study is those respondents with

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post-ACSC TLP scores. To search for changes by period, Table 28 combines cohorts and shows changes in TLP scores for each of the three periods covered by the study: 1997-2000, 1998-2000, and 1999-2000.

As shown in Table 28, the sub-group having a three year span between TLPs did not show any changes in TLP scores, but the sub-group having a two year span between TLPs and the sub-group having a one year span between TLPs both had significant changes. However, the changes for Sub-Group 3 probably are a cohort effect instead of a period effect, because, as discussed in the "Summary of Cohort Effects" section, four of the five cohorts had significant decreases in Transactional Leadership Behavior scores with no significant changes in other TLP measures within two years after graduation from ACSC. Also, with the three-year sub-group and two-year sub-groups having different results, the researcher concluded that period of time will not impact the results from hypothesis testing.

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Table 25

Summary of TLP Score Changes by Period

Sub-group	Summer 1997	Summer 1998	From Summer 1998 to Summer 1999	From Summer 1999 to Summer 2000	Summer 2000
Sub-Group 1: Those who last took TLP in Summer 1997 (n = 163)	TLP ---------- TLP For the period from 1997 through 2000, this Sub-Group did not have any significant changes in any TLP component.				
Sub-Group 2: Those who last took TLP in Summer 1998 (n = 267)		TLP ---------- TLP For the period from 1998 through 2000, this Sub-Group had significant positive changes in Transformational Leadership Behavior score.			
Sub-Group 3: Those who last took TLP in Summer 1999 (n = 113)			TLP ---------- TLP For the period from 1999 through 2000, this Sub-Group had significant decrease in Transactional Leadership Behavior score.		

Notes: Membership of each Sub-Group is detailed in Table 6.
Sub-Group 1 t-test results are in Table 23. Sub-Group 2 t-test results are in Table 24.
Sub-Group 3 (e.g., Class of 1999) t-test results are in Table 21.

Impact of Respondent Age on TLP and JCP Scores

The mean age for subjects in the dissertation's sample is 40.45, with SD = 3.613 and ranged from age 34 through 54. To investigate the possibility of age biasing the study's results, the researcher created two sub-samples, one composed of those subjects in the dissertation's sample older than mean age plus 1 SD (i.e., age 45 and older) and the other group composed of those subjects in the dissertation's sample younger than the mean age minus 1 SD (i.e., age 36 and younger). Next the researcher used independent samples t-tests to compare the means of each of these sub-groups on total JCP and total TLP scores. Results in Table 26 indicate that there is not any significant difference in the scores of these two groups on either instrument.

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Table 26

Independent Samples t-test of Oldest Respondents vs. Youngest Respondents

Year Survey Administered	Age Group	*n* =	Mean Total Score	Std Dev					
2000 TLP	Age 36 and younger	50	197.320	18.812					
	Age 45 and over	70	203.086	16.230					
				F	Sig.	*t*	*df*	Mean Diff.	*p*<
	Equal Variances Assumed			1.115	0.293	-1.795	118	-5.766	0.075
	Equal Variances Not Assumed					-1.751	95.736	-5.766	0.083
2000 JCP	Age 36 and younger	50	135.020	28.170					
	Age 45 and over	70	138.300	32.170					
				F	Sig.	*t*	*df*	Mean Diff.	*p*<
	Equal Variances Assumed			0.998	0.320	-0.579	118	-3.280	0.563
	Equal Variances Not Assumed					-0.592	113.108	-3.280	0.555

Summary of Maturation Effects

The other possible confounding variable was that the process of maturation might have influenced TLP scores and, thus, affected the results of hypothesis testing. However, results from independent samples t-test comparing TLP and JCP scores of the oldest respondents vs. the youngest respondents in the dissertation's sample found no differences in scores between the two groups. Thus, maturation effects did not impact the results of hypothesis testing in this study.

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Results of Hypothesis Testing

Hypotheses 1A, 1B, and 1C

Hypothesis 1A

H1A: The total change in total Visionary Leadership (e.g., total TLP score) for all cohorts combined into a single sample is positively and significantly associated with the level of job developmental opportunity (e.g., total JCP score).

The results of this analysis were significant and as predicted. This hypothesis was tested using multiple regression analysis calculated wherein the Visionary Leadership scores in 2000 (time 2) were regressed on Job Challenge Profile Scores with Visionary Leadership scores in time 1 held constant. Table 27 presents the summary of the regression analysis.

Table 27

Summary of Hierarchical Regression Analysis for Variables Predicting Total TLP Score In 2000, N = 543

Variable	B	Std. Error B	β
Step 1			
Total TLP score from previous submission	0.509	0.034	0.536**
Step 2			
Total TLP score from previous submission	0.494	0.034	0.521**
Total JCP score	0.091	0.021	0.153**

Note: $R^2 = .288$ for Step 1; $\Delta R^2 = .023$ for Step 2 ($p = .000$)
** $p < .01$

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Hypothesis 1B

H1B: The total change in Total Visionary Leadership (e.g., total TLP score) for each individual cohort is positively and significantly associated with the level of job developmental opportunity (e.g., total JCP score).

The results of this analysis were mixed. Significant positive results were found in the ACSC Class of 1998, but no significant results were found in any of the other cohorts.

This hypothesis was tested using multiple regression analysis calculated wherein the Visionary Leadership scores in 2000 (time 2) were regressed on Job Challenge Profile Scores with Visionary Leadership scores in time 1 for each cohort held constant. Tables 28 – 32 present the regression analysis summaries.

Table 28

Summary of Hierarchical Regression Analysis for Variables Predicting Total TLP Score In 2000, ACSC Class of 1995, N = 67

Variable	B	Std. Error B	β
Step 1			
Total TLP score from previous submission	0.724	0.102	0.660**
Step 2			
Total TLP score from previous submission	0.725	0.103	0.661**
Total JCP score	0.021	0.058	0.035

Note: $R^2 = .435$ for Step 1; $\Delta R^2 = .001$ for Step 2

** $p < .01$

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Table 29

Summary of Hierarchical Regression Analysis for Variables Predicting Total TLP Score In 2000, ACSC Class of 1996, N = 81

Variable	B	Std. Error B	β
Step 1			
Total TLP score from previous submission	0.456	0.073	0.574**
Step 2			
Total TLP score from previous submission	0.433	0.073	0.545**
Total JCP score	0.099	0.054	0.168

Note: $R^2 = .330$ for Step 1; $\Delta R^2 = .027$ for Step 2

** $p < .01$

Table 30

Summary of Hierarchical Regression Analysis for Variables Predicting Total TLP Score In 2000, ACSC Class of 1997, N = 124

Variable	B	Std. Error B	β
Step 1			
Total TLP score from previous submission	0.481	0.071	0.524**
Step 2			
Total TLP score from previous submission	0.474	0.070	0.516**
Total JCP score	0.085	0.045	0.145

Note: $R^2 = .274$ for Step 1; $\Delta R^2 = .021$ for Step 2

** $p < .01$

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Table 31

Summary of Hierarchical Regression Analysis for Variables Predicting Total TLP Score In 2000, ACSC Class of 1998, N = 158

Variable	B	Std. Error B	β
Step 1			
Total TLP score from previous submission	0.483	0.071	0.477**
Step 2			
Total TLP score from previous submission	0.444	0.070	0.438**
Total JCP score	0.144	0.040	0.247**
Note: R^2 = .228 for Step 1; ΔR^2 = .060 for Step 2 (p = .000)			
** $p < .01$			

Table 32

Summary of Hierarchical Regression Analysis for Variables Predicting Total TLP Score In 2000, ACSC Class of 1999, N = 113

Variable	B	Std. Error B	β
Step 1			
Total TLP score from previous submission	0.528	0.080	0.533**
Step 2			
Total TLP score from previous submission	0.509	0.081	0.513**
Total JCP score	0.073	0.053	0.112
Note: R^2 = .284 for Step 1; ΔR^2 = .012 for Step 2			
** $p < .01$			

Hypothesis 1C

H1C: The total change in Total Visionary Leadership (e.g., total TLP score) for sample Sub-Group 1 and Sub-Group 2 is positively and significantly associated with the level of job developmental opportunity (e.g., total JCP score). Sub-Group 1 consists of those subjects who last took the TLP in 1997. Sub-Group 2 consists of those subjects who last took the TLP in 1998.

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The results of this analysis were mixed. Significant positive results were found for Sub-Group 2, but no significant results were found for Sub-Group 1.

This hypothesis was tested using multiple regression analysis calculated wherein the Visionary Leadership scores in 2000 (time 2) were regressed on Job Challenge Profile Scores with Visionary Leadership scores in time 1 for each Sub-Group held constant (e.g., time 1 for Sub-Group 1 was 1997 and time 1 for Sub-Group 2 was 1998). Tables 33 – 34 present the regression analysis summaries.

Table 33

Summary of Hierarchical Regression Analysis for Variables Predicting Total TLP Score In 2000, Sub-Group 1, N = 163

Variable	B	Std. Error B	β
Step 1			
Total TLP score from previous submission	0.568	0.061	0.593**
Step 2			
Total TLP score from previous submission	0.556	0.061	0.580**
Total JCP score	0.056	0.042	0.084
Note: $R^2 = .351$ for Step 1; $\Delta R^2 = .007$ for Step 2 ** $p < .01$			

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Table 34

Summary of Hierarchical Regression Analysis for Variables Predicting Total TLP Score In 2000, Sub-Group 2, N = 267

Variable	B	Std. Error B	β
Step 1			
Total TLP score from previous submission	0.455	0.049	0.493**
Step 2			
Total TLP score from previous submission	0.442	0.048	0.478**
Total JCP score	0.122	0.028	0.225**
Note: $R^2 = .240$ for Step 1; $\Delta R^2 = .050$ for Step 2 ($p = .000$)			
** $p < .01$			

Hypotheses 2A through 2J

Hypotheses 2A through 2J postulate relationships between the major components of job challenge and self-reported changes in the major components of Visionary Leadership Theory. Thus, this section organizes hypotheses by VLT component. Additionally, the regression analyses presented are the most parsimonious models derived through testing alternative models (Pedhazur, 1997).

Job Challenge as Related to Reported Changes in Transactional Leadership Behavior

Hypotheses H2A and H2B predicted significant positive relationships between the JCP scales of "Experiencing a Job Transition" and "Managing at High Levels of Responsibility" and the total change in Transactional Leadership Behavior TLP score for all cohorts combined into a single sample.

These hypotheses were tested using multiple regression analysis calculated wherein the Transactional Leadership Behavior scores in 2000 (time 2) were regressed on the Job Challenge

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Profile scale scores of "Experiencing a Job Transition" and "Managing at High Levels of Responsibility" with Transactional Leadership Behavior scores in time 1 held constant.

Table 35 presents the summary of the regression analysis that shows that "Managing at High Levels of Responsibility" is a significant predictor of change in Transactional Leadership Behavior score, but that "Experiencing a Job Transition" is not a significant predictor.

Table 35

Summary of Hierarchical Regression Analysis for Variables Predicting Total Transactional Leadership Behavior Score in 2000, N = 543

Variable	B	Std. Error B	β
Step 1			
Transactional Leadership Behavior score from previous TLP submission	0.449	0.036	0.475**
Step 2			
Transactional Leadership Behavior score from previous TLP submission	0.436	0.036	0.461**
Managing at High Levels of Responsibility	0.078	0.023	0.128**
Step 3			
Transactional Leadership Behavior score from previous TLP submission	0.431	0.036	0.456**
Managing at High Levels of Responsibility	0.088	0.024	0.145**
Experiencing a Job Transition	-0.68	0.045	-0.059
Note: R^2 = .226 for Step 1 (p = .000**); ΔR^2 = .016 for Step 2 (p = .001**); ΔR^2 = .003 for Step 3 ** $p < .01$			

Job Challenge as Related to Reported Changes in Transformational Leadership Behavior

Hypotheses H2C, H2D, and H2E predicted significant positive relationships between the JCP scales of "Creating Change," "Managing at High Levels of Responsibility," and "Dealing with Diversity" and the total change in Transformational Leadership Behavior TLP score for all cohorts combined into a single sample.

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These hypotheses were tested using multiple regression analysis calculated wherein the Transformational Leadership Behavior scores in 2000 (time 2) were regressed on the Job Challenge Profile scale scores of "Creating Change," "Managing at High Levels of Responsibility," and "Dealing with Diversity" with Transformational Leadership Behavior scores in time 1 held constant. Table 36 presents the summary of the regression analysis and shows that the most parsimonious model is achieved in Step 2. Therefore, "Managing at High Levels of Responsibility" is a significant, positive predictor of change in Transformational Leadership Behavior score.[16] Other JCP factors (e.g., "Creating Change," "Managing Boundaries," and "Dealing with Diversity") are not significant predictors.

[16] Though the model in Step 3 includes "Experiencing a Job Transition" as a very small but statistically significant negative predictor of change in Transformational Leadership Behavior score, further investigation into that purported relationship led to the conclusion that there is no relationship between "Experiencing a Job Transition" and changes in Transformational Leadership Behavior scores and the model in Step 3 produced a statistical artifact. (See Appendix F.) Therefore, the model in Step 3 was not reported as a finding.

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Table 36
Summary of Hierarchical Regression Analysis for Variables Predicting Total Transformational Leadership Behavior Score in 2000, N = 543

Variable	B	Std. Error B	β
Step 1			
Transformational Leadership Behavior score from previous TLP submission	0.443	0.034	0.493**
Step 2			
Transformational Leadership Behavior score from previous TLP submission	0.425	0.033	0.473**
Managing at High Levels of Responsibility	0.162	0.037	0.164**
Step 3			
Transformational Leadership Behavior score from previous TLP submission	0.420	0.033	0.468**
Managing at High Levels of Responsibility	0.186	0.038	0.188**
Experiencing a Job Transition	-0.165	0.072	-0.087*
Step 4			
Transformational Leadership Behavior score from previous TLP submission	0.420	0.033	0.467**
Managing at High Levels of Responsibility	0.159	0.041	0.160**
Experiencing a Job Transition	-0.176	0.072	-0.093*
Dealing with Diversity	0.063	0.032	0.077

Note: $R^2 = .243$ for Step 1 ($p = .000$**); $\Delta R^2 = .026$ for Step 2 ($p = .000$**); $\Delta R^2 = .007$ for Step 3 ($p = .022$*); $\Delta R^2 = .005$ for Step 4 ($p = .712$)
* $p < .05$ ** $p < .01$

Job Challenge Relationships to Reported Changes Transformational Leadership Characteristics

Hypotheses H2F through H2J predicted significant positive relationships between the JCP scales of "Experiencing a Job Transition" (H2F), "Creating Change" (H2G), "Managing at High Levels of Responsibility" (H2H), "Managing Boundaries" (H2I), and "Dealing with Diversity" (H2J) and the total change in Transformational Leadership Characteristics TLP score for all cohorts combined into a single sample.

These hypotheses were tested using multiple regression analysis calculated wherein the Transformational Leadership Characteristics scores in 2000 (time 2) were regressed on the Job Challenge Profile scale scores of "Experiencing a Job Transition," "Creating Change,"

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"Managing at High Levels of Responsibility," "Managing Boundaries," and "Dealing with Diversity" with Transformational Leadership Characteristic scores in time 1 held constant.

Table 37 presents the summary of the regression analysis and shows that the most parsimonious model is achieved in Step 2. Therefore, "Managing at High Levels of Responsibility" is a significant predictor of change in Transformational Leadership Characteristics score, but "Experiencing a Job Transition[17]," "Creating Change," "Managing Boundaries," and "Dealing with Diversity" are not significant predictors.

[17] "Experiencing a Job Transition" appears to show a significant, negative relationship in Step 5 of Table 34. However, because it showed no such relationship when first entered (e.g., Step 3), it was not explored. (Pedhazur, 1997)

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Table 37

Summary of Hierarchical Regression Analysis for Variables Predicting Total Transformational Leadership Characteristics Score in 2000, N = 543

Variable	B	Std. Error B	β
Step 1			
Transformational Leadership Characteristics score from previous TLP	.561	.037	0.542**
Step 2			
Transformational Leadership Characteristics score from previous TLP	0.541	0.037	0.522**
Managing at High Levels of Responsibility	0.156	0.037	0.150**
Step 3			
Transformational Leadership Characteristics score from previous TLP	0.536	0.037	0.517**
Managing at High Levels of Responsibility	0.174	0.039	0.168**
Experiencing a Job Transition	-0.125	0.073	-0.064
Step 4			
Transformational Leadership Characteristics score from previous TLP	0.532	0.037	0.514**
Managing at High Levels of Responsibility	0.124	0.046	0.120**
Experiencing a Job Transition	-0.149	0.074	-0.076
Managing Boundaries	0.083	0.042	0.088
Step 5			
Transformational Leadership Characteristics score from previous TLP	0.531	0.037	0.512**
Managing at High Levels of Responsibility	0.102	0.050	0.098*
Experiencing a Job Transition	-0.163	0.075	-0.083*
Managing Boundaries	0.072	0.043	0.077
Creating Change	0.036	0.028	0.055

Note: $R^2 = .293$ for Step 1; $\Delta R^2 = .022$ for Step 2 ($p = .000$);
$\Delta R^2 = .004$ for Step 3 ($p = .087$); $\Delta R^2 = .005$ for Step 4 ($p = .049$)
$\Delta R^2 = .002$ for Step 5 ($p = .210$)
* $p < .05$ ** $p < .01$

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Summary

This chapter addressed several potential threats to result validity and then presented the results from hypothesis testing. Results were presented showing that the composition of the dissertation's sample closely parallels the make-up of the population of ACSC graduates. The next section of this chapter then presented results alleviating concerns about potential threats arising from response bias, possible demographics influences, possibility of having a non-representative sample of the ACSC population, and instrument reliability. The chapter also presented results from a longitudinal assessment of cohort, period, and age effects.

The following hypotheses were testing:

H1A: The total change in total Visionary Leadership (e.g., total TLP score) for all cohorts combined into a single sample is positively and significantly associated with the level of job developmental opportunity (e.g., total JCP score). Results supported this hypothesis.

H1B: The total change in total Visionary Leadership (e.g., total TLP score) for each individual cohort is positively and significantly associated with the level of job developmental opportunity (e.g., total JCP score). Results supported this hypothesis only for the ACSC Class of 1998.

H1C: The total change in Total Visionary Leadership (e.g., total TLP score) for sample Sub-Group 1 and Sub-Group 2 is positively and significantly associated with the level of job developmental opportunity (e.g., total JCP score). Results supported this hypothesis only for Sub-Group 2.

H2A and H2B: These hypotheses predicted significant positive relationships between the JCP scales of "Experiencing a Job Transition" and "Managing at High Levels of Responsibility" and the total change in Transactional Leadership Behavior TLP score for all cohorts combined

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into a single sample. Results show that "Managing at High Levels of Responsibility" is a significant predictor of change in Transactional Leadership Behavior score, but that "Experiencing a Job Transition" is not a significant predictor.

H2C, H2D, and H2E: These hypotheses predicted significant positive relationships between the JCP scales of "Creating Change," "Managing at High Levels of Responsibility," and "Dealing with Diversity" and the total change in Transformational Leadership Behavior TLP score for all cohorts combined into a single sample. Results show that "Managing at High Levels of Responsibility" is a significant predictor of change in Transformational Leadership Behavior score, but "Creating Change" and "Dealing with Diversity" are not significant predictors.

H2F through H2J: These hypotheses predicted significant positive relationships between the JCP scales of "Experiencing a Job Transition," "Creating Change," "Managing at High Levels of Responsibility," "Managing Boundaries," and "Dealing with Diversity" and the total change in Transformational Leadership Characteristics TLP score for all cohorts combined into a single sample. Results show that "Managing at High Levels of Responsibility" is a significant predictor of change in Transformational Leadership Characteristics score, but "Experiencing a Job Transition," "Creating Change," "Managing Boundaries," and "Dealing with Diversity" are not significant predictors.

In summary, these results support the hypothesis of a relationship between level of job challenge as measured by the Job Challenge Profile and self-reported changes in leadership behavior and characteristics as measured by The Leadership Profile. Chapter Five will explore in more detail possible explanations of these results.

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CHAPTER 5 - CONCLUSIONS AND RECOMMENDATIONS

Introduction

The objective of this chapter is to provide a summary and integration of the results of this study. This chapter is organized into six sections: Introduction, Overview, Summary and Discussion of Findings, Implications for Future Research, Implications for Practice, and Conclusion.

The questions that provided the foundation for this research are (1) whether exposure to on-the-job developmental opportunities is associated with self-reported changes in leader behavior and characteristics and (2) exposure to which types of on-the-job developmental opportunities is associated with self-reported changes in transactional leadership behaviors, transformational leadership behaviors and transformational leadership characteristics.

This study analyzes those questions by combining two theoretical perspectives, one that provides an integrated conceptualization of leadership and the other addressing development through challenging work experiences. The first theoretical perspective comes from Visionary Leadership Theory as described by Sashkin and Rosenbach (Sashkin & Rosenbach, 1998) which identifies Transactional Leadership Behaviors, Transformational Leadership Behaviors, and Transformational Leadership Characteristics as the three components of leadership. The second theoretical perspective comes from the theory of on-the-job development as initially described by McCauley, Lombardo, and Usher (1989) and refined by McCauley, Ohlott, and Ruderman (1999). This theory identifies several categories of on-the-job developmental opportunities that are related to managerial growth.

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Based upon Sashkin and Rosenbach's Visionary Leadership Theory, McCauley, et al.'s theory of on-the-job development, and the research questions, the study used four dependent variables representing leadership behavior and characteristics and six independent variables representing aspects of on-the-job development opportunity. The four dependent variables were derived from TLP scores and are: "Total Visionary Leadership Theory" score, "Transactional Leadership Behavior" score, "Transformational Leadership Behavior" score, and "Transformational Leadership Characteristics" score. Likewise, all six independent variables are derived from JCP scores and are: "Experiencing a Job Transition" score, "Creating Change" score, "Managing at High Levels of Responsibility" score, "Managing Boundaries" score, "Dealing with Diversity" score, and "Total On-the-Job Developmental Opportunity" score (e.g., the total JCP score).

Three hypotheses tested the first research question and ten addressed the second research question. The three hypotheses testing the first research question were:

1. H1A: The total change in Total Visionary Leadership (e.g., total TLP score) for all cohorts combined into a single sample is positively and significantly associated with the level of job developmental opportunity (e.g., total JCP score).

2. H1B: The total change in Total Visionary Leadership (e.g., total TLP score) for each individual cohort is positively and significantly associated with the level of job developmental opportunity (e.g., total JCP score).

3. H1C: The total change in Total Visionary Leadership (e.g., total TLP score) for sample Sub-Group 1 and Sub-Group 2 is positively and significantly associated with the level of job developmental opportunity (e.g., total JCP score).

The ten hypotheses that addressed the second research question were:

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1. H2A: For all cohorts combined into a single sample, the total change in transactional leadership behavior is positively and significantly associated with the total score on the "Experiencing a Job Transition" scale.

2. H2B: For all cohorts combined into a single sample, the total change in transactional leadership behavior is positively and significantly associated with the total score on the "Managing at High Levels of Responsibility" scale.

3. H2C: For all cohorts combined into a single sample, the total change in transformational leadership behavior is positively and significantly associated with the total score on the "Creating Change" scale.

4. H2D: For all cohorts combined into a single sample, the total change in transformational leadership behavior is positively and significantly associated with the total score on the "Managing at High Levels of Responsibility" scale.

5. H2E: For all cohorts combined into a single sample, the total change in transformational leadership behavior is positively and significantly associated with the total score on the "Dealing with Diversity" scale.

6. H2F: For all cohorts combined into a single sample, the total change in transformational leadership characteristics is positively and significantly associated with the total score on the "Experiencing a Job Transition" scale.

7. H2G: For all cohorts combined into a single sample, the total change in transformational leadership characteristics is positively and significantly associated with the total score on the "Creating Change" scale.

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8. H2H: For all cohorts combined into a single sample, the total change in transformational leadership characteristics is positively and significantly associated with the total score on the "Managing at High Levels of Responsibility" scale.

9. H2I: For all cohorts combined into a single sample, the total change in transformational leadership characteristics is positively and significantly associated with the total score on the "Managing Boundaries" scale.

10. H2J: For all cohorts combined into a single sample, the total change in transformational leadership characteristics is positively and significantly associated with the total score on the "Dealing with Diversity" scale.

The next section of this chapter provides an overview of the research methodology employed in the study.

Overview

This study used a quasi-experimental design that provided multiple observations of the dependent variable in multiple event-cohorts (Glenn, 1977; Graetz, 1987). Additionally, the research design consisted of five cohorts and the independent variable was the naturally occurring developmental challenges inherent in the sample's various workplaces.

This study used two survey instruments: The Leadership Profile (TLP) and the Job Challenge Profile (JCP). The TLP (Sashkin, 1994, 1996b, 1998a) was used to assess the three components of Visionary Leadership Theory: Transactional Leadership Behavior, Transformational Leadership Behavior, and Transformational Leadership Characteristics. The instrument is the fourth major version of Sashkin's Leader Behavior Questionnaire (LBQ) (Sashkin, 1984, 1988, 1990, 1996b). The JCP (McCauley, Lombardo, & Usher, 1989;

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McCauley, Ohlott, & Ruderman, 1989; McCauley et al., 1999) was used to determine levels of specific on-the-job development opportunities identified as critical for managerial growth: "Experiencing a Job Transition," "Creating Change," "Managing at High Levels of Responsibility," "Managing Boundaries," and "Dealing with Diversity."

The participants in this study were all graduates of the United States Air Force's Air Command and Staff College (ACSC) ten-month, in-residence professional military education course of study. The total sample population is composed of U. S. military officers and civilians who graduated from ACSC in academic years 1995 (N=512), 1996 (N=518), 1997 (N=521), 1998 (N=521), and 1999 (N=513) for a total $N = 2,585$. However, since only those ACSC graduates who had completed a post-ACSC TLP in 1997, 1998 or 1999 were eligible for this study, the largest possible sample was 1,585, composed of members from the following cohorts: 1995 (N=174), 1996 (N=188), 1997 (N=372), 1998 (N=373), and 1999 (N=478).

No site selection was accomplished. Instead, sites surveyed by this research were those naturally occurring work environments of respondents. They included a wide range of work environments from high-level staff organizations such as found in the Pentagon to "front-line" organizations responsible for day-to-day military operations.

Data used in the study came both from the archived ACSC Leadership Database and solicitations sent to eligible ACSC graduates. Requests to participate in this study were sent to eligible ACSC graduates via email (if an email address was available) and/or by regular mail. Also, potential participants were given an option of replying either through a password protected, online website, via email or by returning paper-based survey forms in pre-paid mailers. All participants were provided "Informed Consent" information and confidentiality of respondents was protected.

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The overall response rate was 38.0% and of the 579 surveys submitted, 324 (59.7%) were submitted via the Internet. Of the 579 participants responding, 12 were not included in the dissertation's sample because their job during the JCP evaluation period had been as a full-time student, 18 were not included because they did not have a post-ACSC TLP in 1997, 1998, or 1999, and six were not included because they completed either a TLP or JCP survey but not both. Therefore the dissertation's sample includes responses from a total of 543 participants (i.e., 35.7% of those initially requested to participate).

The next section summarizes and discusses the study's findings.

Summary and Discussion of Findings

Demographics

Personal and job related demographic data were collected from all participants. Personal demographic data collected included: Service, source of commission, ethnic background, gender, marital status, educational level, whether or not the respondent had been promoted before his/her peers to a higher grade/rank (a.k.a., Below-the-Zone promotion) and age. The composition of the dissertation's sample closely matches the composition of the ACSC Leadership Database on the following factors: gender, marital status, source of commission, and ethnic background. In regard to Service composition, the dissertation's sample contains a slightly higher percentage of USAF officers with a corresponding decrease in responses from Army, Navy/USMC, and civilians (e.g., 85.8% vs. 80.8%). The factor showing the biggest difference, initially, was educational level. However, further analysis revealed that the cause of the difference was respondents earning advanced degrees after graduation from ACSC. Due to non-availability of data, it was not possible to compare current and previous respondents on the variables of age and

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Below-the-Zone promotion.[18] Based on these findings it was determined that the demographic profile of the current sample in the dissertation is similar to the demographic profile of the ACSC population that comprises the ACSC Leadership Database.

In addition to personal demographics, the following job related demographics were collected from respondents: number of jobs held during the period covered by their JCP survey response, organizational level at which they had been working, and whether or not they had been a supervisor or commander during the period covered by their JCP survey response, and respondent's career field. Descriptive analysis revealed that most of the respondents (e.g., 67.7%) held some sort of supervisory position during the period of time covered by their JCP rating. Also, the dissertation's sample was almost evenly divided between those working at a higher headquarters level and those working at the operational level (i.e., wing and below). Though there are a wide variety of career fields represented in the dissertation's sample, most of the respondents came from one of three career fields: operations, support, and logistics. Finally, there are slightly more subjects in the dissertation's sample who held more than one job during the period of time covered by their JCP rating (e.g., 59.5%) than those who held only one job during the period of time covered by their JCP rating (e.g., 39.4%). Since work related demographics had not previously been collected, no comparison between the dissertation's sample and the ACSC Leadership Database population was possible.

Analysis of Threats to Validity and Reliability

Threats to validity and reliability analyzed included threats from a possible response bias induced by the method through which participants submitted survey responses, possible impact on TLP change from differing perceptions of job challenge by different demographic segments,

[18] Age data was not available in the ACSC Leadership Database and Below-the-Zone selections were not made until after graduation from ACSC.

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and possible non-generalizable results if the dissertation's sample was not representative of the ACSC population. Additionally, the reliability of the survey instruments was analyzed.

Possible Response Bias

A possibility of response bias was investigated (as reported in Chapter 4). No significant differences in TLP scores were found between the group that completed the surveys online and the group who submitted paper survey forms. However, significant differences were identified in JCP scores. (See Appendix C.) Two demographically balanced sub-groups were constructed of respondents who replied by mail and those who responded via the Internet. With demographically balanced sub-groups, there were no significant differences on any of the JCP scale scores between the two sub-groups. Thus, the differences in JCP scores are attributable to demographic variables and not attributable to a bias created by the medium used to respond.

Possible Bias from Demographic Differences

As mentioned in the previous section, significant differences between demographic variables on many of the JCP scales were found. As a result of that finding, further analysis was conducted to determine whether or not demographic variables would significantly affect the hypothesis testing outcomes. To test for the effects of job and personal demographic variables, multiple regression analyses were calculated wherein the Visionary Leadership scores in 2000 (time 2) were regressed on the demographic variables with Visionary Leadership scores in time 1 held constant. Results revealed that none of the job or personal demographic variables were significant predictors of change in total TLP score. Thus, demographic variables were eliminated as possible alternative hypotheses for affecting changes in TLP scores.

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Generalization Limitations

As mentioned in the Limitations section in Chapter 1, findings from this study might not be generalizable to non-military populations or to other military populations that did not attend an in-residence, mid-career professional military course of instruction. However, the similarity between the demographics of the dissertation's sample and the demographics of the ACSC population in the ACSC Leadership Database raised the possibility of generalizability from the dissertation's sample to the population from which the sample was drawn. To further examine this possibility, the researcher computed independent samples t-tests comparing the post-ACSC scores of subjects in the dissertation's sample against the scores of all post-ACSC respondents for the years 1997, 1998, 1999, and 2000. The results showed no significant differences between the total TLP scores of dissertation subjects and those ACSC graduates not in the dissertation's sample in any of the years examined. Thus, both in terms of demographic variables and total TLP scores, the dissertation's sample is similar to the ACSC population that comprises the ACSC Leadership Database.

Research Question 1, Hypotheses H1A – H1C

Summary of Results for H1A – H1C

The first research question sought to discover whether or not exposure to on-the-job developmental opportunities, as measured by the Job Challenge Profile (JCP), is associated with self-reported changes in leader behavior and characteristics, as assessed by The Leadership Profile (TLP). Hypotheses H1A through H1C analyzed that question from three group-level perspectives: all respondents in the dissertation's sample, individual cohorts, and the sub-groups based upon time period. Table 38 summarizes the results found in Chapter 4.

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Some significant, positive results were found for each hypothesis supporting research question 1 with the magnitude of JCP score impact on total TLP score change ranging from 2.3% (n = 543, standardized Beta = 0.153, p = .000) for the dissertation's entire sample to 6.0% (n = 158, standardized Beta = 0.247, p = .000) for the ACSC Class of 1998. Additionally, total JCP score was found to be a significant, positive predictor accounting for 5.0% of total TLP score change for Sub-Group 2 (n = 267, standardized Beta = 0.225, p = .000). Therefore, hypothesis H1A was supported and hypotheses H1B and H1C were partially supported.[19]

Since significant relationships between total JCP score and changes in total TLP scores were not found for all cohorts and all sub-groups as predicted by hypotheses H1B and H1C, the null hypotheses for H1B and H1C cannot be totally rejected. However, despite the inability to reject the null hypotheses for H1B and H1C, findings support the proposition that level of on-the-job development opportunity is related to changes in self-reported leadership behaviors and characteristics.

[19] The possibility existed that significant support of hypothesis 1 in class of 1998 (e.g., H1B) and Sub-group 2 in H1C was due to larger sample sizes in those groups. To test that possibility, I divided Sub-group 2 in H1C into its component cohorts. Since I had already completed a regression analysis on Cohort 4 for hypothesis H1B, I used the H1C hypothesis and conducted regression analysis on Cohort 1 (n = 24), Cohort 2 (n = 31), and Cohort 3 (n = 51). For Cohorts 1 and 2, total JCP score was not a significant predictor. However, for Cohort 3, total JCP score was a significant predictor accounting for 6.8% of the change in Total TLP score (n = 51, Standardized Beta Coefficient = 0.261*, p = .023*). Those results indicate that significance was not due to the larger size of the Cohorts tested in H1B nor to the larger size of Sub-group 2 in H1C.

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Table 38

Summary of Results for H1A through H1C

Hypothesis	Results
H1A: The total change in Total Visionary Leadership (e.g., total TLP score) for all cohorts combined into a single sample is positively and significantly associated with the level of job developmental opportunity (e.g., total JCP score).	The results of this analysis were as predicted: significant and positive. The total JCP score accounts for 2.3% of the change in total TLP score ($n = 543$, $\beta = 0.153^{**}$, $p = .000^{**}$).
H1B: The total change in Total Visionary Leadership (e.g., total TLP score) for each individual cohort is positively and significantly associated with the level of job developmental opportunity (e.g., total JCP score).	The results of this analysis were mixed. Significant positive results were found in the ACSC Class of 1998, but no significant results were found in any of the other cohorts. The total JCP score accounts for 6.0% of the change in the Class of 1998's total TLP score ($n = 158$, $\beta = 0.247^{**}$, $p = .000^{**}$).
H1C: The total change in Total Visionary Leadership (e.g., total TLP score) for sample Sub-Group 1 and Sub-Group 2 is positively and significantly associated with the level of job developmental opportunity (e.g., total JCP score).	The results of this analysis were mixed. Significant positive results were found for Sub-Group 2, but no significant results were found for Sub-Group 1. The total JCP score accounts for 5.0% of the change in Sub-Group 2's total TLP score ($n = 267$, $\beta = 0.225^{**}$, $p = .000^{**}$).
Note: Detailed H1A results are in Table 27. Detailed H1B results are in Tables 28 – 32. Detailed H1C results are in Tables 33 – 34. ** $p < .01$	

Implications of Results for H1A-H1C

These results demonstrate, with quasi-experimental rigor and statistical significance, that exposure to on-the-job developmental opportunities are associated with self-reported changes in leadership related behaviors and characteristics. These findings extend the reach of previous research in several ways. First, the scope has been extended by study results revealing that challenges found in military work environments are important sources of leadership development. Additionally, the study revealed that challenge was found across the various job sites, not just one. Third, the theoretical reach was extended using quantitative measures to link job development with leadership development.

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There are, also, several practical ramifications of these findings. One practical implication of these findings is that it encourages people to identify and use leadership development opportunities inherent in their job. Another practical implication is that it encourages formation and implementation of personnel policy that assigns the highest potential performers to very challenging jobs. And, for the designers of professional military education (PME) curriculum, these findings reinforce the need for them to be fully aware of the job challenges their graduates will face and to develop curriculum that helps the students prepare to turn those challenges into leadership development. Possibly, mid-career PME curriculum already does a great job of preparing students for future job challenges. Certainly, this study demonstrates that participants are turning job challenges into personal growth. So, the implication of this research is that the connection between PME curriculum and future job challenges might be a fruitful area for curriculum developers to explore and exploit.

Research Question 2, Hypotheses H2A – H2J

Initial Findings, Hypotheses H2A – H2J

The second research question sought to discover whether or not exposure to specific on-the-job developmental opportunities, as measured by the Job Challenge Profile (JCP), were associated with self-reported changes in leader behavior and characteristics, as assessed by The Leadership Profile. Hypotheses H2A through H2J analyzed that question from the group-level perspective of all respondents in the dissertation's sample included in a single group. Table 39 organizes the hypotheses by Visionary Leadership Theory component and summarizes the results from Chapter 4

Hypotheses H2A and H2B predicted that "Experiencing a Job Transition" and "Managing at High Levels of Responsibility" would be significant predictors for changes in

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Transactional Leadership Behavior scores. Regression analysis revealed that "Managing at High Levels of Responsibility" score accounted for 1.6% of the change in Transactional Leadership Behavior score (n = 543, standardized Beta = 0.128, p = .001) and that "Experiencing a Job Transition" was not a significant predictor of changes in Transactional Leadership Behavior score. Thus, H2B was supported, but H2A was not.

Hypotheses H2C, H2D, and H2E predicted that "Creating Change," "Managing at High Levels of Responsibility," and "Dealing with Diversity" would all be significant predictors of changes in Transformational Leadership Behavior scores. Regression analysis revealed that "Managing at High Levels of Responsibility" score accounted for 2.6% of the change in Transactional Leadership Behavior score (n = 543, standardized Beta = 0.164, p = .000), but that the other factors were not significant predictors. Thus, H2D was supported, but H2C and H2E were not supported.

Hypotheses H2F, H2G, H2H, H2I, and H2J predicted that "Experiencing a Job Transition," "Creating Change," "Managing at High Levels of Responsibility," "Managing Boundaries," and "Dealing with Diversity" would all be significant predictors of changes in Transformational Leadership Characteristics scores. Regression analysis revealed that "Managing at High Levels of Responsibility" score accounted for 2.2% of the change in Transactional Leadership Behavior score (n = 543, standardized Beta = 0.168, p = .000), but that the other factors were not significant predictors. Thus, H2H was supported, but H2F, H2G, H2I, and H2J were not supported.

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Table 39

Summary of Results for H2A through H2J

Hypothesis	Results
Transactional Leadership Behaviors: H2A: For all cohorts combined into a single sample, the total change in transactional leadership behavior is positively and significantly associated with the total score on the "Experiencing a Job Transition" scale. H2B: For all cohorts combined into a single sample, the total change in transactional leadership behavior is positively and significantly associated with the total score on the "Managing at High Levels of Responsibility" scale.	H2B was supported, but H2A was not. "Managing at High Levels of Responsibility" score accounted for 1.6% of the change in Transactional Leadership Behavior score (n = 543, $\beta = 0.128^{**}$, $p = .001^{**}$).
Transformational Leadership Behaviors: H2C: For all cohorts combined into a single sample, the total change in transformational leadership behavior is positively and significantly associated with the total score on the "Creating Change" scale. H2D: For all cohorts combined into a single sample, the total change in transformational leadership behavior is positively and significantly associated with the total score on the "Managing at High Levels of Responsibility" scale. H2E: For all cohorts combined into a single sample, the total change in transformational leadership behavior is positively and significantly associated with the total score on the "Dealing with Diversity" scale.	H2D was supported, but H2C and H2E were not. "Managing at High Levels of Responsibility" score accounted for 2.6% of the change in Transformational Leadership Behavior score (n = 543, $\beta = 0.164^{**}$, $p = .000^{**}$).

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Table 39 (continued) Hypothesis	Results
Transformational Leadership Characteristics: H2F: For all cohorts combined into a single sample, the total change in transformational leadership characteristics is positively and significantly associated with the total score on the "Experiencing a Job Transition" scale. H2G: For all cohorts combined into a single sample, the total change in transformational leadership characteristics is positively and significantly associated with the total score on the "Creating Change" scale. H2H: For all cohorts combined into a single sample, the total change in transformational leadership characteristics is positively and significantly associated with the total score on the "Managing at High Levels of Responsibility" scale. H2I: For all cohorts combined into a single sample, the total change in transformational leadership characteristics is positively and significantly associated with the total score on the "Managing Boundaries" scale. H2J: For all cohorts combined into a single sample, the total change in transformational leadership characteristics is positively and significantly associated with the total score on the "Dealing with Diversity" scale.	H2H was supported, but H2F, H2G, H2I, and H2J were not. "Managing at High Levels of Responsibility" score accounted for 2.2% of the change in Transformational Leadership Characteristics score (n = 543, $\beta = 0.168^{**}$, $p = .000^{**}$).
Note: Detailed results for Transactional Leadership Behavior factors are in Table 35. Detailed results for Transformational Leadership Behavior factors are in Table 36. Detailed results for Transformational Leadership Characteristics factors are in Table 37. ** $p < .01$	

In summary, "Managing at High Levels of Responsibility" was found to be the only significant predictor of changes in scores on each of the three VLT components for the entire dissertation sample. However, the findings in the Cohort Effects section of Chapter 4 that there is a lack of homogeneity in TLP changes at the cohort level suggested that additional post hoc analyses were needed. Therefore, the next section discusses the results from the cohort-level analyses.

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Discussion of Post Hoc Analysis Results

Since, as discussed in the Cohort Effects section, the possibility existed that not conducting cohort-level analysis might obscure differences between the cohorts, the researcher used multiple regression analyses for each cohort wherein the VLT component's scores in 2000 (time 2) were regressed on JCP scale scores with the VLT component's scores in time 1 held constant. Table 40 presents the results of the post hoc analysis (complete summary of regression analyses are in Appendix E).

As this series of regression analysis revealed, "Managing at High Levels of Responsibility" was again found to be a significant predictor of TLP score change for all three of the TLP components, Transactional Leadership Behavior, Transformational Leadership Behavior and Transformational Leadership Characteristics, and for three of the five cohorts (e.g., Cohorts 3, 4, and 5). Percentages of variance accounted for were: 3.0% for Cohort 3 (Transformational Leadership Characteristics, n = 124, $\beta = 0.173$, $p = .037$); 6.8% for Cohort 4 (Transformational Leadership Behavior, n = 158, $\beta = 0.261$, $p = .000$); 3.5% for Cohort 5 (Transactional Leadership Behavior, n = 113, $\beta = 0.189$, $p = .023$); and 2.9% for Cohort 5 (Transformational Leadership Characteristics, n = 113, $\beta = 0.172$, $p = .029$).

Unlike the prior analyses, this post-hoc analysis revealed additional sources of job challenge related to TLP score change. For Cohort 2 (the Class of 1996) "Creating Change" was a significant, positive predictor of change in scores of Transformational Leadership Behavior and Transformational Leadership Characteristics accounting for 5.6% (n = 81, $\beta = 0.239$, $p = .015$) and 4.9% (n = 81, $\beta = 0.226$, $p = .036$) of the TLP variance, respectively.

Additionally, "Managing Boundaries" was a significant, positive predictor of change in scores of Transactional Leadership Behavior and Transformational Leadership Characteristics

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for the Class of 1998 (Cohort 4) accounting for 4.0% (n = 158, β = 0.202, p = .006) and 5.3% (n = 158, β = 0.235, p = .001) of the TLP variance, respectively.

In sum, the post hoc analyses revealed significant, positive job challenge effects from several additional sources of challenge. These analyses also demonstrated that different cohorts face different job challenges. The class of 1995 was the only cohort to not have any JCP factors related to changes in TLP scores. These results are summarized in Table 40.

Table 40

Summary of Significant JCP Predictors of Changes in TLP Components Scores, by Cohort

TLP Dimension	Cohort 1 Class of 95 n = 67	Cohort 2, Class of 96 n = 81	Cohort 3, Class of 97 n = 124	Cohort 4, Class of 98 n = 158	Cohort 5, Class of 99 n = 113
Changes in Transactional Leadership Behavior Scores	No significant predictors	No significant predictors	No significant predictors	Managing Boundaries β = 0.202** p = .006** ΔR^2 = .040	Managing at High Levels of Responsibility β = 0.189* p = .023* ΔR^2 = .035
Changes in Transformational Leadership Behavior Scores	No significant predictors	Creating Change β = 0.239* p = .015* ΔR^2 = .056	No significant predictors	Managing at High Levels of Responsibility β = 0.261** p = .000** ΔR^2 = .068	No significant predictors
Changes in Transformational Leadership Characteristics Scores	No significant predictors	Creating Change β = 0.226* p = .036* ΔR^2 = .049	Managing at High Levels of Responsibility β = 0.173* p = .037* ΔR^2 = .030	Managing Boundaries β = 0.235** p = .001** ΔR^2 = .053	Managing at High Levels of Responsibility β = 0.172* p = .025* ΔR^2 = .029

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

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Examining the differences in job-related demographics between Cohorts 2 and 4 provides supporting explanation for the differing sources of job challenge between the two cohorts. For example, Cohort 4, which was 2 years past graduation from ACSC, had most of its members working in staff jobs at various headquarters. One of the characteristics of such jobs is the challenge of influencing those who do not report to you. Thus, for this cohort, "Managing Boundaries" is a predictable source of job challenge. On the other hand, some key job demographics for Cohort 2 are almost a reverse image of Cohort 4 (see Table 41) with most of the members in Cohort 2 at the operational level and having been either supervisors or commanders. So, a different source for job challenge would be reasonable for Cohort 2. For example, since over one-third of that Cohort was a commander during the period covered by their JCP and commanders are frequently responsible for implementing change initiatives, "Creating Change" is a logical source of job challenge for that Cohort 2.

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Table 41

Demographic Comparison: Cohorts 2, 3, 4, and 5

Demographic Variable	Cohort 2 Class of 96 n = 81		Cohort 3 Class of 97 n = 124		Cohort 4 Class of 98 n = 158		Cohort 5 Class of 99 n = 113	
Organizational Level								
Staff Level	23	28.4%	61	49.2%	85	53.8%	46	43.4%
Joint Staff or Combined Headquarters	10	12.3%	34	27.4%	42	26.6%	20	17.7%
Air Staff	5	6.2%	13	10.5%	18	11.4%	13	11.5%
Field Operating Agency or Direct Reporting Agency	4	4.9%	6	4.8%	8	5.1%	5	4.4%
Major Command Headquarters	4	4.9%	8	6.5%	17	10.8%	8	7.1%
Operational Level	53	65.4%	53	42.8%	61	38.6%	51	45.1%
Wing	12	14.8%	9	7.3%	9	5.7%	11	9.7%
Squadron	41	50.6%	44	35.5%	52	32.9%	40	35.4%
Other	4	5.2%	9	8.1%	12	7.6%	16	14.2%
Supervisory Experience								
Not a supervisor	16	19.8%	38	30.6%	56	35.4%	43	38.1%
Was a supervisor, but not a commander	37	45.7%	55	44.4%	72	45.6%	55	48.7%
Was a commander	28	34.6%	31	25.0%	30	19.0%	15	13.3%
Number of Jobs								
One since previous TLP	13	16.0%	26	21.0%	88	55.7%	80	71.4%
More than one since previous TLP	65	82.0%	98	79.0%	69	43.7%	32	28.6%

Unfortunately, the logic in the previous paragraph does not hold together when Cohorts 3 and 5 are considered with Cohort 2. For example, since a large percentage of each of these three cohorts were in higher headquarters staff jobs (e.g., 49.2% for Cohort 3, 48.7% for Cohort 4, and 40.7% for Cohort 5), one would expect that "Managing Boundaries" would be a predictable source of job challenge for all three cohorts, not just for Cohort 4. But, it was not. One possible explanation is that for Cohort 5, which was about one year after graduation, they had not yet recognized "Managing Boundaries" as an important developmental challenge. On the other

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hand, Cohort 3, which was three years beyond graduation, might have already dealt with "Managing Boundaries" and so it was no longer viewed as a developmental challenge. If that assessment is accurate, then it suggests that developmental challenges are transient as well as contextual.

Further comparison of personal and job demographic factors did not supply clues to any rationale for sources of job challenge. For example, Cohorts 3 and 5 had a similar composition on all job demographic variables except for "Number of Jobs Since Previous TLP" and "Supervisory Experience" (see Table 41). Though those cohorts had similar results in that the JCP component "Managing at High Levels of Responsibility" was a significant predictor of changes in Transformational Characteristics scores for both cohorts, there were no clues in the cohorts' similarities or differences that indicated why one JCP component would be significant and others not.

Additionally, Cohorts 1 and 3 had a similar composition on each of the job demographic variables and there were no significant differences between Cohorts 1 and 3 on any of the personal demographic variables. But, none of the JCP components were significant predictors of TLP score change for Cohort 1 even though "Managing at High Levels of Responsibility" was significant for Cohort 3. Therefore, for Cohorts 1, 3 and 5 there appear to be no clues from the demographic variables as to a rationale for presence or lack of significant JCP predictors.

Revised Findings, Hypotheses H2A – H2J

As discussed in the previous section, the post hoc analyses at cohort level add depth and enable better understanding of the initial results from hypothesis testing even though those findings do not change the overall outcomes of hypothesis testing. For example, the results illustrate that different cohorts experience different job challenges and that there are more

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sources of job challenge related to self-reported changes in leadership behavior and characteristics than were initially found. Additionally, when considered with initial findings, these results show support for most of the relationships predicted by hypotheses H2A through H2J. The exceptions were that no relationship between "Experiencing a Job Transition" and VLT components was found (e.g., H2A and H2F) nor was any relationship between "Dealing with Diversity" and VLT components found (e.g., H2E and H2J). The one unexpected finding was that "Managing Boundaries" was related significantly and positively to changes in Transactional Leadership Behavior scores (Cohort 4 only). Table 42 provides a summary of revised results that includes both the original results from hypothesis testing and results from post hoc analyses.

In regard to changes in Transformational Leadership Behavior, the H2C through H2E hypotheses predicted that "Creating Change," "Managing at High Levels of Responsibility," and "Dealing with Diversity" would all be significant predictors. Results from the initial and post hoc analyses revealed that two of the three were significant positive predictors: "Managing at High Levels of Responsibility" for the dissertation's entire sample and Cohort 4 and "Creating Change" for Cohort 2. No support was found for "Dealing with Diversity" as a predictor.

Similarly, hypotheses H2F through H2J predicted that "Experiencing a Job Transition," "Creating Change," "Managing at High Levels of Responsibility," "Managing Boundaries," and "Dealing with Diversity" would all be significant predictors of changes in Transformational Leadership Characteristics scores. Results from the initial and post hoc analyses revealed that three of the five predicted relationships did in fact exist: "Managing at High Levels of Responsibility" for the dissertation's entire sample as well as Cohorts 3 and 5; "Managing

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Boundaries" for Cohort 4; and "Creating Change" for Cohort 2. "Experiencing a Job Transition" and "Dealing with Diversity" were, again, the only JCP factors for which no support was found.

Table 42

Revised Summary of Results for H2A through H2J

Significant, Positive Relationships Predicted	Significant, Positive Relationships Found
Transactional Leadership Behaviors: Hypotheses predicted that "Experiencing a Job Transition" (H2A) and "Managing at High Levels of Responsibility" (H2B) would be significant predictors of change in this VLT component.	Transactional Leadership Behaviors: "Managing at High Levels of Responsibility" for entire sample "Managing at High Levels of Responsibility" for Cohort 5 "Managing Boundaries" for Cohort 4 ("Experiencing a Job Transition" was not found to be a significant predictor)
Transformational Leadership Behaviors: Hypotheses predicted that "Creating Change" (H2C), "Managing at High Levels of Responsibility" (H2D), and "Dealing with Diversity" (H2E) would be significant predictors of change in this VLT component.	Transformational Leadership Behaviors: "Managing at High Levels of Responsibility" for entire sample and for Cohort 4 "Creating Change" for Cohort 2 ("Experiencing a Job Transition" was not found to be a significant predictor)
Transformational Leadership Characteristics: Hypotheses predicted that "Experiencing a Job Transition" (H2F), "Creating Change" (H2G), "Managing at High Levels of Responsibility" (H2H), "Managing Boundaries" (H2I), and "Dealing with Diversity" (H2J) would be significant predictors of change in this VLT component.	Transformational Leadership Characteristics: "Managing at High Levels of Responsibility" for entire sample, Cohort 3, and Cohort 5 "Creating Change" for Cohort 2 "Managing Boundaries" for Cohort 4 ("Experiencing a Job Transition" and "Dealing with Diversity" were not found to be significant predictors)

Lack of Significance of "Experiencing a Job Transition"

Not finding a significant, positive relationship between "Experiencing a Job Transition" and any of the dimensions of leadership was very unexpected, because previous research usually found that scale to be most strongly related to reports of learning and development. This section

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discusses three possible explanations: potential homogeneity of scores, uniqueness of sample, and differences between this research and previous research .

One possible explanation was that the scores were so high in this sample (about 60% had at least one job change) that there was little variability in scores and, thus, less chance of predicting leadership development. To investigate this possibility, I compared the study sample's mean, median, and mode with the JCP definitions of "high," "moderate," and "low" scores (McCauley et al., 1999). (See Table 43.) Results showed that all of the study group's measures of central tendency (Hinkle, Wiersma, & Jurs, 1998) (i.e., mean, median, and mode) were all in the "Moderate" range for JCP scores. Also, the variability of the two groups' scores was very similar (e.g., standard deviations of 3.74 for this sample and 3.95 for the JCP reference group). Thus, it is not likely that the pattern of this sample's scores on the "Experiencing a Job Transition" scale helps us understand why this job component was not a significant predictor of changes in leadership behaviors or leader characteristics.

Table 43

"Experiencing a Job Transition" Score: Comparison of Dissertation Sample and Reference Group

"Experiencing a Job Transition" Scale	Dissertation's Sample n = 543	JCP Reference Group n = 1,143
JCP "High" Scores Range		12 – 25
JCP "Moderate" Scores Range		7 – 11
Mean	10.78	9.65
Median	10.00	Not Available
Mode	8.00	Not Available
JCP "Low" Scores Range		6 and below
Standard Deviation	3.74	3.95

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Another possibility is that job transitions for military officers, though a source of job challenge, might not be related to leadership development. My personal experience as a military officer has been that I, too, have frequently changed jobs and all have required some development or broadening. But, the degree of challenge varied and not all challenges offered by new jobs had leadership components (i.e., many required development of technical skills).

Despite my suspicion that job transitions in the military do present developmental challenges that are not necessarily related to leadership development, the available data does not help us understand the lack of a relationship between "Experiencing a Job Transition" and changes in TLP scores. So, there are a couple of possibilities to consider. The first possibility is that this JCP component is related to leadership development, but respondents in this sample failed to translate that job challenge into leadership growth. Repeating this study with a different sample could help answer that possibility. If a future study fails to find a significant, positive association between this scale and change in TLP scores, then, another possibility is this JCP component assesses challenges related to individual growth and learning that are not necessarily associated with leadership development. Thus, additional research might be needed to identify those aspects of new jobs that create a feeling of challenge and are associated with development of leadership skills

A third alternative comes from examining the criterion measure used in this research with the criterion measures used in previous research. Previous research used subjective measures to correlate with JCP scores. For example, McCauley et al. (1999) correlated the Likert-scale responses to two questions (e.g., how much do you feel challenged by your current job and to what degree do you believe your job is contributing to your growth) with JCP scales. This

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research used an objective measure (i.e., TLP scores at time 2 regressed on TLP scores at time 1).

In summary, of the three possible explanations for not finding a significant, positive relationship between "Experiencing a Job Transition" and any of the dimensions of leadership, uniqueness of the sample and differences in criterion measures from previous research are both viable possibilities. This adds further support to the need for additional research in this area.

Implications of Revised Results for H2A-H2J

These results demonstrate that exposure to specific types of on-the-job developmental opportunities are associated with self-reported changes in leader behaviors and characteristics. This finding adds to the importance and level of detail already provided in answering this study's first research question. Those results revealed a significant, positive relationship between overall level of job challenge and perceived leadership growth. The results from answering the study's second research question, attained with quasi-experimental rigor and statistical significance, provide a finer grained understanding of which types of job challenges were associated with self-reported growth.

These results, too, extend the reach of previous research in several ways. First, the reach has been extended through revealing what specific challenges found by this sample in military work environments were important sources of leadership development. Specifically, dealing with high levels of responsibility, creating organizational change, and learning skills to influence those over whom one does not have direct hierarchical control were all sources of job challenge related to personal growth. In addition to being an important contribution to theory, this can provide important and practical considerations in regard to curriculum development at mid-career PME institutions. For example, knowing that "Managing Boundaries" is an important

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source of job challenge in a staff environment, curriculum can be prepared that will help students maximize that growth opportunity.

In addition to helping us better understand the relationship between specific developmental opportunities and areas of growth in leadership, these findings also add to our understanding of the role of context in creating development opportunities. For example, for the cohort with the largest percentage of its respondents working at the staff level (e.g., Cohort 4) had significant, positive relationships between "Managing Boundaries" and reported growth in both Transactional Leadership Behaviors and Transformational Leadership Characteristics. On the other hand, the Cohort with the largest percentage of respondents in the leadership role of "commander" had significant, positive relationships between "Creating Change" and both transformation leadership behaviors and characteristics. One possible implication is that transactional activities helps one manage boundaries, while transformational approaches are needed for creating change. But, these findings also point out the possibility that different work environments provide different opportunities for leadership growth. If that is true, then it lends quantitative evidence to support policies for rotational assignments.

Another area that these findings identify is the potentially transient nature of job challenges. For example, "Managing Boundaries" was a significant, positive predictor of growth for Cohort 4, but was not a significant predictor for either Cohort 3 or 5 even though a large percentage of both of those cohorts were in staff jobs. One possible explanation, as proffered earlier, is that Cohort 5, with its members new to the staff environment, might not have yet recognized this would be an important developmental challenge. And, most of the members in Cohort 3 might have been completing a staff tour and, having grown in the "Managing

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Boundaries" area, might no longer have perceived it as an important job challenge. However, though this explanation is plausible, further research is needed.

Discussion Summary

This study found support for the proposition that increased exposure to job challenges (as measured by the Job Challenge Profile) is associated with increases in aspects of Visionary Leadership Theory (as measured by The Leadership Profile), because several significant, positive relationships between Job Challenge Profile scores and changes in The Leadership Profile scores were found. One relationship uncovered was that the total level of job challenge (e.g., total JCP score) was found to be a significant, positive predictor of change in total TLP score. This relationship was found in the following samples (as reported in Table 38): dissertation's entire sample (r square change = .023, standardized Beta = 0.153, $p = .000$, n = 543), for the ACSC Class of 1998 (r square change = .060, standardized Beta = 0.247, $p = .000$, n = 158) and for Sub-Group 2 (r square change = .050, standardized Beta = 0.225, $p = .000$, n = 267).

Another set of relationships discovered includes significant, positive relationships between various types of job challenge and VLT components. For example, the job challenge of "Managing at High Levels of Responsibility" was found to be a significant, positive predictor of changes on each of the VLT components (e.g., Transactional Leadership Behaviors, Transformational Leadership Behaviors, and Transformational Leadership Characteristics) both for the dissertation's entire sample and for three of the five cohorts (see Tables 39 and 40). Cohort-level analysis also revealed that the job challenge of "Creating Change" was a significant, positive predictor of change on Transformational Leadership Behaviors and Transformational Leadership Characteristics scores for Cohort 2 and that the job challenge of

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"Managing Boundaries" was a significant, positive predictor of change on Transactional Leadership Behaviors and Transformational Leadership Characteristics scores for Cohort 4 (see Table 40).

Implications for Further Research

Several implications for further research have already been presented in this chapter as the consequence of implications of research findings (i.e., relevance of "Experiencing a Job Transition" in the military context, transient nature of developmental job challenges, repeat the study with a different sample, what developmental challenges are entailed in different types of jobs [i.e., staff versus squadron command], etc.). So, rather than repeat those suggestions, this section presents more macro-level proposals for future research both in terms of conducting research as well as for theory development for both on-the-job development theory and Visionary Leadership Theory.

Implications for Future Data Collection

In regard to conducting survey-based research, one of the unexpected findings from this study was the benefit from allowing participants to choose the method through which they would respond (e.g., either via a traditional paper-based survey or via the Internet). Previous research on this population had occasionally experienced a return rate as low as 18% after graduation from ACSC. However, the return rate for this study was 38.0% and almost 60% of the surveys returned were submitted via the Internet. Further, analysis revealed no bias was induced by the method through which participants submitted survey responses. Based on these findings, my recommendation would be for future researchers to replicate this approach in data collection.

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Specifically, researchers can give potential participants the option of responding either via a password protected Internet survey or via paper forms and return mail. This procedure could possibly increase a researcher's overall return rate without having the response method jeopardize the study's outcomes.

Implications for Research into Leadership Development Through Experience

In regard to building theory, the findings are tantalizing enough to warrant further exploration. For example, though significant, positive relationships were found wherein JCP factors accounted for, at the most, 6.8% of the change in TLP scores from time 1 to time 2, what accounted for the rest of the change? A partial answer is that the TLP scores at time 1 accounted for about one-quarter to one-third of the variance of TLP time 2 scores (see Tables 27-37). But, that means that JCP factors and previous TLP scores combined consistently accounted for less than 40% of the TLP score change. So, the question remains, "What other factors influenced TLP time 2 scores?" Figure 7, which shows an overview of the theory of on-the-job development as revised by this study's findings, may provide some clues by suggesting where additional research is needed to investigate those possibilities.

Specifically, the theory postulates that the following factors will either help or hinder an individual to translate job developmental opportunities into growth: individual's ability to learn from experience; outside support in terms of feedback and reinforce; and personal learning orientation. But, further research is needed to investigate the impact that each of those variables has upon translating experience into leadership growth. For example, there was a cluster of 38 respondents who had very stable TLP scores from time 1 to time 2, but also had very high total JCP scores.[20] When I think of that group, I wonder, paraphrasing T. S. Eliot, if they had the

[20] "Stable," in this situation means that the time 1 total TLP score accounted for at least 90% of the variance in time 2 total TLP score. Additionally, "very high total JCP score" means greater than the mean plus one SD.

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experience but never found the meaning. In other words, what hindered their turning the very high level of job challenge into leadership growth?

Using Figure 7 for hints, could there have been more support from the work environment? For example, could the design of the work environment (Lawler, 1990, 2000, 2001) or the organization's learning climate (Westbrook & Veale, 2001) have impacted growth or lack of growth? Or, would mentoring have helped this group learn from experience (Kotter, 1990a; Vicere, 1997)? Another possibility suggested by Figure 7 is that those subjects might have benefited from improved learning skills. For example, would improvements in their double-loop learning ability have helped them translate experience into growth (Argyris, 1982, 1991, 1993)? Or, maybe they needed a "disorienting dilemma" to that would lead to reflection and growth (Mezirow, 1981, 1998). At this point in time, we do not know. But, given the results of this research, additional investigation is warranted.

So, in sum, though this research supports several important pieces of the theory (e.g., three of the five job demands and overall level of job challenge), additional research is needed to investigate those areas outside the scope of this research.

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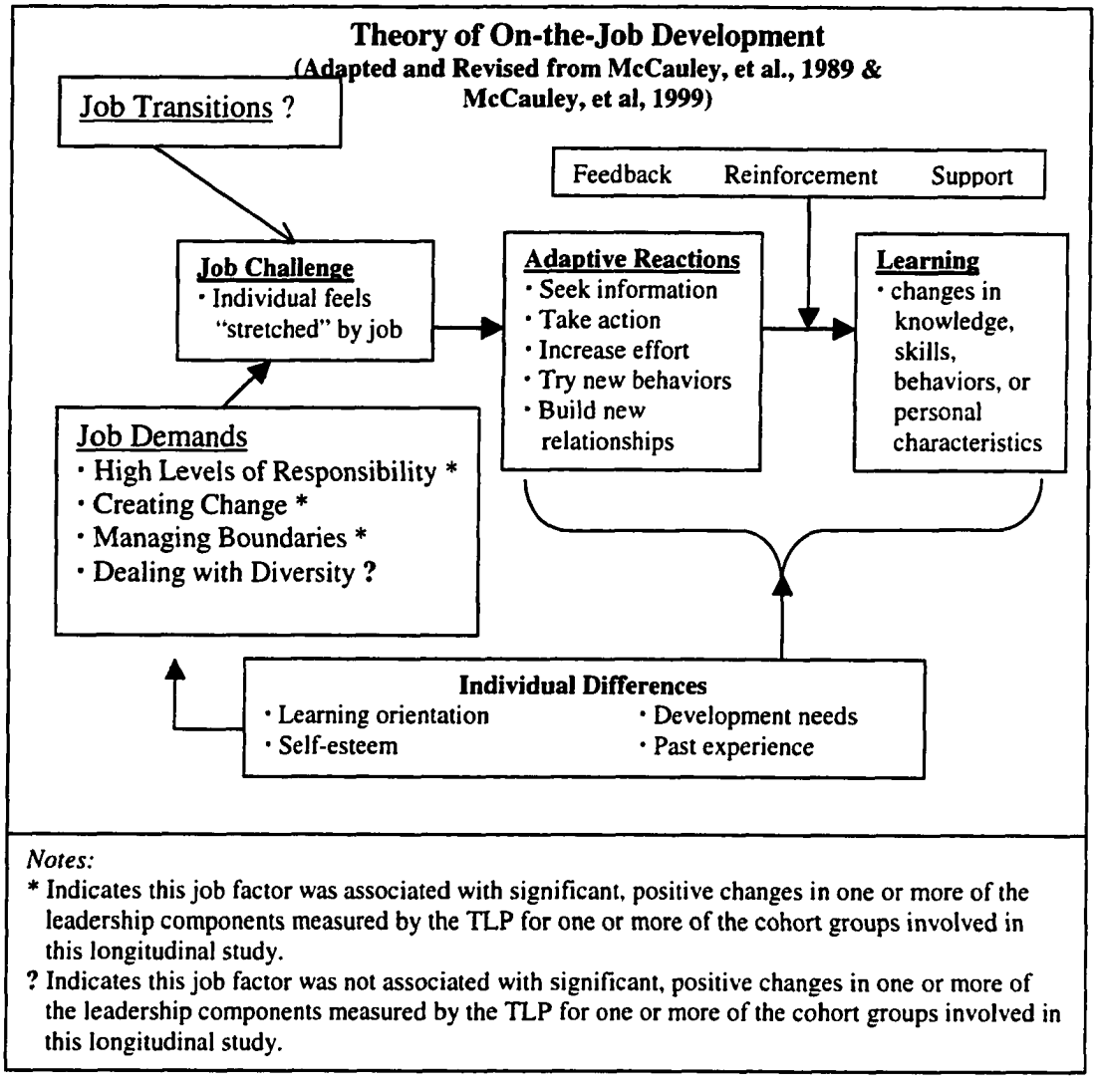

Figure 7: Theory of On-the-Job Development (Adapted and Revised)

Implications for Research into On-the-Job Development Components

In addition to research investigating the relationships of other aspects of on-the-job development theory to self-reported changes in VLT components, additional research into on-the-job development components is warranted because there might be important differences in sources of job challenge between the civilian executives researched to build the JCP and the military officer population in this study (i.e., lack of significance of either "Experiencing a Job

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Transition" or "Managing Diversity"). Thus, the second question arising out of this study's findings is "What are the development job challenges that have led to changes in leadership behaviors and characteristics?" As mentioned earlier, there seems to be a clear distinction between job challenges at staff and unit (i.e., wing or lower) level. So, are the developmental components identified in the JCP the same as the job developmental components that exist at unit level? To some degree the answer is yes, because this study fond that "High Responsibility" and "Creating Change" were significant, positive predictor of self-reported leadership growth. But, are there other job challenges at unit level that contribute to leadership growth? Further research is needed.

A third question that arises from this study's findings is "Are the findings repeatable?" This question could be answered by repeating this study by surveying, in the summer of 2003, ACSC graduates from the Classes of 1995, 1996, 1997, 1998, 1999, and 2000. Not only would such a study extend the longitudinal record of changes in TLP scores by this population and enable a better understanding of post-ACSC leadership development, but it would also allow a reexamination of this study's original hypotheses, predicted JCP-TLP relationships, and findings.

If such a follow-on study is initiated in the summer of 2003, it could also be the launching point for a study addressing the first two questions posed in this section: "What other factors influenced the changes in TLP scores?" and "What are the sources of on-the-job challenge that have led to changes in one's leadership behaviors or approaches to leadership?" To address those questions, a study replicating McCall et al.'s (McCall et al., 1988) original seminal, qualitative investigation into job developmental challenges could be replicated as a follow-on to the survey gathering phase. Specifically, out of the respondent sample, two sub-samples could be derived; one composed of those who had the largest, positive TLP score

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changes during the 2000-2003 time-period and the other sub-group composed of those who had the largest decrease in TLP scores during the 2000-2003 period. Thus, not only could the researchers gain insight into factors potentially related to positive changes in TLP scores, but also gain insight into factors potentially related to decreases in TLP scores. Such research could benefit both on-the-job development theory and Visionary Leadership Theory.

Implications for Practice

In regard to theory building, one of the most important consequences of this study's findings is that further research is warranted into job components as a vehicle for leadership development. This is also true for practice. In other words, since we have identified developmental challenges that account for a significant, if modest, change in TLP scores, the question becomes "How can we maximize that opportunity for more people?"

In answering that question, there are four sets of implications for practice from this study's findings: one set for individuals wanting to improve their leadership skills, another for curriculum development for the professional education of mid-career military officers, a third for personnel policies, and a fourth that pertains broadly to the strategic leadership of the institution that shapes climate and culture. From the individual's perspective, the linkages revealed through this study can be identified and exploited for personal growth by using the Job Challenge Profile early during a job assignment. Using the JCP will help individuals identify job challenges and help them identify ways in which they can better use their current assignment to help achieve personal growth.

From an educational institution perspective, an assessment of current curriculum should be made to ensure that students are prepared to handle the job challenges that have been linked

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with positive changes in leadership scores (e.g., "Managing at High Levels of Responsibility," "Managing Boundaries," and "Creating Change"). In preparing students to grow through those challenges, curriculum development should consider both the potential transient nature of job challenges as well as their context. For example, if students are prepared for managing boundaries, then they can apply the necessary skills more quickly and effectively in the environment that requires them instead taking a year to realize that knowing how to manage boundaries is a job challenge. Likewise, though students might not be faced with the "Creating Change" job challenge until four years after graduation, preparing them for that challenge might help them better translate it into personal growth.

These suggestions are not meant to imply that current curricula at any mid-career PME institution are deficient. In fact, as stated at the outset of the study, curriculum considerations were outside the scope of this study. But, given the potential benefits of helping students prepare for using the identified challenges to achieve personal growth, curriculum review seems a prudent implication from this study. If the curriculum already is designed to maximize student on-the-job learning in future jobs, then the review adds to the curriculum's credibility. However, if that institution's current curriculum does not help prepare students to grow from these challenges, then this study's results provide a strong rationale for modifying the curriculum.

The third practical implication from this study lies in the area of personnel management policies. Given that "Managing at High Levels of Responsibility" was a significant, positive predictor of self-perceived growth in three of the five cohorts, policies governing job assignment following graduation from Air Command and Staff College (ACSC) should be shaped to maximize the number of ACSC graduates going to jobs with high-level responsibilities.

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A fourth practical implication from the study, provided for consideration by senior organizational leaders, is that the organizational climate might not be supportive of translating experience into leadership growth. This possibility comes from considering the question "What is the operational mechanism that would translate job challenges into leadership development?" and, from understanding the underlying differences between the TLP and JCP. The TLP asked respondents to rate frequency of behavior in interpersonal and cognitive areas while the JCP provided an evidentiary assessment of the degree to which certain types of job challenges were present. The on-the-job development theory postulates that the higher the level of job-challenge, the more a person would seek to learn new behaviors; some cognitive, some interpersonal. But, trying out new behaviors requires organization support, such as mentoring or a climate supportive of learning (Brutus, Ruderman, Ohlott, & McCauley, 2000; Westbrook & Veale, 2001). The possibility exists that the modest relationship between job challenge and leadership development would have been stronger in an organizational environment in which senior leaders understand the potential for growth in leadership skills that can accrue from job challenge and have put mechanisms in place to assure that growth occurs. Whether or not that type of environment existed was beyond the scope of this research, but it is an important factor for senior leaders to consider.

Conclusion

This study explored the question of whether or not on-the-job developmental opportunities were related to self-reported changes in leadership behavior and characteristics. Sashkin's Visionary Leadership Theory (VLT), McCauley et al.'s theory of on-the-job

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development, and a time-series design were used in conjunction with respondents from five classes of graduates from the United States Air Force's Air Command and Staff College to test the hypotheses that total amount of job challenge would be significantly and positively related to increases in leadership behavior and characteristics and that various job challenges would be significantly and positively related to increases in scores of specific VLT components.

Findings from this longitudinal study support the proposition that increased exposure to job challenges (as measured by the Job Challenge Profile) is associated with increases in aspects of Visionary Leadership Theory (as measured by The Leadership Profile), because several significant, positive relationships between Job Challenge Profile scores and changes in The Leadership Profile scores were found.

While the longitudinal design used in this study allows us to conclude that job challenge is not a consequence of improved leadership, we cannot definitely say that job challenge is what caused leadership development. Results revealed that in addition to the total amount of job challenge experienced being significantly and positively related to TLP score change, job challenges arising from "Managing at High Levels of Responsibility," "Managing Boundaries," and "Creating Change" are also associated with positive changes in one or more of the VLT components (e.g., Transactional Leadership Behaviors, Transformational Leadership Behaviors, and Transformational Leadership Characteristics).

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Overview

The purpose of this appendix is to help readers understand how data was collected via the Internet while informed consent procedures were followed and participant privacy was protected.

Site Organization

A password protected website was established on a public Internet server so that the "Informed Consent" page and "Frequently Asked Questions" page could be accessed by anyone from anywhere in the world at any time via the World Wide Web. In contrast to the easy accessibility of the "Informed Consent" and "Frequently Asked Questions" pages, data collection pages could only be accessed after a valid password had been entered. Specifically, each participant was required to enter his/her unique Access ID Code[21] on the "Informed Consent" page and then click on the "Submit" button before being granted access to the survey forms.

Figure A1 diagrams the site showing each of the web pages and the hierarchical relationships.

Data Collection Process

After successfully entering a valid Access ID Code, the participant would see the "Survey Options" page that listed the four survey forms available. The participant could select which form he/she wanted to work on and then complete that form. The questions and range of answers used in the online forms were identical to the questions provided on the paper copies (See Appendix B). The difference was that for multiple choice questions in the online forms

[21] To protect participant confidentiality, a unique code was assigned to each possible participant. And, to minimize the possibility of a valid code being inadvertently entered, only 1,522 codes out of a possible 167,310,000 combinations were assigned (i.e., the probability of a valid code being entered in error was one out of 109,928).

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respondents selected their response from drop-down boxes. The default option for multiple-choice questions was "no response" so that participants would know which questions he/she had not yet answered and to preclude the possibility of respondents submitting answers they had not chosen.

After completing a form, the respondent would click on the form's "Submit" button and a data file would containing the respondent's unique Access ID Code and selected responses would be sent to the server. After submitting a form, the participant was taken back to the "Survey Options" page.

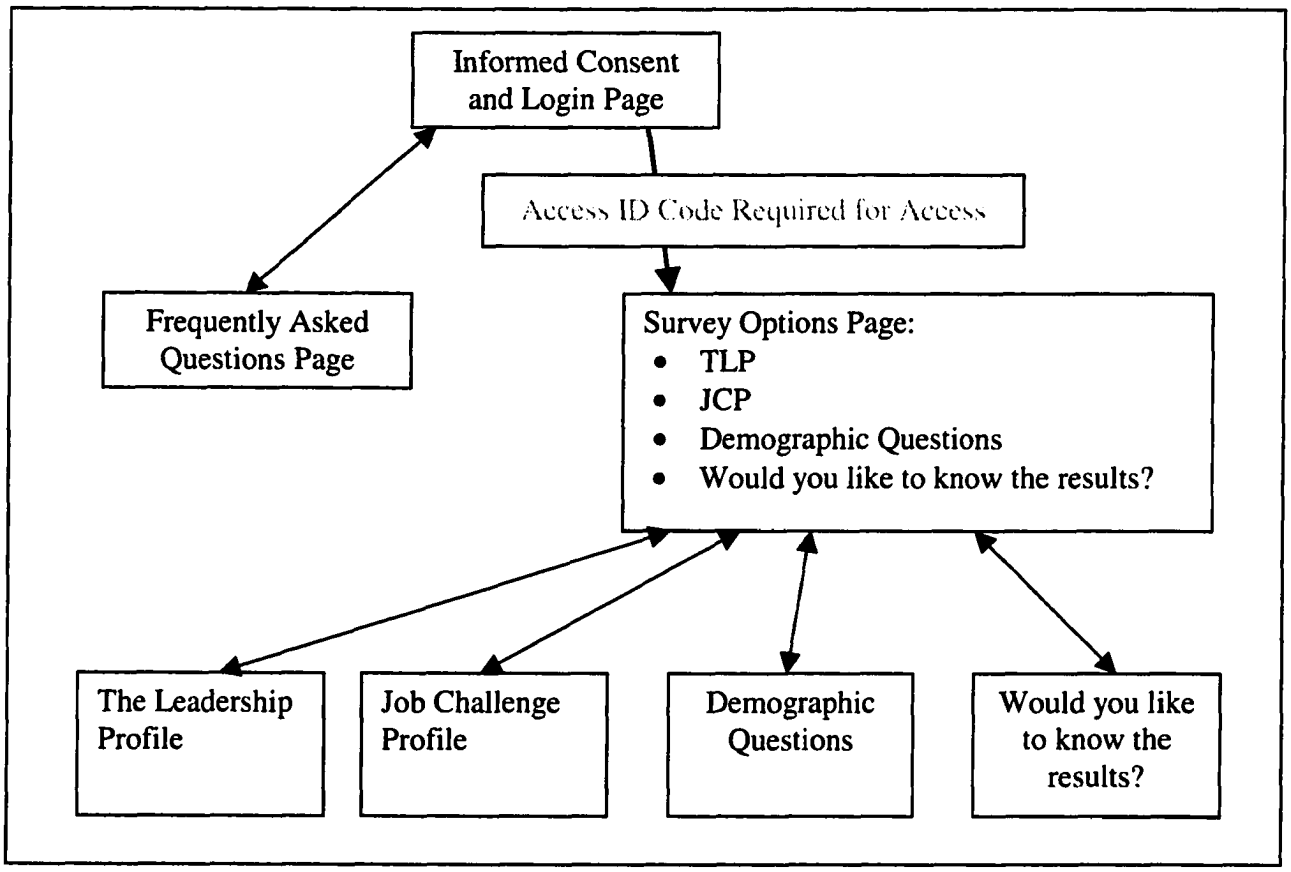

Figure A1: Site Map

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Participants had the option of completing all forms during one session or returning to the site multiple times to complete the forms. In each case, once a participant had completed a form, that form was no longer available (i.e., the form's name would be listed with an annotation of "completed" and the hyperlink to the form itself was inactivated)

Forms

A copy of the first page people would see when entering the site (i.e., the "Informed Consent" page) is provided in this appendix. A copy of the content on the "Frequently Asked Questions" page and each of the survey forms is available in Appendix B.

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The George Washington University
WASHINGTON, D.C.

INFORMED CONSENT FORM

I have been asked to participate in a study examining the changes that have occurred in the leadership behaviors and characteristics of graduates from Air Command and Staff College (ACSC). The purpose of the study is to investigate changes to approaches in leadership and seek to identify work related factors that might foster or hinder leadership development.

I understand that the potential benefit to me for participating in this research is that I could receive insight into ways that on-the-job development opportunities are related to leadership development. Furthermore, research findings will contribute to a theory of leadership development that may influence future leadership education and development programs.

I understand that the data obtained from my participation will be stored with a coded number to preserve confidentiality. I will not be identified by name in any report of the results.

I understand that any information about me obtained as a result of my participation in this research will be kept confidential as legally possible. I understand that my research records, just like my hospital records, may be subpoenaed by court order or may be inspected by federal regulatory authorities.

I understand that I may refuse to participate or discontinue my participation at any time without penalty.

If I had any questions about this research, I contacted the researcher prior to agreeing to participate, and my questions were answered to my satisfaction.

I understand that entering my access code on this electronic form verifies my consent to voluntarily participate in this study.

I VOLUNTEER TO PARTICIPATE IN THE ABOVE STUDY.

Enter Access Code Here ☐ **SUBMIT**

QUESTIONS?

Study Overview
(a.k.a., "Frequently Asked Questions)

Or, Contact thompsonl@ndu.edu
Colonel Lynne C. Thompson
Professor, Behavioral Science
Department of Leadership & Information Systems
Industrial College of the Armed Forces
408 4th Ave, Ft. McNair
Washington, DC 20319-5062
DSN 325-4325 or commercial (202) 685-4325

ANY COMPLAINTS OR COMMENTS ABOUT YOUR PARTICIPATION IN THIS RESEARCH PRODUCT SHOULD BE DIRECTED TO DR. MARSHALL SASHKIN, PROFESSOR, HUMAN RESOURCES DEVELOPMENT, THE GEORGE WASHINGTON UNIVERSITY, 2134 G STREET, WASHINGTON, DC, 20052. TELEPHONE 202-994-8649.

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Overview

The purpose of this appendix is to provide readers with a copy of the information and survey forms that were mailed to ACSC graduates who were potential participants in this study.

Organization of Mailers

Each package mailed to participants contained the following: a personal letter requesting participation, a copy of The Leadership Profile, a copy of the Job Challenge Profile, demographic questionnaire, informed consent information, and an information sheet about the research project.[22] To aid recipients' understanding of the request package, each item was color coded: the request letter was on gray paper, The Leadership Profile was a pre-printed with red ink, the Job Challenge Profile was on off-white paper, the demographic request form was on white paper, and the "Informed Consent" and "Information about this research project" were printed on blue paper.

Data Collection Process

Respondents were given two avenues for participating in this research. One option was for them to complete the paper-based survey forms enclosed in the packet and returning them via the prepaid mailer that was also enclosed in the packet. The request letter also included the data collection site's URL and the respondent's unique Access ID Code. Thus, the second option for participation was via completing web-based survey forms online.

[22] The content in this information sheet is the same as was posted online on the "Frequently Asked Questions" page.

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Lynne Clark Thompson, Colonel, USAF
Professor, Behavioral Science
Industrial College of the Armed Forces
National Defense University
408 4th Ave, Fort McNair
Washington, DC 20319-5062

November 1, 2000

___ _ ___, Maj, USAF
7632 South Fictious Dr.
Northfield, VA 23456

Dear Maj ____:

Please consider taking about 30 minutes to help with a research project that has been underway since 1995. Your responses, along with those of other ACSC graduates of the classes 1995 through 1999, will help us understand the ways each class approaches leadership and more importantly the ways in which their approaches to leadership change over time.

Keeping track of changes in approaches to leadership is important because leadership development, like growth, occurs over time. And, therefore, to better understand leadership growth patterns we need to have a longitudinal picture, not just a one-time snapshot. That is why your help is vital.

My current research has three goals. First, to document the ways graduates from your ACSC class have changed since graduation in terms of leadership behaviors and characteristics. Second, to identify opportunities inherent in day-to-day work settings that are associated with leadership development. And, most importantly, to use those findings to help people gain the most out of opportunities for improving their leadership abilities. My study, though approved by ACSC is independent and the results will reflect my opinions based upon analysis of the data.

If you are willing to participate, you may either complete and return the enclosed survey forms or complete the survey forms via in a password protected Internet site (see "Instructions" below). I will not associate any names with results nor will I publish names of any participants. If you have any questions, you can contact me at (202) 685-4325 or via email (thompsonl@ndu.edu).

With your help, we can better understand the factors impacting leadership development and then help others maximize their opportunities for growth.

Sincerely,

--- signed ---

INSTRUCTIONS: Go to this URL **http://pace.psy.cua.edu/leader/**
At the bottom of that page, enter this Access ID Code **17703E**
After entering the code, click on the "Submit" button

OR: Complete and return the enclosed survey forms using the prepaid mailer *Thank you!*

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The Leadership Profile and the Job Challenge Profile are not included.

Please contact the respective copyright holder to obtain a copy.

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Demographic Information: Please answer these questions.

Last name and first initial: _____

1. Service Affiliation: _____ USAF _____ USA _____ USN
_____ USMC _____ Other _____ (please specify)

for office use _____

2. Current Rank _____ 0-4 _____ 0-5 _____ 0-6
_____ GS-13 _____ GS-14 _____ GS/GM-15
_____ Other _____ (please specify)

3. Are you currently selected for promotion to the next higher grade? ____ Yes ____ No

4. Have you ever been selected below-the-zone for promotion? ____ Yes ____ No

5. Source of Commission: _____ USAFA _____ USNA
_____ USMA _____ OTS/OCS
_____ ROTC _____ Other _____ (please specify)
_____ Not Applicable (e.g., civilian)

for office use _____

6. Gender: _____ Male _____ Female

7. Marital Status: _____ Married, never divorced _____ Divorced, but remarried
_____ Single _____ Divorced and currently single

8. If you are currently married, is your spouse military?
_____ Yes (Active Duty, Reserves, National Guard)
_____ No

9. Ethnic Affiliation:
_____ African-American _____ Asian-American _____ Caucasian
_____ Hispanic _____ Other _____ (please specify)

10. What is the highest level of education that you have completed?
_____ Bachelors degree _____ Masters degree _____ Doctorate degree

for office use _____
for office use _____
for office use _____

11. Current Age _____

12. What was the job you had in May 2000? _____

Continued on reverse side

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13. For the job you held in May 2000, what was its organizational level?

___ Joint or Combined
___ Field Operating Agency (FOA)
___ Major Command Headquarters
___ Squadron
___ Air Staff
___ Direct Reporting Agency (DRA)
___ Wing
___ Other: _____

14. How long were you in that job/assignment?

___ 0 months – one year
___ over one year to two years
___ over two years to three years
___ more than three years

15. Have you changed jobs through either a PCA or PCS since May 2000?
(note: PCA = permanent change of assignment; PCS = permanent change of station)

____ No ____ Yes

16. If you have gone PCA or PCS since May 2000, what is your current job?

_____

17. Since graduation from Air Command and Staff College, what has been your most challenging assignment?

_____

18, For the job you listed for question 17, when was that?

Beginning (approximate month/year)_____
Ending (approximate month/year) _____

19. What is your career group?

___ **Operations** (including pilot; navigator; space, missile, and command and control; intelligence; weather; and operations support)
___ **Logistics** (including logistics commander, logistician, aircraft maintenance & munitions, logistics plans, space & missile maintenance, supply, and transportation)
___ **Support** (including support commander, security forces, civil engineer, communications-information systems, services, public affairs, mission support, and manpower)
___ **Medical** (including medical commander, health services, biomedical, physician, surgery, nurse, dental, and aerospace medicine)
___ **Professional** (including law and chaplain)
___ **Acquisition and Financial Management** (including program director, scientific/research, developmental engineering, acquisition, contracting, and finance)
___ **Special Investigations**
___ **Other** (Please specify: _____)

Please place (1) The Leadership Profile, (2) the Job Challenge Profile, and (3) this demographic information sheet into the prepaid return mailer.

Thank you for completing these surveys.

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INFORMED CONSENT INFORMATION

Title of Investigation: An investigation of the relationships between exposure to on-the-job challenges and changes in leadership behavior and characteristics

Investigator Lynne Clark Thompson, Col, USAF

Phone number to call, if questions arise: 202-685-4325 at the Industrial College of the Armed Forces

Purpose of the Study: The purpose of this study is to examine the relationship between exposure to opportunities inherent in jobs and changes in leadership behaviors and characteristics.

Description of Procedures: Each participant will be asked to complete two survey forms and provide some demographic information using a #2 pencil and then asked to return the forms via pre-paid mailer. Each participant is free to withdraw his/her consent and terminate participation at any time without penalty. All survey responses will be stored with an ID number instead of with full names in order preserve each person's confidentiality.

Risks and Discomforts: Previous experience with participants in similar tasks indicates that participants will be able to complete tasks in less than 40 minutes and, therefore, should not experience risk or discomfort. However, since there is minimal risk of fatigue and each person is free to take breaks and rest as needed to limit the risk of discomfort.

Benefits: One potential benefit to contributing to this research is that each participant can receive insight into changes in his/her approach to leadership since last completing The Leadership Profile. Additionally, study results will provide insight into the nature of changes in leadership behaviors as related to on-the-job experiences. From a broader perspective, participation will help contribute to a theory of leadership development that may influence future leadership education and development programs.

Confidentiality and Debriefing:

- Any information about participants obtained as a result of in this research will be kept confidential as legally possible. Data obtained from participants will be stored with a coded number to preserve confidentiality. Additionally, participants will not be identified by name in any report of the results. However, research records, just like hospital records, may be subpoenaed by court order or may be inspected by federal regulatory authorities.
- Upon completion of the study, each participant may obtain the results of the study by contacting the researcher or by visiting the researcher's website: **http://gwu.edu/~lthomp**

Questions? If you have any questions, please contact the researcher before participating. The researcher can be reached via email at thompsonl@ndu.edu via phone (commercial: 202-685-4325 or DSN 325-4325) or via snail-mail at: Col Lynne Thompson, Industrial College of the Armed Forces, 408 4th Ave, Ft. McNair, Washington, DC 20319-5062.

I UNDERSTAND THAT COMPLETING AND RETURNING THE DEMOGRAPHIC SURVEY, THE LEADERSHIP PROFILE, AND THE JOB CHALLENGE PROFILE VERIFIES MY CONSENT TO VOLUNTARILY PARTICIPATE IN THIS STUDY.

(Reverse side provides background information about this study.)

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Information Sheet about this research project

Question: What is this project and when was it started?

Answer: Prior to 1995, there was no longitudinal, quantitative data documenting changes in approaches to leadership by mid-career military officers and civilian equivalents. Lt Col (Dr.) Brad Lafferty began the data collection effort. Subsequently, each year we have surveyed ACSC graduates to track changes in their approaches to leadership. This year I have added a second instrument to assess on-the-job development opportunities that ACSC graduates have encountered.

Question: What is this the purpose of this research?

Answer: We are doing this research because leadership abilities take time to develop and we recognize that to better understand that development one needs to observe changes over time. As you may be aware, the vast majority of research looks at the "impact" of one event, whether that be training, education, or some work experience. While a single event can give a "snap-shot," it seldom helps us understand long-term leadership development. So, for the first time, with your help, we will be able to follow the developmental path of military officers and career civil servants associated with the military. Also, this research will enable us to ascertain whether there are certain types of job related developmental opportunities that are related to changes in leadership.

Question: Why is this study important?

Answer: This research is important because it can help identify ways to facilitate others in their quest to develop leadership capabilities. For example, one of the research goals is to identify factors within the work environment that facilitate or hinder leadership development. There are many reports indicating that the work environment is the crucible for leadership development. But, few studies have looked at changes over time or sought to discover the elements of the work environment that make a difference in leadership development. This study begins to fill that void in our understanding.

Question: Who has approved this research?

Answer: This study has been approved by Air Command and Staff College and The George Washington University Graduate School of Education and Human Development. Additionally, The Leadership Profile is used with permission of the authors and the Job Challenge Profile is used with mutual permission from the Center for Creative Leadership and Jossey-Bass/Pfeiffer Publishers.

Question: Will anybody be able to find out my responses to these surveys?

Answer: Your name will not be mentioned in any report and your responses will be kept as confidential as legally possible. In other words, I will release names linked to responses only in response to a court order.

Question: Can I find out results from these surveys?

Answer: Yes. If you want to know what has changed since the last time you took The Leadership Profile, please provide me with your email address and I will email you that information when available. (**Note**: Your email address will not be stored with survey responses. My email address is: thompsonl@ndu.edu) ... Findings should start to become available early next year and to find the status of the project and summary of this study's results, please visit http://gwu.edu/~lthomp

Question: If I give you my email or mailing address, what will you do with it?

Answer: I will protect it and will not release it to anybody. I will use the information only to contact you about this research project.

Question: Who is currently conducting this project?

Answer: I am Colonel Lynne Clark Thompson, USAF. I am a military faculty member in the Department of Leadership and Information Systems at the Industrial College of the Armed Forces. Also, I am a doctoral candidate in The George Washington University's Graduate School of Education and Human Development.

(Reverse side provides "informed consent" information and describes measures to protect participant confidentiality.)

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APPENDIX C – ANALYSIS OF POSSIBLE RESPONSE BIAS

Table C1

TLP scale score comparison for those who replied by mail vs. those who replied online

Group Statistics

TLP Component	By Web or Mail	N	Mean	Std. Deviation	Std. Error Mean
T00TAB = Transactional Leadership Behaviors	By Web	324	40.503	4.300	.239
	By Mail	219	40.868	4.362	.295
T00TFB = Transformational Leadership Behaviors	By Web	324	83.966	6.785	.377
	By Mail	219	84.059	7.450	.503
T00TFC = Transformational Leadership Characteristics	By Web	324	75.886	7.102	.395
	By Mail	219	76.324	7.755	.524
T00TOT = Total Visionary Leadership Theory Score	By Web	324	200.355	16.292	.905
	By Mail	219	201.251	17.945	1.2126

Independent Samples Test: Those who replied by mail vs. those who replied online

TLP Component		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
T00TAB	Equal variances assumed	.037	.847	-.963	541	.336	-.365	.378	-1.108	.379
	Equal variances not assumed			-.961	463.473	.337	-.365	.379	-1.110	.381
T00TFB	Equal variances assumed	1.863	.173	-.151	541	.880	-.093	.618	-1.307	1.120
	Equal variances not assumed			-.148	438.015	.882	-.093	.629	-1.329	1.143
T00TFC	Equal variances assumed	1.370	.242	-.680	541	.497	-.438	.645	-1.705	.828
	Equal variances not assumed			-.668	439.798	.504	-.438	.656	-1.728	.851
T00TOT	Equal variances assumed	1.829	.177	-.603	541	.546	-.896	1.485	-3.814	2.021
	Equal variances not assumed			-.592	437.037	.554	-.896	1.513	-3.870	2.078

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Table C2

JCP scale score comparison for those who replied by mail vs. those who replied online

Group Statistics

JCP Scale	by Web or Mail	N	Mean	Std. Deviation	Std. Error Mean
Experiencing a Job Transition	by Web	324	10.216	3.532	.196
	by Mail	219	11.621	3.887	.263
Creating Change	by Web	324	33.954	11.042	.613
	by Mail	219	35.863	11.823	.799
High Responsibility	by Web	324	31.309	6.942	.386
	by Mail	219	33.393	7.200	.487
Managing Boundaries	by Web	324	31.923	7.745	.430
	by Mail	219	34.206	7.886	.533
Diversity	by Web	324	24.438	8.012	.445
	by Mail	219	27.964	9.2810	.627
Total JCP	by Web	324	131.840	26.563	1.476
	by Mail	219	143.046	30.248	2.044

Note: Independent samples t-test results shown on next page.

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Table C-2 (continued)

Independent Samples Test: Web Responses vs. Paper Responses

JCP Component		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Experiencing a Job Transition	Equal variances assumed	4.654	.031	-4.37	541	.000	-1.405	.322	-2.037	-.773
	Equal variances not assumed			-4.29	437.288	.000	-1.405	.328	-2.049	-.761
Creating Change	Equal variances assumed	.442	.506	-1.92	541	.055	-1.91	1.001	-3.862	.043
	Equal variances not assumed			-1.90	446.2	.059	-1.91	1.01	-3.889	.070
High Responsibility	Equal variances assumed	.056	.813	-3.38	541	.001	-2.084	.61646	-3.29500	-.873
	Equal variances not assumed			-3.36	456.4	.001	-2.084	.621	-3.304	-.864
Managing Boundaries	Equal variances assumed	.221	.638	-3.35	541	.001	-2.283	.682	-3.623	-.942
	Equal variances not assumed			-3.33	462.3	.001	-2.283	.685	-3.629	-.937
Diversity	Equal variances assumed	6.533	.011	-4.72	541	.000	-3.525	.748	-4.994	-2.057
	Equal variances not assumed			-4.58	420.9	.000	-3.525	.769	-5.037	-2.014
Total JCP Score	Equal variances assumed	3.003	.084	-4.56	541	.000	-11.206	2.459	-16.036	-6.376
	Equal variances not assumed			-4.45	426.3	.000	-11.206	2.521	-16.161	-6.251

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Table C3

One-Way ANOVA of Personal and Job related Demographic Variables

Demographic Factor		Sum of Squares	df	Mean Square	F	Sig.
Headquarters or Wing level	Between Groups	3.112	1	3.112	.842	.359
	Within Groups	2000.284	541	3.697		
	Total	2003.396	542			
Career Field	Between Groups	3.471	1	3.471	.923	.337
	Within Groups	2023.705	538	3.762		
	Total	2027.176	539			
Rank	Between Groups	.816	1	.816	1.365	.243
	Within Groups	315.082	527	.598		
	Total	315.898	528			
Marital Status	Between Groups	.734	1	.734	.907	.341
	Within Groups	430.646	532	.809		
	Total	431.380	533			
Ethnic	Between Groups	.028	1	.028	.086	.769
	Within Groups	172.662	531	.325		
	Total	172.690	532			
Supervisor during JCP evaluation period?	Between Groups	.767	1	.767	1.450	.229
	Within Groups	286.250	541	.529		
	Total	287.017	542			
Promoted early?	Between Groups	.036	1	.036	.179	.672
	Within Groups	106.557	527	.202		
	Total	106.594	528			
Gender	Between Groups	.024	1	.024	.173	.678
	Within Groups	72.776	531	.137		
	Total	72.799	532			

Note: Groups compared are the group that submitted survey responses online and the group that submitted paper surveys via the mail.

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Table C4

One-way ANOVA using the Job related Demographic Variable of Organizational Level

Variable		Sum of Squares	Df	Mean Square	F	Sig.
Transformational Leadership Characteristics	Between Groups	335.000	2	167.500	3.109	.045*
	Within Groups	29092.872	540	53.876		
	Total	29427.871	542			
Managing Boundaries	Between Groups	1373.631	2	686.815	11.505	.000**
	Within Groups	32236.064	540	59.696		
	Total	33609.694	542			
Experiencing a Job Transition	Between Groups	446.802	2	223.401	16.911	.000**
	Within Groups	7133.555	540	13.210		
	Total	7580.357	542			

Note: Groups compared are Higher Headquarters, Wing, and other.
Note: Only significant relationships are reported in Table C-4.

Table C5

One-way ANOVA using the Demographic Variable of Ethnicity

JCP Component		Sum of Squares	df	Mean Square	F	Sig.
Creating Change	Between Groups	1663.380	4	415.845	3.276	.011*
	Within Groups	67014.503	528	126.921		
	Total	68677.884	532			
Managing Boundaries	Between Groups	909.726	4	227.431	3.713	.005**
	Within Groups	32340.394	528	61.251		
	Total	33250.120	532			
Total JCP Score	Between Groups	11172.786	4	2793.196	3.452	.008**
	Within Groups	427177.289	528	809.048		
	Total	438350.075	532			

Note: Groups compared are African-American, Asian-American, Caucasian, Hispanic, and other.
Note: Only significant relationships are reported in Table C-5.

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Table C6

One-way ANOVA using the Demographic Variable of Marital Status

TLP Component		Sum of Squares	df	Mean Square	F	Sig.
Transactional Leadership Behaviors	Between Groups	151.087	3	50.362	2.711	.044
	Within Groups	9845.498	530	18.576		
	Total	9996.584	533			
Transformational Leadership Behaviors	Between Groups	398.762	3	132.921	2.703	.045
	Within Groups	26059.697	530	49.169		
	Total	26458.459	533			
Transformational Leadership Characteristics	Between Groups	723.686	3	241.229	4.546	.004
	Within Groups	28125.708	530	53.067		
	Total	28849.393	533			
Total Visionary Leadership Theory Score	Between Groups	3458.383	3	1152.794	4.089	.007
	Within Groups	149419.941	530	281.924		
	Total	152878.324	533			

Note: Groups compared are "married never divorced," "divorced and remarried," "single," "divorced and single."
Note: Only significant relationships are reported in Table C-6.

Table C7

One-way ANOVA using the Demographic Variable of Gender

Note: No table is included because no significant differences were found between male and female scores on any TLP or JCP component.

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Table C8

One-way ANOVA using the Demographic Variable of Early Promotion

Variable		Sum of Squares	df	Mean Square	F	Sig.
Transformational Leadership Characteristics	Between Groups	230.086	1	230.086	4.274	.039
	Within Groups	28368.213	527	53.830		
	Total	28598.299	528			
Creating Change	Between Groups	605.432	1	605.432	4.673	.031
	Within Groups	68285.169	527	129.573		
	Total	68890.601	528			
High Responsibility	Between Groups	830.742	1	830.742	16.857	.000
	Within Groups	25972.184	527	49.283		
	Total	26802.926	528			
Managing Boundaries	Between Groups	376.492	1	376.492	6.109	.014
	Within Groups	32481.027	527	61.634		
	Total	32857.520	528			
Total JCP Score	Between Groups	5305.556	1	5305.556	6.489	.011
	Within Groups	430891.541	527	817.631		
	Total	436197.096	528			

Note: Groups compared are the group of respondents who have been promoted early and the group of respondents that were promoted on time.
Note: Only significant relationships are reported in Table C-8.

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Table C9

One-way ANOVA using the job related Demographic Variables of Supervisor

ANOVA: Supervisor, Commander, Not a Supervisor or Commander

Variable		Sum of Squares	df	Mean Square	F	Sig.
Transformational Leadership Behaviors	Between Groups	369.017	2	184.508	3.746	.024
	Within Groups	26600.976	540	49.261		
	Total	26969.993	542			
Creating Change	Between Groups	8431.430	2	4215.715	36.776	.000
	Within Groups	61901.133	540	114.632		
	Total	70332.564	542			
High Responsibility	Between Groups	1574.902	2	787.451	16.445	.000
	Within Groups	25858.015	540	47.885		
	Total	27432.917	542			
Diversity	Between Groups	502.416	2	251.208	3.338	.036
	Within Groups	40632.947	540	75.246		
	Total	41135.363	542			
Total JCP Score	Between Groups	24352.065	2	12176.033	15.677	.000
	Within Groups	419418.907	540	776.702		
	Total	443770.972	542			

Note: Groups compared are the group of respondents who have been a Supervisor (but not Commander), the group who have been a Commander, and the group of respondents who were neither a supervisor nor Commander.

Note: Only significant relationships are reported in Table C-9.

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Table C10

Web vs. Mail, TLP t-tests using demographically balanced sub-groups
(*Note*: The entire table is provided, even though no significant relationships were found.)

Group Statistics Using Demographically Balanced Sub-groups

TLP Component	subgroup of web or mail	N	Mean	Std. Deviation	Std. Error Mean
Transactional Leadership Behaviors	web	85	40.8118	4.022	.436
	paper	85	40.0941	4.700	.510
Transformational Leadership Behaviors	web	85	84.2235	6.331	.687
	paper	85	82.8000	8.004	.868
Transformational Leadership Characteristics	web	85	76.6235	6.622	.718
	paper	85	75.8235	8.320	.902
Total Visionary Leadership Theory Score	web	85	201.6588	14.850	1.611
	paper	85	198.7176	19.496	2.115

Note: Table C-10 continued on next page.

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Table C10 (continued)

Independent Samples Test Using Demographically Balanced Sub-groups

TLP Component		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Transactional Leadership Behaviors	Equal variances assumed	2.443	.120	1.070	168	.286	.718	.671	-.607	2.042
	Equal variances not assumed			1.070	164.089	.286	.718	.671	-.607	2.042
Transformational Leadership Behaviors	Equal variances assumed	3.315	.070	1.286	168	.200	1.424	1.107	-.762	3.609
	Equal variances not assumed			1.286	159.538	.200	1.424	1.107	-.763	3.610
Transformational Leadership Characteristics	Equal variances assumed	2.870	.092	.694	168	.489	.800	1.153	-1.477	3.077
	Equal variances not assumed			.694	159.953	.489	.8000	1.153	-1.478	3.078
Total Visionary Leadership Theory Score	Equal variances assumed	4.728	.031	1.106	168	.270	2.941	2.658	-2.307	8.189
	Equal variances not assumed			1.106	156.927	.270	2.941	2.658	-2.309	8.192

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Table C11

Web vs. Mail, JCP t-tests using demographically balanced sub-groups

Group Statistics Using Demographically Balanced Sub-groups					
JCP Component	**Subgroup of web or mail**	**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**
Experiencing a Job Transition	Web	85	10.671	3.822	.415
	Paper	85	11.765	4.005	.434
Creating Change	Web	85	35.306	11.023	1.196
	Paper	85	35.706	11.168	1.211
High Responsibility	Web	85	32.200	6.998	.759
	Paper	85	32.741	7.120	.772
Managing Boundaries	Web	85	33.024	8.090	.878
	Paper	85	34.282	8.279	.898
Diversity	Web	85	25.577	8.101	.879
	Paper	85	27.577	9.559	1.037
Total JCP Score	Web	85	136.777	26.478	2.872
	Paper	85	142.071	30.425	3.300

Note: Table C-11 continued on next page.

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Table C11 (continued)

Independent Samples Test Using Demographically Balanced Sub-groups

JCP Component		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Experiencing a Job Transition	Equal variances assumed	.626	.430	-1.822	168	.070	-1.094	.600	-2.279	.091
	Equal variances not assumed			-1.822	167.633	.070	-1.094	.600	-2.279	.091
Creating Change	Equal variances assumed	.146	.702	-.235	168	.814	-.400	1.702	-3.760	2.960
	Equal variances not assumed			-.235	167.971	.814	-.400	1.702	-3.760	2.960
High Responsibility	Equal variances assumed	.135	.714	-.500	168	.618	-.541	1.083	-2.679	1.597
	Equal variances not assumed			-.500	167.950	.618	-.541	1.083	-2.679	1.597
Managing Boundaries	Equal variances assumed	.013	.910	-1.003	168	.317	-1.259	1.256	-3.737	1.220
	Equal variances not assumed			-1.003	167.911	.317	-1.259	1.256	-3.737	1.220
Diversity	Equal variances assumed	2.138	.146	-1.472	168	.143	-2.000	1.359	-4.683	.683
	Equal variances not assumed			-1.472	163.603	.143	-2.000	1.359	-4.684	.684
Total JCP Score	Equal variances assumed	1.172	.280	-1.210	168	.228	-5.294	4.375	-13.931	3.343
	Equal variances not assumed			-1.210	164.858	.228	-5.294	4.375	-13.932	3.344

Note: The entire table is provided, even though no significant relationships were found.

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APPENDIX D – ANALYSIS OF POSSIBLE BIAS FROM DEMOGRAPHIC DIFFERENCES

This appendix describes the process and provides the results of testing for possible impacts on change in TLP scores due to demographic differences.

To test for the effects of job and personal demographic variables, multiple regression analyses were calculated wherein the Visionary Leadership scores in 2000 (time 2) were regressed on the on the Job Challenge Profile Scores and demographic variables with Visionary Leadership scores in time 1 held constant.

In addition to the TLP scores, regression models used for the regression analysis included demographic variables grouped into separate clusters of personal, career, and job related factors. Similar demographic factors (i.e., job related, personal, etc.) were grouped together after discovering that individually and as a group they were not significant predictors. Therefore, several iterations of the regression analysis were run to find the most parsimonious model grouping. Results are detailed in Table D1.

Findings are that none of the demographics variables of the demographics variables had a significant influence on changes in total TLP scores. As the results show, Model 1 is the best model and the only significant predictors are the variables of previous TLP total score and total JCP score. These two variables have a combined R^2 of 0.316 with a significance level of .000. Career Field was not included as a significant predictor even though it is significant in Models #3 and #5, because it was not a significant predictor when first introduced (i.e., in Model #2)

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Table D1

Summary of Hierarchical Regression Analysis for Variables Predicting Total TLP Score in 2000, N = 543

Variable	B	Std. Error B	β
Step 1			
Transformational Leadership Characteristics score from previous TLP	0.510	0.036	0.527**
Total Job Challenge Profile score	0.088	0.022	0.149**
Step 2			
Transformational Leadership Characteristics score from previous TLP and Total Job Challenge Profile score	0.510	0.036	0.528**
Total Job Challenge Profile score	0.082	0.022	0.139**
Career Field	0.566	0.337	0.062
Step 3			
Transformational Leadership Characteristics score from previous TLP and Total Job Challenge Profile score	0.511	0.036	0.529**
Total Job Challenge Profile score	0.079	0.023	0.134**
Career Field	0.688	0.347	0.076*
Service affiliation	-0.074	0.459	-0.006
Current educational level	-3.734	2.800	-0.051
Supervisory experience since last TLP	0.692	0.876	0.030
Step 4			
Transformational Leadership Characteristics score from previous TLP and Total Job Challenge Profile score	0.511	0.036	0.529**
Total Job Challenge Profile score	0.078	0.023	0.132**
Career Field	0.687	0.351	0.076
Service affiliation	-0.102	0.462	-0.008
Current educational level	-3.697	2.804	-0.051
Supervisory experience since last TLP	0.717	0.878	0.031
Gender	-1.820	1.871	-0.039
Marital status	1.022	0.763	0.054
Ethnic background	-0.093	1.192	-0.003

Note: Table D1 continued on next page.

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Table D1 (continued)

Summary of Hierarchical Regression Analysis for Variables Predicting Total TLP Score in 2000, N = 543

Variable	B	Std. Error B	β
Step 5			
Transformational Leadership Characteristics score from previous TLP and Total Job Challenge Profile score	0.508	0.036	0.526**
Total Job Challenge Profile score	0.077	0.023	0.130**
Career Field	0.736	0.355	0.081*
Service affiliation	0.173	0.496	0.014
Current educational level	-3.564	2.829	-0.049
Supervisory experience since last TLP	0.762	0.886	0.033
Gender	-1.633	1.890	-0.035
Marital status	1.041	0.771	0.055
Ethnic background	-0.270	1.203	-0.009
Job level	-0.216	0.348	-0.024
Current rank	-1.460	0.991	-0.060
Early promotion	-0.371	1.423	-0.010
More than one job since last TLP	0.411	1.359	0.012

Notes: $R^2 = .316$ for Step 1;
$\Delta R^2 = .004$ for Step 2 ($p = .094$);
$\Delta R^2 = .003$ for Step 3 ($p = .461$);
$\Delta R^2 = .003$ for Step 4 ($p = .568$)
$\Delta R^2 = .003$ for Step 5 ($p = .651$);
* $p < .05$ ** $p < .01$

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APPENDIX E – POST HOC REGRESSION ANALYSES FOR H2A THROUGH H2J

Overview

This appendix presents the summary for each post hoc hierarchical regression analysis for each cohort for hypotheses H2A through H2J in which one ore more JCP components were found to be significant predictors. Hierarchical regression analyses that did not yield any JCP components as a significant predictor are not shown.

Class of 1995, Cohort 1

No JCP factors were found to a significant predictor of changes in scores on any VLT components.

Class of 1996, Cohort 2

For Cohort 2 (e.g., the Class of 1996) "Creating Change" was a significant, positive predictor of change in scores of Transformational Leadership Behavior and Transformational Leadership Characteristics. (See Tables E1 and E2.)

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Table E1

Summary of Hierarchical Regression Analysis for Variables Predicting Transformational Leadership Behavior Score In 2000, ACSC Class of 1996, N = 81

Variable	B	Std. Error B	β
Step 1			
Transformational Leadership Behavior score from previous TLP	0.385	0.076	0.495**
Step 2			
Transformational Leadership Behavior score from previous TLP	0.353	0.075	0.454**
Creating Change	0.137	0.055	0.239*
Note: $R^2 = .245$ for Step 1; $\Delta R^2 = .056$ for Step 2 ($p = .015$*); * $p < .05$ ** $p < .01$			

Table E2

Summary of Hierarchical Regression Analysis for Variables Predicting Transformational Leadership Characteristics Score In 2000, ACSC Class of 1996, N = 81

Variable	B	Std. Error B	β
Step 1			
Transformational Leadership Characteristics score from previous TLP	.518	.079	.594**
Step 2			
Transformational Leadership Characteristics score from previous TLP	.482	.078	.554**
Creating Change	.134	.053	.226*
Note: $R^2 = .353$ for Step 1; $\Delta R^2 = .049$ for Step 2 ($p = .013$*); * $p < .05$ ** $p < .01$			

Class of 1997, Cohort 3

For Cohort 3, "Managing at High Levels of Responsibility" was a significant, positive predictor of change in Transformational Leadership Characteristics scores. (See Table E3.)

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Table E3

Summary of Hierarchical Regression Analysis for Variables Predicting Transformational Leadership Characteristics Score In 2000, ACSC Class of 1997, N = 124

Variable	B	Std. Error B	β
Step 1			
Transformational Leadership Characteristics score from previous TLP	.422	.087	.402**
Step 2			
Transformational Leadership Characteristics score from previous TLP	.401	.086	.382**
Managing at High Levels of Responsibility	.198	.094	.173*
Note: $R^2 = .162$ for Step 1; $\Delta R^2 = .030$ for Step 2 ($p = .037$*); * $p < .05$ ** $p < .01$			

Class of 1998, Cohort 4

For Cohort 3, "Managing Boundaries" was a significant, positive predictor of change in scores of Transactional Leadership Behavior and Transformational Leadership Characteristics. Additionally, "Managing at High Levels of Responsibility" was a significant, positive predictor of change in Transformational Leadership Behavior scores. (See Tables E4 through E6.)

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Table E4

Summary of Hierarchical Regression Analysis for Variables Predicting

Transactional Leadership Behavior Scores In 2000, ACSC Class of 1998, N = 158

Variable	B	Std. Error B	β
Step 1			
Transactional Leadership Behavior score from previous TLP	.402	.070	.417**
Step 2			
Transactional Leadership Behavior score from previous TLP	.374	.069	.388**
Managing Boundaries	.105	.037	.202**
Note: $R^2 = .174$ for Step 1; $\Delta R^2 = .040$ for Step 2 ($p = .006$**); * $p < .05$ ** $p < .01$			

Table E5

Summary of Hierarchical Regression Analysis for Variables Predicting

Transformational Leadership Behavior Scores In 2000, ACSC Class of 1998, N = 158

Variable	B	Std. Error B	β
Step 1			
Transformational Leadership Behavior score from previous TLP	.408	.071	.419**
Step 2			
Transformational Leadership Behavior score from previous TLP	.385	.068	.396**
Managing at High Levels of Responsibility	255	.069	.261**
Note: $R^2 = .176$ for Step 1; $\Delta R^2 = .068$ for Step 2 ($p = .000$**); * $p < .05$ ** $p < .01$			

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Table E6

Summary of Hierarchical Regression Analysis for Variables Predicting Transformational Leadership Characteristics Scores In 2000, ACSC Class of 1998, N = 158

Variable	B	Std. Error B	β
Step 1			
Transformational Leadership Characteristics score from previous TLP	.574	.074	.528**
Step 2			
Transformational Leadership Characteristics score from previous TLP	.520	.073	.478**
Managing Boundaries	.217	.062	.235**
Note: $R^2 = .279$ for Step 1; $\Delta R^2 = .053$ for Step 2 ($p = .001$**); * $p < .05$ ** $p < .01$			

Class of 1999, Cohort 5

For Cohort 5, "Managing at High Levels of Responsibility" was a significant, positive predictor of change in Transactional Leadership Behavior scores (see Table E7) and in Transformational Leadership Characteristics scores (see Table E8.)

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Table E7

Summary of Hierarchical Regression Analysis for Variables Predicting

Transactional Leadership Characteristics Score In 2000, ACSC Class of 1999, N = 113

Variable	B	Std. Error B	β
Step 1			
Transformational Leadership Characteristics score from previous TLP	0.556	0.095	0.484**
Step 2			
Transformational Leadership Characteristics score from previous TLP	0.537	0.094	0.468**
Managing at High Levels of Responsibility	0.121	0.053	0.189*
Note: $R^2 = .234$ for Step 1 ($p = .000$**); $\Delta R^2 = .035$ for Step 2 ($p = .023$*); * $p < .05$ ** $p < .01$			

Table E8

Summary of Hierarchical Regression Analysis for Variables Predicting

Transformational Leadership Characteristics Score In 2000, ACSC Class of 1999, N = 113

Variable	B	Std. Error B	β
Step 1			
Transformational Leadership Characteristics score from previous TLP	0.611	0.077	0.601**
Step 2			
Transformational Leadership Characteristics score from previous TLP	0.584	0.077	0.574**
Managing at High Levels of Responsibility	0.174	0.076	0.172*
Note: $R^2 = .361$ for Step 1; $\Delta R^2 = .029$ for Step 2 ($p = .025$*); * $p < .05$ ** $p < .01$			

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APPENDIX F – POST HOC ANALYSIS OF POSSIBLE RELATIONSHIP BETWEEN "EXPERIENCING A JOB TRANSITION" AND CHANGES IN TRANSFORMATIONAL LEADERSHIP BEHAVIOR SCORES

Background

Given the finding of a significant negative relationship between "Experiencing a Job Transition" and changes in Transformational Leadership Behavior scores for the dissertation sample[23] as a whole, additional analyses were conducted.

Findings

Results suggest that the significant, negative relationship found between "Experiencing a Job Transition" and changes in Transformational Leadership Behavior scores was a statistical artifact and that the proper interpretation is that there is no relationship between "Experiencing a Job Transition" and changes in Transformational Leadership Behavior scores. The following section details the logic trail from which that conclusion was derived.

Analysis and Results

The first step was to examine other segments of the dissertation sample. Since this relationship was not found in any of the cohorts, I examined the sub-groups. Each of the three sub-groups provided an assessment of job challenge and leadership score changes over a different length of time. Specifically, Sub-group 1 was composed of participants who submitted a TLP in 1997 and 2000 and whose JCP covered the same three-year period. Sub-group 2 was composed of participants who submitted a TLP in 1998 and 2000 and whose JCP covered the

[23] n = 543. Standardized Beta = -0.087*, r square change = .007, p = .022

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same two-year period. And, Sub-group 3 was composed of participants who submitted a TLP in 1999 and 2000 and whose JCP covered the same one-year period.

Regression analyses were conducted for each sub-group to determine whether or not "Experiencing a Job Transition" was a significant predictor of TLP change. Findings were that JCP component was a significant, negative predictor of changes in Transformational Leadership Behavior scores (n = 160, Standardized Beta = -0.179, r square change = .030, p = .005**) for Sub-group 1. But, "Experiencing a Job Transition" was not a significant predictor of Transformational Leadership Behavior score change for either of the other sub-groups.[24]

Since the relationship was only found in one of the three sub-groups, I next ran a one-way ANOVA on the relevant TLP and JCP scales. The one-way ANOVA (Table F1) revealed that a significant difference between the sub-groups existed for "Experiencing a Job Transition" scale scores, but that there wasn't any significant difference between the sub-groups for "Transformational Leadership Behavior" scale scores. The "Experiencing a Job Transition" scale means showed an increase from year-to-year that could be considered normal progression: Sub-group 1, the most senior group, had the highest scale mean of 11.319; Sub-group 2, the intermediate group, had an intermediate scale mean of 10.760; and Sub-group 3, the junior group, had the lowest scale mean of 10.062.

The progressive increase in level of job challenge seems reasonable, because one would expect that the more senior officers would have more challenging jobs than the more junior. Since Sub-group 3 was composed of officers and civilian equivalents who had graduated from ACSC a year earlier, one would expect that their level of job challenge from new jobs would be

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[24] Sub-group 2: "Experiencing a Job Transition was not a significant predictor of changes in Transformational Leadership Behavior scores (n = 265, Standardized Beta = -0.075, r square change = .005, p = .183).
Sub-group 3: "Experiencing a Job Transition was not a significant predictor of changes in Transformational Leadership Behavior scores (n = 265, Standardized Beta = 0.000, r square change = .000, p = .999).

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less than that of Sub-group 2 which was composed mostly of officers and civilian equivalents who had graduated from ACSC two years earlier. Likewise, one would expect that Sub-group 2's level of job challenge from new jobs would be less than that of Sub-group 3 which was composed of officers and civilian equivalents who had graduated from ACSC three to five years earlier (i.e., in 1995, 1996, or 1997). The results in Table F1 confirm that.

This conclusion is reinforced by the demographic data in Table F2 that shows the most junior sub-group (e.g., Sub-group 3) with the lowest percentage of subjects having more than one job (28.3%) and the most senior sub-group (e.g., Sub-group 1) with the highest percentage of subjects having more than one job (85.3%). Sub-group 2's percentage of subjects having more than one job is in the middle (56.9%). Thus, the more senior respondents are not only changing jobs, but are probably moving into more challenging jobs than the less senior respondents.

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Table F1

One-way ANOVA (Groups: Sub-group 1, Sub-group 2, Sub-group 3)

Variable		Sum of Squares	df	Mean Square	F	Sig.
Transformational Leadership Behavior score, 2000 (T00TFB)	Between Groups	108.382	2	54.191	1.089	.337
	Within Groups	26861.611	540	49.744		
	Total	26969.993	542			
Experiencing a Job Transition score (J_EJT)	Between Groups	105.721	2	52.860	3.819	.023*
	Within Groups	7474.637	540	13.842		
	Total	7580.357	542			

* Significant at the .05 level

Sub-group 1, n = 163; JCP covered a three-year period (e.g., 1997-2000).

Sub-group 2, n = 267; JCP covered a two-year period (e.g., 1998-2000).

Sub-group 3, n = 113; JCP covered a one-year period (e.g., 1999-2000).

Variable		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
T00TFB	1997	163	83.405	7.602	.595	82.229	84.581	58	100
	1998	267	84.427	6.788	.415	83.609	85.245	64	100
	1999	113	83.867	6.842	.644	82.592	85.143	65	98
	Total	543	84.004	7.054	.303	83.409	84.598	58	100
J_EJT	1997	163	11.319	4.026	.315	10.696	11.942	5.0	22
	1998	267	10.760	3.675	.225	10.317	11.203	5.0	24
	1999	113	10.062	3.350	.315	9.438	10.686	5.0	18
	Total	543	10.783	3.740	.160	10.467	11.098	5.0	24

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Table F2

Job Frequency Demographics by Sub-group

Sub-group	Frequency	Percentage
Sub-group 1		
One job during JCP period	21	12.9%
More than one job during the JCP period	139	85.3%
Total	160	98.2%
Missing	3	1.8%
Total for Sub-group 1	163	100.0%
Sub-group 2		
One job during JCP period	113	42.3%
More than one job during the JCP period	152	56.9%
Total	265	99.3%
Missing	2	0.7%
Total for Sub-group 2	267	100.0%
Sub-group 3		
One job during JCP period	80	70.8%
More than one job during the JCP period	32	28.3%
Total	112	99.1%
Missing	1	0.9%
Total for Sub-group 3	113	100.0%

Sub-group 1, n = 163, JCP covered a three-year period (e.g., 1997-2000).
Sub-group 2, n = 267, JCP covered a two-year period (e.g., 1998-2000).
Sub-group 3, n = 113, JCP covered a one-year period (e.g., 1999-2000).

The findings, so far, were that Sub-group 1 was the only sub-group in which a significant relationship was found between "Experiencing a Job Transition" and changes in "Transformational Leadership Behavior" scores, and that there was a significant increase in "Experiencing a Job Transition" mean scale scores from the most junior to the most senior sub-groups. So, the next step was to examine Sub-group 1 to see if there had been an increase in "Transformational Leadership Behavior" scores similar to the increase between sub-groups in "Experiencing a Job Transition" scores. A paired t-test between the "Transformational Leadership Behavior" scores for Sub-group 1 in 1997 and 200 revealed no significant change.

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(See Table F3.) So, these results indicated that the scores for this TLP factor had been relatively stable.

Table F3

Paired t-test of Transformational Leadership Behavior Scores, Sub-group 1

Scale	*N*	Mean	Mean Diff.	SD Dif	*df*	*T*	*P<*
Transformational Behavior	163	1997: 83.196 2000: 83.405	0.209	7.029	162	0.379	0.705
* Significant at the .05 level ** Significant at the .01 level							

An independent samples t-test (Table F4) showed that there was no significant difference between Sub-group 1 and Sub-group 3's "Transformational Leadership Behavior" scores. However, Sub-group 1's "Experiencing a Job Transition" scores were significantly higher than Sub-group 3's.

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Table F4

Independent Samples t-test of Sub-group 1 vs. Sub-group 3

Scale Name	*Sub-group*	*N* =	Mean Scale Score	Std Dev					
Transformational Leadership Behavior score, from 2000 TLP	Sub-group 1	163	83.405	7.602					
	Sub-group 3	113	83.867	6.842					
				F	Sig.	*t*	*df*	Mean Diff.	*p*<
	Equal Variances Assumed			1.438	.232	-0.517	274	-0.462	0.605
	Equal Variances Not Assumed					-0.527	256.065	-0.462	0.598
Experiencing a Job Transition score from 2000 JCP	Sub-group 1	163	11.319	4.026					
	Sub-group 3	113	10.062	3.350					
				F	Sig.	*t*	*df*	Mean Diff.	*p*<
	Equal Variances Assumed			4.397	0.037*	2.728	274	1.257	0.007**
	Equal Variances Not Assumed					2.820	264.94	1.257	0.005**

* Significant at the .05 level ** Significant at the .01 level

Discussion

The results indicate that "Transformational Leadership Behavior" scores for Sub-group 1 have remained constant over time. However, at the same time, Sub-group 1 became progressively less homogeneous, as some of its members experienced job reassignments, at least some of which in all likelihood, were more challenging. This had the effect of creating sub-sub-groups which differed in JCP mean scores, but not in TLP mean scores. When a regression is run across sub-sub-groups, the net effect of different sub-sub-group JCP mean scores in conjunction with stable TLP scores is a negative correlation. (This is a commonly occurring psychometric problem for which the conventional remedy is standardization of test scores prior to mixing scores from different groups.) The negative relationship was not found for Sub-group 3 because it was much more homogeneous than Sub-group 1. A negative relationship was found

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in Sub-group 2 as well, but it was insignificant because that sub-group was intermediate in homogeneity between the other two.

Therefore, the significant negative relationship found between "Experiencing a Job Transition" and changes in "Transformational Leadership Behavior" scores was a statistical artifact and does not indicate that "Transformational Leadership Behavior" scores have decreased with an increase in the level of job challenge from job transitions.

Though this is a logical deduction based upon the analyses, an alternative possibility was that the effect was related to a specific demographic variable. In other words, potentially, the sub-sub-group that differed in JCP mean scores, but not in TLP mean scores, was a predefined subgroup within a demographic variable. To investigate this alternative, I conducted one-way ANOVAs or t-tests (as appropriate) of the mean scores for "Experiencing a Job Transition" and "Transformational Leadership Behavior" scales for each personal and job demographic variables. Personal variables analyzed were: Service, commissioning source, rank, gender, marital status, age, and educational level achieved. Job variables investigated included: Supervisory experience, organizational level of current job, career field, and number of jobs (i.e., one job or more than one job during the period assessed by the JCP).

For all personal demographic variables, there were no significant differences for either "Experiencing a Job Transition" or "Transformational Leadership Behavior" scores.[25] The only job variable for which a significant difference existed, was Organizational Level.[26] The "Experiencing a Job Transition" scores for the sub-group composed of those working at a higher headquarters level were significantly higher than those of the sub-group composed of

[25] Tables showing analyses for non-significant findings are not included.
[26] Tables showing analyses for non-significant findings are not included.

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respondents working at wing or lower level. However, there were no significant differences on the "Transformational Leadership Behavior" scores for these two sub-groups.

Table F5

Independent Samples t-test of two sub-groups from Sub-group 1 (i.e., those at higher headquarters organizational level vs. those at wing/squadron level)

Scale Name	*Sub-group*	*N* =	Mean Scale Score	Std Dev					
Transformational Leadership Behavior score, from 2000 TLP	Higher Headquarters	80	82.400	7.665					
	Wing and below	83	84.373	7.458					
				F	Sig.	*t*	*df*	Mean Diff.	*p*<
	Equal Variances Assumed			0.216	.643	-1.666	161	-1.973	0.098
	Equal Variances Not Assumed					-1.666	160.337	-1.973	0.098
Experiencing a Job Transition score from 2000 JCP	Higher Headquarters	80	12.513	4.246					
	Wing and below	83	10.169	3.453					
				F	Sig.	*t*	*df*	Mean Diff.	*p*<
	Equal Variances Assumed			4.069	.045	3.873	161	2.344	0.000**
	Equal Variances Not Assumed					3.859	152.22	2.344	0.000**

* Significant at the .05 level ** Significant at the .01 level

Subsequently, I conducted a regression analysis of the "Higher Headquarters" sub-group to ascertain whether there was a significant negative relationship between "Experiencing a Job Transition" and changes in "Transformational Leadership Behavior" scores. The results show relatively stable "Transformational Leadership Behavior" scores between time 1 and time 2 with time 1 accounting for 46.0% of the variance ($p = .000$**). However, there was not a significant

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relationship between "Experiencing a Job Transition" and changes in "Transformational Leadership Behavior" scores.

These findings further support the earlier conclusion that the significant negative relationship between "Experiencing a Job Transition" and changes in Transformational Leadership Behavior scores for the dissertation sample[27] as a whole was a statistical artifact because there are no pre-defined sub-groups within Sub-group 1 for which that significant relationship exists.

[27] n = 543, Standardized Beta = -0.087*, r square change = .007, p = .022

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Table F6

Summary of Hierarchical Regression Analysis for Variables Predicting Transformational Leadership Behavior Score for Higher Headquarters Subgroup of Sub-group 1, N = 80

Variable	B	Std. Error B	β
Step 1			
Transformational Leadership Behavior score from previous TLP submission	0.710	0.087	0.678**
Step 2			
Transformational Leadership Behavior score from previous TLP submission	0.682	0.087	0.652**
Managing at High Levels of Responsibility	0.167	0.094	0.148
Step 3			
Transformational Leadership Behavior score from previous TLP submission	0.668	0.086	0.639**
Managing at High Levels of Responsibility	0.230	0.098	0.205*
Experiencing a Job Transition	-0.293	0.155	-0.162
Step 4			
Transformational Leadership Behavior score from previous TLP submission	0.677	0.085	0.646**
Managing at High Levels of Responsibility	0.148	0.109	0.132
Experiencing a Job Transition	-0.362	0.159	-0.200*
Creating Change	0.104	0.062	0.162

Note: $R^2 = .460$ for Step 1 ($p = .000$**);
$\Delta R^2 = .021$ for Step 2 ($p = .079$);
$\Delta R^2 = .023$ for Step 3 ($p = .063$);
$\Delta R^2 = .018$ for Step 4 ($p = .099$)
* $p < .05$ ** $p < .01$

Conclusion

Weight of evidence supports the deduction that the statistical relationship initially found exists because, for some sub-sub-groups, transformational leadership behavior scores have remained constant even though job challenge from new jobs has increased. Thus, the logical conclusion is that the significant negative relationship found between "Experiencing a Job

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Transition" and changes in "Transformational Leadership Behavior" scores is a statistical artifact and should be disregarded.

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