

PREDICTING LEADER EFFECTIVENESS: PERSONALITY TRAITS AND
CHARACTER STRENGTHS

by

Dennis P. O'Neil

Department of Psychology and Neuroscience
Duke University

Date: _____

Approved:

Dr. Philip R. Costanzo, Supervisor

Dr. Timothy J. Strauman

Dr. Harris M. Cooper

Dr. Nancy E. Hill

Dissertation submitted in partial fulfillment of
the requirements for the degree of Doctor
of Philosophy in the Department of
Psychology in the Graduate School
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ABSTRACT

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Abstract

Personality traits have been used extensively over the past forty years in assessing leadership potential, with varying degrees of success. A major limitation of this research has been the measures of personality. Another important limitation has been the availability of quantifiable measures of leader effectiveness. A third limitation is the lack of longitudinal studies. Because of these limitations, researchers have had difficulty determining the strength of personality traits as predictors of leadership effectiveness over time. Recent studies have used the Five Factor Model of personality to predict leadership effectiveness (e.g., Hogan, Curphy, & Hogan, 1994; Judge, Bono, Ilies, & Gerhardt, 2002; McCormack & Mellor, 2002); and researchers in positive psychology (e.g., Seligman, Steen, Park, & Peterson, 2005; Seligman & Csikszentmihalyi, 2000) have suggested that character strength and virtues (i.e., courage, temperance, and transcendence) might also offer an approach useful in predicting leadership success. This research builds on these approaches and examined two trait-based instruments, the Big Five instrument (NEO-PI-R) and the Values in Action Inventory of Strength (VIA-IS) instrument as they relate to leader effectiveness. Using undergraduates at the United States Military Academy as participants, the research examines the relationship and efficacy of the NEO-PI-R and the VIA-IS in predicting leadership effectiveness over a two and a half year study. Regression analysis demonstrated that conscientiousness was

the most significant predictor of leadership effectiveness. However, latent growth curve analysis suggests that there are three distinct patterns of leadership effectiveness. Using mixture modeling, these trajectories are best explained by the personality factors and virtue variables of extraversion, agreeableness, conscientiousness and temperance. The findings of this study have broad implications for emergent leader selection, leader development programs, and executive coaching in organizations.

Contents

Abstract	iv
List of Tables.....	x
List of Figures	xi
1. Introduction	1
1.1 Statement of Research Problem, Background, Context	1
1.2 Importance/Significance of the Study	2
1.3 Research Questions.....	4
1.4 Definitions.....	6
1.4.1 Defining Leadership	6
1.4.2 Defining Personality	8
1.5 Overview	11
1.5.1 Leadership, Personality, and Virtues Overview	11
1.5.2 Methodology Overview	14
2. Literature Review and Hypothesis.....	16
2.1 Leadership.....	16
2.1.1 Traits and Attributes Theories.....	16
2.1.2 Behavioral Theories.....	19
2.1.3 Contingency and Situational Theories	20

2.1.4 Transactional Theories.....	24
2.1.5 New-genre Theories.....	28
2.2 Personality.....	33
2.2.1 The Personality Debate.....	33
2.2.2 Five Factor Model.....	37
2.2.3 Character Strengths and Virtues	39
2.3 Personality and Leadership.....	40
2.3.1 Personality Traits Correlated with Leadership Effectiveness.....	41
2.3.2 Meta-Analytic Reviews of Personality and Leadership.....	42
2.4 Research Hypothesis	43
3. Methodology.....	46
3.1 Introduction	46
3.2 Analytic Techniques	46
3.3 Review of Research Questions and Hypotheses	47
3.4 Setting: The United States Military Academy (USMA).....	48
3.5 Participants	48
3.6 Measures	49
3.6.1 NEO-PI-R.....	49
3.6.2 Values in Action Inventory of Strength (VIA-IS).....	50
3.6.3 Leadership Effectiveness Scores.....	51

3.7 Procedures.....	53
3.7.1 Data Collection	53
3.7.2 Statistical Analysis	55
3.8 Limitations	57
4. Results.....	58
4.1 Overview	58
4.2 Descriptive Statistics.....	58
4.3 Data	59
4.3.1 Correlations Among Study Variables	59
4.3.2 Exploratory Analysis of Demographic Variables	60
4.4 Test of Hypothesis	61
4.4.1 Hypothesis 1.....	61
4.4.2 Hypothesis 2.....	62
4.4.3 Hypothesis 3.....	63
4.4.4 Hypothesis 4.....	65
5. Discussion	75
5.1 The Study’s Major Findings.....	75
5.2 Limitations of the Study.....	81
5.3 Conclusion	82
References	85

Biography	97
Appendix A: The Big Five Facets.....	98
Appendix B: Classification of Character Strengths	99
Appendix C: NEO PI-R Survey Guidance.....	100
Appendix D: NEO PI-R Questions	103
Appendix E: The VIA-IS Survey Guidance	110
Appendix F: The VIA-IS Survey Questions	111
Appendix G: Military Performance Score	118
Appendix H: NEO-PI-R on Leadership Effectiveness	119
Appendix I: VIA-IS on Leadership Effectiveness	124
Appendix J: Combined NEO-PI-R and VIA-IS Regressions	126
Appendix K: NEO-PI-R Mixture Model Analysis.....	137
Appendix L: VIA-IS Mixture Model Analysis	141
Appendix M: Combined Mixture Model Analysis	145

List of Tables

Table 1: Demographics	59
Table 2: Correlations	60
Table 3: NEO-PI-R Means and Percentage by Class	68
Table 4: VIA-IS Means and Percentage by Class	70
Table 5: Combine Model Means and Percentage by Class.....	72

List of Figures

Figure 1: Predicted Leadership Trajectories.....	45
Figure 2: Leadership Effectiveness Trajectories Over 2 ½ Years.....	66
Figure 3: NEO-PI-R Variables Associated with Leadership Trajectories.....	69
Figure 4: VIA-IS Variables Associated with Leadership Trajectories.....	71
Figure 5: Combined Model Variables Associated with Leadership Trajectories.....	73

1. Introduction

1.1 Statement of Research Problem, Background, Context

Picture yourself running through an obstacle course as part of a four person team. The next event on the obstacle course is a wall that you and your team must successfully scale. As you approach the wall, each member might see the task from a different perspective. The first person approaches the wall full speed and yells, "let's get over the wall now!" The next person ponders the question, "what is the best way for our team to get over this wall together?" The third person just thinks to themselves, "Oh-well, another wall to climb." And finally the last person ponders the important question, "Why don't we just go around the wall?" These different approaches, or behavioral tendencies, to the obstacle course wall seem to mimic the approaches we take to the 'walls' in our lives. Now consider that one of these four members is the leader of the team that needs to scale the wall. Which of the four approaches will produce the best outcome for the team? This question begins the scientific study of the relationship between leadership effectiveness and the personality of the leader.

The study of leadership and personality is not only a search for understanding the thoughts and actions of leaders, but also a search for how to improve the performance and motivation of both individuals and groups. It is generally well accepted that leadership is a complex experience whereby both the person and the

situation influence actions. Given the importance of leadership to the success of groups, organizations and even entire civilizations, there are few more pressing questions than, “Can we make leaders more effective and if so, how?” Scholarly attempts to answer these questions are evident in the early discussions of the notion of leaders. However, only in the past century has leadership effectiveness become an area of significant study. Although much research concerning personality and leadership has been conducted, few studies have examined the relationship between a leader’s personality and their leader effectiveness longitudinally.

Between World War I and World War II, numerous psychological tests were developed to assist in selecting and training leaders for the armed forces. Psychologists supplied models on personality assessment, course of action development, and information processing. Governments, businesses, industries, and private organizations also turned to behavioral scientists to better understand how managers and leaders can improve workers’ performance and instill teamwork and commitment. Since psychologists began to study leadership, researchers have searched for predictors of successful leadership abilities one, five, or even ten years later.

1.2 Importance/Significance of the Study

Intuitively, our behavioral tendencies should have an impact on our ability to lead effectively. Previous studies have used trait based instruments to identify the behavioral tendencies that are relatively stable over time that correlate with successful

leadership. Over the past two decades, the Five Factor Model of personality has become the gold standard measure of personality (e.g., Hogan et al., 1994; Judge et al., 2002; McCormack et al., 2002). However, previous findings have been inconsistent in determining the strength of personality traits as predictors of leadership effectiveness over time (Atwater, 1992; Judge et al., 2002; Lord, Devader, & Alliger, 1986).

Part of the limitations on this research has been the inconsistency stemming from different measures of personality traits. Another important limitation has been the quality of quantifiable measures of leader effectiveness. A third limitation has been the lack of longitudinal studies correlating personality traits with leader effectiveness.

This study provides a unique contribution to the literature by assisting in clarifying the inconsistent findings in the relationships between personality and leadership effectiveness. Strengths of this study include the use of longitudinal data and multi-rater feedback to create leadership effectiveness ratings. Another contribution is the unique approach of using latent curve analysis to identify groups or clusters of individuals who display similar personality characteristics associated with leadership effectiveness trajectories.

The current research examined the relationship between two trait-based instruments, the Big Five instrument (NEO-PI-R) and the Values in Action (VIA) instrument, and leader effectiveness in a two and a half year longitudinal study. Recent studies in positive psychology (e.g., Seligman et al., 2005; Seligman et al., 2000) have

suggested that character strength and virtues might also offer a useful approach to predicting leadership success. Consequently, this study compared a hierarchical trait approach measured with the Neuroticism-Extraversion-Openness Personality Inventory-Revised (NEO-PI-R) and the Values in Action (VIA) inventory in an attempt to partially answer the question, “what are the characteristics of effective leaders?”

1.3 Research Questions

The study examined four specific research questions:

1. *What is the strength of personality traits (e.g. neuroticism, extraversion, openness, agreeableness, and conscientiousness) as predictors of leadership effectiveness over time?* In the first meta-analysis of the relationship between personality traits and leadership, Lord, DeVader, and Alliger (1986) reexamined the relationships between traits and leader perceptions and between traits and leader emergence. They found that, consistent with social perception theory, intelligence, masculinity, and dominance were significantly related followers’ perceptions of leadership effectiveness. They also argued that earlier reported inconsistencies in results might be attributed to methodological differences in the examined studies. Overall, the Lord et al. (1986) findings present a more optimistic view of the power of personality traits to predict effective leader behavior.

In the other meta-analysis of personality and leadership, Judge, Bono, Ilies, and Gerhardt (2002) provided both a qualitative and a quantitative review of the trait approach to leadership. This study meta-analyzed 73 empirical articles that used a five-

factor model (FFM) of personality. Overall, personality had a multiple correlation of .48 with leadership. Extraversion ($r=.31$) had the strongest correlation with leadership emergence and effectiveness. This review also concluded that there was strong support for both the trait perspective and the use of the FFM in the study of leadership effectiveness. Overall, the findings suggest that personality traits are important in understanding leadership effectiveness.

2. *What is the strength of virtues (e.g. wisdom or knowledge, courage, humanity, justice, temperance, and transcendence) as predictors of leadership effectiveness over time?* Positive psychology researchers have attempted to design a classification and measurement system for specific character strengths and broad virtues, including those that emerged consistently across cultures: courage, justice, humanity, temperance, transcendence, and wisdom. However, no one has yet empirically studied the relationship between virtues and leadership effectiveness.

3. *What is the combination of personality factors and virtues that best predict leadership effectiveness?* While some early psychologists sought an understanding of character and virtues, during most of the 20th-century, the study of character was separated from personality literature (McCullough & Snyder, 2000). The primary personality psychologist in the past century, Gordon Allport, argued that virtues were included in the study of philosophy, but not psychology (Allport & Vernon, 1930). Allport's position discouraged further exploration of character strengths and virtues under the

aegis of psychology until Peterson, Seligman (2004), and other researchers focused attention on this area.

4. Are there any latent class variables of personality traits and character strengths that provide a trajectory of leadership effectiveness? Previous research suggests that more basic underlying factors exist within both personality trait measures and character strength measures of behavioral tendencies. In addition, intuitively, we would expect individuals to exhibit different patterns of leadership effectiveness over time. For example, certain individuals might consistently perform at a high, average, or low level of leadership effectiveness. Other individuals may start off performing poorly, but improve in leadership effectiveness. Still others may start high in leadership effectiveness, but decline over time. These distinct developmental trajectories may be associated with certain clusters of personality and character traits. This research examined if any latent class clusters of factors predict distinct leadership effectiveness trajectories.

1.4 Definitions

1.4.1 Defining Leadership

As many definitions of leadership exist as do authors who have studied the concept. Concepts and definitions of leaders and leadership have been reviewed by Shartle (1956), Bass (1960), and Hunt, Sekaran, & Schriesheim (1982) among others.

Some of the more recent definitions of leadership focus on influence, collective understanding, effectiveness and facilitation:

- “Leadership appears to be a working relationship among members in a group, in which the leader acquires status through active participation and demonstration of his or her capacity to carry cooperative tasks to completion” (Bass & Stogdill, 1990, p. 77)
- “Leadership is a process of giving purpose [meaningful direction] to collective effort, and causing willing effort to be expended to achieve purpose” (Jacobs & Jaques, 1990).
- “A definition of leadership that would be widely accepted by the majority of theorists and researchers might say that ‘leadership is a process of social influence in which one person is able to enlist the aid and support of others in the accomplishment of a common task’” (Chemers, 1997, p. 1).
- “Leadership is influencing people—by providing purpose, direction and motivation—while operating to accomplish the mission and improving the organization” (FM 22-100, 1999, p. 1-2)
- “[L]eadership is an influence process with defined relationships between leaders and followers. Getting things done through others implies a process where people work together to achieve shared goals and aspirations” (Ridgway, 2000, p. 1).

- “Leadership is the process of influencing others to understand and agree about what needs to be done and how it can be done effectively, and the process of facilitating individual and collective efforts to accomplish the shared objectives” (Yukl, 2002, p. 7).

The common thread in these and the majority of leadership definitions is that leadership is an active process of one person exerting influence over others toward a common goal or objective. In general, an adequate definition of leadership needs to account for both the individual person and the situational context. In this vein, the definition provided by the US Army is fairly comprehensive and useful: “influencing people—by providing purpose, direction and motivation—while operating to accomplish the mission and improving the organization” (FM 22-100, 1999, p. 1-2).

The definition is useful because it acknowledges that different leaders (e.g. General MacArthur, General Eisenhower, and General Patton) can each have a unique approach to providing purpose, direction and motivation and still be extremely effective in similar situations.

1.4.2 Defining Personality

As many definitions of personality exist as there are for leadership. An overview of major personality development theories can shed light on how personality has been historically studied. Theorists such as Freud, Skinner, Rogers, and Eysenck have each had unique orientations in examining personality and personality development. For

example, Freud's psychodynamic view of personality examined the three interactive components of the id, ego, and superego. To Freud, personality was a way to resolve unconscious conflict. Skinner's behavioral view argued that an individual's personality was driven by a pursuit of reinforcement where operant behavioral response tendencies were tied to stimulus situations. Rogers' humanistic view examined the relationship between a person's self-concept and their actual experiences, where the congruence or incongruence between self and experiences provided motivation. Rogers defined personality as habitual manners of self actualizing. And Eysenck's biological view of personality examined the heritability of personality structures in terms of hierarchy of traits partially activated by environmental factors.

In addition to these theoretical approaches, numerous scholars have provided definitions of personality:

- "Personality of an individual will be defined as the combination of all of the relatively enduring dimensions of individual differences on which he can be measured" (Byrne, 1974, p. 26)
- "Personality is a stable set of characteristics and tendencies that determine those commonalities and differences in the psychological behavior (thoughts, feelings and actions) of people that have continuity in time and that may not be easily understood as the sole result of the social and biological pressures of the moment" (Maddi, 1996, p. 9).

- “Personality represents those characteristics of the person or of people generally that account for consistent patterns of behavior” (Pervin & John, 1997, p. 4).

These examples suggest that there are three components to consider in defining personality: 1) the notion of individual traits; the notion of relative consistency across time; and 3) the notion of relative consistency across situations. Therefore, a more complete definition of personality would be:

- “Personality is the pattern of characteristic thoughts, feelings, and behaviors that distinguishes one person from another and that persists over time and situations” (Phares, 1988, p. 4).

The current study reflects the assumption that personality is a set of characteristics that are relatively stable across time and situations, and which impact a person’s behavior in social and organizational situations. Thus, a discussion of “personality” and “leadership” is a discussion of the role that personality plays in determining leader behavior. Taxonomies of personality will be examined in the personality literature review.

1.5 Overview

1.5.1 Leadership, Personality, and Virtues Overview

Five historical approaches in the leadership literature are reviewed: 1) traits and attributes theories, 2) behavioral theories, 3) contingency and situation theories, 4) influence and relationship theories, and 5) new-genre theories.

Trait and attributes theories began with the study of the “Great Man” concept—what the leader is (Galton, 1869). Later, Stogdill (1948) examined 124 separate investigations that emphasized the personal qualities of those in leadership roles. The focus of the majority of these studies was to determine the characteristic differences between leaders and followers. Stogdill (1948) found slightly higher intelligence measures for leaders and second, he found positive relationships between adjustment, extroversion, dominance and leadership. However, Stogdill failed to find traits that were universally associated with leadership and that could be reliably used to predict who might be an emerging leader.

Behavioral theorists emphasized the observable nature of leadership (what the leader does) in order to differentiate not only the nature of leadership and leader activity, but also behavioral patterns of effective leaders (Chemers, 1997). These researchers attempted to capture and measure leadership behavior by describing the behavior of the leader. However, the behavioral approaches were limited in explaining why some leaders are more effective than others.

Contingency and situational theories examine both the task and follower characteristics to specify what behavior is required of effective leaders. There exist several contingency and situational theories, including Fiedler's (1967) contingency theory of leadership, Hersey and Blanchard (1969) Situational Leadership Model, House's (1971) path-goal theory of leadership, and Vroom-Yetton's (1973) normative decision-making model. Overall, the implications of the contingency models suggest that leadership is not based solely on a specific combination of traits or behaviors, but rather on an "if-then" relationship in which a leader can be successful under one condition and fail in another. Given this "if-then" orientation, leader effectiveness occurs when the leader's traits and behaviors can meet the demands and needs of the situation. Transactional leadership models are a subset of the situational approach and examine the exchanges between leaders and followers.

The transactional models emphasize a process-oriented exchange between leaders and followers. As Hollander and Offermann (1990a, p. 87) argued, transactional models center on the followers' perceptions of the leader's actions and on the leader's perceptions of the followers. The concern for process stems from the social exchange between leaders and followers as a function of effectiveness. Similarly, these models emphasize persuasive influence instead of compelled compliance.

However, these theories do not fully address how we can increase leadership effectiveness, or understand how personality might impact on a leader's ability to be

effective. More recent theories examined under the umbrella of “new-genre” have taken on this challenge, and the literature review section more thoroughly addresses the links between leadership and personality.

Turning to the personality literature, personality researchers have sought to classify personalities by looking at both trait facets and trait factors. Previous research on personality has suggested that taxonomies allow us to order and define traits and characteristics into subordinate categories or superordinate factors. However, until recently, researchers have not agreed on a generalized personality model (Graziano, 2003).

Using factor analysis, Fiske (1949) identified a five-factor model (FFM) to create a taxonomy for classifying individual behavior. Fiske labeled the initial five factors as extroversion, agreeableness, conscientiousness, emotional stability, and culture. His analysis was later duplicated by Norman (1963). Subsequent research has generally supported the use of the FFM in personality testing (Barrick & Mount, 1991; Salgado, 1998; McCrae & Costa, 1987). In the FFM, the hierarchical factors consist of numerous distinctive subordinate traits and behavioral tendencies (McCrae & Costa, 1989). McCrae and Costa (1985) designated five factors of personality and their model is used in the current analysis. These five-factors are oftentimes referred to as the “Big Five” and include agreeableness, conscientiousness, extraversion, neuroticism, and openness.

Overall, the FFM offers an approach to understanding the relationship between personality and leadership effectiveness.

According to Peterson and Seligman (2004), character strengths and virtues exist in a similar taxonomy with that outlined by personality psychologists. Specifically, they have proposed the existence of hierarchical virtues of strengths of restraint, intellectual strengths, interpersonal strengths, emotional strengths, and theological strengths. In addition, they suggest that the first three factors correspond to the Big Five Factors of conscientiousness, openness, and agreeableness. Also, emotional strengths might be inversely related to the FFM of neuroticism. Only theological strengths (i.e. gratitude and spirituality) do not appear to have a corresponding Big Five Factor (Peterson & Seligman, 2004). And from the FFM, extraversion did not have a corresponding virtue.

Overall, the findings of the Positive Psychology movement suggest that there are both similarities and differences between personality traits and character strengths and virtues. If so, character strengths and virtues should also relate to leadership effectiveness.

1.5.2 Methodology Overview

This research was conducted at the United States Military Academy (USMA) at West Point on the class of 2008. The class entered the Academy with 1236 cadets and currently has 1122 cadets remaining. The measures represent two different approaches to understanding personality. First, the NEO-PI-R was used to measure the Big Five

factors of personality. Second, the Values in Action (VIA) instrument was used to assess character strengths and virtues. Next, these facets and factors were correlated with leader effectiveness after one, two, and two and a half years.

2. Literature Review and Hypothesis

2.1 Leadership

2.1.1 Traits and Attributes Theories

Few areas of research have had a more controversial history than leadership traits and attributes. One question that leadership researchers have tried to answer is “who is exerting the influence?” During the 19th century and early 20th century, “great man” theories dominated leadership discussions to answer this question. The “great man” concept suggested that leaders possessed special traits or characteristics that allowed them to ascend above others. Specifically, the trait conception of leadership was based on the belief that leaders possessed certain characteristics or traits which enhanced their ability to be leaders (Hollander & Offermann, 1990b). It is often linked to the 19th century philosopher Thomas Carlyle, who wrote that “The history of the world is but the biography of great men.” In short, the attributes of effective leaders were seen as inborn and permanent, and they applied across various circumstances. Later, Galton (1869) expounded on this concept in his book *Hereditary Genius* where he argued that reputation flows from heredity. This idea implied that men in leadership roles were there by the power of special attributes. The earliest studies of the leadership led to the beliefs that attributes are the primary determinants of leadership.

The scientific study of leadership began in the 20th century. The Great Man theory led to hundreds of research studies that looked at personality traits, physical characteristics, intelligences, and values to differentiate leaders from followers. In the early 1900's psychologists developed intelligence testing to measure individual differences in analytic ability. Their work led other psychologists to begin measuring individual characteristics that could predict future achievement. Initial findings that intelligence correlated with leadership led researchers toward searching for additional non-intellective traits that might be predictors of behavioral tendencies (Chemers, 1997).

Stogdill (1948) was the first researcher to summarize the results of these studies. He examined 124 separate investigations that emphasized the personal qualities of those in leadership roles. The focus of the majority of these studies was to determine the characteristic differences between leaders and followers. He came to two major conclusions. First, Stogdill (1948) found slightly higher intelligence measures for leaders and second, he found positive relationships between adjustment, extroversion, dominance and leadership. However, Stogdill failed to find traits that were universally associated with leadership and that could be reliably used to predict who might be an emerging leader. Stogdill concluded that "a person does not become a leader by virtue of the possession of some combination of traits, but the pattern of personal characteristics of the leader must bear some relevant relationships to the characteristics,

activities, and goals of the followers” (1948, p. 63). Overall, having some “special” combination of traits does not guarantee leadership success.

Subsequent leadership trait reviews by Mann (1959) and Stogdill (1974), involving additional reviews of more detailed studies, came to the same conclusion, that although individuals with certain characteristics were more likely to be successful leaders, leaders were not altogether different from followers. As a result, follow-on researchers apparently concluded that personal traits and attributes alone could not be used to predict future leadership success; and, most subsequent research shifted to examining other predictors of leadership success.

It was not until publication of a meta-analysis by Lord, De Vader, and Alliger (1986) that traits, including intelligence and personality, regained favor with leadership researchers. Their article reexamined the relationship between personality traits and leadership perceptions and emergence. In contrast with the conclusion of earlier nonquantitative literature reviews of traits and leadership, Lord et al. (1986) (utilizing the literature investigated by Mann in his 1959 review and subsequent relevant studies) concluded that prior research on trait theories were misinterpreted. These researchers claimed that the studies really measured the relationship between leader traits and leader emergence. Using meta-analytic techniques, their results supported social perception theories where several traits were expected to be related to leadership perception. Specifically, they found that leader intelligence, masculinity-femininity, and

dominance were significantly related to a follower's perceptions of their leader's (i.e. supervisor's) effectiveness.

Other researcher found that, even though possessing a certain combination of traits does not ensure successful leadership, effective leaders do indeed differ from ineffective leaders in certain aspects (Kirkpatrick & Locke, 1991). Kirkpatrick and Locke found that successful leaders have higher levels of: drive (including achievement, motivation, ambition, energy, tenacity, and initiative), the desire to lead, honesty and integrity, self-confidence, cognitive ability, and competence. They also argued that these key traits assist a leader in formulating a vision and developing a plan of action to pursue their vision. Overall, this evidence suggests that the study of traits and attributes in relation to leadership is more promising than originally thought.

2.1.2 Behavioral Theories

After World War II, researchers emphasized the observable nature of leadership in order to differentiate not only the nature of leadership and leader activity, but also behavioral patterns of effective leaders (Chemers, 1997). A research program at Ohio State in the 1940's attempted to capture and measure leadership behavior whereby group members described the behavior of the leader. From this data, Hemphill (1950) quantified 150 behavior descriptors that lead to the Leader Behavior Description Questionnaire (LBDQ), which is still used as a measure in leadership research today. Halpin and Winer (1957), while developing an adaptation of the instrument for use in

the Air Force, identified Initiating Structure and Consideration as two fundamental dimensions of leader behavior.

Katz and Kahn (1951) also attempted to identify general styles of leadership. From interviews with subordinate employees or “followers,” they recognized two general styles: production-oriented and employee-oriented. The former style, production-oriented leadership, is focused on planning, preparation, direction, and endstate productivity. In contrast, employee-oriented leaders identified with followers, exemplified openness, and showed concern for the well being of subordinates.

Because the behavioral approaches could not fully explain why some leaders were more effective than others, leadership researchers (e.g., Fiedler, 1961b; Hersey & Blanchard, 1969; House, 1971, etc.) shifted their focus away from just what leaders do, and began to examine how behaviors relate to leader effectiveness (i.e., how often a leader communicates with followers, types of reward and discipline methods s/he uses, and decisions they make). This shift in focus resulted in the emergence of contingency approaches to leadership to account for differences found across situations.

2.1.3 Contingency and Situational Theories

Contingency and situational theories were formulated in an attempt to account for the role of situational factors in the relationship between leader characteristics (traits or behaviors) and leadership effectiveness. These theories examine both the task and follower characteristics to specify what leader behavior is required in a specific situation.

There exist several contingency and situational theories, but perhaps the most commonly researched were Fiedler's (1967) contingency theory of leadership, Hersey and Blanchard (1969) Situational Leadership Model, House's (1971) path-goal theory of leadership, and Vroom-Yetton's (1973) normative decision-making model.

Fiedler's contingency model proposes that leader effectiveness is a function of the match between the leader and specific situational factors: position power, task structure, and leader-member relations. Fiedler's model differentiates between task-oriented and relationship-oriented leadership styles. He argued that a leader is one or the other; not both. Fiedler's model is similar to Katz and Kahn's production-oriented and employee-oriented styles (or the LBDQ) but, Fiedler claimed a leader uses one style or the other; but can't use both. Fiedler found that the effectiveness of the leader-follower interaction was contingent upon the factors of leader-follower relationship, task structure, and leader position power. If these factors were all high or all low, it was determined that a task-centered leader would be most effective. However, if the factors were mixed, an employee-centered leader was found to be most effective (Fiedler, 1961a).

Further, Fiedler argues that leaders can not adjust their behavior to changing circumstances because their style is set. Therefore if a leader's style is not appropriate for a specific situation, the leader will not be successful and an organization needs to

change the leader. However, most contemporary theorists believe that leaders can adjust their style. If so, what should leaders consider in making adjustments?

Hersey and Blanchard's (1969) Situational Leadership Model sought to answer this questions using the LBDQ findings. According to the Situational Leadership Model, leader behavior should change based on follower capacity for carrying out a specific task and on the follower commitment for carrying out their task. When these two categories were studied, the effectiveness of the leader depended on whether the follower lacked capacity and therefore needed task guidance; or whether the follower lacked commitment and therefore needed encouragement from the leader; or whether the follower lacked both and therefore the leader needed to supply both guidance and encouragement.

Another contingency model deals with different aspects of leader-follower relationships. Path-goal theory is based on the core idea that it is the leader's responsibility to motivate his/her followers. Leaders do this by clarifying the path, removing obstacles, and providing feedback to achieve organizational goals while providing guidelines on how to accomplish those goals (House, 1971). Path-goal theory can trace its roots to expectancy theory which assumes that individuals will be motivated to do what they think will provide them the greatest reward. House's (1974) path-goal theory examines the leader's effectiveness at increasing a subordinate's motivation along a pathway leading to a certain goal. House proposed three areas

would affect the path-goals relationship: the task, characteristics of the followers, and the nature of the group to which the followers belong. The theory hypothesizes that certain subordinates will better respond to direction when a task is unstructured, for example, developing building plans. Thus, the appropriate leader style (directive or participative) depends on characteristics of the task (structured or unstructured) and the capabilities of the followers (e.g., tolerance for ambiguity) (House & Dessler, 1974).

All of these models of contingency leadership have helped to develop an understanding of leadership complexities. Although contingency theories dominated leadership research for decades, a number of writers have questioned the methods used to tests these theories (Yukl, 2002). For example, Wofford and Liska (1993) quantitatively reviewed 120 path-goal studies and found that only seven of the moderators used were significant. Miller and Monge (1986) meta-analyzed research on the effects of participation in decision making on satisfaction and productivity. Results provided no support for any of the contingency model predictions, even after considering both job type and organizational type as possible moderating variables. Wagner and Gooding (1987) conducted another meta-analysis of the effects of four situational moderators (i.e. group size, task interdependency, complexity, and performance) on the relationships between participation and five outcomes (i.e. task, decision performance, motivation, satisfaction, and acceptance). They concluded that the positive findings published in

research on the relationships between participation and performance outcomes may be due to methodological artifacts.

2.1.4 Transactional Theories

The transactional models of leadership are derived from social reinforcement-exchange theories. The basic tenet of social exchange theory argues that, “small-group interactions will most probably be sustained, positively evaluated, and positively experienced by the participants when they view them as more rewarding than costly” (Shaw & Costanzo, 1982, p. 68). These models assume a process-oriented exchange between leaders and followers. As Hollander and Offermann (1990a, p. 87) explained, “generally speaking the transactional models center on the followers’ perceptions of and expectations about the leader’s actions and motives, in accordance with attributional analysis.” The concern for process stems from the social exchange between leaders and followers as a function of effectiveness. Similarly, these models emphasize persuasive influence instead of compelled compliance.

Edwin Hollander developed a transactional leadership model and coined the term “idiosyncratic credit.” Idiosyncratic credits are oftentimes defined as a tit-for-tat exchange. Hollander (1958) explained that leadership was a social exchange where ‘legitimacy’ was the currency of the exchange. To have a successful transaction, the leader must provide direction, guidance, and technical knowledge, as well as

recognition of the followers' inputs. In turn, the followers increase their receptiveness to and add legitimacy to the leader's influence attempts (Hollander, 1993).

In this framework, the leader, earns idiosyncrasy credits via demonstrated capabilities, and in turn spends credits when he exercises influence attempts (e.g. taking the group in a new direction). By demonstrating competency, assisting achievement of group goals, and conforming to group norms, leaders demonstrate commitment to the group and in turn earn credits (Chemers, 1997). By obtaining credits, the leader gains latitude to explore novel ideas, methods, and courses of action, all of which can potentially lead to new innovations. Overall, if the leader's initiatives are successful and group performance increases, the idiosyncrasy credit exchange leads to legitimacy in shaping subordinate perceptions (Green & Mitchell, 1979). Ultimately, a leader can deviate from the norms of the group that he or she leads when credit is achieved, and thus take the group in new directions.

Other relationship and influence oriented theories include leader-member exchange, and Pygmalion. Leader-member exchange theory (e.g., Graen & Ginsburgh, 1977) proposes that leaders have "in-groups" of trusted individuals ("informal leaders") within their organization. Other subordinates ("hired hands") in the "out-group" are supervised through a more formal authority process. Another theory under relationship and influence leadership is coined Pygmalion. The Pygmalion leadership theory investigates situations in which a leader's expectation of a follower influences the

follower's performance through transference of that expectation (Eden, 1990; Eden, 1992). A critical component of Pygmalion theory is the self-fulfilling prophecy, which suggests that raising leader expectations regarding follower potential for achievement produces an improvement in the follower's actual performance (Eden, 1990). Over nearly three decades, researchers (see Eden et al., 2000 for a review of this literature) have found that if leaders have confidence in followers and set high goals and expectations for them, then the followers' likelihood of success is higher due to a self-fulfilling prophecy effect. For instance, McNatt (2000) conducted a meta-analysis among adults working in management contexts (58 effect sizes from 17 studies), reporting an overall effect of $d = 1.13$.

From a theoretical perspective, a common complaint regarding these relationship and influence leadership theories is lack of generalizability to women and established work groups (White & Locke, 2000). For example, several Pygmalion studies, with the exception of McNatt's (2000) meta-analysis, have reported weak effect sizes when controlling for gender (Eden et al., 2000). Moreover, because a majority of Pygmalion research has been conducted in military settings, there is the potential problem of its generalizability to other settings. Indeed, McNatt (2000) reported significant differences in the effect sizes across different leadership contexts, with the results stronger in the military, with men, and for followers for whom low expectations were initially held.

Transactional theories put particular emphasis on both the perceptions and the role of followers in the interactive process of leadership. As Taylor and Rosenbach (2000, p. 123) note, “few leaders can be successful without first learning the skills of followership.” Evidence suggests that effective followership and leadership is a developmental process that occurs longitudinally. Therefore, a discussion of leadership theory must also include a discussion of followership.

Kelly (1998) has argued that a prerequisite to effective leadership is followership. Effective followers are “intent on high performance and recognize that they share the responsibility for the quality of the relationship they have with their leaders” (Potter, Rosenbach, & Pittman, 2000, p. 130). Four types of followers are described by Potter, Rosenbach, and Pittman (2000): subordinate, contributor, politician, and partner. The “subordinate” is a follower who is competent at his or her function, does what is specified, and is not interested in engaging in extra effort. A “contributor” is a follower who works hard and is praised for the quality of his or her work. The “politician” pays more attention to relationships than performance. A “partner” focuses on both high performance and effective group dynamics. Successful leaders are those who value partners and encourage all followers to become partners (Potter et al., 2000).

The relationship and influence theories have furthered our scientific understanding of the leadership phenomena. However, these theories stop short of answering our most intricate questions about how we increase leader effectiveness. For

example, how do leaders use other more enlightened and transformational forms that create referent effects beyond just legitimacy? And, how do we account for followers developing into partners as a result of successful relationships? Is the challenge of leadership to create a climate where the followers put goals and objectives above their own needs? More recent leadership theories have sought to explain these challenges. These more recent theories are examined under the umbrella of “new-genre.”

2.1.5 New-genre Theories

New-genre refers to theories that have dominated leadership research since the 1980s including charismatic, inspirational, transformational, and visionary leadership (Bass, 1998; Bryman, 1992). Bryman (1992, p. 21) commented “there was considerable disillusionment with leadership theory and research in the early 1980s. Out of this pessimism emerged a number of alternative approaches, which shared some common features ...collectively referred to as the new leadership.” Unlike the ‘traditional’ leadership models, the new leadership approaches emphasize symbolic leader behavior, visionary, inspirational messages, emotional feelings, ideological and moral values, individualized attention, and intellectual stimulation.

Emerging from these early works, charismatic and transformational leadership theories have turned out to be the most frequently researched theories over the last fifteen years (Judge & Piccolo, 2004). The accumulated research shows that charismatic/transformational leadership is positively associated with leadership

effectiveness across many different types of organizations, levels of analyses, and cultures (see Avolio, Bass, Walumbwa, & Zhu, 2004 for a summary of this literature). Under new-genre, we examine the two most common approaches—transformational leadership and charismatic leadership.

As Hollander and Offermann (1990a, p. 88) described transformational leadership, “[it] can be seen as an extension of transactional leadership, but with greater leader intensity or follower arousal.” The study of transformational leadership is rooted in Max Weber’s (1946) notion of a leader. In this theory, leaders are seen as active transforming agents, changing the outlook and behavior of their followers (Burns, 1978). Burns described transformational leadership as a process where, “leaders and followers raise one another to higher levels of morality and motivation” (1978, p. 20).

Factor analytic studies on leadership have recognized four key components of transformational leadership (Bass, 1985; Avolio & Howell, 1992): idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration.

The first component, idealized influence, suggests that transformational leaders act as role models for their subordinates. Followers respect and trust their leaders because leaders readily put others’ needs before their own. Leaders set an example of moral conduct in both their personal and professional lives leading to follower identification (Bass, 1996). The use of formal, legitimate power is a last resort for a transformational leader.

The second element of transformational leadership is inspirational motivation. Transformational leaders motivate and inspire subordinates by providing meaning and challenge through emphasis on teamwork. The leader works with the followers to build a common vision for the organization while clearly articulating expectations and goals (Bass, 1996). Inspirational motivation leads to internalization.

Another aspect of transformational leadership is intellectual stimulation. By structuring a questioning environment, leaders allow subordinates to creatively address problems through new techniques. Leaders ensure an open exchange of ideas by allowing mistakes, soliciting new methods for problem solving, and evaluating the followers' processes rather than just situational outcomes. This component dictates that ideas are not criticized solely because they differ from the leader's opinions (Bass, 1996).

The fourth and final component of transformational leadership is individualized consideration. The leader acts as a coach, teacher, and mentor for each subordinate, providing individual attention and feedback, both positive and negative. The mentor-protégé relationship allows for followers to increase their levels of potential by creating new learning environments and benefiting from bi-directional communication. Critical to individualized considerations are the understandings and empathy of personal concerns, effective listening, and an acceptance of individual differences (Bass, 1996). Additionally beyond such social awareness, individualized consideration relates to the leader's motivation to treat each individual differently.

Similar to transformational leadership, charismatic leadership is a second new-genre leadership approach. This theory is also based on follower perceptions that the leader possesses certain desirable characteristics. Weber proposed that charisma can occur when a leader with certain qualities emerges during a crisis to propose a new vision. Charismatic leaders exert enormous power and influence over followers, especially followers searching for direction or during times of crisis. The notions presented by Weber lead to great debate over whether charismatic leadership is a result of leader traits, ripe situational conditions, or the relationship process between followers and leaders. The majority of current theorists view charismatic leadership as resulting from a combination of all three elements. House (1977) developed a theory of charismatic leadership based on the premise that charisma has a distinct effect on followers. Charismatic leaders tend to be self-confident, achievement motivated, desire to assert influence, and possess strong convictions. These types of leaders advocate change and are able to mass followers in support of their own vision. Other theories centering on charisma focus on attributes (see Conger & Kanungo, 1987), a self-concept theory (Shamir, House, & Arthur, 1993), and a social contagion explanation (Meindl, 1990).

A recent meta-analysis by Avolio, Reichard, Hannah, Walumbwa, & Chan (2004) compared the impacts of leadership studies conducted to date where the researcher examined new-genre leadership versus those that manipulated traditional theories (e.g.

behavioral, trait or contingency theories). Results showed that new-genre leadership theories had appreciably larger effects than those based on traditional leadership theories for both affective and cognitive dependent variables, while traditional theories had a slightly larger effect on more proximal behavioral outcomes. These findings appear consistent with the chosen focus of each approach. New-genre theories such as transformational leadership have strong affective and cognitive components and thus are positively linked to dependent variables such as liking, trust or intellectual engagement. Conversely, research on contingency and other more transactional leadership theories have focused more on short-term behavioral change.

One of the latest 'new-genre' approaches of leadership study is the framework proposed in Authentic Leadership Theory (see Gardner, Avolio, Luthans, May, & Walumbwa, 2005; Avolio & Gardner, 2005; Avolio, Gardner, Walumbwa, Luthans, & May, 2004). This theory holds that high levels of leader self-awareness, self-regulation and transparency among other things will increase the leader's positive effects on their followers.

Overall, current research suggests that the study of leadership, leader development and leadership effectiveness all focus on the dynamic interaction between the leader, the follower, and the situation. If this is so, then identifying personality traits, character strengths, leader virtues might play an important role in predicting a

leader's effectiveness overtime. We now examine research correlating personality and leadership effectiveness.

2.2 Personality

2.2.1 The Personality Debate

The debate over the existence or absence of personality structures is less divisive now than it was 20 years ago (Graziano, 2003). Virtually all of the studies that correlate personality and leadership assume that personality is a stable trait. Many theories emphasize its enduring nature and ignore the potential impact of time (Biesanz, West, & Kwok, 2003). However, in order to assess the validity of studies that relate personality and leadership across time, a review of research on personality stability and change in young adults is necessary.

Some theorists, such as Roberts, Caspi, and Moffitt have argued that personality development ends by age 5 or even before this (2001). In the middle of the spectrum, Costa and McCrae have argued that personality is fully formed and stable by age 30 (1986; 2000). At the other end of the spectrum, Lewis contends that personality development continues across the life-span (1998).

The general issue of growth and stability in personality development during the transition from adolescence to adulthood is especially important. Erickson (1997) highlighted this period of emerging adulthood as a series of complex tests resulting in

emergent patterns of adaptation. Other psychologists have addressed the topic of personality stability with several theoretical developments and experiments over the past decade. Roberts, Caspi, and Moffitt (2001), utilizing a birth cohort from age 18 to age 26, explored personality change in four ways: (a) differential continuity, (b) mean-level change, (c) individual differences in change, and (d) ipsative change.

These authors examined an individual's relative change, rather than analyzing the sample as a whole. By using a Q-sort methodology, the authors report that the level of profile consistency ranged from -.74 to 1.00 and the average profile consistency was .70 (SD=.22) indicating that the majority of participants showed strong consistency but that some participants (7%) underwent significant change. Personality changes for emergent adults that did take place reflected more control and social confidence and less anger and alienation (Roberts, Caspi, & Moffitt, 2001).

In another recent study (N=270), Robins, Fraley, Roberts and Trzesniewski (2001) assessed student continuity and change in personality over four years of college. Overall, the authors' findings are consistent with emergent literature that personality traits are relatively stable over time, but can change in a systematic manner. Robins et al. (2001) found small to medium mean-level changes, large rank-order stability, high personality structure stability, and moderate ipsative stability. Robins et al. sought to utilize empirical work indicating a five-factor approach to understanding personality (Digman, 1990; Digman, 1997). Based on combining the personality and developmental

literatures, this author predicts mean-level changes in transition from adolescence to young adulthood in the following ways: decreased neuroticism, increased openness, increased agreeableness, increased conscientiousness, and no change in extraversion.

Robins et al. (2001) make a unique contribution to the literature by longitudinally testing personality structure invariance with the Big Five personality dimensions using Costa and McCrae's 60-item NEO-FFI. Measurements were taken during the first week of college and again four years later. In this analysis, Robins et al. (2001) focused on stability and change in personality in four areas according to a Big Five model: (a) mean-level, (b) rank-order, (c) structural, and (d) ipsative. For mean-level changes, the authors found that neuroticism scores decreased over the four years; no significant change in extraversion; and scores on openness, agreeableness, and conscientiousness showed small to medium positive changes. For rank-order stability coefficients, the authors found that medium to large (.53 to .70) stability. For structural stability, the authors found highly stable intercorrelations among the Big Five. Finally, the authors found moderate ipsative stability (i.e. profile stability) and that the majority of profile change reflected changes in mean-levels (Robins, Fraley, Roberts, & Trzesniewski, 2001).

Overall, these findings are consistent with a perspective which says that personality shows moderate continuity over time, while changing in systematic ways. One important contribution is the insight that the definition of "change" influences conclusions about whether personality changes over time. By offering four definitions

and analyses of change, the authors show both change and stability. These seemingly contradictory findings are important in understanding the ongoing stability vs. plasticity debate.

Another recent study also explored stability and change in personality over time. Morizot and Le Blanc (2003) utilized a two-study approach. They found that the majority of personality research points to a normative psychological maturation past the previously accepted benchmark of age 30, although at a slower rate over time.

Morizot and LeBlanc conducted a long-term longitudinal study of personality which served to answer some otherwise unaddressed questions in the field. Their novel approach to studying comprehensive superordinate and subordinate trait theory, which makes use of comparative samples, hierarchical analysis, and integrates implications of situations on normative development, contributes greatly to the currently literature on personality continuity and change. This type of study may offer significant contributions when correlating predictive variables such as leadership with personality over time.

Both continuity and change are continually observed in modern personality literature. Rank-order assessments indicate relative consistency in personality. Mean-level changes indicate developmental changes in personality from adolescence to adulthood. Studies comparing different contexts for personality maturation suggest that the situation might influence personality development between adolescence and

adulthood. More analysis is required to understand the impact of special situations such as a leadership development institution on the natural maturation of personality. We now examine the classification of personality and character.

2.2.2 Five Factor Model

Throughout the past century, scientists have sought to classify personalities by looking at both subordinate traits and superordinate factors. Some researchers have developed measures which assume that there are only three constructs (Eysenck, 1991) or four constructs (Myers, McCaulley, & Most, 1985). Other have attempted to capture personality measures under the umbrella of 16 or more constructs (Megargee, 1972; Cattell, Eber, & Tatsuoka, 1970). What all these researchers have in common is that they suggest that a common taxonomy or factor approach exists to classify personality types. All the models attempt to minimize within-group variances and maximize between-group variances. The following reviews the literature on personality taxonomy.

In the 1940s, factor analysis in statistics allowed researchers to examine questions about adequate personality models. Fiske (1949) identified a five-factor model (FFM) for classifying individual behavior. Fiske labeled the initial five factors as extroversion, agreeableness, conscientiousness, emotional stability, and culture. His analysis was later replicated by Norman (1963). Subsequent research has generally supported the use of the FFM in personality testing (Barrick et al., 1991; Salgado, 1998; McCrae et al., 1987). In

the FFM, the hierarchical factors consist of numerous distinctive subordinate traits and behavioral tendencies (McCrae et al., 1989). McCrae and Costa (1985) also designated five factors of personality. These five-factors are oftentimes referred to as the “Big Five” and include agreeableness, conscientiousness, extraversion, neuroticism, and openness. Several recent studies correlating personality and leadership effectiveness have suggested the use of the FFM (Hogan et al., 1994; Judge et al., 2002). See Appendix A for highlights of the traits embedded within the FFM.

The first factor within the model is agreeableness. Agreeableness refers to the quality of interpersonal relationships (DeNeve & Cooper, 1998). Hogan et al. (1994), defined agreeableness as a measure of an individual’s sympathy, cooperation, and warmth. According to Piedmont (1998), agreeableness includes the facets of trust, straightforwardness, altruism, compliance, modesty, and tender-mindedness.

The second factor is conscientiousness. Conscientiousness or constraint refers to task behavior and impulse control (DeNeve et al., 1998). Conscientious individuals work hard, persevere, and are organized (Hogan et al., 1994). Furthermore, conscientiousness includes the facets of competence, order, dutifulness, achievement, self-discipline, and deliberation (Piedmont, 1998).

Extraversion, the third factor, focuses on both the quality and the intensity of relationships (DeNeve et al., 1998). Extraversion is sometimes referred to as surgency.

Extraversion include the facets of warmth, gregariousness, assertiveness, activity, excitement seeking, and positive emotions (Piedmont, 1998).

The fourth factor, Neuroticism refers to a lack of adjustment and is inversely related to emotional stability (DeNeve et al., 1998). Neurotic individuals are impulsive, irresponsible and not dependable (Hogan et al., 1994). Neuroticism includes the facets of anxiety, hostility, depression, self-consciousness, impulsiveness, and vulnerability (Piedmont, 1998).

The fifth and final factor is openness or openness to experience. Openness concerns an individual's ability to be imaginative, broad minded and curious (Hogan et al., 1994). Openness includes the facets of fantasy, aesthetics, feelings, actions, ideas, and values (Piedmont, 1998). Overall, the FFM provides an opportunity to explore the relationship between personality and leadership effectiveness.

2.2.3 Character Strengths and Virtues

In contrast with the FFM, Peterson and Seligman have attempted to measure character strengths and virtues (2004). Virtues are the core traits valued necessary for an individual to possess good character. Character strengths are the psychological processes underlying the broad categories of virtues. Although derived utilizing two separate approaches to understanding behavioral tendencies, the positive psychology literature on character strengths appears to have a similar composition to the Five Factor

Model. Before examining the relationship between these two approaches, we provide an overview of the character strengths and virtues.

According to Peterson and Seligman's (2004) exploratory factor analysis of scale scores using varimax rotation, they suggest the strengths correspond with five superordinate factors (strengths of restraint, intellectual strengths, interpersonal strengths, emotional strengths, and theological strengths). In addition, they suggest that the first three factors correspond to the Big Five Factors of conscientiousness, openness, and agreeableness. Also, emotional strengths might be inversely related to the Big Five Factor of neuroticism. Only theological strengths (i.e. gratitude and spirituality) did not appear to have a corresponding Big Five Factor (Peterson et al., 2004). And from the Big Five Factors, extraversion did not have a corresponding VIA-IS factor. See Appendix B for the classification of character strengths.

2.3 Personality and Leadership

As noted earlier, previous correlation and meta-analytic studies have suggested that there is a relationship between personality and leadership. The major objective of this section is to analyze and clarify inconsistencies in the personality and leadership literatures, and to identify which characteristics of personality are likely to influence leadership effectiveness.

Early reviews of traits and leadership were conducted by Stogdill (1948) and Mann (1959). Although Stogdill found inconsistent results in the studies he examined, a

significant relationship between intelligence and leadership emerged, with correlations ranging from .28 to .90. Later, Mann (1959) examined the relationship between personality and perceptions of small group leadership. Specifically, Mann sought to examine attained status of individuals in leaderless groups. While, the studies included in this review did not focus specifically on leadership effectiveness, Mann found small but significant relationships between leadership and personality traits. However, possibly due to later misinterpretations, these two reviews led to the common belief that personality was not effective in the prediction of later leadership.

2.3.1 Personality Traits Correlated with Leadership Effectiveness

Twenty-six years after his initial review, Stogdill's (1974) second review supported the notion that leadership is related to personality. Specifically, Stogdill found positive relationships between leadership and agreeableness (i.e., friendliness), conscientiousness (i.e., achievement), extraversion (i.e., dominance, assertiveness, and sociability), and openness (i.e., self-confidence). Clarifying his earlier work, Stogdill's (1974) review concludes that personality and leadership are significantly interconnected.

Several other studies have consistently linked personality with leadership attributes. Avolio, Dionne, Atwater, Lau, and Camobreco (1996) predicted leadership styles using personality constructs. Atwater & Yammarino (1993) examined the relationship between personal attributes and perceptions of leadership. Other studies have examined personality traits and obtained rank within an organization (Vickers,

Hervig, & Booth, 1996). Still other researchers sought to incorporate what we know about personality research into selection criteria for jobs that require effective leaders (Helton & Street, Jr., 1992; Street, Jr., Helton, & Nontasak, 1993). Overall, there has been strong evidence that some personality traits are related to leadership (Batlis & Green, 1980).

Many researchers examining trait theory often showed inconsistent results or focused on the situational context (Lord, Foti, & Devader, 1984; Muchinsky, 1990; Yukl & Van Fleet, 1992). As a result, subsequent reviews of the literature have suggested that trait theories have diminished in the leadership literature, but did not disappear altogether (Zaccaro, Foti, & Kenny, 1991; Judge et al., 2002). As noted earlier, due to the disappointing and inconsistent results of trait approaches, researchers began reviewing situation-specific predictors of leadership effectiveness (Yukl et al., 1992; Bass et al., 1990). Nonetheless, some trait-based analyses continued to appear in the literature. Specifically, two meta-analytic studies sought to identify specific traits that may influence leadership effectiveness.

2.3.2 Meta-Analytic Reviews of Personality and Leadership

The first meta-analyses of the relationship between personality traits and leadership by Lord, DeVader, and Alliger (1986) was discussed previously. In the only other meta-analysis of personality and leadership, Judge, Bono, Ilies, and Gerhardt (2002) provided both a qualitative and a quantitative review of the trait-perspective

approach to leadership. This study meta-analyzed 73 empirical articles utilizing a five-factor model (FFM). Overall, personality, as measured by a FFM, had a multiple correlation of .48 with leadership. Extraversion ($r=.31$) had the strongest correlation with leadership emergence and effectiveness. This review concluded that there was strong support for both the trait perspective and the use of the FFM in the study of leadership. This review also suggested that context was important in understanding the relationship between personality and leadership. By regressing leadership perceptions on the FFM across three settings, the authors found stronger correlations in student settings ($r=.63$) than in other settings (business $r=.55$, government $r=.29$). The findings suggest that personality traits are important in understanding leadership. Furthermore, these findings allow for us to draw inferences to begin to answer the four research questions.

2.4 Research Hypothesis

Based on what we know about the relationship between personality traits, virtues, and leadership effectiveness, the following hypotheses were proposed:

Hypothesis 1: I hypothesized that a positive relationship exists between *agreeableness* (i.e. trust, straightforwardness, altruism, compliance, modesty, and tender-mindedness), *conscientiousness* (i.e. competence, order, dutifulness, achievement striving, self-discipline, and deliberation), and *extraversion* (i.e. gregariousness, assertiveness, activity, excitement-seeking, positive emotions, and warmth) and leadership effectiveness.

Hypothesis 2: I hypothesized that a positive relationship exists between *humanity* (i.e. love, kindness, and social intelligence) and *justice* (i.e. citizenship, fairness, and loyalty) and leadership effectiveness.

Hypothesis 3: I hypothesized that there is a significant positive correlation exists between: conscientiousness and temperance, and agreeableness and humanity. I further theorize that these four variables can be combined to create a mixed model to better predict leadership effectiveness overall.

Hypothesis 4: I hypothesized that there exist five distinct trajectories of leadership effectiveness over time, where individuals remain constant (high, medium, or low effectiveness), increase in effectiveness, or decrease in effectiveness. Figure 1 diagrams this hypothesis.

Leadership Effectiveness Trajectories

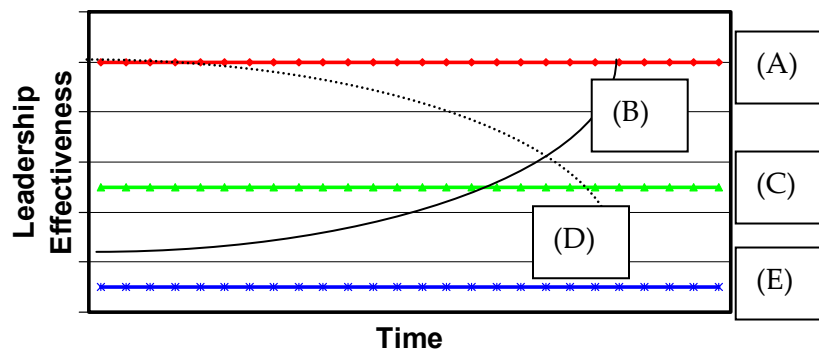


Figure 1: Predicted Leadership Trajectories

Specifically, based on inferences from the research by Lord, DeVader, and Alliger (1986), I hypothesize that cadets high on conscientiousness and temperance will consistently be rated high in leadership effectiveness (Trajectory A). Cadets high on openness and transcendence will consistently score average (Trajectory C). Cadets low on conscientiousness and high in neuroticism and low in temperance will consistently score low (Trajectory E). Based on interpretations of the leadership emergence study of Judge et al. (2002), cadets who score low on extraversion will show a downward trend (Trajectory D) and cadets who score high on extraversion but high on conscientiousness will show an upward trend (Trajectory B).

3. Methodology

3.1 Introduction

There is ample evidence that hierarchy in personality traits and virtues exist; and that there is a relationship between personality traits and leadership effectiveness. However, previous studies have not provided adequate measures of leadership effectiveness, they have not explored the relationship longitudinally, and no studies have examined the relationship between virtues and leadership effectiveness, or the relative efficacy of personality traits versus character strengths and virtues in such predictions. This study addresses these issues by examining the possible combinations of personality traits and virtues that lead to different leadership effectiveness trajectories (i.e. different patterns of leadership effectiveness over time) using linear regression and latent class (trajectory modeling and mixture modeling) analysis.

3.2 Analytic Techniques

Latent class variables classify similar items into groups where the initial number of groups and the structure (e.g. personality variables) of each group are unknown. Structure refers to the cluster of variables sorted into a specific class. Thus, each class is a group of variables with its own mean, variance, and covariance, where similar observed variables are assumed to come from the same distribution. Class identification

involves minimizing within group variation and maximizing between group variation. Latent class analysis allows us to determine both the number of classes and the properties (mean of the each variable making up the class) of each class. Then, these empirical classifications are paired with best-fit “trajectories” of a continuous dependent variable. By combining this trajectory modeling with empirical classifications or “mixture” modeling, latent class analysis allows us to determine the number of distinct trajectories within a sample and the characteristics of the group that demonstrate each trajectory (Vermunt & Magidson, 2007). See Costanzo et al. for an example of trajectory analysis and mixture modeling using latent class analysis (2007).

3.3 Review of Research Questions and Hypotheses

This project was an investigation into the relationship among personality traits, character strengths and virtues and leadership effectiveness trajectories. Based on past research, the following hypotheses were tested:

Hypothesis 1: There is a positive relationship between agreeableness, conscientiousness, and extraversion with leadership effectiveness; and this positive relationship continues over time.

Hypothesis 2: There is a positive relationship between humanity and justice with leadership effectiveness; and this positive relationship continues over time.

Hypothesis 3: A combined model using conscientiousness, temperance, agreeableness, and humanity best predicts leadership effectiveness over time.

Hypothesis 4: There exist five distinct trajectories of leadership effectiveness over time, and these distinct trajectories pattern with distinct personality profiles (see Figure 1 for the 5 trajectories).

3.4 Setting: The United States Military Academy (USMA)

The research was conducted at the United States Military Academy at West Point. This setting was particularly appropriate for a longitudinal exploration of leadership development because USMA is considered to be one of the premier leadership development institutions in the world. The advantage to studying leadership at a military academy, as outlined by Atwater and Yammarino (1993), include participant saturation in a leadership culture that is expected to produce positive increases in leadership ability within the first two and a half years.

3.5 Participants

Participants in this research came from the West Point class of 2008. This class arrived in the summer of 2004 with 1236 new cadets after Cadet Basic Training (CBT), 1223 cadets remained. By the completion of the first semester, 1146 cadets remained; at the completion of two and a half years, 1122 cadets remained (a total decrease of 114 cadets). Cadets leaving prior to the completion of the term are not included in the data analysis due to the lack of a military development grade. The demographics of the class minimally changed during their first two years at the Academy.

3.6 Measures

3.6.1 NEO-PI-R

A personality trait is a tendency to behave in a certain manner in a variety of situations. As discussed in the Five Factor Model section, most approaches to studying personality assume that certain traits are more basic or all encompassing than others. Costa and Robert (1995) used factor analysis to empirically support the FFM organized into five broad domains Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness. These five domains are often referred to as the “Big-Five” in personality profiles. The NEO PI-R was developed to operationalize the five-factor model of personality, a representation of the structure of traits. NEO PI-R stands for Neuroticism, Extraversion, Openness Personality Inventory Revised. Each of these domains consists of six specific facet scales. The NEO PI-R helps assesses personality at both levels, with six specific facet scales in each of the five broad domains (see Appendix A).

The NEO PI-R is a widely utilized instrument that has published norms and a record of reliability, validity, and predictive utility. The NEO-PI-R consists of 240 items that individuals answer on a one to five scale from strongly disagree

to strongly agree Likert-type scale. The results of this personality test compare answers to the average responses of other adults normed by age and gender. For the purposes of this study, the NEO PI-R is normed against college age students. See Appendix D for NEO-PI-R questions.

The NEO-PI-R is a self-administered test designed to provide a systematic assessment of emotional coping, interpersonal skills, attitudes, and motivation factors. The survey takes approximately 45-60 minutes to complete. McCrae and Costa (1989) report internal consistency coefficients range from .86 - .95 for domain scales and .56 - .90 for facet scales. At West Point, cadets are administered this survey as part of their General Psychology class in their freshman year. As a result, almost the entire class is administered the NEO-PI-R. See Appendix C for NEO-PI-R survey guidance.

3.6.2 Values in Action Inventory of Strength (VIA-IS)

As part of recent developments in Positive Psychology, Peterson and Seligman concluded that character strengths could be measured with self-reports for each of the 24 strengths (2004). They created the VIA-IS survey for adults which is a 240 question survey using a 5-point Likert scale to measure the degree to which participants support each of the 24 strengths measured in the taxonomy with higher scores reflecting more strength on the character strength. The VIA-IS is a preliminary instrument, but internal

consistencies for all scales exceed alphas $> .70$ and four month test retest reliability exceed $> .70$ (Peterson et al., 2004). The VIA-IS has undergone five iterations and has been completed by over 150,000 adults. See Appendix B for VIA-IS classifications. A complete discussion of reliability and validity of the VIA-IS is given by Peterson and Seligman (2004). See Appendix E for VIA-IS survey guidance and Appendix F for VIA-IS survey questions.

3.6.3 Leadership Effectiveness Scores

Leadership effectiveness ratings were obtained from Military Program Score (MPS). MPS are assessed after each summer training session and academic semester. The MPS score represents a weighted average of each three independent assessments of effectiveness. This combined score is the main evaluative measure of leadership performance for each term. The cadet's score is based on a compilation of weighted averages of scores from three sources: rater, intermediate rater, and senior rater.

The rater is the primary supervisor and counselor of the rated cadet. This cadet is responsible for periodic developmental reviews and they contribute 25% of the leadership effectiveness rating. The intermediate rater is usually a cadet one level above the rater and "while not having the level of familiarity of the rater, has a greater breadth of perspective, which allows the intermediate rater to measure the rated cadet's performance against others in similar positions of responsibility" (USCC, 2004). The intermediate rater contributes 20% of the leadership effectiveness rating. The senior

rater is a commissioned military officer and is the tactical officer in charge of leadership development for the rated cadet. The senior rater contributes 55% of the leadership effectiveness rating. In total, each cadet receives three separate ratings of their leadership effectiveness every term. These weighted scores provide were used to determine a cadet's MPS. The study used MPS as the proxy of overall leadership effectiveness at eight discrete points in time over two and a half years as measures of followership as well direct and indirect leadership.

Theoretically, each annual score is measuring a different aspect of leadership effectiveness. After one year, the score is measuring a cadet's ability to be an effective follower. After two years, the score is measuring a cadet's ability to effectively manage direct report subordinates. After two and a half years, the score is measuring a cadet's ability to effectively lead both direct and indirect subordinates.

After admission to USMA, during summer training prior to their freshman year, the new cadets undergo training in basic soldier and cadet skills for six weeks. After completion of summer training, cadets begin an academic study program similar to most undergraduate institutions in the country. During their freshman (a.k.a. plebe) year, students continue their military and physical development as a member of a squad. Leadership effectiveness ratings provided during this year is a direct measure of an individual's followership. Following their plebe year, the cadets spend their second

summer at the Academy learning advanced soldier skills and they begin to assume leadership roles within their assigned organization.

After completing their summer training, cadets begin their sophomore (a.k.a. yearling) year. During this year, the cadets not only focus on their own academics, but they are also directly responsible for the development of one or two plebes each semester. Leadership evaluations this year provide an assessment of not only followership, but direct supervisory ability as well. At the completion of yearling year, each cadet has been evaluated on their leadership effectiveness a total of six times.

After this year, cadets enter their junior (a.k.a. cow) year. By the middle of the junior year, each cadet has been responsible for their own development as well as the development of first and second line reports. As a result, leadership effectiveness feedback measures individual followership, direct supervisor roles, and indirect leadership ability. At the end of two and a half years at the Academy, a cadet's leadership effectiveness ratings span all three domains with a total of eight discrete rating periods. See Appendix G for leadership effectiveness measures.

3.7 Procedures

3.7.1 Data Collection

During a cadet's first year at USMA, individuals completed two questionnaires (the NEO-PI-R and the VIA-IS) in order to establish a baseline for personality traits and

virtues. First, at the completion of Cadet Basic Training, in the fall of 2004 a subset of the class completed the Value in Action survey in support of institutional research. During their initial training, cadets are randomly assigned to one of nine organizations or companies. One of these companies was selected by USMA's Institute for Research Support to participate in the VIA-IA survey. In accordance with West Point's procedures for conduct human subject research, cadets in the chosen company signed informed consent and were given the opportunity to participate in the survey. Participants were not compensated. 124 cadets participated in the survey; 102 remained at the completion of two and a half years. Demographically, the cadets in the participating company are representative of cadets in the other eight companies due to the initial entry assignments.

Second, during their plebe year, every cadet is enrolled in PL100, General Psychology for Leaders. Half of the class takes PL100 each semester. As part of a course requirement, the cadets completed the NEO-PI-R instrument. In accordance with West Point's procedures for conduct human subject research, cadets signed informed consent and were given the opportunity for their NEO-PI-R data to be utilized as part of this research. The majority of cadets (n=1020) consented to their NEO-PI-R data to be utilized for this project. Participants were not compensated because the questionnaire was conducted as a mandatory course requirement.

3.7.2 Statistical Analysis

Exploratory analyses examined main effects of gender, age, and race differences on leadership effectiveness. These exploratory analyses were conducted through an examination of means, standard deviations, and t-test comparisons.

Hypothesis 1 was tested using linear regressions of each of the five personality factors against leadership effectiveness at three discrete times. Recall that leadership effectiveness is measured at the end of summer training and at the end of each semester. This annual score of leadership effectiveness is the dependent variable for each regression. The independent variable is the score for each factor of the NEO-PI-R. Age and gender were entered as covariates. Interaction terms are considered under testing in Hypothesis 4. Overall, this hypothesis was examined by conducting three step-wise linear regressions in order to determine the main effects of personality traits in predicting leadership effectiveness over time.

Hypothesis 2 was tested with linear regressions of the six virtues against leadership effectiveness at three discrete times. Similar to Hypothesis 1 above, annual scores of leadership effectiveness was regressed onto the virtues measured utilizing the VIA-IS. The virtues scores were the independent variables and the annual leadership effectiveness scores were the dependent variables. Age and gender were entered as covariates. Overall, this hypothesis was examined by conducting three linear

regressions in order to examine the main effects of character traits as predictors of leadership effectiveness over time.

Hypothesis 3 was tested using enter method linear regressions with the factors of the NEO-PI-R and the virtues of the VIA-IS as predictors of leadership effectiveness. These analyses examined the significance of an overall model which combined both the NEO-PI-R and the VIA-IS in order to determine what combination of factors would best predict leadership effectiveness for this sample. By combining the results of Hypotheses 1, 2, and 3, this study then built on these findings to examine latent class variables.

Hypothesis 4 analysis was conducted using the Muthen and Muthen (2004) M-Plus statistical suite in two stages of latent class analyses. In the first, using trajectory modeling for a longitudinal design, this dissertation constructed and evaluated a latent growth model of leadership effectiveness utilizing the NEO-PI-R and the VIA-IS. Recall that I hypothesized five distinct trajectories of leadership effectiveness over the two and a half years. This stage tested the developmental pathways by combining trajectory modeling with mixture modeling, or latent class analysis. In other words, the sample is modeled as a mixture of subgroups defined by their personality factors and virtues with different behavioral tendency profiles for the NEO-PI-R and the VIA-IS. Then these trajectories models were compared with the trajectory models using the significant factors from hypothesis three. This allows for the examination of personality and virtue trends with leadership effectiveness trajectories.

3.8 Limitations

This study is limited in certain areas. For measurements, the entire class of 2008 participated in the NEO-PI-R with approximately 1000 respondents agreeing to use their data for research. However, due to the time constraints of freshman year, only about 100 cadets were available for the VIA-IS, thus creating unequal sample sizes and a loss of power for hypothesis 3. For indexes, we are bound by ceiling effects and possibly small variances using a Likert-style scale for both instruments.

However, even with the limitations, this study provided a good baseline to determine if the NEO-PI-R, the VIA-IS, or a combination of the two, best predict leadership effectiveness over time.

4. Results

4.1 Overview

The purpose of this study was to determine which personality traits and virtues described in Chapter 2 best predict leadership effectiveness over time. The independent variables include personality measures of Neuroticism, Extraversion, Openness, Agreeableness, Conscientiousness and virtues of Wisdom, Courage, Humanity, Justice, Temperance, and Transcendence. The dependent variable combines multi-rater measure of leadership effective named the Military Performance Score.

4.2 Descriptive Statistics

This study consisted on 835 cadets. The class of 2008 entered with 1223 cadets. Of the 1223 cadets, 1122 cadets remained for the duration of this two and a half year study and were eligible to participate. Of the 1122 cadets, 733 consented to participate in the study by completing only the NEO-PI-R and 102 participated by completing both the NEO-PI-R and the VIA-IS for a total of 835 participants. With respect to gender, 705 (84.4%) were male and 130 (15.6%) were female (see Table 1). Of the 835 participants, 51 were African American, 653 were Caucasian, 48 were Asian, 13 American Indian, 53 Hispanic, 10 other and 7 did not select an ethnicity (see Table 1). The mean age of the

sample at their entrance to the Academy was 18.8 years and ages ranged from 17 to 23 years old.

Table 1: Demographics

		Frequency	Percent
Gender			
	Female (F)	130	15.6
	Male (M)	705	84.4
Race			
	African Amer (AA)	51	6.1
	Caucasian (C)	653	78.2
	Asian (M)	48	5.7
	American Indian (R)	13	1.6
	Hispanic (H)	53	6.3
	Other (X)	10	1.2
	Unknown (Z)	7	.8

4.3 Data

Each variable was analyzed for skewness, and kurtosis. The data were analyzed using the methods suggested by Hoaglin, Mosteller, and Turkey (1991). Only one variable (transcendence) was found with a skewness of +/- 0.8. No corrections were made.

4.3.1 Correlations Among Study Variables

The correlation matrix between the NEO-PI-R and the VIA-IS variables and 2-tailed significance tests is show in Table 4.

Table 2: Correlations

	Neuro	Extra	Open	Agree	Cons	Wis	Cour	Hum	Just	Temp	Trans
Neuro	1	-.324(**)	-.023	-.223(**)	-.385(**)	-.390(**)	-.418(**)	-.217(*)	-.170	-.277(**)	-.166
Extra	-.324(**)	1	.352(**)	.150(**)	.241(**)	.316(**)	.248(*)	.479(**)	.262(**)	.030	.398(**)
Open	-.023	.352(**)	1	.168(**)	.021	.221(*)	.042	.178	.147	.020	.275(**)
Agree	-.223(**)	.150(**)	.168(**)	1	.173(**)	.217(*)	.195	.341(**)	.470(**)	.644(**)	.372(**)
Cons	-.385(**)	.241(**)	.021	.173(**)	1	.420(**)	.393(**)	.203(*)	.274(**)	.463(**)	.232(*)
Wis	-.390(**)	.316(**)	.221(*)	.217(*)	.420(**)	1	.789(**)	.664(**)	.593(**)	.451(**)	.691(**)
Cour	-.418(**)	.248(*)	.042	.195	.393(**)	.789(**)	1	.650(**)	.627(**)	.485(**)	.684(**)
Hum	-.217(*)	.479(**)	.178	.341(**)	.203(*)	.664(**)	.650(**)	1	.731(**)	.467(**)	.787(**)
Just	-.170	.262(**)	.147	.470(**)	.274(**)	.593(**)	.627(**)	.731(**)	1	.699(**)	.674(**)
Temp	-.277(**)	.030	.020	.644(**)	.463(**)	.451(**)	.485(**)	.467(**)	.699(**)	1	.518(**)
Trans	-.166	.398(**)	.275(**)	.372(**)	.232(*)	.691(**)	.684(**)	.787(**)	.674(**)	.518(**)	1

** Correlation is significant at the 0.01 level (2-tailed).

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

The matrix above shows the correlations between the factors from the NEO-PI-R and the VIA-IS for two tailed test significant to the $p < .05$ level. A review of the correlation matrix indicated that numerous factors are significantly related with each other, thus suggesting a few underlying factors. We examine these correlations further when we test hypothesis 3.

4.3.2 Exploratory Analysis of Demographic Variables

An analysis was conducted to determine the effect of age, gender and race on leadership effectiveness.

Gender. A one-way ANOVA was conducted with gender coded on the leadership effectiveness scores at each time period. Significant main effects were found between gender and leadership effectiveness at Time 1 ($F(1,833) = 7.728, p < .01$), and at

Time 2 ($F(1,833)=16.976, p<.001$). At these two time periods, males scored .1 grades higher on leadership effectiveness score. There was no main effect at Time 3.

Age. A one-way ANOVA was conducted with age on the leadership effectiveness scores at each time period. Significant main effects were found between age and leadership effectiveness at Time 1 ($F(1,833) = 4.303, p<.001$), and at Time 2 ($F(1,833)=3.426, p<.01$).

At these two time periods, older cadets scored higher on leadership effectiveness ratings. There was no main effect at Time 3.

Ethnicity. A one-way ANOVA was conducted with ethnicity coded on the personality and virtue variables. No significant main effects were found.

Because of these statistically significant differences with age and gender, regressions were conducted comparing predictive models with and without controlling for age and gender. Similar predictive results were obtained with both sets of regressions. Therefore, we can reasonably conclude that age, gender, and race did not significantly impact the tested models.

4.4 Test of Hypothesis

4.4.1 Hypothesis 1

This hypothesis posited that a positive relationship exists between agreeableness, conscientiousness, and extraversion with leadership effectiveness. Results showed that only *conscientiousness* was a consistent predictor of leadership effectiveness.

The intent of this test was to discover which components of the NEO-PI-R are significant predictors of leadership effectiveness. I tested the full model of all five independent variables of the NEO-PI-R at each of the three time periods. Multivariate regression analysis of the NEO-PI-R at Time 1 yielded a statistically significant model ($F(2,832)=91.6, p<.001$), with conscientiousness and neuroticism as significant predictors. Specific β weights for variables included in this model are as follows: conscientiousness ($\beta=.455, p<.001$) and neuroticism ($\beta=.114, p=.001$). Regression analysis of the NEO-PI-R at Time 2 yielded a statistically significant model ($F(1,833)=144.5, p<.001$), with only conscientiousness as the overall significant predictor. Specific β weight for the variable included in this model follows: conscientiousness ($\beta=.384, p<.001$). Regression analysis of the NEO-PI-R at Time 3 yielded a statistically significant model ($F(2,832)=47.8, p<.001$), with conscientiousness and neuroticism as significant predictors. Specific β weights for variables included in this model are as follows: conscientiousness ($\beta=.343, p<.001$) and neuroticism ($\beta=.082, P<.05$). There were no significant two-way interactions between these terms. Overall, when considered in the presence of other predictors, conscientiousness was a significant predictor of leadership effectiveness at all three times. Complete NEO-PI-R regressions tables are located in Appendix H.

4.4.2 Hypothesis 2

This hypothesis posited that a positive relationship exists between humanity and justice and leadership effectiveness due to the strong impact of competency, trust and

loyalty on a leader. Results showed that humanity and justice were related to leadership effectiveness, but only at Time 1 and humanity was negatively related.

Multivariate regression analysis of the VIA-IS at Time 1 yielded a statistically significant model ($F(2,119)=35.6, p<.05$), with negative humanity and justice as significant predictors. Specific β weights for variables included in this model are as follows: humanity ($\beta=-.387, p<.05$) and justice ($\beta=.309, p<.05$). At Time 2 and at Time 3, the overall model was not significant. Overall, humanity and justice were the only significant predictors of leadership effectiveness and only at Time 1. There were no significant two-way interactions between these terms. Contrary to a priori hypothesis, negative humanity (*love, kindness, and social intelligence*) was actually related to leadership effectiveness in the presence of justice at Time 1. Complete VIA-IS regressions tables are located in Appendix I.

4.4.3 Hypothesis 3

Based on the idea that personality traits and virtues together may have better predictive ability than either instrument alone, this hypothesis posited that a combined model using conscientiousness, temperance, agreeableness and humanity will best predict leadership effectiveness over time.

Multivariate regression analysis of the independent variables at Time 1 yielded a statistically significant model ($F(3,118)=7.600, p<.001$), with conscientiousness,

agreeableness, and negative humanity as significant predictors. Specific β weights for variables included in this model are as follows: conscientiousness ($\beta=.305$, $p<.01$), and agreeableness ($\beta=.247$, $p<.05$), and humanity ($\beta=-.282$, $p<.01$). Time 2 yielded a statistically significant model ($F(1,105)=7.293$, $p<.01$). Conscientious ($\beta=.266$, $p<.01$) was a significant predictor at Time 2. Time 3 yielded a statistically significant model ($F(1,96)=4.122$, $p<.05$). Negative openness ($\beta=-.203$, $p<.05$) was the only significant predictor at Time 3. There were no significant two-way interactions between these terms.

Overall, the combined model suggests that there is predictive validity to a combined model using the NEO-PI-R and the VIA-IS. Specifically, the factors of agreeableness, conscientiousness were positive predictors, and humanity and openness are negative predictors of leadership effectiveness at one or more times. However, which factors predict at each point in time varies greatly. This variation suggests that the personality variables and virtue variables that associate with leadership effectiveness change over time; and/or there may exist different leadership effectiveness trajectories for individuals with distinct personality and virtue patterns. The next hypothesis examines this possibility. Complete NEO-PI-R and VIA-IS regressions tables are located in Appendix I.

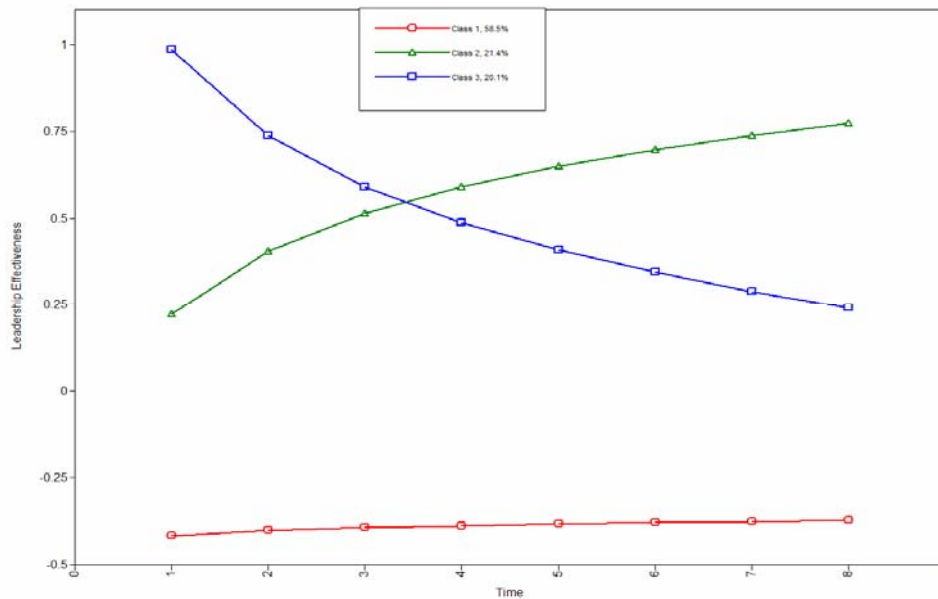
4.4.4 Hypothesis 4

The above results suggest that there exist patterns of personality traits and character variables that predict leadership effectiveness over time. The results also suggest that the patterns that effectively predict at Time 1 may not predict at Time 2 or Time 3. In short, the above hypotheses do not account for differing developmental trajectories over time. Furthermore, clusters of personality characteristics may exist which predicts these different leadership effectiveness trajectories. The research hypothesized that there exist five distinct trajectories of leadership effectiveness over time where individuals would remain constant (high, medium, or low effectiveness), increase in effectiveness, or decrease in effectiveness (see Figure 1). Specifically, in terms of stable trajectories over time, I predicted cadets high on conscientiousness and temperance will consistently rate high in leadership effectiveness. Cadets high on openness and transcendence will consistently score average. Cadets low on conscientiousness and high in neuroticism and low in temperance will consistently score low. For the trajectories which show change in leadership effectiveness overtime, I predicted cadets who score high on extraversion and low on neuroticism will show a downward trend and cadets who score low on extraversion but high on conscientiousness will show an upward trend.

The analysis for this hypothesis was conducted by combining trajectory modeling with latent class analysis using the M-Plus statistical package by Muthen and

Muthen (2004). This analysis was conducted in two stages. First, I constructed latent growth models of leadership effectiveness over two and a half years. Next, latent growth models compare the intercepts at each time with the population intercepts. Overall, the model calculates each individual's probability of membership in a particular class. The best fitting model produced three distinct leadership effectiveness trajectories. Results from the baseline trajectories are shown in Figure 2.

Figure 2: Leadership Effectiveness Trajectories Over 2 ½ Years



The trajectory patterns indicated that three distinct leadership effectiveness developmental trajectories existed in the cadet data. One group of cadets (Class 1) remains relatively consistent, another group (Class 2) increases in effectiveness, and the final group (Class 3) decreases over time. While the overall hypothesis that there exist distinct and identifiable leadership effectiveness trajectories is correct (see Appendix J),

contrary to my initial hypothesis of five trajectories, only three distinct trajectories of leadership effectiveness emerged from the data. These results were obtained using the model's Bayesian Information Criterion (BIC) sample-size adjusted score. BIC is a goodness-of-fit measure derived from the log-likelihood index. It provides a baseline measure of fit to compare models proposing multiple developmental trajectories. Lower values represent better model fit.

Next, again using M-Plus, the analysis uncovered latent classes of individuals with distinct profiles for three class trajectories in leadership effectiveness. The model associated personality profiles with the three unique leadership effectiveness trends.

This procedure was conducted three times to create profiles based on the NEO-PI-R, on the VIA-IS, and on a combined model based using only the personality and virtue variables identified by Hypothesis 1 through 3 as having potential to predict leadership effectiveness: extraversion, agreeableness, conscientiousness, openness, humanity, justice, temperance, and transcendence.

The model utilizing the NEO-PI-R revealed three latent personality classes with 43% in Class 1, 23% in Class 2, and 34% in Class 3. The three classes were significantly different on all personality measures ($p < .01$). See Table 5 for a listing of the standardized means for each personality factor by class.

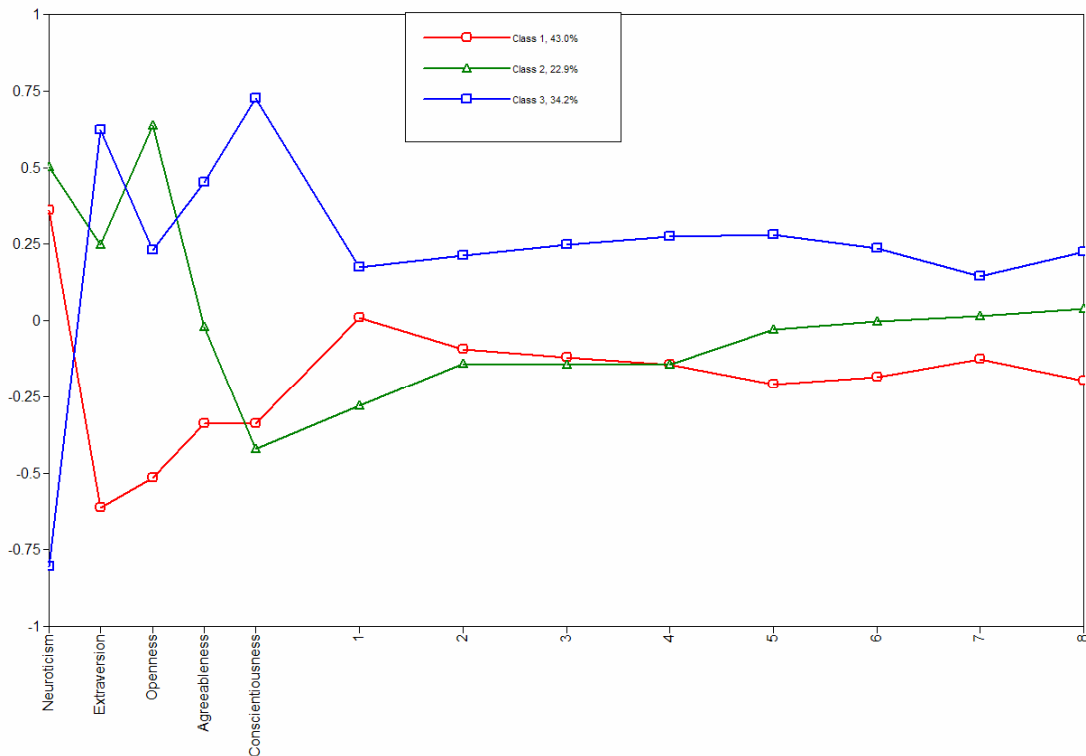
Table 3: NEO-PI-R Means and Percentage by Class

	Class 1 (43%)	Class 2 (23%)	Class 3 (34%)
Neuroticism	.362	.506	-.798
Extraversion	-.615	.241	.624
Openness	-.523	.640	.228
Agreeableness	-.336	-.028	.453
Conscientiousness	-.323	-.411	.741

The means for each personality factor by class are depicted in Figure 3 to graphically represent the personality profile for each class. In addition, the standardized residual variances for leadership effectiveness at the eight time periods measured ranged from .471 to .769, suggesting that the personality variables accounted for approximately half of the leadership effectiveness scores.

As expected, the personality variables from the NEO-PI-R contributing the most to each class (as determined by the intercepts of each variable in the model) are: Class 1, conscientiousness, Class 2, conscientiousness and openness, and Class 3, conscientiousness. The graph below visually depicts the personality profiles associated with three leadership effectiveness trends over a two and a half year study.

Figure 3: NEO-PI-R Variables Associated with Leadership Trajectories



Mean scores for each personality factor in a particular class are reported in standard deviations. Class 1 is characterized by extremely low extraversion (mean = -.615), and openness (mean = -.523), low agreeableness (mean = -.336) and conscientiousness (mean = -.323), and high neuroticism (mean = .362). These individuals show a downward trajectory in leadership effectiveness over time. Class 2 is characterized by extremely high neuroticism (mean = .506) and openness (mean = .640), and low conscientiousness (mean = -.411). These individuals show an upward trajectory in leadership effectiveness over time. Class 3 is characterized by extremely low neuroticism (mean = -.798), extremely high conscientiousness (mean = .741) and

extraversion (mean = .624), and high agreeableness (mean = .453). These individuals consistently rate high in leadership effectiveness. Sample-size adjusted BIC for the NEO-PI-R model is 31241.710.

The mixture model utilizing the VIA-IS revealed three latent personality classes with 17% in Class 1, 53% in Class 2, and 30% in Class 3. The three classes were significantly different on all personality measures ($p < .01$). See Table 4 for the means of each virtue variable within each class.

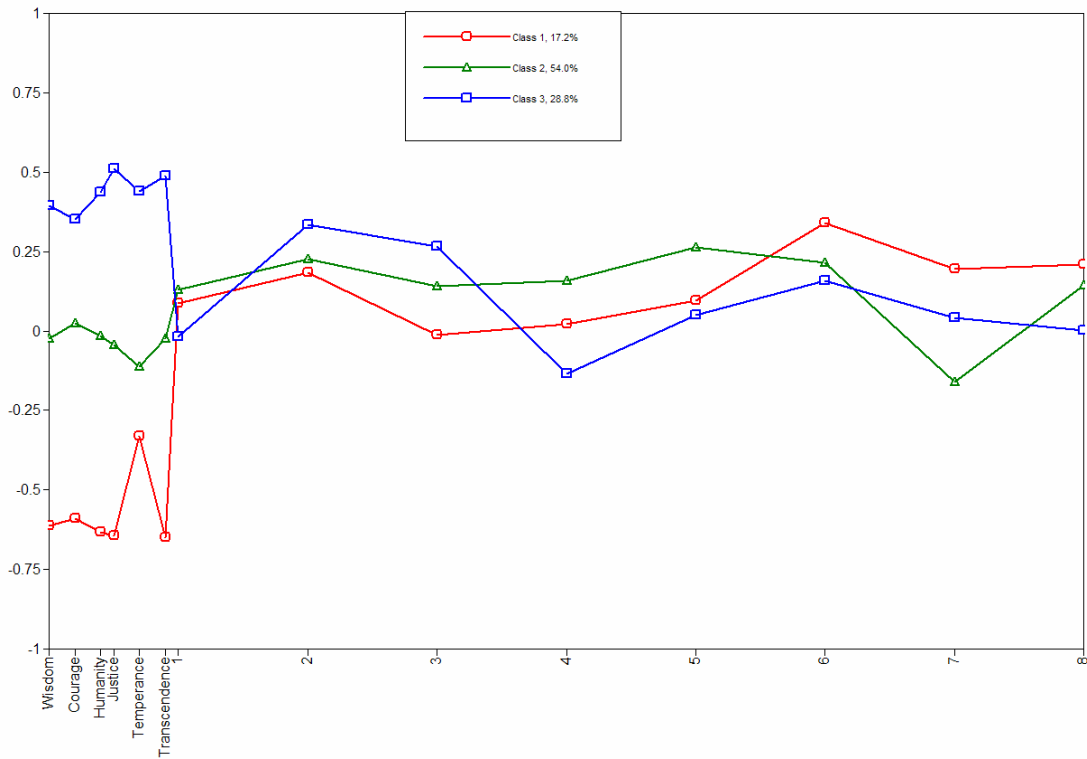
Table 4: VIA-IS Means and Percentage by Class

	Class 1 (17%)	Class 2 (53%)	Class 3 (30%)
Wisdom	-.614	-.023	.395
Courage	-.590	.025	.351
Humanity	-.634	-.015	.439
Justice	-.644	-.044	.512
Temperance	-.331	-.111	.440
Transcendence	-.650	-.024	.490

Based on the empirical results in Hypothesis 2, I would have expected humanity and justice to have the largest effect size. However, the virtue variables contributing the most to each class are: Class 1, wisdom, Class 2, humanity, and Class 3, transcendence (see Appendix L). The standardized residual variances for leadership effectiveness at the eight time periods measured ranged from .520 to .867 suggesting that the variables in this model did not account for variations in leadership effectiveness scores as much as

the previous model. The graph below visually depicts the VIA-IS profiles associated with the three leadership effectiveness trends over a two and a half year study.

Figure 4: VIA-IS Variables Associated with Leadership Trajectories



As evident in Figure 4, the VIA-IS variables are associated with leadership effectiveness trajectories and the trajectories are significantly different ($p < .01$). Sample size adjusted BIC for the VIA-IS model is 2407.031. This is a significantly better model fit than found using the NEO-PI-R model. However, the associated virtue profiles associated with each trajectory do not appear to impact on a consistent trajectory of leadership effectiveness. For example, Class 3 intersects Class 2 at four separate times indicating that these two group do not conform to predictable developmental trajectories.

Although the trajectories depicted in Figure 4 are statistically significant, they appear to have little useful interpretation. Therefore, I examined an overall model using the significant personality factors and virtue variable from Hypotheses 1 through 3.

The third and final mixture model combined the significant result of the variables identified as having potential to predict leadership effectiveness at one or more points in time: extraversion, agreeableness, conscientiousness, openness, humanity, justice, temperance, and transcendence. These eight variables were used in the mixture model in conjunction with the three identified leadership effectiveness trajectories. This model revealed three latent classes with 12% in Class 1, 51% in Class 2, and 37% in Class 3. See Table 5 for the means of each included variable reported in standard deviations.

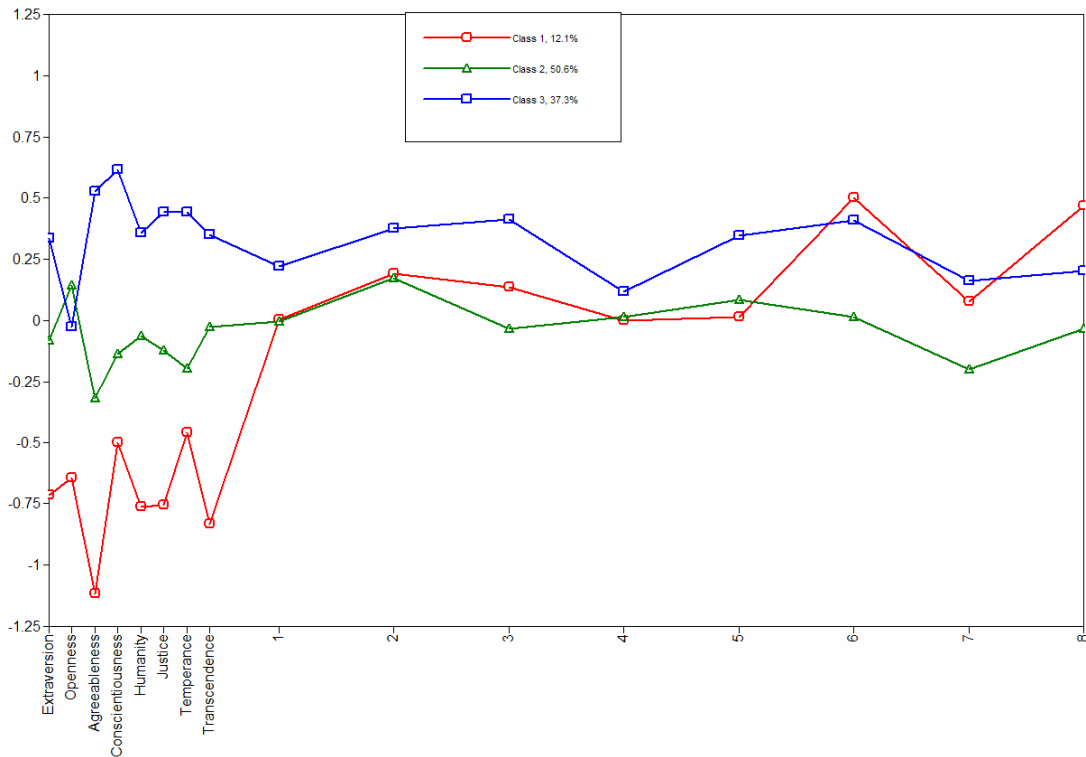
Table 5: Combine Model Means and Percentage by Class

	Class 1 (12%)	Class 2 (51%)	Class 3 (37%)
Extraversion	-.714	-.081	.334
Openness	-.647	.142	-.025
Agreeableness	-1.118	-.320	.529
Conscientiousness	-.501	-.138	.616
Humanity	-.763	-.061	.356
Justice	-.756	-.120	.444
Temperance	-.460	-.196	.443
Transcendence	-.832	-.026	.350

The variables contributing the most to each class are: Class 1, extraversion, agreeableness, and conscientiousness, Class 2, extraversion and agreeableness, and Class 3, agreeableness and conscientiousness (see Appendix M). Note that the factors of the

VIA-IS did not significantly contribute to the model in the presence of the NEO-PI-R factors. The standardized residual variances for leadership effectiveness at the eight time periods measured ranged from .520 to .926. The three classes were significantly different on all personality measures ($p < .01$). The graph below visually depicts the combined profiles associated with three leadership effectiveness trends.

Figure 5: Combined Model Variables Associated with Leadership Trajectories



These developmental trajectories created from the mixture model have significant implications. This is the only model where individual trends remain consistent or increase in leadership effectiveness. Unlike the previous models, these patterns of traits are associated with more consistent performance and possibly suggest an upward

developmental trends for certain individuals. Class 1, with an upward performance trajectory, is characterized by extremely low extraversion (mean = $-.714$), agreeableness (mean = -1.118) and conscientiousness (mean = $-.501$). Class 2, with consistently average performance, is characterized by low agreeableness (mean = $-.320$). Class 3, with consistently high leadership effectiveness, is characterized by extremely high agreeableness (mean = $.529$) and conscientiousness (mean = $.616$). These patterns are similar to the results found using linear regression in Hypothesis 1, but they begin to allow us to separate the characteristics of individuals associated with distinct developmental trajectories. Overall, the sample size adjusted BIC for the combined model is 3429.714. Statistically, the combined model's goodness-of-fit is stronger than the NEO-PI-R model and weaker than the VIA-IS model. However, the trajectories for the combined model provide distinct patterns of leadership effectiveness. The discussion section further examines the findings from this study.

5. Discussion

We discuss our results in three sections. First, a summary of the major findings of the study are presented. Second, interpretations of the findings are presented in an attempt to place the overall results into a broader context. Third, recommendations are made for future research.

5.1 The Study's Major Findings

First, Stogdill's (1974) assertion that personality is related to leadership effectiveness appears to be valid. The analysis suggests that there exist significant correlations between personality variables, virtues, and leadership effectiveness. This study found that eight of eleven predictor variables (extraversion, agreeableness, conscientiousness, openness, humanity, justice, temperance, and transcendence) were significant predictors of leadership effectiveness at discrete points in time. However, this study failed to find a single set of variables, except conscientiousness, that predicted leadership effectiveness at each discrete point in time.

When we examined the relationship between the NEO-PI-R traits and leadership effectiveness, conscientiousness was significantly related to leadership effectiveness at all three time periods and neuroticism was significantly correlated at Time 1 and Time 2. Individuals high on conscientiousness generally display competence, deliberation, a need for achievement and a strong duty concept. Individuals high on neuroticism

display anxiety, impulsiveness, and self-consciousness. At first appearance, these traits seem polar opposite. Yet, they begin to merge together to form a pattern of effective leadership. These individuals display attention to detail, are flexible and adaptive, and are self-aware. Recall, the opening story of how we each approach the obstacle course wall. The pattern of effective leaders we see is an individual who successfully attacks any “obstacle course” with conscientiousness (i.e. competence and deliberation) yet, at the same time, still conveys urgency and awareness of the needs of subordinates and the surrounding environment. Overall, this model begins to portray a leader who focuses on detail while having the ability to relate to and motivate others. Followers can identify and relate with this leader. As a result, followers believe they have access to this leader ultimately leading to higher levels of effectiveness.

When we examine the VIA-IS variables related to leadership effectiveness, negative humanity and justice were significant predictors, but only at Time 1. Recall that Time 1 leadership score represents a measure of followership. Therefore, it is reasonable to conclude that the traits of effective followers do not necessarily represent the traits of effective leaders. Humanity, including kindness and social intelligence, has a negative relationship with leadership effectiveness. We do not look for the followers who can just get along. As a leader, we are looking for more out of our subordinates. Specifically, justice (i.e. responsibility and loyalty) is valued because this trait represents

a follower who can be trusted by the leader. Overall, justice and negative humanity best predict followership.

In addition to the significant traits identified above, when we combine the two models, agreeableness is significant at Time 1 and negative openness is significant at Time 3. Effective leaders display low levels of fantasy and are not ruled by their feelings. Again, these findings suggest that the personality traits of effective followers are distinct from the personality traits of effective leaders.

What begins to emerge is a portrait of an effective leader based on personality traits and virtues. The leader's personality traits and virtues impact on behavior and, in turn, manifest themselves in follower perceptions. Individuals who display self-discipline, competence, dutifulness, and who are aggressive while maintaining self-awareness of themselves and their environments are seen as effective leaders. Specifically, these individuals relate well to their subordinates. The ability to relate to their subordinates allows these followers to feel that they have access to the leader. In addition to gaining access, subordinates also find these leaders to be admirable due to the effectiveness of their personal style and adaptability. However, there are clearly distinct patterns of personality traits and virtues that predict effective followership from leadership effectiveness. In other words, there are unique developmental pathways in leadership.

Overall, these findings suggest that there are developmental trajectories in leadership effectiveness where the personality variables that predict followership do not predict direct (immediate supervisor) leadership or indirect (two or more hierarchical levels) of leadership. Therefore, these possible developmental trajectories were explored.

Initially, I examined the correlations between the NEO-PI-R and the VIA-IS. (See Table 4 for correlations.) As expected, there is significant overlap between the two instruments. Given the findings above that conscientiousness was the single best predictor of leadership effectiveness, I examined the VIA-IS factors significantly correlated with conscientiousness. Interestingly, all six factors of the VIA-IS are significantly correlated with values ranging from $r=.203$ to $r=.463$.

Second, three distinct leadership effectiveness trajectories exist. In terms of leadership effectiveness, individuals remain consistent, increase or decrease in performance. Using latent class analysis, these three developmental trajectories correspond with unique clusters of predictor variables. A combined model utilizing the eight significant variables discussed above. Using mixture modeling, all three models significantly predicted the three developmental trajectories. Statistically, the model based on the VIA-IS had the best goodness-of-fit. However, I found this model uninterruptible due to the lack of consistent developmental trajectories.

Overall, the combined model using extraversion, agreeableness, conscientiousness, openness, humanity, justice, temperance, and transcendence provided the best interpretable model in explaining the variable clusters or classes corresponding to the three distinct leadership effectiveness trajectories. Four independent variables (extraversion, agreeableness, conscientiousness, and temperance), account for most of the between group variance. In other words, these four variables carry the most weight in predicting leadership effectiveness. First, individuals who scored lower than average on extraversion, agreeableness, conscientiousness, and temperance demonstrated an upward trajectory in leadership effectiveness. Next, individuals who scored average on extraversion, agreeableness, conscientiousness, and temperance started average and showed no change in leadership effectiveness ratings. Lastly individuals who ranked above average on extraversion, agreeableness, conscientiousness, and temperance started high and remained high in leadership effectiveness ratings (see Figure 4 for leadership effectiveness trajectories).

There are two interpretations of these findings. First, there are individuals who are not effective followers, but become effective leaders. In other words, the personality traits and virtues clusters of the individuals who rate low in effectiveness (i.e. low extraversion, agreeableness, conscientiousness, and temperance) as followers, allow them to become increasingly more effective as they provide purpose, direction, and motivation to others. In contrast, individuals who consistently rank high in leadership

effectiveness consist have above average extraversion, agreeableness, conscientiousness, and temperance. These individuals perform well as both followers and leaders.

The second interpretation of these findings suggests that, in the study's environment, individuals might actually learn to change their behavioral tendencies. One possible explanation to these results is that individuals actually increase in extraversion, agreeableness, conscientiousness, and temperance as a result of natural maturation or the structured environment of a military academy. Further research would have to be done to explore this possible explanation.

Based on the findings, we conclude that certain personality traits and virtues are significantly related to leadership effectiveness. Furthermore, these two constructs could be modified and combined to better predict leadership effectiveness. Finally, there exist personality and virtue factors clusters or groups that predict distinct developmental trajectories of leadership effectiveness. These findings have broad implications for leader developers. First, there is a distinct profile of individuals who consistently perform above average in leadership effectiveness. Second, there is a group who increase in effectiveness over time. Training and self-awareness may accelerate or strengthen this increase in effectiveness. And third, there is a group of individuals who demonstrate a flat trajectory over time. A unique leader development program may be needed for these individuals to move from average to above average in leadership effectiveness.

5.2 Limitations of the Study

Some researchers may criticize this study due to its use of a cadet sample; the subjects are relatively young and were already selected because of their demonstrated leadership potential. The predictors utilized in this study may perform differently in a more mature sample such as business, government, or military units.

In addition, in this study, context was limited to a military academy. In the military, rank, but not necessarily leadership effectiveness, is a determinant of being in a leadership position. A military chain-of-command exerts influence where the normal tendency is to obey orders regardless of your personality cluster. The trend towards obedience is not necessarily a function of leadership effectiveness, but rather the result of institutional support within a hierarchical organization. In this type of hierarchy, individual differences may blend with rank. As a result, personality maybe less relevant in a military setting. In fact, it maybe that in hierarchical organizations, such as the military, personality plays a smaller role in leadership effectiveness.

On the other hand, what appears to be a limitation of the study may be a potential strength. In the military, leadership effectiveness may result from a person's ability the receive information from a superior and disseminate the orders to subordinates. In such a role, personality may not impact evaluated effectiveness as much as in other non-hierarchical organizations. As such, differences in personality and

virtue predictors of leadership effectiveness may actually be underrepresented in the studies population and these findings would be stronger in other contexts.

Further research in this area should be focused in two areas. First, one plausible explanation of the findings was there was actually a change in behavioral tendencies over the two and a half years of the study. Future studies relating personality and leadership effectiveness should measure personality change or consistency longitudinally. Second, although conscientious was by far the most significant predictor of leadership effectiveness, this study did not examine the subordinate facets of conscientiousness or other predictor variables to further explain the findings. Subsequent research should consider the subordinate facets, particularly of conscientiousness, that may help explain predictors of leadership effectiveness.

In addition, future research might utilize other measures of leadership effectiveness so see if the relationship holds true. For example, another measure of leadership effectiveness might use composite scores of evaluations such as 360-degree feedback from subordinate, peer, and superior ratings, obtained ranks, and advanced service school selections.

5.3 Conclusion

The main question asked and investigated in the current paper is “how do we develop better leaders?” In order to begin answering this question, the study examined personality factors and virtues that correlate with leadership effectiveness in military

environments over time. This study found that conscientiousness is the most significant predictor. These results were consistent in the direction of the findings with previous research. However, when evaluated utilizing latent growth curves and mixture modeling, extraversion, agreeableness, conscientiousness and temperance allow for the prediction of not only leadership effectiveness, but distinct developmental trajectories as well. Based on the results, we can reach several conclusions.

First, personality has a significant impact on leadership effectiveness. The differences in personality are evident when measured using a five-factor model of agreeableness, conscientiousness, extraversion, neuroticism, and openness. Across three different leader effectiveness trajectories, personality was significantly associated with leadership effectiveness.

Second, contrary to expected findings, virtues do not significantly predict leadership effectiveness consistently over time. However, when the personality variables and values are combined and examined using latent growth curve analysis, three distinct leadership effectiveness trajectories emerge. The three trajectories are best predicted by the personality and virtue factors of extraversion, agreeableness, conscientiousness, and temperance.

The implications are clear: given the increased emphasis on developing leaders in organizations, a further understanding of personality factors and virtue variables is warranted. As evident in numerous business scandals, natural disasters, and armed

conflicts, we will increasingly rely on effective leaders to provide purpose, direction and motivation to others. By identifying emergent leader's traits and tailoring leadership training to unique groups of people, we can better answer the question, "How do we produce more effective leaders?"

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Biography

Dennis P. O'Neil

Major Dennis O'Neil serves on the faculty of the Department of Behavioral Sciences and Leadership at the United States Military Academy where he is an Assistant Professor of Leadership and Psychology.

Dennis brings years of studying, practicing, teaching and coaching the art and science of effective leadership. His passion is in assisting individuals and groups to achieve optimal performance and strategy execution through building leadership aptitude. Dennis' expertise is in teaching emergent leadership and building teams.

Originally from Everett, Washington, Major O'Neil entered active duty in the Army in 1994. His leadership background consists of an array of operational assignments. His most recent tactical positions were as commander of a headquarters company and a tank company in Fort Hood, Texas. Dennis worked with the National Military Academy of Afghanistan to establish their Psychology and Leadership programs.

He holds a Bachelor's degree in Management from the United States Military Academy, as well as Masters and Doctoral degrees in Social and Developmental Psychology from Duke University. For the Army, he is a research psychologist where he designs online assessments focused on developing self-awareness within individuals. Dennis' research interests primarily focus on personality correlates of leadership effectiveness.

Appendix A: The Big Five Facets

The NEO PI-R Facets of the Big Five

Big Five	Dimension	Facet
N	Neuroticism vs. Emotional Stability	Anxiety Angry hostility Depression Self-consciousness Impulsiveness Vulnerability
E	Extraversion vs. Introversion	Gregariousness Assertiveness Activity Excitement-seeking Positive emotions
O	Openness vs. Closed to experience	Warmth Ideas Fantasy Aesthetics Actions Feelings Values
A	Agreeableness vs. Antagonism	Trust Straightforwardness Altruism Compliance Modesty Tender-mindedness
C	Conscientiousness vs. Lack of Direction	Competence Order Dutifulness Achievement striving Self-discipline Deliberation

(John & Srivastava, 1999, p. 130)

Appendix B: Classification of Character Strengths

The VIA-IS Facets of Character Strength

	Dimension	Facet
W	Wisdom and Knowledge	Creativity (originality, ingenuity) Curiosity (interest, novelty-seeking, openness to experience) Open-Mindedness (judgment, critical thinking) Love of Learning
C	Courage	Perspective (wisdom) Bravery (valor) Persistence (perseverance, industriousness) Integrity (authenticity, honesty)
H	Humanity	Vitality (zest, enthusiasm, vigor, energy) Love Kindness (generosity, nurturance, care, compassion, altruistic love, nice-ness) Social Intelligence (emotional intelligence, personal intelligence)
J	Justice	Citizenship (social responsibility, loyalty, teamwork) Fairness Leadership
T	Temperance	Forgiveness and Mercy Humility and Modesty Prudence
Tr	Transcendence	Self-regulation (self-control) Appreciation of Beauty and Excellence (awe, wonder, elevation) Gratitude Hope (optimism, future-mindedness, future orientation) Humor (playfulness) Spirituality (religiousness, faith, purpose)

Appendix C: NEO PI-R Survey Guidance

MEMORANDUM FOR PL100 STUDENTS

SUBJECT: The Five-Factor Model of Personality

1. A personality trait is a tendency to behave in a certain manner in a variety of situations. Most approaches to studying personality assume that certain traits are more basic or all encompassing than others. Paul Costa and Robert McCrae used factor analysis to derive five overarching traits or a Five Factor Model. The Five Factor Model organizes personality traits hierarchically into five broad domains Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness. These five domains are oftentimes referred to as the “Big-Five” in personality profiles. Each of these domains consists of six specific facet scales. The NEO PI-R you are about to take helps assesses personality at both levels, with six specific facet scales in each of the five broad domains.

2. NEO PI-R stands for Neuroticism, Extraversion, Openness Personality Inventory Revised. The NEO PI-R was developed to operationalize the five-factor model of personality, a representation of the structure of traits. The NEO PI-R is a widely utilized instrument that has published norms and a record of reliability, validity, and predictive utility. The questionnaire consists of 240

questions. The results of this personality test will allow you to statistically compare your answers to the average responses of other adults. Because this inventory is based solely on your self-report, the quality of the feedback will be directly related to your time and diligence as you complete the questionnaire. During Lesson 33, you will receive the results of your NEO PI-R from your instructor. The goal of this assessment is to offer you insight and self-awareness on how you generally behave in a variety of situations.

3. You will also take this assessment your Second Class year during PL300-Leadership. At that time, you will be able to compare the results of your Plebe and Cow year NEO PI-Rs. This material should be integrated with all other sources of information to offer you insights into your behavior tendencies.

4. **Taking the NEO PI-R is a PL100 course requirement.** This report is confidential and the results are only intended for your professional development. However, allowing your results to be utilized for research is voluntary. You are encouraged to allow your survey data to be included in a research database. This database is coded to remove any identifying data. You will indicate your decision on the informed consent form provided by your instructor. Direct questions about research to your PL100 instructor.

5. As a significant leadership development tool offering you insight into your own personal behavioral tendencies, I highly encourage you to invest the time to complete the NEO PI-R accurately and completely. Feel free to contact your PL100 instructor if you have any questions.

Appendix D: NEO PI-R Questions

- 1 I am not a worrier.
- 2 I really like most people I meet.
- 3 I have a very active imagination.
- 4 I tend to be cynical and skeptical of others' intentions.
- 5 I'm known for my prudence and common sense.
- 6 I often get angry at the way people treat me.
- 7 I shy away from crowds of people.
- 8 Aesthetic and artistic concerns aren't very important to me.
- 9 I'm not crafty or sly.
- 10 I would rather keep my options open than plan everything in advance.
- 11 I rarely feel lonely or blue.
- 12 I am dominant, forceful, and assertive.
- 13 Without strong emotions, life would be uninteresting to me.
- 14 Some people think I'm selfish and egotistical.
- 15 I try to perform all the tasks assigned to me conscientiously.
- 16 In dealing with other people, I always dread making a social blunder.
- 17 I have a leisurely style in work and play.
- 18 I'm pretty set in my ways.
- 19 I would rather cooperate with others than compete with them.
- 20 I am easy-going and lackadaisical.
- 21 I rarely overindulge in anything.
- 22 I often crave excitement.
- 23 I often enjoy playing with theories or abstract ideas.
- 24 I don't mind bragging about my talents and accomplishments.
- 25 I'm pretty good about pacing myself so as to get things done on time.
- 26 I often feel helpless and want someone else to solve my problems.
- 27 I have never literally jumped for joy.
- 28 I believe letting students hear controversial speakers can only confuse and mislead them.
- 29 Political leaders need to be more aware of the human side of their policies.
- 30 Over the years I've done some pretty stupid things.
- 31 I am easily frightened.
- 32 I don't get much pleasure from chatting with people.
- 33 I try to keep all my thoughts directed along realistic lines and avoid flights of fancy.
- 34 I believe that most people are basically well-intentioned.
- 35 I don't take civic duties like voting very seriously.
- 36 I'm an even-tempered person.
- 37 I like to have a lot of people around me.

- 38 I am sometimes completely absorbed in music I am listening to.
- 39 If necessary, I am willing to manipulate people to get what I want.
- 40 I keep my belongings neat and clean.
- 41 Sometimes I feel completely worthless.
- 42 I sometimes fail to assert myself as much as I should.
- 43 I rarely experience strong emotions.
- 44 I try to be courteous to everyone I meet.
- 45 Sometimes I'm not as dependable or reliable as I should be.
- 46 I seldom feel self-conscious when I'm around people.
- 47 When I do things, I do them vigorously.
- 48 I think it's interesting to learn and develop new hobbies.
- 49 I can be sarcastic and cutting when I need to be.
- 50 I have a clear set of goals and work toward them in an orderly fashion.
- 51 I have trouble resisting my cravings.
- 52 I wouldn't enjoy vacationing in Las Vegas.
- 53 I find philosophical arguments boring.
- 54 I'd rather not talk about myself and my achievements.
- 55 I waste a lot of time before settling down to work.
- 56 I feel I am capable of coping with most of my problems.
- 57 I have sometimes experienced intense joy or ecstasy.
- 58 I believe that laws and social policies should change to reflect the needs of a changing world.
- 59 I'm hard-headed and tough-minded in my attitudes.
- 60 I think things through before coming to a decision.
- 61 I rarely feel fearful or anxious.
- 62 I'm known as a warm and friendly person.
- 63 I have an active fantasy life.
- 64 I believe that most people will take advantage of you if you let them.
- 65 I keep myself informed and usually make intelligent decisions.
- 66 I am known as hot-blooded and quick-tempered.
- 67 I usually prefer to do things alone.
- 68 Watching ballet or modern dance bores me.
- 69 I couldn't deceive anyone even if I wanted to.
- 70 I am not a very methodical person.
- 71 I am seldom sad or depressed.
- 72 I have often been a leader of groups I have belonged to.
- 73 How I feel about things is important to me.
- 74 Some people think of me as cold and calculating.
- 75 I pay my debts promptly and in full.
- 76 At times I have been so ashamed I just wanted to hide.

- 77 My work is likely to be slow but steady.
- 78 Once I find the right way to do something, I stick to it.
- 79 I hesitate to express my anger even when it's justified.
- 80 When I start a self-improvement program, I usually let it slide after a few days.
- 81 I have little difficulty resisting temptation.
- 82 I have sometimes done things just for "kicks" or "thrills."
- 83 I enjoy solving problems or puzzles.
- 84 I'm better than most people, and I know it.
- 85 I am a productive person who always gets the job done.
- 86 When I'm under a great deal of stress, sometimes I feel like I'm going to pieces.
- 87 I am not a cheerful optimist.
- 88 I believe we should look to our religious authorities for decisions on moral issues.
- 89 We can never do too much for the poor and elderly.
- 90 Occasionally I act first and think later.
- 91 I often feel tense and jittery.
- 92 Many people think of me as somewhat cold and distant.
- 93 I don't like to waste my time daydreaming.
- 94 I think most of the people I deal with are honest and trustworthy.
- 95 I often come into situations without being fully prepared.
- 96 I am not considered a touchy or temperamental person.
- 97 I really feel the need for other people if I am by myself for long.
- 98 I am intrigued by the patterns I find in art and nature.
- 99 Being perfectly honest is a bad way to do business.
- 100 I like to keep everything in its place so I know just where it is.
- 101 I have sometimes experienced a deep sense of guilt or sinfulness.
- 102 In meetings, I usually let others do the talking.
- 103 I seldom pay much attention to my feelings of the moment.
- 104 I generally try to be thoughtful and considerate.
- 105 Sometimes I cheat when I play solitaire.
- 106 It doesn't embarrass me too much if people ridicule and tease me.
- 107 I often feel as if I'm bursting with energy.
- 108 I often try new and foreign foods.
- 109 If I don't like people, I let them know it.
- 110 I work hard to accomplish my goals.
- 111 When I am having my favorite foods, I tend to eat too much.
- 112 I tend to avoid movies that are shocking or scary.
- 113 I sometimes lose interest when people talk about very abstract, theoretical matters.
- 114 I try to be humble.
- 115 I have trouble making myself do what I should.
- 116 I keep a cool head in emergencies.

- 117 Sometimes I bubble with happiness.
I believe that the different ideas of right and wrong that people in other societies have may
118 be valid for them.
- 119 I have no sympathy for panhandlers.
- 120 I always consider the consequences before I take action.
- 121 I'm seldom apprehensive about the future.
- 122 I really enjoy talking to people.
I enjoy concentrating on a fantasy or daydream and exploring all its possibilities, letting it
123 grow and develop.
- 124 I'm suspicious when someone does something nice for me.
- 125 I pride myself on my sound judgment.
- 126 I often get disgusted with people I have to deal with.
- 127 I prefer jobs that let me work alone without being bothered by other people.
- 128 Poetry has little or no effect on me.
- 129 I would hate to be thought of as a hypocrite.
- 130 I never seem to be able to get organized.
- 131 I tend to blame myself when anything goes wrong.
- 132 Other people often look to me to make decisions.
- 133 I experience a wide range of emotions or feelings.
- 134 I'm not known for my generosity.
- 135 When I make a commitment, I can always be counted on to follow through.
- 136 I often feel inferior to others.
- 137 I'm not as-quick and lively as other people.
- 138 I prefer to spend my time in familiar surroundings.
- 139 When I've been insulted, I just try to forgive and forget.
- 140 I don't feel like I'm driven to get ahead.
- 141 I seldom give in to my impulses.
- 142 I like to be where the action is.
- 143 I enjoy working on "mind-twister"-type puzzles.
- 144 I have a very high opinion of myself.
- 145 Once I start a project, I almost always finish it.
- 146 It's often hard for me to make up my mind.
- 147 I don't consider myself especially "light-hearted."
I believe that loyalty to one's ideals and principles is more important than "open-
148 mindedness."
- 149 Human need should always take priority over economic considerations.
- 150 I often do things on the spur of the moment.
- 151 I often worry about things that might go wrong.
- 152 I find it easy to smile and be outgoing with strangers.
If I feel my mind starting to drift off into daydreams, I usually get busy and start
153 concentrating on some work or activity instead.

- 154 My first reaction is to trust people.
- 155 I don't seem to be completely successful at anything.
- 156 It takes a lot to get me mad.
- 157 I'd rather vacation at a popular beach than an isolated cabin in the woods.
- 158 Certain kinds of music have an endless fascination for me.
- 159 Sometimes I trick people into doing what I want.
- 160 I tend to be somewhat fastidious or exacting.
- 161 I have a low opinion of myself.
- 162 I would rather go my own way than be a leader of others.
- 163 I seldom notice the moods or feelings that different environments produce.
- 164 Most people I know like me.
- 165 I adhere strictly to my ethical principles.
- 166 I feel comfortable in the presence of my bosses or other authorities.
- 167 I usually seem to be in a hurry.
- 168 Sometimes I make changes around the house just to try something different.
- 169 If someone starts a fight, I'm ready to fight back.
- 170 I strive to achieve all I can.
- 171 I sometimes eat myself sick.
- 172 I love the excitement of roller coasters.
- 173 I have little interest in speculating on the nature of the universe or the human condition.
- 174 I feel that I am no better than others, no matter what their condition.
- 175 When a project gets too difficult, I'm inclined to start a new one.
- 176 I can handle myself pretty well in a crisis.
- 177 I am a cheerful, high-spirited person.
- 178 I consider myself broad-minded and tolerant of other people's lifestyles.
- 179 I believe all human beings are worthy of respect.
- 180 I rarely make hasty decisions.
- 181 I have fewer fears than most people.
- 182 I have strong emotional attachments to my friends.
- 183 As a child I rarely enjoyed games of make believe.
- 184 I tend to assume the best about people.
- 185 I'm a very competent person.
- 186 At times I have felt bitter and resentful.
- 187 Social gatherings are usually boring to me.
Sometimes when I am reading poetry or looking at a work of art, I feel a chill or wave of
- 188 excitement.
- 189 At times I bully or flatter people into doing what I want them to.
- 190 I'm not compulsive about cleaning.
- 191 Sometimes things look pretty bleak and hopeless to me.
- 192 In conversations, I tend to do most of the talking.

- 193 I find it easy to empathize-to feel myself what others are feeling.
- 194 I think of myself as a charitable person.
- 195 I try to do jobs carefully, so they won't have to be done again.
- 196 If I have said or done the wrong thing to someone, I can hardly bear to face them again.
- 197 My life is fast-paced.
- 198 On a vacation, I prefer going back to a tried and true spot.
- 199 I'm hard-headed and stubborn.
- 200 I strive for excellence in everything I do.
- 201 Sometimes I do things on impulse that I later regret.
- 202 I'm attracted to bright colors and flashy styles.
- 203 I have a lot of intellectual curiosity. .
- 204 I would rather praise others than be praised myself.
- 205 There are so many little jobs that need to be done that I sometimes just ignore them all.
- 206 When everything seems to be going wrong, I can still make good decisions.
- 207 I rarely use words like "fantastic!" or "sensational!" to describe my experiences.
I think that if people don't know what they believe in by the time they're 25, there's
- 208 something wrong with them.
- 209 I have sympathy for others less fortunate than me.
- 210 I plan ahead carefully when I go on a trip.
- 211 Frightening thoughts sometimes come into my head.
- 212 I take a personal interest in the people I work with.
- 213 I would have difficulty just letting my mind wander without control or guidance.
- 214 I have a good deal of faith in human nature.
- 215 I am efficient and effective at my work.
- 216 Even minor annoyances can be frustrating to me.
- 217 I enjoy parties with lots of people.
- 218 I enjoy reading poetry that emphasizes feelings and images more than story lines.
- 219 I pride myself on my shrewdness in handling people.
- 220 I spend a lot of time looking for things I've misplaced.
- 221 Too often, when things go wrong, I get discouraged and feel like giving up.
- 222 I don't find it easy to take charge of a situation.
Odd things-like certain scents or the names of distant places-can evoke strong moods in
- 223 me.
- 224 I go out of my way to help others if I can.
- 225 I'd really have to be sick before I'd miss a day of work.
- 226 When people I know do foolish things, I get embarrassed for them.
- 227 I am a very active person.
- 228 I follow the same route when I go someplace.
- 229 I often get into arguments with my family and co-workers.
- 230 I'm something of a "workaholic."

- 231 I am always able to keep my feelings under control.
- 232 I like being part of the crowd at sporting events.
- 233 I have a wide range of intellectual interests.
- 234 I'm a superior person.
- 235 I have a lot of self-discipline.
- 236 I'm pretty stable emotionally.
- 237 I laugh easily.
- 238 I believe that the "new morality" of permissiveness is no morality at all.
- 239 I would rather be known as "merciful" than as "just."
- 240 I think twice before I answer a question.

Appendix E: The VIA-IS Survey Guidance

VIA Strengths Scale (6/25/01) © VALUES IN ACTION INSTITUTE

We are developing a questionnaire to measure a person's strengths. Could you help with our project by choosing one option in response to each statement? All of the questions reflect statements that many people would find desirable, but we want you to answer only in terms of **whether the statement describes what you are like**. Please be honest and accurate! Because the questionnaire is long, work quickly, and trust your first response. Thank you for helping.

Appendix F: The VIA-IS Survey Questions

- 1 I find the world a very interesting place.
- 2 I always go out of my way to attend educational events.
- 3 I always identify the reasons for my actions
- 4 Being able to come up with new and different ideas is one of my strong points.
- 5 I am very aware of my surroundings.
- 6 I always have a broad outlook on what is going on.
- 7 I have taken frequent stands in the face of strong opposition.
- 8 I never quit a task before it is done.
- 9 I always keep my promises.
- 10 I am never too busy to help a friend.
- 11 I am always willing to take risks to establish a relationship.
- 12 I never miss group meetings or team practices.
- 13 I always admit when I am wrong.
- 14 In a group, I try to make sure everyone feels included.
- 15 I have no trouble eating healthy foods.
- 16 I have never deliberately hurt anyone.
- 17 It is important to me that I live in a world of beauty.
- 18 I always express my thanks to people who care about me.
- 19 I always looks on the bright side.
- 20 I am a spiritual person.
- 21 I am always humble about the good things that have happened to me.
- 22 Whenever my friends are in a gloomy mood, I try to tease them out of it.
- 23 I want to fully participate in life, not just view it from the sidelines.
- 24 I always let bygones be bygones.
- 25 I am never bored.
- 26 I love to learn new things.
- 27 I always examine both sides of an issue.
When someone tells me how to do something, I automatically think of alternative
- 28 ways to get the same thing done.
- 29 I know how to handle myself in different social situations.
- 30 Regardless of what is happening, I keep in mind what is most important.
- 31 I have overcome an emotional problem by facing it head on.
- 32 I always finish what I start.

- 33 My friends tell me that I know how to keep things real.
- 34 I really enjoy doing small favors for friends.
- 35 There are people in my life who care as much about my feelings and well-being as they do about their own.
- 36 I really enjoy being a part of a group.
- 37 Being able to compromise is an important part of who I am.
- 38 As a leader, I treat everyone equally well regardless of his or her experience.
- 39 Even when candy or cookies are under my nose, I never overeat.
- 40 "Better safe than sorry" is one of my favorite mottoes.
- 41 The goodness of other people almost brings tears to my eyes.
- 42 I get chills when I hear about acts of great generosity.
- 43 I can always find the positive in what seems negative to others.
- 44 I practice my religion.
- 45 I do not like to stand out in a crowd.
- 46 Most people would say I am fun to be with.
- 47 I never dread getting up in the morning.
- 48 I rarely hold a grudge.
- 49 I am always busy with something interesting.
- 50 I am thrilled when I learn something new.
- 51 I make decisions only when I have all of the facts.
- 52 I like to think of new ways to do things.
- 53 No matter what the situation, I am able to fit in.
- 54 My view of the world is an excellent one.
- 55 I never hesitate to publicly express an popular opinion.
- 56 I am a goal-oriented person.
- 57 I believe honesty is the basis for trust.
- 58 I go out of my way to cheer up people who appear down.
- 59 There are people who accept my shortcomings.
- 60 I am an extremely loyal person.
- 61 I treat all people equally regardless of who they might be.
- 62 One of my strengths is helping a group of people work well together even when they have their differences.
- 63 I am a highly disciplined person.
- 64 I always think before I speak.
- 65 I experience deep emotions when I see beautiful things.
- 66 At least once a day, I stop and co t my blessings.

- 67 Despite challenges, I always remain hopeful about the future.
- 68 My faith never deserts me during hard times.
- 69 I do not act as if I am special person
- 70 I welcome the opportunity to brighten someone else's day with laughter.
- 71 I never approach things halfheartedly.
- 72 I never seek vengeance.
- 73 I am always curious about the world.
- 74 Every day, I look forward to the opportunity to learn and grow.
- 75 I value my ability to think critically.
- 76 I pride myself on being original.
- 77 I have the ability to make other people feel interesting.
- 78 I have never steered a friend wrong by giving bad advice.
- 79 I must stand up for what I believe even if there are negative results.
- 80 I finish things despite obstacles in the way.
- 81 I tell the truth even if it hurts.
- 82 I love to make other people happy.
- 83 I am the most important person in someone else's life.
- 84 I work at my very best when I am a group member.
- 85 Everyone's rights are equally important to me.
- 86 I am very good at planning group activities.
- 87 I control my emotions.
- 88 My friends believe that I make smart choices about what I say and do.
- 89 I see beauty that other people pass by without noticing.
- 90 If I receive a gift, I always let the person who gave it know I appreciated it.
- 91 I have a clear picture in my mind about what I want to happen in the future.
- 92 My life has a strong purpose.
- 93 I never brag about my accomplishments.
- 94 I try to have fun in all kinds of situations.
- 95 I love what I do.
- 96 I always allow others to leave their mistakes in the past and make a fresh start.
- 97 I am excited by many different activities.
- 98 I am a true life-long learner.
- 99 My friends value my objectivity.
- 100 I am always coming up with new ways to do things.
- 101 I always know what makes someone tick.
- 102 People describe me as "wise beyond my years."

- 103 I call for action while others talk.
- 104 I am a hard worker.
- 105 My promises can be trusted.
- 106 I have voluntarily helped a neighbor in the last month.
My family and close friends cannot do anything that would make me stop loving
107 them.
- 108 I never bad-mouth my group to outsiders.
- 109 I give everyone a chance.
- 110 To be an effective leader, I treat everyone the same.
I never want things that are bad for me in the long r , even if they make me feel good
111 in the short r .
- 112 I always avoid activities that are physically dangerous.
- 113 I have often been left speechless by the beauty depicted in a movie.
- 114 I am an extremely grateful person.
If I get a bad grade or evaluation, I focus on the next opportunity, and plan to do
115 better.
- 116 In the past 24 hours, I have spent 30 minutes in prayer, meditation or contemplation.
- 117 I am proud that I am an ordinary person.
- 118 I try to add some humor to whatever I do.
- 119 I look forward to each new day.
- 120 I believe it is best to forgive and forget.
- 121 I have many interests.
- 122 I always go out of my way to visit museums.
- 123 When the topic calls for it, I can be a highly rational thinker.
- 124 My friends say that I have lots of new and different ideas.
- 125 I always get along well with people I have just met.
- 126 I am always able to look at things and see the big picture.
- 127 I always stand up for my beliefs.
- 128 I do not give up.
- 129 I am true to my own values.
- 130 I always call my friends when they are sick.
- 131 I always feel the presence of love in my life.
- 132 It is important for me to maintain harmony within my group.
- 133 I am strongly committed to principles of justice and equality
- 134 I believe that our human nature brings us together to work for common goals.
- 135 I can always stay on a diet.
- 136 I think through the consequences every time before I act.

- 137 I am always aware of the natural beauty in the environment.
- 138 I go to extremes to acknowledge people who are good to me.
- 139 I have a plan for what I want to be doing five years from now.
- 140 My faith makes me who I am.
- 141 I prefer to let other people talk about themselves.
- 142 I never allow a gloomy situation to take away my sense of humor.
- 143 I have lots of energy.
- 144 I am always willing to give someone a chance to make amends.
- 145 I can find something of interest in any situation.
- 146 I read all of the time.
- 147 Thinking things through is part of who I am.
- 148 I am an original thinker.
- 149 I am good at sensing what other people are feeling.
- 150 I have a mature view on life.
- 151 I always face my fears.
- 152 I never get sidetracked when I work.
- 153 I take pride in not exaggerating who or what I am.
- 154 I am as excited about the good fortune of others as I am about my own.
- 155 I can express love to someone else.
- 156 Without exception, I support my teammates or fellow group members.
- 157 I refuse to take credit for work I have not done.
- 158 My friends always tell me I am a strong but fair leader.
- 159 I can always say "enough is enough."
- 160 I always keep straight right from wrong.
- 161 I greatly appreciate all forms of art.
- 162 I feel thankful for what I have received in life.
- 163 I know that I will succeed with the goals I set for myself.
- 164 I believe that each person has a purpose in life.
- 165 I rarely call attention to myself.
- 166 I have a great sense of humor.
- 167 I cannot wait to get started on a project.
- 168 I rarely try to get even.
- 169 It is very easy for me to entertain myself.
- 170 If I want to know something, I immediately go to the library or the Internet and look it up.
- 171 I always weigh the pro's and con's.

- 172 My imagination stretches beyond that of my friends.
- 173 I am aware of my own feelings and motives.
- 174 Others come to me for advice.
- 175 I have overcome pain and disappointment.
- 176 I stick with whatever I decide to do.
- 177 I would rather die than be phony.
- 178 I enjoy being kind to others.
- 179 I can accept love from others.
- 180 Even if I disagree with them, I always respect the leaders of my group.
- 181 Even if I do not like someone, I treat him or her fairly.
- 182 As a leader, I try to make all group members happy.
- 183 Without exception, I do my tasks at work or school or home by the time they are due.
- 184 I am a very careful person.
- 185 I am in awe of simple things in life that others might take for granted.
- 186 When I look at my life, I find many things to be grateful for.
- 187 I am confident that my way of doing things will work out for the best.
- 188 I believe in a universal power, a god.
- 189 I have been told that modesty is one of my most notable characteristics.
- 190 I find satisfaction in making others smile or laugh.
- 191 I can hardly wait to see what life has in store for me in the weeks and years ahead.
- 192 I am usually willing to give someone another chance.
- 193 I think my life is extremely interesting.
- 194 I read a huge variety of books.
- 195 I try to have good reasons for my important decisions.
- 196 In the last month I have found an original solution to a problem in my life.
- 197 I always know what to say to make people feel good.
- 198 I may not say it to others, but I consider myself to be a wise person.
- 199 I always speak up in protest when I hear someone say mean things.
- 200 When I make plans, I am certain to make them work.
- 201 My friends always tell me I am down to earth.
- 202 I am thrilled when I can let others share the spotlight.
- 203 I have a neighbor or someone at work or school that I really care about as a person.
- 204 It is important to me to respect decisions made by my group.
- 205 I believe that everyone should have a say.
- 206 For me, practice is as important as performance.
- 207 As a leader, I believe that everyone in the group should have a say in what the group

does.

- 208 I always make careful choices.
- 209 I often have a craving to experience great art, such as music, drama, or paintings.
- 210 I feel a profound sense of appreciation every day.
- 211 If I feel down, I always think about what is good in my life.
- 212 My beliefs make my life important.
- 213 No one would ever describe me as arrogant.
- 214 I believe life is more of a playground than a battlefield.
- 215 I awaken with a sense of excitement about the day's possibilities.
- 216 I do not want to see anyone suffer, even my worst enemy.
- 217 I really enjoy hearing about other countries and cultures.
- 218 I love to read nonfiction books for fun.
- 219 My friends value my good judgment.
- 220 I have a powerful urge to do something original during this next year.
- 221 It is rare that someone can take advantage of me.
- 222 Others consider me to be a wise person.
- 223 I am a brave person.
- 224 When I get what I want, it is because I worked hard for it.
- 225 Others trust me to keep their secrets.
- 226 I always listen to people talk about their problems.
- 227 I easily share feelings with others.
- 228 I gladly sacrifice my self-interest for the benefit of the group I am in.
- 229 I believe that it is worth listening to everyone's opinions.
- 230 When I am in a position of authority, I never blame others for problems.
- 231 I exercise on a regular basis.
- 232 I cannot imagine lying or cheating.
- 233 I have created something of beauty in the last year.
- 234 I have been richly blessed in my life.
- 235 I expect the best.
- 236 I have a calling in my life.
- 237 People are drawn to me because I am humble.
- 238 I am known for my good sense of humor.
- 239 People describe me as full of zest.
- 240 I try to respond with understanding when someone treats me badly.

Appendix G: Military Performance Score

	Cadet Summer Training	Term 1	Term 2
Fourth Class Year	Rater-25% IR-20% SR-55%	Rater-25% IR-20% SR-55%	Rater-25% IR-20% SR-55%
Third Class Year	Rater-25% IR-20% SR-55%	Rater-25% IR-20% SR-55%	Rater-25% IR-20% SR-55%
Second Class Year	Rater-25% IR-20% SR-55%	Rater-25% IR-20% SR-55%	Not observed
Annual Military Development Score Percentage	30.0%	35.0%	35.0%

Military Development grades are assigned to cadets through a forced distribution model, based on a 20/40/40 distribution. No more than 20% of a defined population may receive an “A,” while the total number of “A’s” and “B’s” may not exceed 60%.

Rating Schemes.

- a. Rater (Cadet). Primary counselor and rater of the rated cadet. Contributes (25%) percentage of the Military Development grade.
- b. Intermediate Rater-IR (Cadet or USMA Staff and Faculty). This cadet is generally one level up from the rater and, while not having the level of familiarity of the rater, has a greater breadth of perspective, which allows the intermediate rater to measure the rated cadet’s performance against others in similar positions of responsibility. Contributes (20%) percentage of the Military Development grade.
- d. Senior Rater-SR (TAC Officer or TAC NCO). Contributes (55%) percentage of the Military Development grade. (USCC, 2004)

Appendix H: NEO-PI-R on Leadership Effectiveness

Linear Regression: NEO-PI-R at Time 1

Variables Entered/Removed(a)

Variables Entered	Variables Removed	Method
Conscientiousness		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
Neuroticism		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a. Dependent Variable: AY 2005 Year Military Program Score7

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.412(a)	.170	.169	.377590
.425(b)	.181	.179	.375305

a Predictors: (Constant), Conscientiousness

b Predictors: (Constant), Conscientiousness, Neuroticism

ANOVA(c)

	Sum of Squares	df	Mean Square	F	Sig.
Regression(a)	24.240	1	24.240	170.016	.000(a)
Residual	118.764	833	.143		
Total	143.004	834			
Regression(b)	25.814	2	12.907	91.632	.000(b)
Residual	117.190	832	.141		
Total	143.004	834			

a Predictors: (Constant), Conscientiousness

b Predictors: (Constant), Conscientiousness, Neuroticism

c Dependent Variable: AY 2005 Year Military Program Score

Coefficients(a)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta	B	Std. Error
(Constant)	1.911	.078		24.443	.000
Conscientiousness	.008	.001	.412	13.039	.000
(Constant)	1.601	.121		13.246	.000
Conscientiousness	.009	.001	.455	13.394	.000
Neuroticism	.002	.001	.114	3.343	.001

a Dependent Variable: AY 2005 Year Military Program Score

Excluded Variables(c)

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
Neuroticism	.114(a)	3.343	.001	.115	.852
Extraversion	-.024(a)	-.737	.462	-.026	.942
Openness	-.011(a)	-.356	.722	-.012	1.000
Agreeableness	-.010(a)	-.299	.765	-.010	.970
Extraversion	.004(b)	.128	.898	.004	.879
Openness	-.010(b)	-.305	.760	-.011	.999
Agreeableness	.009(b)	.280	.780	.010	.941

a Predictors in the Model: (Constant), Conscientiousness

b Predictors in the Model: (Constant), Conscientiousness, Neuroticism

c Dependent Variable: AY 2005 Year Military Program Score

Linear Regression: NEO-PI-R at Time 2

Variables Entered/Removed(a)

Variables Entered	Variables Removed	Method
Conscientiousness		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a Dependent Variable: AY 2006 Year Military Program Score

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.384(a)	.148	.147	.395640

a Predictors: (Constant), Conscientiousness

ANOVA(b)

	Sum of Squares	df	Mean Square	F	Sig.
Regression	22.620	1	22.620	144.510	.000(a)
Residual	130.390	833	.157		
Total	153.011	834			

a Predictors: (Constant), Conscientiousness

b Dependent Variable: AY 2006 Year Military Program Score

Coefficients(a)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta	B	Std. Error
(Constant)	2.005	.082		24.478	.000
Conscientiousness	.008	.001	.384	12.021	.000

a Dependent Variable: AY 2006 Year Military Program Score

Excluded Variables(b)

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
Neuroticism	.026(a)	.757	.449	.026	.852
Extraversion	.021(a)	.631	.528	.022	.942
Openness	-.054(a)	-1.675	.094	-.058	1.000
Agreeableness	.025(a)	.775	.439	.027	.970

a Predictors in the Model: (Constant), Conscientiousness

b Dependent Variable: AY 2006 Year Military Program Score

Linear Regression: NEO-PI-R at Time 3

Variables Entered/Removed(a)

Variables Entered	Variables Removed	Method
Conscientiousness		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
Neuroticism		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a Dependent Variable: AY 2007 Half Year Military Program Score

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.312(a)	.097	.096	.54199
.321(b)	.103	.101	.54058

a Predictors: (Constant), Conscientiousness

b Predictors: (Constant), Conscientiousness, Neuroticism

ANOVA(c)

	Sum of Squares	df	Mean Square	F	Sig.
Regression	26.354	1	26.354	89.716	.000(a)
Residual	244.693	833	.294		
Total	271.047	834			
Regression	27.918	2	13.959	47.768	.000(b)
Residual	243.130	832	.292		
Total	271.047	834			

a Predictors: (Constant), Conscientiousness

b Predictors: (Constant), Conscientiousness, Neuroticism

c Dependent Variable: AY 2007 Half Year Military Program Score

Coefficients(a)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta	B	Std. Error
(Constant)	1.917	.112		17.086	.000
Conscientiousness	.009	.001	.312	9.472	.000
(Constant)	1.609	.174		9.238	.000
Conscientiousness	.010	.001	.343	9.655	.000
Neuroticism	.002	.001	.082	2.313	.021

a Dependent Variable: AY 2007 Half Year Military Program Score

Excluded Variables(c)

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
Neuroticism	.082(a)	2.313	.021	.080	.852
Extraversion	-.054(a)	-1.582	.114	-.055	.942
Openness	-.049(a)	-1.476	.140	-.051	1.000
Agreeableness	-.030(a)	-.898	.369	-.031	.970
Extraversion	-.036(b)	-1.021	.308	-.035	.879
Openness	-.047(b)	-1.444	.149	-.050	.999
Agreeableness	-.017(b)	-.509	.611	-.018	.941

a Predictors in the Model: (Constant), Conscientiousness

b Predictors in the Model: (Constant), Conscientiousness, Neuroticism

c Dependent Variable: AY 2007 Half Year Military Program Score

Appendix I: VIA-IS on Leadership Effectiveness

Linear Regression: VIA-IS at Time 1

Variables Entered/Removed(a)

Variables Entered	Variables Removed	Method
Humanity		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
Justice		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a Dependent Variable: AY 2005 Year Military Program Score

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.181(a)	.033	.025	.417682
.293(b)	.086	.071	.407735

a Predictors: (Constant), V3_Humanity

b Predictors: (Constant), V3_Humanity, V4_Justice

ANOVA(c)

	Sum of Squares	df	Mean Square	F	Sig.
Regression(a)	.710	1	.710	4.067	.046(a)
Residual	20.935	120	.174		
Total	21.645	121			
Regression(b)	1.861	2	.931	5.597	.005(b)
Residual	19.784	119	.166		
Total	21.645	121			

a Predictors: (Constant), V3_Humanity

b Predictors: (Constant), V3_Humanity, V4_Justice

c Dependent Variable: AY 2005 Year Military Program Score

Coefficients(a)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta	B	Std. Error
(Constant)	3.698	.339		10.909	.000
V3_Humanity	-.172	.085	-.181	-2.017	.046
(Constant)	3.381	.352		9.598	.000
V3_Humanity	-.368	.112	-.387	-3.294	.001
V4_Justice	.278	.106	.309	2.632	.010

a Dependent Variable: AY 2005 Year Military Program Score

Excluded Variables(c)

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
V1_WisdomKnowledge	.175(a)	1.628	.106	.148	.691
V2_Courage	.182(a)	1.588	.115	.144	.607
V4_Justice	.309(a)	2.632	.010	.235	.555
V5_Temperance	.134(a)	1.362	.176	.124	.826
V6_Transcendence	.048(a)	.346	.730	.032	.414
V1_WisdomKnowledge	.140(b)	1.320	.189	.121	.678
V2_Courage	.091(b)	.757	.451	.070	.535
V5_Temperance	-.036(b)	-.296	.768	-.027	.511
V6_Transcendence	-.008(b)	-.060	.952	-.006	.404

a Predictors in the Model: (Constant), V3_Humanity

b Predictors in the Model: (Constant), V3_Humanity, V4_Justice

c Dependent Variable: AY 2005 Year Military Program Score

Appendix J: Combined NEO-PI-R and VIA-IS Regressions

Linear Regression: NEO-PI-R and VIA-IS at Time 1

Variables Entered/Removed(a)

Variables Entered	Variables Removed	Method
Conscientiousness	·	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
V3_Humanity	·	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
Agreeableness	·	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a Dependent Variable: AY 2005 Year Military Program Score

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.320(a)	.102	.093	.407395
.380(b)	.145	.127	.399794
.442(c)	.195	.170	.389838

a Predictors: (Constant), Conscientiousness

b Predictors: (Constant), Conscientiousness, V3_Humanity

c Predictors: (Constant), Conscientiousness, V3_Humanity, Agreeableness

ANOVA(d)

	Sum of Squares	df	Mean Square	F	Sig.
Regression(a)	1.817	1	1.817	10.949	.001(a)
Residual	15.933	120	.166		
Total	17.750	121			
Regression(b)	2.566	2	1.283	8.027	.001(b)
Residual	15.184	119	.160		
Total	17.750	121			
Regression(c)	3.465	3	1.155	7.600	.000(c)
Residual	14.286	118	.152		
Total	17.750	121			

a Predictors: (Constant), Conscientiousness

b Predictors: (Constant), Conscientiousness, V3_Humanity

c Predictors: (Constant), Conscientiousness, V3_Humanity, Agreeableness

d Dependent Variable: AY 2005 Year Military Program Score

Coefficients(a)

	Unstandardized Coefficients		Standardized Coefficients	t		Sig.
	B	Std. Error	Beta	B	Std. Error	
(Constant)	2.256	.239		9.444		.000
Conscientiousness	.006	.002	.320	3.309		.001
(Constant)	2.916	.385		7.582		.000
Conscientiousness	.007	.002	.363	3.741		.000
V3_Humanity	-.193	.089	-.210	-2.164		.033
(Constant)	2.688	.387		6.953		.000
Conscientiousness	.006	.002	.305	3.128		.002
V3_Humanity	-.260	.091	-.282	-2.849		.005
Agreeableness	.006	.002	.247	2.432		.017

a Dependent Variable: AY 2005 Year Military Program Score

Excluded Variables(d)

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
Neuroticism	.111(a)	.906	.367	.093	.627
Extraversion	-.199(a)	-2.022	.046	-.203	.936
Openness	-.088(a)	-.914	.363	-.093	.999
Agreeableness	.160(a)	1.592	.115	.161	.914
V1_WisdomKnowledge	-.151(a)	-1.422	.158	-.144	.824
V2_Courage	-.131(a)	-1.246	.216	-.127	.846
V3_Humanity	-.210(a)	-2.164	.033	-.217	.959
V4_Justice	-.035(a)	-.346	.730	-.035	.925
V5_Temperence	-.100(a)	-.919	.361	-.094	.786
V6_Transcendence	-.110(a)	-1.110	.270	-.113	.946
Neuroticism	.081(b)	.667	.506	.069	.618
Extraversion	-.130(b)	-1.181	.240	-.121	.746
Openness	-.052(b)	-.532	.596	-.055	.964
Agreeableness	.247(b)	2.432	.017	.243	.831
V1_WisdomKnowledge	-.006(b)	-.041	.967	-.004	.474
V2_Courage	.018(b)	.134	.894	.014	.507
V4_Justice	.243(b)	1.736	.086	.176	.449
V5_Temperence	-.001(b)	-.008	.994	-.001	.641
V6_Transcendence	.136(b)	.876	.383	.090	.375
Neuroticism	.106(c)	.899	.371	.093	.613
Extraversion	-.128(c)	-1.193	.236	-.123	.746
Openness	-.090(c)	-.943	.348	-.097	.940
V1_WisdomKnowledge	.035(c)	.255	.800	.026	.467
V2_Courage	.062(c)	.472	.638	.049	.497
V4_Justice	.153(c)	1.055	.294	.109	.405
V5_Temperence	-.220(c)	-1.610	.111	-.165	.450
V6_Transcendence	.081(c)	.529	.598	.055	.366

a Predictors in the Model: (Constant), Conscientiousness

b Predictors in the Model: (Constant), Conscientiousness, V3_Humanity

c Predictors in the Model: (Constant), Conscientiousness, V3_Humanity, Agreeableness

d Dependent Variable: AY 2005 Year Military Program Score

Linear Regression: NEO-PI-R and VIA-IS at Time 2

Variables Entered/Removed(a)

Variables Entered	Variables Removed	Method
Conscientiousness		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a Dependent Variable: AY 2006 Year Military Program Score

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.266(a)	.071	.061	.404365

a Predictors: (Constant), Conscientiousness

ANOVA(b)

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	1.193	1	1.193	7.293	.008(a)
Residual	15.697	105	.164		
Total	16.890	106			

a Predictors: (Constant), Conscientiousness

b Dependent Variable: AY 2006 Year Military Program Score

Coefficients(a)

	Unstandardized Coefficients		Standardized Coefficients	t		Sig.
	B	Std. Error	Beta	B	Std. Error	
(Constant)	2.428	.237		10.241		.000
Conscientiousness	.005	.002	.266	2.701		.008

a Dependent Variable: AY 2006 Year Military Program Score

Excluded Variables(b)

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
Neuroticism	.215(a)	1.751	.083	.177	.627
Extraversion	-.090(a)	-.886	.378	-.091	.936
Openness	-.040(a)	-.406	.686	-.042	.999
Agreeableness	-.016(a)	-.159	.874	-.016	.914
V1_WisdomKnowledge	-.141(a)	-1.301	.196	-.132	.824
V2_Courage	-.177(a)	-1.672	.098	-.169	.846
V3_Humanity	-.144(a)	-1.439	.154	-.146	.959
V4_Justice	-.159(a)	-1.568	.120	-.159	.925
V5_Temperence	-.159(a)	-1.437	.154	-.146	.786
V6_Transcendence	-.091(a)	-.895	.373	-.091	.946

a Predictors in the Model: (Constant), Conscientiousness

b Dependent Variable: AY 2006 Year Military Program Score

Linear Regression: NEO-PI-R and VIA-IS at Time 3

Variables Entered/Removed(a)

Variables Entered	Variables Removed	Method
Openness		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a Dependent Variable: AY 2007 Half Year Military Program Score

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.203(a)	.041	.031	.55318

a Predictors: (Constant), Openness

ANOVA(b)

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1.262	1	1.262	4.122	.045(a)
Residual	29.377	96	.306		
Total	30.639	97			

a Predictors: (Constant), Openness

b Dependent Variable: AY 2007 Half Year Military Program Score

Coefficients(a)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta	B	Std. Error
(Constant)	3.737	.365		10.249	.000
Openness	-.007	.003	-.203	-2.030	.045

a Dependent Variable: AY 2007 Half Year Military Program Score

Excluded Variables(b)

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
Neuroticism	.138(a)	1.381	.171	.140	.997
Extraversion	.030(a)	.285	.776	.029	.884
Agreeableness	.017(a)	.169	.866	.017	.965
Conscientiousness	.063(a)	.631	.529	.065	.999
V1_WisdomKnowledge	-.012(a)	-.115	.909	-.012	.951
V2_Courage	-.023(a)	-.230	.819	-.024	.998
V3_Humanity	-.069(a)	-.678	.500	-.069	.968
V4_Justice	-.011(a)	-.104	.917	-.011	.978
V5_Temperence	-.068(a)	-.675	.501	-.069	1.000
V6_Transcendence	.086(a)	.824	.412	.084	.925

a Predictors in the Model: (Constant), Openness

b Dependent Variable: AY 2007 Half Year Military Program Score

Appendix J: Trajectory Model Analysis

SUMMARY OF ANALYSIS

Number of groups	1
Number of observations	984
Number of dependent variables	8
Number of independent variables	0
Number of continuous latent variables	2
Number of categorical latent variables	1

Covariance Coverage

	TMPS05_0	TMPS05_1	TMPS05_2	TMPS06_0	TMPS06_1
TMPS05_0	1.000				
TMPS05_1	1.000	1.000			
TMPS05_2	1.000	1.000	1.000		
TMPS06_0	0.988	0.988	0.988	0.988	
TMPS06_1	1.000	1.000	1.000	0.988	1.000
TMPS06_2	0.999	0.999	0.999	0.987	0.999
TMPS07_0	0.742	0.742	0.742	0.731	0.742
TMPS07_1	1.000	1.000	1.000	0.988	1.000

Covariance Coverage

	TMPS06_2	TMPS07_0	TMPS07_1
TMPS06_2	0.999		
TMPS07_0	0.742	0.742	
TMPS07_1	0.999	0.742	1.000

TESTS OF MODEL FIT

Loglikelihood

H0 Value	-9849.384
H0 Scaling Correction Factor for MLR	1.086

Information Criteria

Number of Free Parameters	19
Akaike (AIC)	19736.769
Bayesian (BIC)	19829.710
Sample-Size Adjusted BIC ($n^* = (n + 2) / 24$)	19769.365
Entropy	0.493

Class Counts and Proportions

Latent Classes

1	624	0.63415
2	174	0.17683
3	186	0.18902

Average Latent Class Probabilities for Most Likely Latent Class Membership (Row) by Latent Class (Column)

	1	2	3
1	0.835	0.096	0.069
2	0.179	0.643	0.178
3	0.127	0.206	0.667

MODEL RESULTS

Estimates S.E. Est./S.E. Std StdYX

Latent Class 1

Residual Variances

TMPS05_0	0.706	0.053	13.335	0.706	0.955
TMPS05_1	0.652	0.031	20.979	0.652	0.871
TMPS05_2	0.557	0.027	20.429	0.557	0.798
TMPS06_0	0.693	0.033	21.256	0.693	0.798
TMPS06_1	0.509	0.029	17.392	0.509	0.714
TMPS06_2	0.476	0.028	17.062	0.476	0.676
TMPS07_0	0.752	0.040	18.921	0.752	0.750
TMPS07_1	0.579	0.036	16.304	0.579	0.683

Latent Class 2

Residual Variances

TMPS05_0	0.706	0.053	13.335	0.706	0.955
TMPS05_1	0.652	0.031	20.979	0.652	0.871
TMPS05_2	0.557	0.027	20.429	0.557	0.798
TMPS06_0	0.693	0.033	21.256	0.693	0.798
TMPS06_1	0.509	0.029	17.392	0.509	0.714
TMPS06_2	0.476	0.028	17.062	0.476	0.676
TMPS07_0	0.752	0.040	18.921	0.752	0.750
TMPS07_1	0.579	0.036	16.304	0.579	0.683

Latent Class 3

Residual Variances

TMPS05_0	0.706	0.053	13.335	0.706	0.955
TMPS05_1	0.652	0.031	20.979	0.652	0.871
TMPS05_2	0.557	0.027	20.429	0.557	0.798
TMPS06_0	0.693	0.033	21.256	0.693	0.798
TMPS06_1	0.509	0.029	17.392	0.509	0.714
TMPS06_2	0.476	0.028	17.062	0.476	0.676
TMPS07_0	0.752	0.040	18.921	0.752	0.750
TMPS07_1	0.579	0.036	16.304	0.579	0.683

R-SQUARE

Class 1

Observed	
Variable	R-Square
TMPS05_0	0.045
TMPS05_1	0.129
TMPS05_2	0.202
TMPS06_0	0.202
TMPS06_1	0.286
TMPS06_2	0.324
TMPS07_0	0.250
TMPS07_1	0.317

Class 2

Observed	
Variable	R-Square
TMPS05_0	0.045
TMPS05_1	0.129
TMPS05_2	0.202
TMPS06_0	0.202
TMPS06_1	0.286
TMPS06_2	0.324
TMPS07_0	0.250
TMPS07_1	0.317

Class 3

Observed	
Variable	R-Square
TMPS05_0	0.045
TMPS05_1	0.129
TMPS05_2	0.202
TMPS06_0	0.202
TMPS06_1	0.286
TMPS06_2	0.324
TMPS07_0	0.250
TMPS07_1	0.317

Appendix K: NEO-PI-R Mixture Model Analysis

SUMMARY OF ANALYSIS

Number of groups	1
Number of observations	984
Number of dependent variables	13
Number of independent variables	0
Number of continuous latent variables	2
Number of categorical latent variables	1
Observed dependent variables	

COVARIANCE COVERAGE OF DATA

Covariance Coverage

	TMPS05_0	TMPS05_1	TMPS05_2	TMPS06_0	TMPS06_1
TMPS05_0	1.000				
TMPS05_1	1.000	1.000			
TMPS05_2	1.000	1.000	1.000		
TMPS06_0	0.988	0.988	0.988	0.988	
TMPS06_1	1.000	1.000	1.000	0.988	1.000
TMPS06_2	0.999	0.999	0.999	0.987	0.999
TMPS07_0	0.742	0.742	0.742	0.731	0.742
TMPS07_1	1.000	1.000	1.000	0.988	1.000
NEUROTIC	0.849	0.849	0.849	0.836	0.849
EXTRAVER	0.849	0.849	0.849	0.836	0.849
OPENNESS	0.849	0.849	0.849	0.836	0.849
AGREEABL	0.849	0.849	0.849	0.836	0.849
CONSCIEN	0.849	0.849	0.849	0.836	0.849

Covariance Coverage

	TMPS06_2	TMPS07_0	TMPS07_1	NEUROTIC	EXTRAVER
TMPS06_2	0.999				
TMPS07_0	0.742	0.742			
TMPS07_1	0.999	0.742	1.000		
NEUROTIC	0.848	0.631	0.849	0.849	
EXTRAVER	0.848	0.631	0.849	0.849	0.849
OPENNESS	0.848	0.631	0.849	0.849	0.849
AGREEABL	0.848	0.631	0.849	0.849	0.849
CONSCIEN	0.848	0.631	0.849	0.849	0.849

Covariance Coverage			
	OPENNESS	AGREEABL	CONSCIEN
OPENNESS	0.849		
AGREEABL	0.849	0.849	
CONSCIEN	0.849	0.849	0.849

TESTS OF MODEL FIT

Loglikelihood

H0 Value	-15492.667
H0 Scaling Correction Factor for MLR	1.133

Information Criteria

Number of Free Parameters	69
Akaike (AIC)	31123.333
Bayesian (BIC)	31460.855
Sample-Size Adjusted BIC ($n^* = (n + 2) / 24$)	31241.710
Entropy	0.495

Class Counts and Proportions

Latent Classes

1	454	0.46138
2	186	0.18902
3	344	0.34959

MODEL RESULTS

Estimates S.E. Est./S.E. Std StdYX

Residual Variances

TMPS05_0	0.734	0.043	16.899	0.734	0.707
TMPS05_1	0.642	0.030	21.358	0.642	0.673
TMPS05_2	0.546	0.027	20.413	0.546	0.619
TMPS06_0	0.711	0.033	21.852	0.711	0.662
TMPS06_1	0.512	0.029	17.636	0.512	0.569
TMPS06_2	0.471	0.027	17.624	0.471	0.533
TMPS07_0	0.769	0.041	18.914	0.769	0.638
TMPS07_1	0.559	0.033	16.848	0.559	0.550

Latent Class 2

Residual Variances

TMPS05_0	0.734	0.043	16.899	0.734	0.707
TMPS05_1	0.642	0.030	21.358	0.642	0.673
TMPS05_2	0.546	0.027	20.413	0.546	0.619
TMPS06_0	0.711	0.033	21.852	0.711	0.662
TMPS06_1	0.512	0.029	17.636	0.512	0.569
TMPS06_2	0.471	0.027	17.624	0.471	0.533
TMPS07_0	0.769	0.041	18.914	0.769	0.638
TMPS07_1	0.559	0.033	16.848	0.559	0.550

Latent Class 3

Residual Variances

TMPS05_0	0.734	0.043	16.899	0.734	0.707
TMPS05_1	0.642	0.030	21.358	0.642	0.673
TMPS05_2	0.546	0.027	20.413	0.546	0.619
TMPS06_0	0.711	0.033	21.852	0.711	0.662
TMPS06_1	0.512	0.029	17.636	0.512	0.569
TMPS06_2	0.471	0.027	17.624	0.471	0.533
TMPS07_0	0.769	0.041	18.914	0.769	0.638
TMPS07_1	0.559	0.033	16.848	0.559	0.550

R-SQUARE

Class 1

Observed	
Variable	R-Square
TMPS05_0	0.293
TMPS05_1	0.327
TMPS05_2	0.381
TMPS06_0	0.338
TMPS06_1	0.431
TMPS06_2	0.467
TMPS07_0	0.362
TMPS07_1	0.450

Class 2

Observed	
Variable	R-Square
TMPS05_0	0.293
TMPS05_1	0.327
TMPS05_2	0.381
TMPS06_0	0.338
TMPS06_1	0.431
TMPS06_2	0.467
TMPS07_0	0.362
TMPS07_1	0.450

Class 3

Observed	
Variable	R-Square
TMPS05_0	0.293
TMPS05_1	0.327
TMPS05_2	0.381
TMPS06_0	0.338
TMPS06_1	0.431
TMPS06_2	0.467
TMPS07_0	0.362
TMPS07_1	0.450

Appendix L: VIA-IS Mixture Model Analysis

SUMMARY OF ANALYSIS

Number of groups	1
Number of observations	98
Number of dependent variables	14
Number of independent variables	0
Number of continuous latent variables	2
Number of categorical latent variables	1
Observed dependent variables	

COVARIANCE COVERAGE OF DATA

Covariance Coverage					
	TMPS05_0	TMPS05_1	TMPS05_2	TMPS06_0	TMPS06_1
TMPS05_0	1.000				
TMPS05_1	1.000	1.000			
TMPS05_2	1.000	1.000	1.000		
TMPS06_0	1.000	1.000	1.000	1.000	
TMPS06_1	1.000	1.000	1.000	1.000	1.000
TMPS06_2	1.000	1.000	1.000	1.000	1.000
TMPS07_0	0.724	0.724	0.724	0.724	0.724
TMPS07_1	1.000	1.000	1.000	1.000	1.000
WIS	1.000	1.000	1.000	1.000	1.000
COUR	1.000	1.000	1.000	1.000	1.000
HUM	1.000	1.000	1.000	1.000	1.000
JUS	1.000	1.000	1.000	1.000	1.000
TEMP	1.000	1.000	1.000	1.000	1.000
TRAN	1.000	1.000	1.000	1.000	1.000

Covariance Coverage					
	TMPS06_2	TMPS07_0	TMPS07_1	WIS	COUR
TMPS06_2	1.000				
TMPS07_0	0.724	0.724			
TMPS07_1	1.000	0.724	1.000		
WIS	1.000	0.724	1.000	1.000	

COUR	1.000	0.724	1.000	1.000	1.000
HUM	1.000	0.724	1.000	1.000	1.000
JUS	1.000	0.724	1.000	1.000	1.000
TEMP	1.000	0.724	1.000	1.000	1.000
TRAN	1.000	0.724	1.000	1.000	1.000

Covariance Coverage

	HUM	JUS	TEMP	TRAN
HUM	1.000			
JUS	1.000	1.000		
TEMP	1.000	1.000	1.000	
TRAN	1.000	1.000	1.000	1.000

TESTS OF MODEL FIT

Loglikelihood

H0 Value	-1178.644
H0 Scaling Correction Factor for MLR	1.105

Information Criteria

Number of Free Parameters	79
Akaike (AIC)	2515.289
Bayesian (BIC)	2719.501
Sample-Size Adjusted BIC ($n^* = (n + 2) / 24$)	2470.031
Entropy	0.930

Average Latent Class Probabilities for Most Likely Latent Class Membership
(Row) by Latent Class (Column)

	1	2	3
1	0.959	0.041	0.000
2	0.010	0.983	0.007
3	0.000	0.039	0.961

MODEL RESULTS

Estimates S.E. Est./S.E. Std StdYX

Latent Class 1

Residual Variances

TMPS05_0	0.680	0.169	4.021	0.680	0.559
TMPS05_1	0.610	0.096	6.343	0.610	0.607
TMPS05_2	0.655	0.103	6.366	0.655	0.635
TMPS06_0	0.718	0.121	5.939	0.718	0.646
TMPS06_1	0.581	0.114	5.095	0.581	0.580
TMPS06_2	0.521	0.086	6.056	0.521	0.533
TMPS07_0	0.867	0.174	4.971	0.867	0.637
TMPS07_1	0.520	0.082	6.321	0.520	0.495

Latent Class 2

Residual Variances

TMPS05_0	0.680	0.169	4.021	0.680	0.559
TMPS05_1	0.610	0.096	6.343	0.610	0.607
TMPS05_2	0.655	0.103	6.366	0.655	0.635
TMPS06_0	0.718	0.121	5.939	0.718	0.646
TMPS06_1	0.581	0.114	5.095	0.581	0.580
TMPS06_2	0.521	0.086	6.056	0.521	0.533
TMPS07_0	0.867	0.174	4.971	0.867	0.637
TMPS07_1	0.520	0.082	6.321	0.520	0.495

Latent Class 3

Residual Variances

TMPS05_0	0.680	0.169	4.021	0.680	0.559
TMPS05_1	0.610	0.096	6.343	0.610	0.607
TMPS05_2	0.655	0.103	6.366	0.655	0.635
TMPS06_0	0.718	0.121	5.939	0.718	0.646
TMPS06_1	0.581	0.114	5.095	0.581	0.580
TMPS06_2	0.521	0.086	6.056	0.521	0.533
TMPS07_0	0.867	0.174	4.971	0.867	0.637
TMPS07_1	0.520	0.082	6.321	0.520	0.495

R-SQUARE

Class 1

Observed	
Variable	R-Square
TMPS05_0	0.441
TMPS05_1	0.393
TMPS05_2	0.365
TMPS06_0	0.354
TMPS06_1	0.420
TMPS06_2	0.467
TMPS07_0	0.363
TMPS07_1	0.505

Class 2

Observed	
Variable	R-Square
TMPS05_0	0.441
TMPS05_1	0.393
TMPS05_2	0.365
TMPS06_0	0.354
TMPS06_1	0.420
TMPS06_2	0.467
TMPS07_0	0.363
TMPS07_1	0.505

Class 3

Observed	
Variable	R-Square
TMPS05_0	0.441
TMPS05_1	0.393
TMPS05_2	0.365
TMPS06_0	0.354
TMPS06_1	0.420
TMPS06_2	0.467
TMPS07_0	0.363
TMPS07_1	0.505

Appendix M: Combined Mixture Model Analysis

SUMMARY OF ANALYSIS

Number of groups	1
Number of observations	98
Number of dependent variables	16
Number of independent variables	0
Number of continuous latent variables	2
Number of categorical latent variables	1
Observed dependent variables	

COVARIANCE COVERAGE OF DATA

Covariance Coverage					
	TMPS05_0	TMPS05_1	TMPS05_2	TMPS06_0	TMPS06_1
TMPS05_0	1.000				
TMPS05_1	1.000	1.000			
TMPS05_2	1.000	1.000	1.000		
TMPS06_0	1.000	1.000	1.000	1.000	
TMPS06_1	1.000	1.000	1.000	1.000	1.000
TMPS06_2	1.000	1.000	1.000	1.000	1.000
TMPS07_0	0.724	0.724	0.724	0.724	0.724
TMPS07_1	1.000	1.000	1.000	1.000	1.000
EXTRA	1.000	1.000	1.000	1.000	1.000
OPEN	1.000	1.000	1.000	1.000	1.000
AGREE	1.000	1.000	1.000	1.000	1.000
CONSC	1.000	1.000	1.000	1.000	1.000
HUM	1.000	1.000	1.000	1.000	1.000
JUS	1.000	1.000	1.000	1.000	1.000
TEMP	1.000	1.000	1.000	1.000	1.000
TRAN	1.000	1.000	1.000	1.000	1.000

Covariance Coverage

	TMPS06_2	TMPS07_0	TMPS07_1	EXTRA	OPEN
TMPS06_2	1.000				
TMPS07_0	0.724	0.724			
TMPS07_1	1.000	0.724	1.000		
EXTRA	1.000	0.724	1.000	1.000	
OPEN	1.000	0.724	1.000	1.000	1.000
AGREE	1.000	0.724	1.000	1.000	1.000
CONSC	1.000	0.724	1.000	1.000	1.000
HUM	1.000	0.724	1.000	1.000	1.000
JUS	1.000	0.724	1.000	1.000	1.000
TEMP	1.000	0.724	1.000	1.000	1.000
TRAN	1.000	0.724	1.000	1.000	1.000

Covariance Coverage

	AGREE	CONSC	HUM	JUS	TEMP
AGREE	1.000				
CONSC	1.000	1.000			
HUM	1.000	1.000	1.000		
JUS	1.000	1.000	1.000	1.000	
TEMP	1.000	1.000	1.000	1.000	1.000
TRAN	1.000	1.000	1.000	1.000	1.000

TESTS OF MODEL FIT

Loglikelihood

H0 Value	-1644.215
H0 Scaling Correction Factor for MLR	0.983

Information Criteria

Number of Free Parameters	99
Akaike (AIC)	3486.429
Bayesian (BIC)	3742.341
Sample-Size Adjusted BIC ($n^* = (n + 2) / 24$)	3429.714
Entropy	0.962

Latent Classes

1	12	0.12245
2	50	0.51020
3	36	0.36735

Average Latent Class Probabilities for Most Likely Latent Class Membership (Row) by Latent Class (Column)

	1	2	3
1	0.985	0.015	0.000
2	0.001	0.983	0.015
3	0.000	0.007	0.993

MODEL RESULTS

Estimates S.E. Est./S.E. Std StdYX

Latent Class 1

Residual Variances

TMPS05_0	0.681	0.136	4.999	0.681	0.514
TMPS05_1	0.596	0.090	6.653	0.596	0.486
TMPS05_2	0.647	0.102	6.360	0.647	0.493
TMPS06_0	0.739	0.130	5.695	0.739	0.510
TMPS06_1	0.536	0.111	4.848	0.536	0.415
TMPS06_2	0.547	0.094	5.826	0.547	0.406
TMPS07_0	0.926	0.167	5.553	0.926	0.523
TMPS07_1	0.520	0.080	6.505	0.520	0.370

Latent Class 2

Residual Variances

TMPS05_0	0.681	0.136	4.999	0.681	0.514
TMPS05_1	0.596	0.090	6.653	0.596	0.486
TMPS05_2	0.647	0.102	6.360	0.647	0.493
TMPS06_0	0.739	0.130	5.695	0.739	0.510
TMPS06_1	0.536	0.111	4.848	0.536	0.415
TMPS06_2	0.547	0.094	5.826	0.547	0.406
TMPS07_0	0.926	0.167	5.553	0.926	0.523
TMPS07_1	0.520	0.080	6.505	0.520	0.370

Latent Class 3

Residual Variances

TMPS05_0	0.681	0.136	4.999	0.681	0.514
TMPS05_1	0.596	0.090	6.653	0.596	0.486
TMPS05_2	0.647	0.102	6.360	0.647	0.493
TMPS06_0	0.739	0.130	5.695	0.739	0.510
TMPS06_1	0.536	0.111	4.848	0.536	0.415
TMPS06_2	0.547	0.094	5.826	0.547	0.406
TMPS07_0	0.926	0.167	5.553	0.926	0.523
TMPS07_1	0.520	0.080	6.505	0.520	0.370

R-SQUARE

Class 1

Observed	
Variable	R-Square
TMPS05_0	0.486
TMPS05_1	0.514
TMPS05_2	0.507
TMPS06_0	0.490
TMPS06_1	0.585
TMPS06_2	0.594
TMPS07_0	0.477
TMPS07_1	0.630

Class 2

Observed	
Variable	R-Square
TMPS05_0	0.486
TMPS05_1	0.514
TMPS05_2	0.507
TMPS06_0	0.490
TMPS06_1	0.585
TMPS06_2	0.594
TMPS07_0	0.477
TMPS07_1	0.630

Class 3

Observed	
Variable	R-Square
TMPS05_0	0.486
TMPS05_1	0.514
TMPS05_2	0.507
TMPS06_0	0.490
TMPS06_1	0.585
TMPS06_2	0.594
TMPS07_0	0.477
TMPS07_1	0.630