ABSTRACT

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The purpose of this research has been to assess the relationships between language use, personality and performance ratings. More specifically, this research attempted to assess whether writing style could predict student performance in a scholarship setting and whether a significant amount of variance in writing style could be accounted for by personality. Writing samples from two groups of applicants to a university scholarship program were drawn and content analyzed. Three factors of language were found including use of positive words, use of negative words and use of cognitive words. Analyses indicate that there were significant differences between selected and non-selected students in terms of usage of positive words, with selected applicants using significantly more positive words. Correlations between the three language factors and a five-factor model of personality showed no significant correlations. Regression analyses revealed that personality factors were better able to predict student performance ratings based on a four-factor model of student performance. However, use of positive words did add incremental variance in addition to personality on two of the four performance factors. Implications for the use of content analysis of student essays and administration of personality tests to scholarship applicants are discussed.

THE LANGUAGE OF PERFORMANCE: THE LINK BETWEEN LANGUAGE, PERSONALITY, AND PERFORMANCE

by
TORREY ELIZABETH RIESER

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PERSONAL BIOGRAPHY

Torrey E. Rieser is a graduate of the University of North Carolina at Chapel Hill where she received Bachelor of Arts degrees in Psychology and Romance Languages – Spanish in the spring of 2001. She is currently a student at North Carolina State University in the Industrial, Organizational and Vocational Psychology program.

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Introduction

Previous researchers have established links between language and personality (Pennebaker and Francis, 1999) and personality and performance (Barrick & Mount, 1991; Tett, Jackson, & Rothstein, 1991; Piedmont & Weinstein, 1994; Barrick, Mount & Judge, 2001), but have neglected to investigate the direct link between language and performance. This research investigation will attempt to find a direct relationship between language and performance as well as determine what amount of variance in language is accounted for by personality.

Applicants to university and scholarship programs are typically asket to submit essays in their application materials. In this research, application essays written by members of two student samples drawn from a university scholarship program were content analyzed. Using existing content dimensions contained in the Linguistic Inquiry and Word Count (LIWC, Pennebaker and Francis, 1999), applicants who were selected to the program were successfully discriminated from applicants who were not selected to the program. Given the success of this discrimination procedure, the next step was to determine the extent to which text analysis information could be used to predict applicant success in the scholarship program. This study will explore ways to use this text analysis procedure to better quantify and understand the essay information for selection purposes.

Literature Review

Pennebaker and King (1999) found that linguistic style is an independent marker of one's personality after correlating categories of the Linguistic Inquiry and Word Count (LIWC) with the Five-Factor Model personality dimensions. This finding should not be surprising, however, because it was a perusal of the English dictionary by Galton in 1884 for personality descriptive terms that began a taxonomy of personality. This taxonomy was sharpened by Allport and Odbert (1936), Cattell (1943), and Norman (1967), and through the use of factor analyses, ultimately led to the development of the Five-Factor Model of personality (FFM) that is so commonly used today. In fact, Goldberg (1990) confirmed that an analysis of any large sample of English trait adjectives results in a five-factor structure. These five factors have been named Neuroticism (or Emotional Stability or Need for Stability), Extraversion, Openness to Experience, Agreeableness, and Conscientiousness (McCrae & Costa, 1987).

Research on job performance using the FFM has found that at least two of the five factors, Conscientiousness and Neuroticism, are reliable, valid predictors of overall job performance measures (Barrick, Mount, & Judge, 2001) and performance motivation (Judge & Ilies, 2002). Though the remaining three factors do not predict overall job performance measures in all studies, they do reliably predict important specific performance criteria. Extraversion has been found to relate significantly to teamwork, training performance, leadership, self-efficacy motivation, and managerial performance (Barrick, Mount & Judge, 2001; Judge & Ilies, 2002). Agreeableness relates to teamwork, training proficiency,

interpersonal facilitation and goal-setting motivation (Hurtz & Donovan, 2000; Judge & Ilies, 2002). Openness to Experience relates to training proficiency and training performance (Salgado, 1997). In addition to overall job performance, Neuroticism is a valid predictor of teamwork, and Conscientiousness predicts teamwork and training performance (Barrick, Mount, & Judge, 2001).

This research study explored the relationships between language and performance by performing a text analysis procedure on a group of student essays. Relationships were investigated between language dimensions and the FFM using the NEO PI-R (Costa & McCrae, 1992). In addition, the relationships between personality factors and important performance criteria as defined by the scholarship program were determined. Finally, performance ratings were predicted using dimensions based on the text analysis of the student application essays. The following sections will discuss the key points and the recent trends found in the language, personality, and performance literatures. By discussing these concepts in this order, I will clarify the links between language and personality and between personality and performance in order to establish the proposed direct link between language and performance.

Language

Research in language and psychology is revealing many interesting insights to the realm of human functioning. Extensive research has found that writing about traumatic events or about thoughts and feelings improves both mental and physical health, results in better academic grades, and results in

unemployed workers finding new jobs faster (Pennebaker & Seagal, 1999; Pennebaker & Graybeal, 2001). Importantly, these results are similar across cultures, social classes, and personality types (Pennebaker & Graybeal, 2001).

Text analysis has rapidly become an efficient way of studying language. It is a non-invasive, reliable, and blind procedure that can be used to evaluate interviews, letters, diaries, survey responses, TAT protocols, scripts of therapy sessions, essays, electronic mail, and newspaper stories without having to directly involve the writer or speaker (Zullow, Oettinger, Peterson, & Seligman, 1988; Lee & Peterson, 1997; Daw, 2001). Lee and Peterson (1997) argue that text analysis is particularly useful for measuring cognitive variables and constructs, and that its use is particularly advantageous for the expansion of the participant pool to include the famous, dead, unavailable, or in the case of this study, large numbers of student essays.

Zullow and Seligman (1990) analyzed 20 nomination speeches from Democratic and Republican conventions and found that pessimistic rumination predicted which candidate lost the election 90 percent of the time. In a procedure that Zullow et. al. (1988) called content analysis of verbatim explanations (CAVing), text analysis, or content analysis, applied to transcribed psychotherapy sessions helped predict mood swings and depression by looking at patients' causal explanations of events. They found that pessimistic explanations predicted depressive behavior, while optimistic explanations predicted non-depressive behavior. These researchers concluded that verbatim records can, in fact, be used to make inferences about one's explanatory style.

Other researchers, such as Mergenthaler (1996) and Pennebaker, Francis, and Mayne (1997), have used similar text analysis procedures. Mergenthaler chose to research emotional tone, or the density of emotion words within an area of text, due to its importance in many psychotherapies. Pennebaker, Francis, and Mayne (1997), using transcripts from two brief interviews, found that increases in insightful and causal thinking and increases in positive emotion words improved health and student grades. Importantly, the text analysis of the two interviews in this study predicted self-reports and behaviors one year later.

The impressive results of these studies led researchers to believe that examining linguistic style was an independent and meaningful way of researching personality style and cognitive processing. Language serves as a marker of individual differences, and language variables show consistency across time and context (Pennebaker & Graybeal, 2001). Individuals express themselves verbally and through written language with their own unique styles. By analyzing word frequencies, it has been possible to establish the identities of the authors of biblical and literary works, to understand the speaking styles of political leaders, and to distinguish the authors of letters written by soldiers in the 1800s (Pennebaker & King, 1999). It is also possible to monitor employee moods by detecting changes in negativity in an employee's electronic mailings, and to detect fraud (Daw, 2001; Dyrness, 2002). Due to the many benefits of text analysis, researchers have recently developed a sophisticated technique hoping to influence this type of analysis.

Pennebaker and King (1999) have created a word-based counting system called the Linguistic Inquiry and Word Count (LIWC). Most text analysis programs using word counts are unable to consider context, irony, sarcasm, and multiple word meanings, and, therefore, have seldom been used by social and personality psychologists. However, judges independently rated the LIWC's dictionaries. These ratings were then compared with LIWC analyses of the same text. The strong correlations between judge's ratings and LIWC analyses of the text helped to establish a more sophisticated and valid picture of text analysis through word counts (Pennebaker & King, 1999).

The LIWC has demonstrated its success in many recent studies. The following studies have all used the LIWC in their analyses. Pennebaker and Seagal (1999) assessed improvements in mental and physical health, and found that those who benefit most from writing over time use more positive emotion words, a moderate amount of negative emotion words, and an increased use of cognitive words over time. Similarly, Klein and Boals (2001) determined that the increased use of causal and insight words is associated with greater working memory improvements, which may help to explain why writing improves health. Pennebaker, Crow, Dabbs, and Price (2001) were able to extract linguistic categories from recorded daily conversations, and Stirman and Pennebaker (2001) were able to find linguistic predictors of suicide. Most recently, Pennebaker (2002) found that, in general, patterns in articles, prepositions, conjunctions, and pronouns show impressive links to mental and physical health.

Substantial amounts of research have shown the usefulness of the LIWC in research on language, which leads to my first hypothesis: content analysis of a combination of the essays from the Sample 1 and the Sample 2 will discriminate between those applicants selected to the scholarship program and those not selected to the program.

The next section of this research paper will concentrate on the link between language and personality as well as the development of the Five-Factor Model of personality. This section will also elaborate on the proposed relationships between dimensions of language and personality.

Personality

It is generally known that people have their own styles of expression through both written and spoken language. Literary works and even personal letters have been analyzed by assessing word frequencies to determine their authors. However, social and personality psychologists have paid little attention to text analysis in naturally occurring language and instead have relied on self-reports of personality (Pennebaker & King, 1999). The research that exists on personality correlates of language usually centers on speech and speech styles or patterns. For instance, Furnham (1990) studied the relationship between extraversion and frequency of silent pauses and amount of verbal productivity. In addressing the gap between text analysis in language and self-reports of personality, new methods such as the LIWC are making the process of relating

text analysis to personality assessment more feasible (Pennebaker & Francis, 1999).

Linguistic style is an independent marker of one's personality (Pennebaker & King, 1999). When correlating LIWC categories with the FFM dimensions, Pennebaker and King (1999) found significant, reliable correlations between Neuroticism and use of negative and positive emotion words ($r = .13$ and $r = -.13$ respectively), Extraversion and use of positive ($r = .15$) and negative emotion words ($r = -.08$), Agreeableness and use of positive ($r = .07$) and negative emotion words ($r = -.15$), Conscientiousness and use of positive ($r = .07$) and negative emotions words ($r = -.15$), and Openness with use of insight ($r = .07$) and causation ($r = -.08$) words. See Figure 1 for a graphical representation of these relationships.

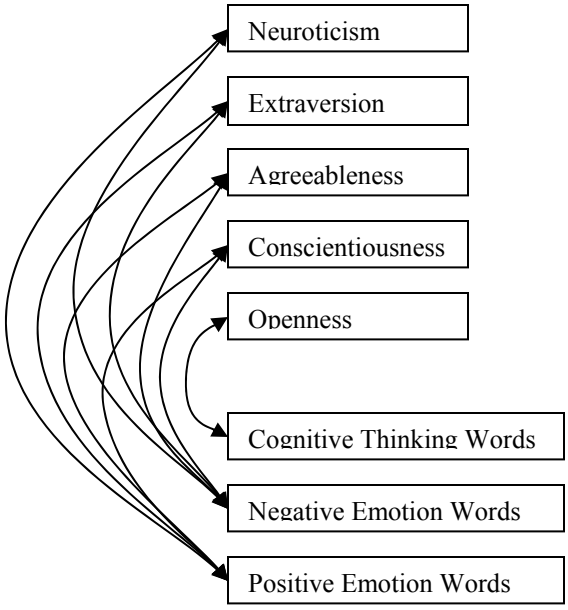

Figure 1: Graphical representation of the Pennebaker and King (1999) study results and proposed relationships between language and personality of this thesis research study.

Though correlations between personality and linguistic style are not large, they are consistent throughout the literature (Digman & Takemoto-Chock, 1981; Barrick & Mount, 1991; Tett, Jackson & Rothstein, 1991; Pennebaker & King, 1999). This research study will attempt to replicate and build upon the findings of the Pennebaker and King (1999) study (see Figure 1). Despite the relatively small correlations, Pennebaker and Graybeal (2001) stated that "language use correlates with real-world behaviors at least as highly as many traditional personality dimensions" after text analysis of student essays revealed correlations between language use and physical health, alcohol use, and school grades.

Pennebaker and Francis (1999) and Pennebaker and Graybeal (2001) found word category usage to be stable across time and writing topic, offering evidence that language use is a reliable individual difference, or personality style. However, as Goldberg (1981) asked himself, of all the individual differences that one can observe, which are the most important? The more important an individual difference is the more likely it will be noticed and talked about, and therefore, the more likely different languages will have invented a term for it. Hence, it became useful to look for personality in studies of words and language. For example, English has only one word for camel, while Nomadic Arabs have twenty. In their climate, it makes sense to distinguish between certain types of camels, while most Americans do not have that need (Sternberg, 2003). This same process occurs for words used to describe people. Relating more to personality, it appears that the distinction between normal and abnormal behaviors is an important distinction in most cultures. Disturbed thought and

behavior similar to schizophrenia, anxiety, and depression are noticeable enough that almost every language has a term for them (Murphy, 1976; Morice, 1978). It is in these studies of language trait terms that the FFM has its origins (McCrae & John, 1992).

The search for personality factors necessarily began in the natural language. For the layperson, personality is defined by the words one uses everyday to describe friends, family, and co-workers. Using these words is the basic way in which one understands others and oneself. Therefore, a theory of personality must explain how individuals use linguistic terms in everyday life (McCrae & John, 1992).

In 1936, Allport and Odbert began the daunting task of cataloging some 18,000 personality terms from a perusal of the *Webster's 1925 Second Edition English Dictionary*. These terms were divided into four lists, the first of which was categorized as "biophysical," or stable, traits. Of these approximately 4,500 terms, plus some psychological terms that he added, Cattell (1943) constructed 171 scales and had judges use them to rate people whom they knew. Cattell then developed a set of 36 bipolar clusters of related terms based on the correlations among the different ratings, and constructed rating scales, including the 16 Personality Factors Questionnaire (16PF). However, when Fiske (1949) as well as Digman and Takemoto-Chock (1981) later factor analyzed Cattell's data, they found only five factors.

In similar fashion, Goldberg (1990) empirically analyzed 1,431 trait terms. He found that in either self-descriptions or peer descriptions, the five-factor

structure was supported, and concluded that virtually all English trait terms can be represented within the same model. By explaining as much as possible with these five factors, and then looking for communalities in what was left to be explained, a systematic mapping of personality was finally possible (McCrae & John, 1992). The result was the birth of the Five-Factor Model of personality, or the "Big Five."

The FFM is a version of trait theory, which states that the five basic factors of Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness sufficiently summarize how individuals differ in their "enduring, interpersonal, experiential, attitudinal, and motivational styles" (McCrae, 1991). The FFM represents the dimensions of personality on a broad level with five heterogeneous and inclusive domains (Briggs, 1992).

Neuroticism measures such emotions as fear, guilt, anxiety, depression, embarrassment, insecurity, and frustration. It contrasts emotional stability with maladjustment. Individuals scoring high in Neuroticism tend to have irrational ideas, difficulty controlling their impulses, and trouble coping with stress (Costa & McCrae, 1992). Those who score high on this factor tend to choose jobs that have set routines, are less complex, and require more teamwork rather than independent work (Lindley & Borgen, 2000). Individuals scoring low on Neuroticism are calm, relaxed, even-tempered, and face stress easily (Costa & McCrae, 1992).

Extraversion encompasses sociability, optimism, dominance, cheerfulness, gregariousness, assertion, talkativeness, and high activity levels. These

individuals like social gatherings and prefer large groups rather than being alone. The opposite end of this scale, Introversion, is represented by adjectives such as reserved, independent, and even-paced (Barrick & Mount, 1991; Costa & McCrae, 1992).

Openness to Experience is associated with the importance of self-actualization, imagination, culture, originality, aesthetic sensitivity, intellectual curiosity, and liberality. These individuals are more often likely to entertain novel ideas, to experience strong emotions more than others, and to live experientially richer lives. Low scorers on this domain tend to be conventional and conservative. They prefer routines and are reserved in their emotions. Openness to Experience is related to certain aspects of intelligence, such as divergent thinking, or creativity. While it includes aspects of intellectual ability, Openness to Experience and intelligence are separate and distinct factors (McCrae & John, 1992; Costa & McCrae, 1992).

Individuals scoring high in Agreeableness show trust, support, sympathy, cooperation, courtesy, flexibility, forgiveness, tolerance, and are team-oriented. These individuals are altruistic and while eager to help others, believe that others will reciprocate in similar fashion. Those scoring low on Agreeableness are egocentric, skeptical, and competitive. Even though low scorers may seem maladjusted, their skepticism often leads to accuracy in scientific analyses (McCrae, 1991; Costa & McCrae, 1992)

Finally, Conscientiousness relates to competence, need for achievement, organization, planning, carrying out tasks to completion, and being purposeful,

hardworking, responsible, careful, persevering, strong-willed, and self-disciplined. High scores are related to academic and occupational achievement, while low scores relate to extreme tidiness and overworking (Barrick & Mount, 1991; McCrae, 1991; Costa & McCrae, 1992; Lindley & Borgen, 2000). While many researchers have worked to expand the descriptions of these five personality dimensions, McCrae and Costa have been very important in their development and use today.

McCrae and Costa have made crucial contributions to the development of this taxonomy of personality. In 1980, they began work on an instrument to classify personality traits using items based on analyses of standardized questionnaires. They called the resulting instrument the NEO Inventory (NEO-I) due to the fact that the original instrument was built around only three of the major personality domains, Neuroticism, Extraversion, and Openness to Experience. This instrument also re-named Norman's Culture factor to Openness to Experience. Mental ability they argued, though related to Openness to Experience, was really a separate factor (Costa & McCrae, 1980). McCrae and Costa (1987) believed that if the FFM was to be representative of personality, it had to be found in both measures of trait adjectives and questionnaires, as well as in self-reports and observer ratings. The lexical approach was limited to those personality descriptive terms existing in language, while the questionnaire approach allowed more theoretical characteristics (McCrae & John, 1992). Comparisons between the two approaches had to be made in order to accomplish a more representative model of personality.

By 1985, McCrae and Costa had found substantial correlations between personality models based on adjective factors and those based on standardized questionnaires as well as strong validity coefficients with both self-reports and peer ratings. These findings led to the empirical justification of the correspondence between the two approaches and to the addition of two more factors to their model, Agreeableness and Conscientiousness. This five-factor inventory was renamed the NEO-Personality Inventory (NEO-PI) and measured all five factors as well as specific facets defining each factor. The NEO-PI consists of two forms: Form S is used for self-reports, and Form R is used by raters. Moderate-to-strong correlations were found between the NEO-PI and other inventories such as the Eysenk Personality Inventory, the Guilford-Zimmerman Temperament Survey, five measures of well-being, the Myers-Briggs Type Indicator, and the Holland Self-Directed Search (Dolliver, 1987; MacDonald, Anderson, Tsagarakis, Holland, 1994). Factor analysis also showed substantial correlations between the needs assessed by Jackson's Personality Research Form (PRF) and the NEO-PI, demonstrating that there is no need to develop separate measures or taxonomies for traits and needs (Costa & McCrae, 1988). Re-test coefficients for the NEO-PI are very high, emphasizing the stability of individual differences (McCrae, 1991).

The NEO-PI (Costa & McCrae, 1992) and the Hogan Personality Inventory (HPI) (Hogan, 1986) are the only two inventories developed explicitly to assess the FFM. The primary goals of the NEO-PI were to assess the FFM through item and factor analysis, to maximize its convergent and discriminate

validity, and to ensure that the five factors would replicate across a variety of observers. Using virtually every personality inventory available, Costa and McCrae have uncovered the same five-factor structure consistently with the NEO-PI (Briggs, 1992). Hogan, on the other hand, began with work on the FFM, but changed his focus to predicting work-related performance criteria. The HPI is, therefore, a less faithful measure of the FFM when compared to the NEO-PI (Briggs, 1992).

The comprehensiveness of the FFM has been supported by research in both natural language adjectives and standardized personality questionnaires. The same five factors are found in self-reports and ratings, in children, college students, older adults, men and women, and in English, Dutch, German, and Japanese samples (John, 1990; McCrae & John, 1992). The factors have also shown convergent and discriminate validity across instruments and observers, and have endured for decades in adult samples (McCrae & Costa, 1990). Heritability estimates of the five factors are quite high. Agreeableness reaches uncorrected estimates of .39, while Extraversion reaches .49 (Bouchard, 1997). Though the FFM may not be the last model to ever describe personality, some version of these five traits are needed to accurately describe individual differences because these five factors are found either singly, or in combination, in virtually all personality instruments (McCrae & John, 1992).

Many researchers argue that the FFM is too broad and insufficient in describing all that is known about individual differences (Mershon & Corsuch, 1988). Researchers are not suggesting that only five personality traits exist.

Rather, they propose that having five broad factors can help organize a much larger number of traits (Lindley & Borgen, 2000). Because the five factors represent the highest hierarchical level of trait description, they may not encompass every description of personality, but it is highly unlikely that there are additional common factors given the increasing support for the comprehensiveness of the FFM (McCrae & John, 1992). Occasionally studies will show evidence of more than five factors in their analyses, but these extra factors have never been replicable and are most likely due to differences in methodology and sampling (Lanning & Gough, 1991; Goldberg, 1990). Some researchers argue that all five factors are unnecessary (Zuckerman, Kuhlman, & Camac, 1988; Peabody, 1987). However, empirical analyses have consistently supported the need for all five factors (McCrae & Costa, 1987; Goldberg, 1990; Fleenor & Eastman, 1997). Given the overwhelming support for and ease of classification with the FFM, many researchers have begun to relate these five personality domains to other behaviors, such as job performance (Barrick & Mount, 1991; Tett, Jackson, & Rothstein, 1991; Barrick, Mount, & Judge, 2001).

Due to the comprehensiveness of the NEO-PI in assessing the five factors of personality and the ability of the LIWC to use text analysis to identify these five domains, my second hypothesis is: language factors found by the LIWC will be related to the five personality domains assessed by the NEO-PI. Specifically, a Positive language factor will include LIWC categories related to positive emotions and feelings, a Negative language factor will include LIWC categories related to negative emotions and feelings, and a Cognitive thinking language

factor will include LIWC categories related to insight and causality. My third hypothesis is: the Positive and Negative factors will be related to Conscientiousness, Extraversion, Agreeableness, and Neuroticism, and the Cognitive factor will be related to Openness to Experience (see Figure 1).

Performance

Until the last 20 years, research on the relationship between personality and performance showed dismal and inconclusive results due to a lack of clarity about the personality traits and indecision on how they were to be classified. In addition, literature on the subject was largely lacking in quantitative studies and did not correct for study artifacts that deflated validity estimates. Relationships between the personality traits and performance criteria were undeniably difficult to uncover under these circumstances (Barrick, Mount, & Judge, 2001).

Since the 1980's, the FFM has revolutionized the way researchers look at the relationships between personality and performance. Recent research, meta-analysis in particular, has shown that factors of personality can consistently predict job performance (Barrick & Mount, 1991; Tett, Jackson, & Rothstein, 1991; Piedmont & Weinstein, 1994; Barrick, Mount, & Judge, 2001). Corrected estimates of the overall relationship between personality and job performance are usually in the .20s to .30s, though the estimate increases if job analysis is used to select predictors (Tett, Jackson, & Rothstein, 1991). The estimates are lower than that of cognitive ability estimates, however, it would be unreasonable to expect personality validities to generalize across different jobs as well as cognitive

ability due to the diversity of personality traits necessary for different jobs (Anastasi, 1985). Because personality provides information about individuals in addition to cognitive ability measures, the use of both methods creates a powerful predictive combination for selection purposes (Piedmont & Weinstein, 1994; Oakes, Ferris, Martocchio, Buckley & Broach, 2001). In addition, larger correlations between personality and performance may be found with better-developed measures of performance (Furnham, Crump, & Whelan, 1997). Well-developed personality measures also combat adverse impact for minority applicants, and increase productivity and social justice with their use in pre-employment screening. Though some gender differences do exist in personality, these differences do not result in differential selection rates when applying for jobs (Hogan, Hogan, & Roberts, 1996).

Conscientiousness consistently predicts all job performance criteria for all occupational groups with validity estimates generally in the .20s (Hough et. al., 1990; Furnham, Crump, & Whelan, 1997; Barrick & Mount, 1991; Barrick & Mount, 1993; Piedmont & Weinstein, 1994; Furnham & Coveney, 1996; Salgado, 1997; Hurtz & Donovan, 2000; Barrick, Mount, & Judge, 2001). This relationship makes intuitive sense because possessing characteristics such as hard-working, responsible, persevering, and achievement-oriented are important in all occupations (Barrick & Mount, 1991). Conscientiousness is also a positive predictor of teamwork and training performance (Barrick, Mount, & Judge, 2001) as well as leadership, especially leader emergence (Judge, Bono, Ilies & Gerhardt, 2002). When looking at the facet scores, Piedmont and Weinstein (1994) found

that competence, achievement striving, and self-discipline were important characteristics underlying successful performance in every rated area. Furnham, Crump, and Whelan (1997) found that Conscientiousness correlates highly with manager capability ratings of "Drive to Achieve" and "Internal Locus of Control," and Judge and Ilies (2002) found Conscientiousness to be a consistent correlate of performance motivation with an average validity of r = .24. Conscientiousness has also been found to highly relate to citizenship performance, including helping others with their jobs, organizational support, and volunteering for additional work. This aspect of Conscientiousness is particularly important because these activities, unlike task-oriented activities, are similar across most jobs (Borman, Penner, Allen, & Motowidlo, 2001).

Conscientiousness has also consistently correlated with educational achievement. Peer ratings on this factor correlated .43 with first-year college grades, and teacher ratings correlated .70 with educational achievement earned in high school. This factor is also correlated .60 with vocational achievement (Digman & Takemoto-Chock, 1981; Smith, 1967). Women tend to score higher than men do on Conscientiousness (Hogan & Hogan, 1995). Overall, Conscientiousness relates more highly to job and academic performance than any other personality factor, and should maintain a large role in any theory attempting to explain these types of performance (Barrick, Mount, & Judge, 2001).

Extraversion shows consistent relationships with occupations involving social interaction, such as management and sales, and positively predicts training proficiency (Barrick & Mount, 1991). Other research has found Extraversion to

significantly relate to overall job performance when using self-report measures, such as the NEO-PI, and supervisor ratings (Barrick & Mount, 1993; Furnham, Crump, & Whelan, 1997; Piedmont & Weinstein, 1994). Mount, Barrick, and Strauss (1994), however, found mixed results. They discovered that while observer ratings of Extraversion predicted performance, self-ratings did not. Recent research by Barrick, Mount, and Judge (2001) has found that while the relationship between Extraversion and performance reaches estimates of .15, with a 90% confidence interval, the correlation is indistinguishable from zero. However, they did find positive correlations between Extraversion and teamwork, training performance, and managerial performance. Furnham, Crump, and Whelan (1997) found high correlations between Extraversion and "Social Adaptability" and "Optimism," and Judge and Ilies (2002) found a moderately strong correlation between Extraversion and self-efficacy motivation. Importantly, Judge, Bono, Ilies and Gerhardt (2002) found that Extraversion was the most consistent correlate of leadership among the Big Five, with a correlation coefficient estimated at $r = .31$. Ployhart, Lin and Chan (2001) found that Extraversion predicted both typical and maximum ratings of transformational leadership performance. Women are generally more extraverted than men (Furnham & Stringfield, 1993). It seems that while a significant relationship between Extraversion and overall job performance may not be consistent, there is sufficient support that Extraversion is significantly related to certain components of job performance such as teamwork and training performance (Barrick, Mount & Judge, 2001).

Individuals possessing characteristics of Neuroticism would be less successful at work due to traits such as anxiety, insecurity, and depression, which tend to inhibit job tasks (Barrick & Mount, 1991). High scores of Neuroticism are consistent negative predictors of job performance, performance motivation (Judge & Ilies, 2002), leadership (Judge, Bono, Ilies & Gerhardt, 2002), ratings of interpersonal relations, absenteeism, and adaptive capacity (Tett, Jackson & Rothstein, 1991; Furnham, 1994; Piedmont & Weinstein, 1994; Furnham & Coveney, 1996; Barrick, Mount, & Judge, 2001). However, high scores of Neuroticism are positive predictors of teamwork (Barrick, Mount, & Judge, 2001), training proficiency, (Salgado, 1997), typical transformational leadership performance (Ployhart, Lin & Chan, 2001) and counterproductive work behavior (Penner & Spector, 2002). Furnham (1994) failed to find a relationship between Neuroticism and productivity, but Furnham, Crump, and Whelan (1997) did find high correlations with management capability ratings of "Resilience," "Internal Locus of Control," and "Optimism." Neurotic individuals are also less satisfied in their jobs and have a harder time making career decisions (Furnham, 1994; Furnham & Zacherl, 1986; Lindley & Borgen, 2000). Men tend to score higher on Neuroticism (Hogan, Hogan, & Roberts, 1996). There is now sufficient support to show that low scorers on Neuroticism scales have higher job performance and better interpersonal skills than people who score high on the same scale (Tett, Jackson & Rothstein, 1991; Furnham, 1994; Piedmont & Weinstein, 1994; Furnham & Coveney, 1996; Barrick, Mount, & Judge, 2001).

Training proficiency is positively predicted by Openness to Experience because these individuals possess traits such as intellectual curiosity and open-mindedness (Salgado, 1997). These traits are associated with positive attitudes toward learning new tasks and being motivated to learn upon entry, which help these individuals to benefit more from training (Barrick & Mount, 1991; Barrick, Mount, & Judge, 2001). Judge, Bono, Ilies, and Gerhardt (2002) found Openness to Experience to be predictive of leadership, with a regression coefficient of r = .21, which was the highest of the Big Five behind Extraversion and Conscientiousness. Ployhart, Lin and Chan (2001) also found Openness to Experience to be predictive of transformational leadership performance. Furnham, Crump, and Whelan (1997) found that Openness to Experience correlates positively with management capabilities "Conceptual Ability" and "Intuition," and negatively with "Resilience." Tett, Jackson, and Rothstein (1991) found Openness to Experience to predict overall job performance when using confirmatory analyses and job analysis in predictor selection, but other studies have not supported this relationship (Piedmont & Weinstein, 1994). Openness to Experience is, thus far, a consistent predictor of training proficiency but not overall job performance (Barrick & Mount, 1991; Barrick, Mount, & Judge, 2001).

Agreeableness has been found to significantly predict job performance in studies using confirmatory analyses and job analysis (Tett, Jackson & Rothstein, 1991), but not in those using scales specifically designed to measure the FFM, such as the NEO-PI (Piedmont & Weinstein, 1994; Furnham, Crump, & Whelan,

1997; Barrick, Mount, & Judge, 2001). Piedmont and Weinstein (1994) found that low scores on straightforwardness, a facet of Agreeableness, are, however, related to the ability of achieving goals and adapting to changing work conditions. In research based on management capability, Furnham, Crump, & Whelan (1997) found that Agreeableness negatively correlates with "Drive to Lead" and positively correlates with "Interpersonal Sensitivity." Agreeableness has also been found to relate with training proficiency, interpersonal facilitation, and leader effectiveness (Salgado, 1997; Hurtz & Donovan, 2000; Judge, Bono, Ilies, Gerhardt, 2002). Along with Conscientiousness, Extraversion, and Neuroticism, Agreeableness was also found to predict teamwork in a study conducted by Barrick, Mount and Judge (2001) who quantitatively summarized 15 meta-analytic studies on the relationship between the FFM and job performance.

Though Conscientiousness predicts overall job performance well by itself, most performance criteria are best predicted by a combination of personality factors (Hogan, Hogan, & Roberts, 1996). Conscientiousness and Neuroticism together substantially predict supervisor ratings of job performance (Ones, Viswesvaran, & Schmidt, 1993). Frei and McDaniel (1998) found mean validities of .50 for predicting performance in service jobs with customer service scales containing facets of Agreeableness and Neuroticism. Furnham, Crump, and Whelan (1997) found that combinations of high Conscientiousness and Extraversion, and low Agreeableness and Neuroticism predicted the management capability factor they called "energy drive and motivation". High scores of Extraversion and Agreeableness, and low scores of Neuroticism predicted

"optimistic internal locus of control." They also found that Openness to Experience and Neuroticism predicted "cognitive flexibility". Witt et. al. (2002) found that high scores on both Conscientiousness and Agreeableness predict higher job performance ratings than those who scored high on Conscientiousness and low on Agreeableness. Such research gives support to the increased use of combinations of personality factors as well as cognitive ability in predicting performance.

Due to research suggesting that personality factors as well as cognitive ability predict performance both singly and in combination, my fourth hypothesis is: the performance ratings made by Subject Matter Experts (SMEs) in the scholarship program will reveal two separate performance factors. One factor will be consistent with Intellectual Ability and the other will be consistent with student Character. More specifically, my fifth hypothesis is: (1) the Neuroticism, Agreeableness and Extraversion personality factors will relate to the Character performance factor, and (2) the Openness to Experience and Conscientiousness personality factors will relate to both the Intellectual Ability and Character factors (see Figure 2).

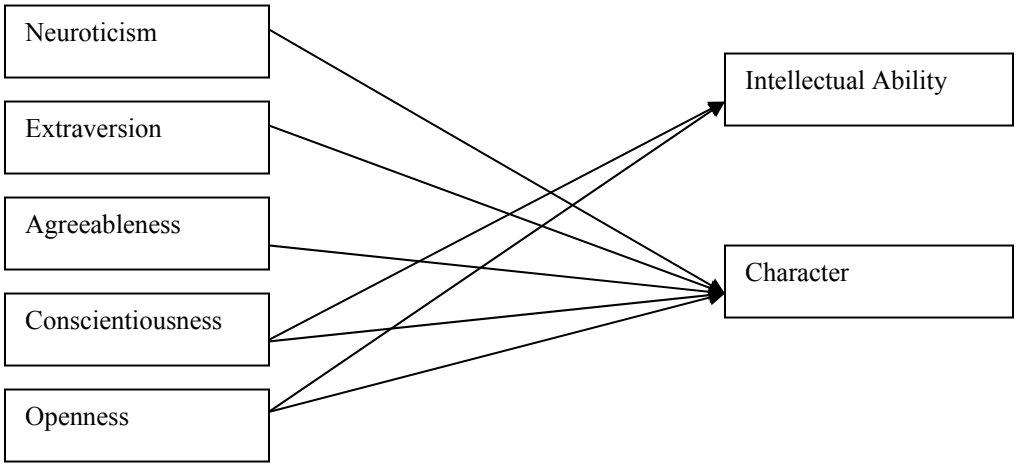

Figure 2: Proposed relationships between personality and performance factors.

Also related to performance, many studies have shown the importance of the relationship between personality and leadership. Studies of adult leadership have found that personality characteristics contribute to leadership ability (Karnes & D'Ilio, 1990). Cattell and Eber (1966) found that leaders scored higher on scales of intelligence, enthusiasm, conscientiousness, self-sufficiency, and self-control. Piedmont and Weinstein (1994) found that during group situations, individuals scoring high on Extraversion and low on straightforwardness (a facet of Agreeableness) are more often perceived as leaders. In research relating personality to the Strong Interest Inventory, Lindley and Borgen (2000) found that Conscientiousness was related to preferences of leading others, directing, and persuading. Openness to Experience was correlated to learning environments, leading others, and risk taking, while Neuroticism was not related to any scale.

Keller (1999) found that all of the five personality factors influence implicit leadership theories, or idealized leadership images. Agreeableness positively predicted leader sensitivity but was negatively related to leader tyranny.

Conscientiousness related to leader dedication and predicted leader tyranny, and Extraversion positively predicted leader charisma. Openness to Experience, self-monitoring, and Neuroticism significantly related to leader sensitivity.

When researching transformational leadership, Judge and Bono (2000) found that Extraversion, Openness to Experience, and Agreeableness were positively correlated with transformational leadership, while Neuroticism and Conscientiousness showed no significant relations. All together, the corrected multiple correlation between the five domains and transformational leadership was .40. Transformational leadership also shows significant correlations with leader effectiveness (Fuller, Patterson, Hester, & Stringer, 1997). Those leaders judged to be most effective by superiors are rated highly as exhibiting transformational behaviors by their subordinates (Judge & Bono, 2000). Transformational, or charismatic, leaders inspire followers to reach beyond their own interests (Burns, 1978), and articulation and emotional expressiveness are important characteristics when achieving these goals (Friedman, Prince, Riggio, & DiMatteo, 1980).

In their study with 95 student leaders, Karnes and D'Ilio (1990) used the High School Personality Questionnaire (HSPQ) and the Leadership Skills Inventory (LSI) to explore the relationship between personality characteristics and leadership skills. Among many significant correlations, positive correlations were found between Warmth and Written Communication Skills, Speech Communication Skills, Group Dynamic Skills, Personal Development Skills, and Planning Skills, while Emotional Stability positively correlated with all of the LSI

subscales. Boldness and Control positively correlated with all LSI subscales, while Anxiety negatively correlated with all LSI subscales. Girls scored significantly higher on the Emotional Stability scale. These researchers stated that study participants could best be described as emotionally mature, stable, conscientious, moralistic, determined, adventuresome, friendly, and not apprehensive, self-blaming, insecure, or anxious. These results are consistent with results found by Chauvin and Karnes (1983) who found that 181 gifted secondary students scored higher on the intelligence, enthusiasm, and self-sufficiency subscales of the High School Personality Questionnaire when compared to adult leader profiles.

This brief discussion of leadership has been included due to the scholarship program's interest in selecting and developing future leaders. Therefore, student leadership ability and interest are important parts of the performance rating and will most likely fall under the Character factor of performance.

Many of the aforementioned studies on personality and leadership have been based upon the use of self-report measures. Inherent in the use of self-report measures is the argument that face validity and faking can be problematic. While face validity increases applicant's acceptance of the tests, it also increases opportunities for social desirability faking. However, when faking is controlled for through empirical keying, applicants tend to complain about the lack of face validity (Hogan, Hogan, & Roberts, 1996), and correcting for faking usually reduces the validity of corrected scales (McCrae & Costa, 1985). In an effort to

curb effects of social desirability faking, lie scales have been implemented in many personality measures. In all, deliberate faking in applicant pools tends to be low, and faking has been shown to not have a significant effect on validation studies using job applicants (Hogan, Hogan, & Roberts, 1996; Hough, Eaton, Dunnette, Kamp, & McCloy, 1990; Tett, Jackson & Rothstein, 1991). In addition, personality assessment using text analysis may be subject to less faking than self-reports of personality due to decreasing the social desirability found with self-reports.

When choosing the best candidates for a scholarship program based on commitment to leadership, scholarship, service, and character, it is important to find those students who will benefit most from the program's training and development services. Personality styles are apparent in writing samples, and because research has suggested that personality styles are associated with performance in school and in leadership roles, examining student essays should give insight to their performance potential. This leads to my sixth, and final, hypothesis: the Positive and Negative language factors will relate to the Character performance factor, and the Cognitive language factor will relate to the Intellectual Ability performance factor (see Figure 3).

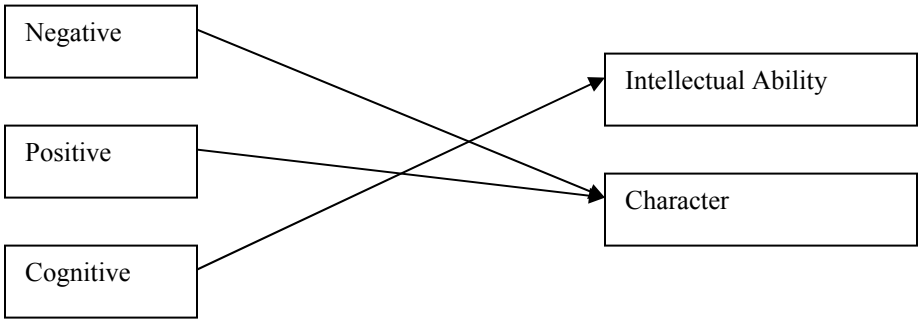

Figure 3: Proposed relationships between language and performance dimensions.

As discussed in the previous sections, research has looked at the relationships between language and personality and between personality and performance. However, no research has yet to attempt looking at a direct relationship between language and performance. This study proposes that these direct relationships exist (see Figure 3). Figure 4 below is a combination of Figures 1 through 3 and suggests that measures of personality can be replaced by measures of three language dimensions in order to predict performance.

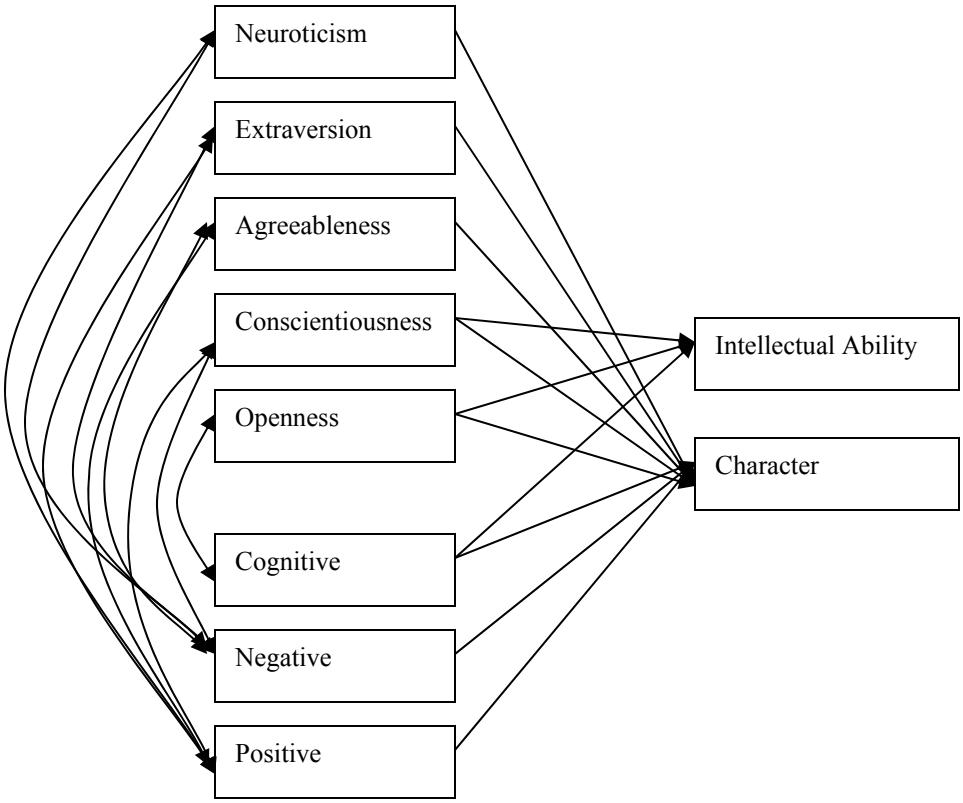

Figure 4: Proposed full model of the relationships between language, personality, and performance.

Method

Participants

Participants were randomly selected from applicants who were and were not selected to be part of a scholarship program at a large southeastern university. Participants were drawn from two consecutive application periods. See Table 1 for demographic statistics for all applicant samples. In the scholarship application packet, students were instructed to submit both a personal and service statement.

A total of 277 personal and service statements were collected from 139 applicants during the first application period. This applicant group will be called Sample 1. One of the applicants did not write a service statement, so the number of essays collected from the selected applicants totaled 137. Both types of statements were obtained from each of the 70 applicants that were not selected into the program, so the number of essays collected from this group totaled 140.

The total number of selected applicants from Sample 1 was 69, which included all current students, 4 individuals who declined admittance into the program, and one who deferred admittance to the following year. The remaining 70 applicants were chosen at random from those applicants not selected to proceed further in the application process. Typed personal and service statements were collected from the application files of all applicants.

Table 1. Applicant Demographic Information

	Male	Female	Caucasian	Native Am	African Am	Asian	Hispanic	GPA	SATV	SATM
Sample 1	66	73	109	1	19	5	5			
Selected	30	39	52	1	10	4	2	4.48	696	710
Not Sel.	36	34	57	0	9	1	3	4.19	602	635
Sample 2	59	55	99	3	7	3	1			
Selected	24	33	47	2	5	2	1	4.52	691	714
Not Sel.	35	22	52	1	2	1	0	3.64	588	630
Pooled										
Selected	54	72	99	3	15	6	3	4.50	694	712
Not Sel.	71	56	109	1	11	2	3	3.94	596	633

A similar number of personal and service statements were collected from the following application period using the same methods as the previous year. This sample included 57 students who were selected to the scholarship program and 57 who were not selected, for a total number of 114 applicants selected to participate in this research. This group of applicants will be called Sample 2. Both personal and service statements were obtained from each of the 57 applicants that were selected to the program and each of the 57 applicants that were not selected into the program. The number of essays collected from this group total 228.

The total number of selected applicants from Sample 2 was 57, which included all current students and 12 individuals who declined admittance into the program. The remaining 57 applicants were chosen at random from those applicants not selected to proceed further in the application process. Typed personal and service statements were collected from the application files of all applicants.

The personal and service statements written by applicants in Sample 1 and Sample 2 were pooled into one large sample. This sample includes 126 applicants selected to the scholarship program and 127 applicants not selected to the scholarship program. Both types of statements were obtained from each of the 126 applicants selected to the program, except for one student in Sample 1 who did not write a service statement. Therefore, the total number of personal and service statements collected from selected applicants is 251. Both types of

statements were obtained from each of the 127 applicants not selected to the program for a total number of 254 personal and service statements collected. These statements were analyzed using the LIWC in order to determine language differences between the selected and non-selected applicants.

All selected applicants from Samples 1 and 2 were given the Revised NEO Personality Inventory (NEO PI-R; Costa & McCrae, 1992) to measure their personality based on the FFM. Supervisor ratings were collected for these students as a measure of their performance including managing academic potential, critical thinking skills, leadership skills, seeking or accepting leadership roles, quality of service behavior, self-awareness, integrity, adaptability, and presence, plus one rating on the student's overall effectiveness taking into account the previous 9 criteria.

Materials

Applicant Essays. As a part of the application process, applicants were requested to submit two essays: a personal statement and a service statement. For the personal statements, applicants were asked to describe a person or event that had a significant impact on their ideas, values, goals and educational or professional aspirations. They were also asked to explain how this experience influenced their thinking, and to emphasize any special insights gained about themselves. Instructions for the service statements requested applicants to describe a social problem of interest, to describe a public service activity or project that they could engage in during college to address the identified social problem, and to indicate why being involved in the proposed program would be

important. Instructions for both statements requested that essays be written in fewer than 500 words.

Linguistic Inquiry and Word Count. Pennebaker and Francis's (1999) Linguistic Inquiry and Word Count was developed to provide an efficient method for studying various cognitive, structural, and emotional components in text samples. The LIWC is a text analysis computer program that counts and classifies the percentage of words used by an individual into 72 categories. These categories are listed in Appendix A. These 72 categories are collected into 17 standard linguistic dimensions (e.g., word count, percentage of articles used), 25 psychological process categories (e.g., affect, cognition), 10 relativity dimensions (e.g., time, space), and 19 personal concern categories (e.g., work, home). The LIWC captures approximately 80% of words used in writing. All of the LIWC's word categories were developed and evaluated by expert judges to establish their reliability and validity. The levels of agreement between judges for placing words into certain categories ranged from 93% for the insight category to 100% for the eating, metaphysical, friends, human and relatives categories. Pearson correlation coefficients between LIWC output and expert judge's ratings of 72 student essays ranged from r =.22 for the optimism category to r =.41 for the anger category (Pennebaker & Francis, 1999). Reliability estimates between LIWC categories range from r =.18 for insight to r =.40 for first person singular. Though the reliability estimates are fairly low, the LIWC has been successfully used in numerous studies (Pennebaker & Seagal, 1999; Klein & Boals, 2001; Pennebaker, Crowe, Dabbs, & Price, 2001; Stirman & Pennebaker, 2001;

Pennebaker, 2002; Pennebaker & Lee, 2002), including the prediction of self-reports and behaviors related to physical health, psychological health, and suicidal tendencies. The LIWC has also been a successful indicator of grade point average, adaptive bereavement, and psychological state (Stirman & Pennebaker, 2001; Pennebaker & Mayne, 1997).

In this study, only ten subcategories comprising the affect and cognitive constructs will be considered due to their ability in previous analyses to discriminate between selected and non-selected applicants. These subcategories are: positive emotion, positive feeling, optimism, anxious, anger, negative emotion, sad, cause, insight and cognitive mechanisms.

NEO PI-R. Costa and McCrae's (1992) NEO PI-R is a comprehensive measure of the 5 domains and 30 facets that define each dimension of normal personality. The 30 facet scales were constructed to identify important distinctions within each of the 5 domains of the FFM, and give a more detailed analysis of an individual's personality. This revised version replaces the previous 1985 and 1989 versions by the same authors and includes facet scales for Agreeableness and Conscientiousness and minor changes in some of the Neuroticism, Extraversion, and Openness items. This revised version is just as valid as its predecessor is, with correlations between the two ranging from .93 to .95. The NEO PI-R consists of two forms: Form S for self-ratings and Form R for observer ratings. Form S is self-administered, is appropriate for both sexes, and will be used in this study.

Form S consists of 240 items with a 5-point response scale, and 3 additional items at the bottom of the answer sheet that serve as validity checks. Internal consistency coefficient alphas for this form range from r = .86 for Agreeableness to r =.92 for Neuroticism. Retest reliabilities for Neuroticism, Extraversion, and Openness are r =.87, r =.91, and r =.86 respectively. Long-term retest coefficients range from r =.63 to r =.83 for all five factors, demonstrating its stability in measuring enduring dispositions. Using principal components analysis with varimax rotation, correlations between the factor scores and the five domain scales ranged from r =.89 for Extraversion and Conscientiousness to r =.95 for Openness and Agreeableness, representing a factor structure consistent with the FFM. Median convergent validity coefficients range from r =.30 for Neuroticism to r =.40 for Extraversion for self-report and peer ratings. The NEO PI-R exhibits construct validity with its use in studies on psychological well-being, coping, needs, and job performance, demonstrating its application in many different types of research (McCrae & Costa, 1986; Costa & McCrae, 1988; Piedmont & Weinstein, 1994).

Performance Ratings. A group of 11 people in the scholarship program who had continuous contact with the selected applicants were selected as subject matter experts (SMEs). These SMEs met to discuss the appropriate criteria desired by the scholarship program. Four behavior dimensions were selected as adequate. These dimensions were Scholarship, Leadership, Service, and Character. The SMEs then developed a list of 10 performance criteria that appropriately reflected these behavior dimensions and could be incorporated into

a performance rating scale. These performance criteria included managing academic potential, critical thinking skills, leadership skills, seeking or accepting leadership roles, quality of service behavior, self-awareness, integrity, adaptability, and presence, plus one rating on the student's overall effectiveness taking into account the previous 9 criteria. Effective management of academic potential and critical thinking skills measured the Scholarship behavior dimension. Leadership skills and leadership roles measured the Leadership behavior dimension. Quality of student's service commitment measured the Service behavior dimension. Self-awareness, integrity, adaptability, and presence measured the Character behavior dimension. See Appendix B for the performance rating booklet and further descriptions and examples of each scale. Ratings of the 10 scales were made on a 7-point scale ranging from *not at all effective* (1) to *very effective* (7).

Procedure

The primary purpose of this study is to compare essays of selected applicants with those who were not selected, and to determine whether writing ability is predictive of program performance. All essays were scanned as text files into Microsoft Word. The spelling and grammar check, set on the formal writing setting, corrected any misspellings created during the scanning process. Each file was then saved separately and analyzed using the LIWC program. Output from this program was saved as an Excel file to be used in subsequent data analysis. Because language use has been found to be stable over time and writing

samples (Pennebaker & Francis, 1999), word counts for the personal and service statements were summed to create a total word count for each LIWC category.

The 64 Sample 1 students were administered the NEO PI-R (Costa & McCrae, 1992) Form S in one large group. The 45 Sample 2 students were administered the NEO PI-R the following year in one large group. Supervisors in the scholarship office rated the performance of students in in both samples over two years.

Results

The LIWC reports percentages of words used in writing samples, which may violate sample normality assumptions. Due to this fact, an arcsine transformation, one of the most popular transformations used with proportions (Cohen & Cohen, 1983), was performed on the language data before any analyses were conducted. However, means and standard deviations reported in this document are given in percentages for ease of understanding.

The 7 affect (positive emotion, positive feeling, optimism, negative emotion, anxiety, anger and sadness) and 3 cognitive (cognitive mechanisms, insight and causal) LIWC subcategories were subjected to an exploratory factor analysis. The principal factor method of factor analysis using priors equal to the squared multiple correlations was used to extract the factors, which was followed by a varimax (orthogonal) rotation. A scree test suggested three factors; so three factors were retained for rotation. Eigenvalues of the reduced correlation matrix are shown in Table 2. The rotated factor pattern can be seen in Table 3, and the correlations between LIWC subcategories can be found in Table 4.

Table 2 Eigenvalues for Language Factors

Factor	Eigenvalue	Difference	Proportion	Cumulative
1	1.71	0.48	0.46	0.46
2	1.23	0.08	0.33	0.80
3	1.14	0.92	0.31	1.11
4	0.22	0.07	0.05	1.17
5	0.14	0.09	0.03	1.21
6	0.05	0.10	0.01	1.22
7	-.04	0.17	-0.01	1.21
8	-.22	0.02	-0.05	1.15
9	-.24	0.06	-0.06	1.08
10	-.30	-0.08	1.00	

N = 277

Table 3. Rotated Factor Pattern of Language Factors

	1 = Negative	2 = Cognitive	3 = Positive
Negative Emotion	**.843**	**-**.013	.051
Sad	**.561**	.062	.080
Anger	**.577**	.098	-.054
Anxiety	**.471**	-.068	.031
Cognitive Mechanisms	.073	**.757**	.065
Insight	.105	**.698**	-.070
Cause	-.071	**.448**	.009
Positive Emotion	-.042	.055	**.778**
Optimism	.168	.047	**.514**
Positive Feeling	-.030	-.074	**.525**

Note: Numbers in bold indicate subcategories said to load on each factor.
N=277

Table 4. Language Subcategory Correlation Matrix

	1	2	3	4	5	6	7	8	9
1. Pos. Emot.									
2. Pos. Feel.	0.48**								
3. Optimism	0.43**	0.11							
4. Neg. Emot.	-0.03	0.01	0.16*						
5. Anxiety	-0.05	0.03	0.14*	0.41**					
6. Anger	-0.04	-0.02	0.09	0.46**	0.19**				
7. Sad	0.04	0.07	0.12	0.47**	0.19**	0.20**			
8. Cog. Mech	0.10	-0.04	0.13*	0.06	0.02	0.10	0.12		
9. Cause	0.04	-0.05	0.02	-0.04	-0.11	0.04	-0.04	0.35**	
10. Insight	-0.02	-0.09	-0.01	0.04	0.06	0.16*	0.09	0.61**	0.25**

N=277, **p<.01, *p<.05

When interpreting the rotated factor pattern, a subcategory was said to load on a given factor if the factor loading was .40 or greater for that factor, and less than .40 for the other two factors. Using these criteria, four subcategories, negative emotion words, sad words, anger words, and anxiety words, were found to load on the first factor. This factor was labeled the negative factor. Three subcategories, cognitive mechanism words, insight words, and causal words, were found to load on the second factor. This factor was labeled the cognitive factor. The final three categories, positive emotion words, optimism words, and positive feeling words, loaded on the third factor. This factor was labeled the positive factor.

This three-factor model, using data from the pooled sample, is consistent with preliminary analyses conducted using only the data from Sample 1. A general linear model multivariate analysis of variance (MANOVA) with the three language factors as dependent variables, determined that the two samples did not significantly differ in regards to scores on the factors, justifying their being pooled into one large sample.

MANOVAs for group, gender, and ethnicity were then computed. Results of the omnibus tests indicated significant differences between selected and non-selected students, $\underline{F}(3,248) = 5.44$, $p < .001$, and between males and females, $\underline{F}(3, 248) = 4.87$, $p < .01$, but not between ethnic groups. See Table 5 for results from the MANOVAs and follow-up ANOVAs.

Table 5. Language Analysis of Variance

Source	Wilks' Λ	df	MS	F
Gender	0.95	3		4.87**
Negative		1	10.03	1.90
Cognitive		1	14.71	0.97
Positive		1	72.05	11.63**
Group	0.94	3		5.44**
Negative		1	9.75	1.85
Cognitive		1	28.35	1.86
Positive		1	81.87	13.21**
Ethnic	0.92	12		1.67
Negative		4	3.03	0.58
Cognitive		4	49.49	3.25*
Positive		4	5.91	0.95

N = 252, **p<.01, *p<.05

Univariate tests assessed the differences found between selection groups and gender. A significant difference was found between males and females on the positive factor $\underline{F}(1, 251) = 11.63$, $p < .0008$, with females using significantly more positive words (M = 7.77%) than males (M = 6.61%). No other gender differences were found. Significant differences were found between selection groups on the positive factor, $\underline{F}(1, 251) = 13.21$, $p < .0003$, with the selected student group using significantly more positive words (M = 7.83%) than the non-selected group (M = 6.70%). No significant difference was found between selection groups on the negative or cognitive factors. Despite a non-significant omnibus test, a significant difference was found between ethnic groups on the cognitive factor $\underline{F}(4,249) = 3.25$, $p<.0127$, with Asian Americans using the most cognitive words (M = 20.75%). Mean scores on the factors for sample groups, gender and ethnicity are shown in Table 6.

Table 6. Means and Standard Deviations for Language Factors

		Negative		Cognitive		Positive	
	N	Mean	SD	Mean	SD	Mean	SD
Selected	110	3.06	2.26	16.85	3.92	7.83	2.85
Not Sel.	142	2.62	2.32	17.44	4.03	6.70	2.57
Sample 1	139	2.84	2.37	17.07	3.94	7.06	2.40
Sample 2	113	2.78	2.23	17.32	4.06	7.35	2.82
Male	125	2.57	2.15	16.94	3.65	6.61	2.54
Female	127	3.06	2.43	17.43	4.30	7.77	2.53
Caucasian	206	2.86	2.40	16.83	3.86	7.24	2.61
Native Am.	4	2.25	0.96	17.75	2.99	7.75	2.36
Afr. Am.	26	2.88	1.88	18.73	4.38	6.85	2.82
Asian Am.	8	2.00	1.20	20.75	2.92	7.50	2.67
Hispanic	6	2.33	1.86	17.17	4.96	5.67	1.03

N = 252

The positive factor was the only language factor to differentiate between both the selected and non-selected groups. An analysis of covariance (ANCOVA) was performed on the positive factor to ensure that high school GPA and total SAT score did not influence its relationship with the sample groups. After adjustment by covariates, GPA and SAT scores, the positive language factor varied significantly with the selected group, $F(3, 251) = 4.66$, $p<.01$. Neither of the two covariates were significantly associated with the positive language factor, and thus, did not influence the relationship between the positive factor and selected or non-selected student groups.

To assess relationships between the three language factors and the FFM, correlations were performed between scores on each language factor and NEO PI-

R factors. Means, standard deviations and correlations for the five personality factors and the three language factors are presented in Table 7.

Table 7. Personality and Language Factor Correlations

	Mean	SD	1	2	3	4	5	6	7
1. Neuroticism	86.84	21.26							
2. Extraversion	123.36	25.25	-0.12						
3. Openness	126.63	22.46	0.03	0.25***					
4. Agreeableness	124.24	16.48	-0.04	0.13	0.25***				
5. Conscientiousness	120.21	23.44	-0.45***	0.14	-0.25***	-0.06			
6. Negative	3.06	2.26	0.05	0.05	0.02	-0.07	-0.07		
7. Cognitive	16.85	3.92	-0.17*	0.06	0.10	-0.09	0.02	0.07	
8. Positive	7.83	2.50	0.03	0.07	0.06	0.18*	-0.12	0.09	0.00

N=110, ***p<.01, **p<.05, *p<.10

Results indicate that the only correlations that approach significance between the language and personality factors are a negative relationship between the use of cognitive words and Neuroticism (r = -.17) and between the use of positive words and Agreeableness (r = .18). The negative relationship between cognitive words and Neuroticism was not found in the Pennebaker and King (1999) study. The positive relationship between positive words and Agreeableness was stronger in this study than in the Pennebaker and King (1999) study. The negative relationship between the positive factor with Conscientiousness was the next largest correlation in magnitude (r = -.12), but was in the opposing direction as hypothesized and supported by the Pennebaker and King study (1999). The highly significant negative relationship between Conscientiousness and Neuroticism and the positive relationship between Extraversion and Openness, first noted by Costa, McCrae and Dye (1991), was evident in this study.

A principal components analysis (PCA) was conducted on the performance rating scale for Sample 1. The principal component method was used to extract the factors, which was followed by a promax (oblique) rotation due to moderate to high correlations between performance factors. This PCA resulted in possible 2-factor or 4-factor solutions based upon eigenvalues, a scree test, and theoretical conceptions of the factors. Eigenvalues are presented in Table 8. The two-factor and four-factor solution rotated factor patterns can be found in tables 9 and 10 respectively. An item was said to load on a given factor

if the factor loading was .40 or greater for that factor, and less than .40 for the other factors.

Table 8. Eigenvalues for Performance Factors

Factor	Eigenvalue	Difference	Proportion	Cumulative
1	6.02	4.90	0.60	0.60
2	1.12	0.42	0.11	0.72
3	0.70	0.13	0.07	0.79
4	0.56	0.17	0.05	0.84
5	0.39	0.05	0.04	0.88
6	0.33	0.02	0.03	0.91
7	0.30	0.03	0.03	0.95
8	0.27	0.10	0.03	0.97
9	0.16	0.06	0.02	0.99
10	0.10	0.00	0.01	1.00

N = 64

Table 9. Rotated Factor Pattern of Two-Factor Performance Model

	Factor 1	Factor 2
Managing academic potential (Sch)	-.11	**.95**
Critical thinking skills (Sch)	.04	**.87**
Leadership skills (Lead)	**.99**	-.25
Seeking leadership roles (Lead)	**.83**	-.04
Quality of service behavior (Serv)	**.43**	.28
Self-awareness (Char)	**.72**	.24
Integrity (Char)	**.71**	.19
Adaptability (Char)	**.50**	**.45**
Presence(Char)	**.82**	.05
Overall effectiveness	**.76**	.27

N = 64, total variance accounted for = 71.5%

Table 10. Rotated Factor Pattern of Four-Factor Performance Model

	Factor 1	Factor 2	Factor 3	Factor 4
Managing academic potential (Sch)	-.06	.00	**.93**	.07
Critical thinking skills (Sch)	.19	.03	**.85**	-.12
Leadership skills (Lead)	.31	**.78**	-.15	-.09
Seeking leadership roles (Lead)	.13	**.93**	.16	.07
Quality of service behavior (Serv)	.03	.02	-.03	**.98**
Self-awareness (Char)	**.86**	.10	.06	-.09
Integrity (Char)	**.91**	.02	-.02	-.04
Adaptability (Char)	**.77**	-.14	.17	.15
Presence (Char)	**.58**	.35	-.05	.07
Overall effectiveness	**.56**	.28	.12	.17

N = 64, total variance accounted for = 84.2%

Note: Letters in parenthesis indicate the scholarship program's selection criteria; Sch = scholarship, Lead = leadership, Serv = service and Char = character. Numbers in bold are said to load on that factor.

Because the two-factor solution accounted for only 72-percent of the total variance, a confirmatory factor analysis (CFA) was conducted on Sample 2 using the four-factor performance model. This was followed by a CFA conducted on the pooled sample. CFAs were conducted using both correlation and covariance matrices to ensure accurate fit in both instances. These four factors mirror the four selection criteria employed by the scholarship program: scholarship, leadership, service and character. Fit indices for the CFA of both Sample 2 and the pooled sample are reported in Table 11.

Table 11. Confirmatory Factor Analysis: Fit Indices

Sample	N	X^2	df	RMR	CFI	GFI	NNI
Sample 2	44	68.63**	29	0.05	.85	.79	.77
Pooled	110	45.18*	29	0.02	.98	.92	.96

**p<.01, *p<.05
RMR = root mean residual, CFI = comparative fit index, GFI = goodness of fit index, NNI = nonnormed fit index

The CFA of the four-factor performance model fit the Sample 2 data moderately well, $X^2 = 68.63$, $p<.01$, RMR = .05, CFI = .85, NNI = .77, GFI = .85. Once the four-factor performance model was confirmed in Sample 2, a CFA was performed on the pooled sample to assess its fit to the combined sample data. The CFA of the four-factor performance model fit the pooled sample data very well, $X^2 = 45.18$, $p<.05$, RMR = .02, CFI = .98, NNI = .77, GFI = .92. All indices fell within acceptable ranges, and all item loadings were above .40 on their respective factors for both performance models.

Regression and correlation analyses were conducted for the three language factors, the five personality factors, and the four performance factors. Multiple linear regression was performed first to assess the relationships between the language factors and the performance factors. Means, standard deviations and correlations for all factors are shown in Table 12. Correlations between all performance factors were highly statistically significant. Correlations between Scholarship and the use of cognitive words (r = .16) and the use of positive words (r = -.16) approached significance. No other correlations approached or reached significance.

Standardized Beta weights for the language factors obtained in the prediction of all performance factors are shown in Table 13. None of the models for the prediction of the four performance factors showed a statistically significant fit, and none accounted for more than 6% variance in the performance factors. Despite the non-significant omnibus test for the Scholarship factor, the negative correlation between the use of positive words and Scholarship ratings still approached significance (r = .16).

Table 12. Language and Performance Factor Correlations

	Mean	SD	1	2	3	4	5	6
1. Leadership	8.1	1.5						
2. Character	21.0	3.2	.75***					
3. Scholarship	9.0	1.5	.40***	.61***				
4. Service	3.8	1.0	.38***	.48***	.32***			
5. Cognitive	16.9	3.9	-.09	.01	.16*	-.12		
6. Positive	7.8	2.5	-.06	.04	-.16*	-.15	.00	
7. Negative	3.1	2.3	-.10	-.07	-.10	-.08	.07	.09

N = 110, ***p<.01, *p<.10

Table 13. Language Factors in the Prediction of Performance Variables

	Beta	t	DF	F	R^2
Leadership			3	.35	.00
Negative	.03	.36	1		
Cognitive	-.11	-1.23	1		
Positive	-.06	-.58	1		
Character			3	.43	.01
Negative	-.07	-.73	1		
Cognitive	-.02	-.25	1		
Positive	.04	.38	1		
Scholarship			3	2.09	.06
Negative	-.06	-.61	1		
Cognitive	.13	1.35	1		
Positive	-.16	-1.68*	1		
Service			3	1.61	.04
Negative	-.07	-.72	1		
Cognitive	-.15	-1.59	1		
Positive	.15	1.63	1		

N = 110, *p<.10

Multiple linear regression between the personality factors and the performance factors resulted in more optimistic findings. Means, standard deviations and correlations are shown in Table 14. The correlation between Scholarship and Conscientiousness reached statistical significance ($r = .29$, $p<.01$) while the correlations between Scholarship and Neuroticism ($r = -.18$), Leadership and Extraversion ($r = .16$), Service and Extraversion ($r = .18$), and Leadership and Agreeableness ($r = .18$) approached significance.

Table 14. Personality and Performance Factor Correlations

	M	SD	1	2	3	4	5	6	7	8
1. Neuroticism	86.8	21.3								
2. Extraversion	123.4	25.2	-.11							
3. Openness	126.6	22.46	.03	.25***						
4. Agreeableness	124.2	16.5	-.04	.13	.25**					
5. Conscientiousness	120.2	23.4	-.45***	-.14	-.24*	-.06				
6. Leadership	8.1	1.5	.01	.16*	-.02	.18*	.09			
7. Character	21.0	3.2	-.13	.15	.03	.17	.13	.75***		
8. Scholarship	9.0	1.5	-.18*	-.05	.11	.07	.29***	.40***	.61***	
9. Service	3.8	1.0	-.08	.18*	-.06	.06	.12	.39***	.48***	.32***

N = 110, ***p<.01, **p<.05, *p<.10

Standardized Beta weights for the prediction of the performance factors from a combination of the personality factors are shown in Table 15. The only statistically significant omnibus test was for the Scholarship factor, with Conscientiousness showing statistically significant predictive power and Openness approaching significance. The omnibus tests for Leadership, Character and Service were not statistically significant. The standardized Beta weights for Extraversion and Agreeableness approached significance for predicting Leadership and the standardized Beta weight for Extraversion was significant in predicting Service.

Table 15. Personality Factors in the Prediction of Performance Variables

	Beta	t	DF	F	R^2
Leadership			5	1.82	.08
Neuroticism	.11	1.06	1		
Extraversion	.19	1.92*	1		
Openness	-.08	-.77	1		
Agreeableness	.19	1.92*	1		
Conscientiousness	.16	1.43	1		
Character			5	1.64	.07
Neuroticism	-.05	-.43	1		
Extraversion	.14	1.44	1		
Openness	-.01	-.13	1		
Agreeableness	.17	1.69*	1		
Conscientiousness	.14	1.22	1		
Scholarship			5	3.00**	.13
Neuroticism	-.05	-.52	1		
Extraversion	-.06	-.66	1		
Openness	.19	1.95*	1		
Agreeableness	.05	.52	1		
Conscientiousness	.30	2.83***	1		
Service			5	1.39	.06
Neuroticism	.01	.14	1		
Extraversion	.22	2.15**	1		
Openness	-.09	-.91	1		
Agreeableness	.06	.64	1		
Conscientiousness	.14	1.23	1		

N = 110, ***P<.01, **P<.05, *p<.10

Finally, stepwise regressions were performed with all language and personality factors as independent variables and the performance variables as dependent variables. Though the results of these analyses were not specifically hypothesized, post-hoc analyses revealed interesting and insightful findings. Results of the stepwise regression analyses are presented in Table 16. Self-ratings of Agreeableness and Conscientiousness combined to significantly predict performance ratings of Character, $F(3,107) = 2.72$, $p<.05$. Ratings of Openness and Conscientiousness combined to significantly predict Scholarship performance ratings, $F(3, 107) = 5.64$, $p<.01$. Ratings on Extraversion and Conscientiousness combined to significantly predict ratings of Service, $F(3, 107) = 2.85$, $p<.05$. Ratings of Leadership approached significance, $F(2,108) = 2.84$, $p<.10$, through ratings of Agreeableness. Intercorrelations between all language, personality and performance factors are shown in Table 17.

Table 16. Stepwise Regression Analysis on Student Performance

	Beta	t	DF	F	Δ R^2	R^2
Leadership			2	2.84*		.05
Agreeableness	.16	1.68*	1		.03	
Extraversion	.14	1.46	1		.02	
Character			3	2.72**		.07
Agreeableness	.16	1.74*	1		.03	
Conscientiousness	.16	1.69*	1		.02	
Extraversion	.15	1.57	1		.02	
Scholarship			3	5.64***		.14
Conscientiousness	.32	3.42***	1		.08	
Openness	.20	2.16**	1		.04	
Positive	-.14	1.52	1		.02	
Service			3	2.85**		.07
Extraversion	.19	2.03**	1		.03	
Conscientiousness	.16	1.72*	1		.02	
Positive	.15	1.56	1		.02	

N = 110, ***p<.01, **p<.05, *p<.10

Table 17. Intercorrelations of all Factors

	1	2	3	4	5	6	7	8	9	10	11
1. Neuroticism											
2. Extraversion	-.11										
3. Openness	.03	.25***									
4. Agreeableness	-.04	.13	.25***								
5. Conscientiousness	-.45***	-.14	-.24**	-.06							
6. Leadership	.01	.16*	-.02	.18*	.09						
7. Character	-.13	.15	.03	.17*	.13	.75***					
8. Scholarship	-.18*	-.05	.11	.07	.29***	.40***	.61***				
9. Service	-.08	.18*	-.06	.06	.12	.38***	.48***	.32***			
10. Negative	.05	.05	.02	-.07	-.09	.03	-.10	-.07	-.10		
11. Cognitive	-.17*	.06	.10	-.09	.02	-.10	-.01	.16*	-.12	.07	
12. Positive	-.03	.07	.06	.18*	-.12	-.01	.04	-.16*	.14	.09	.00

N = 110, ***p<.01, **p<.05, *p<.10

Discussion

The purpose of this study was twofold. First, it was necessary to replicate previous findings of the discriminative power of text analysis on student application essays. This included defining a factor structure of language through exploratory factor analysis and performing MANOVAs to confirm that the use of positive words significantly differs between students selected and not selected to the scholarship program. Second, this study explored the relationships between language, personality and performance to determine whether student performance could be predicted either singly or in a combination of the language and personality factors. This included defining and confirming a factor structure of student performance as well as using multiple regression techniques to find a predictive combination of independent variables.

The student samples from Samples 1 and 2 were pooled into one large sample in order to have enough predictive power to use factor analysis and to reveal significant relationships between constructs. A post hoc MANOVA confirmed that there were no differences between the classes concerning the sole discriminatory language factor, the positive factor. An exploratory factor analysis with orthogonal rotation performed on the 10 affect and cognitive LIWC subcategories supported the hypothesis of a three-factor structure consisting of positive, negative and cognitive language factors.

The multivariate analyses of variance (MANOVA) for selection groups, gender and ethnicity revealed significant differences between selection groups and gender, but not between the five ethnic groups represented in this sample.

Univariate analyses showed that the only language factor that discriminated between selected and not selected students was the positive language factor. These results support the hypothesis that there would be significant differences between sample groups using positive words, indicating that the selected students used more positive emotion, positive feeling, and optimistic words in their application essays. No significant differences, however, were found between sample groups on the use of negative or cognitive words.

Women tended to use significantly more positive emotion words than men, increasing their chances of selection to the program. Despite the nonsignificant omnibus test regarding ethnic groups, exploratory post-hoc univariate tests indicated significant differences between ethnic groups on the cognitive language factor, with Asian-Americans using the highest percentage of cognitive words. This finding is worth investigating further, however, the cognitive factor did not show significant differences between those applicants selected to the scholarship program and those not selected, hence, they were not investigated further in this study. Even though Asian-Americans used the highest percentage of cognitive words among the five ethnic groups represented in this study, their usage of these words neither helped nor hurt their chances of selection to the program.

These results support the use of quantitative analysis of application essays in the selection of scholarship recipients. A post-hoc analysis of covariance (ANCOVA) showed that the relationship between use of positive words and selection to the program was significant despite the differences between selection

groups in high school GPA and total SAT scores. If selection decisions are currently based upon grades and SAT scores, then quantitative measures of positive language may serve as an additional predictor for scholarship selection. As Murphy and Shiarella (1997) note, using a combination of cognitive ability and non-cognitive measures to predict performance yields higher validity estimates than either cognitive ability measures or non-cognitive measures alone. These results are encouraging, especially because writing style is consistent across time and writing topic (Pennebaker & Francis, 1999) and because no adverse impact was shown to occur in this study.

This research indicates that the use of positive words in application essays can discriminate between students who will be selected into the program and those who will not. This study's findings support those found by Pennebaker and Francis (1999), regarding the positive correlation found between the Five-Factor scale of Extraversion and positive emotion words. According to the Five-Factor theory, extraverts are more likely to become leaders when working in teams. A study by Karnes and D'Ilio (1990) also support these findings by revealing positive correlations between Warmth and Written Communication Skills, Speech Communication Skills, Group Dynamic Skills, Personal Development Skills, and Planning Skills, which are all scales on the Leadership Skills Inventory. These research studies are very important, because the scholarship program used in this study selects students who are likely to be influential leaders. This study found that use of positive language is significantly different between students selected and not selected to the program. Positive emotion words have been found to

correlate with Extraversion, which is reflective of leadership skills (Karnes & D'Ilio, 1990; Pennebaker & Francis, 1999). Following this logic, use of positive language may be indicative of future leadership behaviors.

There is evidence that a relationship exists between the use of a high rate of positive affect words and scholarship, leadership, character and service potential. To explore this relationship further, the next step in this research was to assess relations between language use and personality. If positive affect words really are indicative of extraverted behaviors, then the correlation between the positive language factor and the FFM Extraversion factor should be high.

Pennebaker and King (1999) found small significant correlations between language use and personality. This study replicated the work by Pennebaker and King (1999) in order to determine if quantitative analysis of application essays could be used instead of personality tests during the scholarship selection process. Large correlations between the two constructs would justify the less invasive tactic of using essays over personality tests. Results mostly consistent with the Pennebaker and King (1999) study were expected.

In their study, high usage of negative and positive words related to Neuroticism, Extraversion, Agreeableness, and Conscientiousness, and high usage of the cognitive words related to Openness to Experience. The current research did not replicate these findings. No significant correlations were found between language use and personality rating. Relationships between the use of cognitive words and Neuroticism and the use of positive words and Agreeableness approached, but did not reach, significance.

There was no significant correlation between Extraversion and positive words. It is possible that restriction of range in the selected student sample is hiding a relationship between these two factors that may have influenced selection decisions during the application process. Previous findings of differences between selected and non-selected students on the positive language factor cannot be attributed to differences in level of extraversion at this time. Future research would benefit from personality and language measures from all potential scholarship applicants. None of these findings are consistent with those found in the Pennebaker and King (1999) study. These small and insignificant findings do not support using quantitative analysis of student essays in place of personality tests.

A principal components analysis was performed on the performance ratings from Sample 1. Results from this analysis indicated a possible two or four-factor structure. Due to the higher percentage of variance accounted for and the possibility of performing a confirmatory factor analysis on the four-factor solution, the four-factor structure was chosen to best describe the student performance construct. These four factors mirrored the four selection criteria used by the scholarship program, and so made theoretical sense as well. Confirmatory factor analyses performed on both Sample 2 and the pooled sample showed adequate fit with the four-factor structure.

Once the language and performance constructs were adequately defined, multiple linear regression was performed between the two constructs. Multiple linear regression with the three language factors predicting each performance

factor showed no significant relationships. Apparently, language use by itself is not predictive of performance. Again, the true relationships between language and performance may be masked due to a restriction of range in the selected student sample.

Multiple linear regression between personality and performance factors showed more optimistic results. The scholarship performance factor was significantly predicted with a combination of all five personality factors, with Conscientiousness providing the highest predictive weight. All five personality factors combined to account for 13% of the explained variance in scholarship performance. Neither the leadership, character nor service factors were significantly predicted by the personality factors.

Despite the relatively small number of significant findings up until this point, stepwise regression analyses with the language and personality factors serving as independent variables revealed exciting findings. Results show that the character, scholarship and service factors were significantly predicted while the leadership factor approached significance. Extraversion, Agreeableness and Conscientiousness entered into the regression equation to significantly predict character ratings. Students who show lots of energy, and are warm and responsible tend to receive higher character ratings. Openness, Conscientiousness and the positive language factor entered into the regression equation to significantly predict scholarship ratings. Students who are open, hard-working and who use fewer positive words tend to receive higher ratings on scholarship. Extraversion, Conscientiousness, and the positive language factor entered into the

regression equation to significantly predict service ratings. Students who are outgoing, responsible and who express themselves in a more positive manner tend to receive higher ratings on service.

The results for the service and scholarship ratings are particularly exciting because they show that writing style can add to the prediction of performance along with the personality factors. This gives support to the idea that quantitatively analyzing application essays will aid in the selection of university scholarship recipients, especially with respect to the scholarship and service criteria.

The overall implications of this research support the use of both text analysis of application essays and FFM personality tests in the selection of scholarship recipients. This study's findings indicate that language use and personality are not substantially correlated, but that both add incremental predictive power to performance ratings.

Despite the scholarship program's wish to refrain from giving applicants personality tests due to negative reactions from applicants and cost considerations, recent research advocates the use of online personality testing. Studies by Mead (2001) and Reynolds, Sinar and McClough (2000) investigated applicant perceptions of Internet-based personality testing. They found that applicants had more positive perceptions toward online personality testing than traditional modes of testing, and that 81 percent of applicants were "satisfied" rather than "dissatisfied" with an online version of the 16PF Questionnaire. These studies indicate that online personality tests do not result in negative

applicant reactions, which may occur with traditional paper-and-pencil personality tests. Additionally, Mead and Coussons-Read (2002) found support for the equivalence of online and paper-and-pencil versions of the 16PF Questionnaire, with mean cross-mode correlations of 0.85.

In this study, there is evidence that relationships exist between language use, personality, and scholarship, leadership, character and service potential. Though these results are very interesting and exciting, it is important to note that this study was exploratory in nature. The scholarship program used in this study cannot accept all applicants that apply. Therefore, potential relationships between language, personality and performance may have been masked due to restriction in range. Future research should be conducted to better understand the relationship between affective expression and leadership potential among both scholarship recipients and university and job applicants. This research may be extended to include applicants to the university at large instead of just the scholarship program, which may remedy some restriction in range as well as aid in the selection of university applicants. Future research should also re-write the LIWC dictionaries in order to better capture personality dimensions, and thus support and extend these findings.

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APPENDICES

LIWC Dimensions

I. Standard Linguistic Dimensions
Word Count
Words per sentence
Sentences ending with ?
Unique words (type/token ratio)
% words captured, dictionary words
% words longer than 6 letters
Total pronouns
    1st person singular
    1st person plural
Total first person
Total second person
Total third person
Negations
Assents
Articles
Prepositions
Numbers

II. Psychological Processes
Affective or Emotional Processes
  Positive Emotions
  Positive feelings
  Optimism and energy
  Negative Emotions
  Anxiety or fear
  Anger
  Sadness or depression
Cognitive Processes
  Causation
  Insight
  Discrepancy
  Inhibition
  Tentative
  Certainty
Sensory and Perceptual Processes
  Seeing
  Hearing
  Feeling
Social Processes
  Communication

Other references to people
Friends
Family
Humans

III. Relativity
Time
Past tense verb
Present tense verb
Future tense verb
Space
Up
Down
Inclusive
Exclusive
Motion

IV. Personal Concerns
Occupation
School
Job or work
Achievement
Leisure activity
Home
Sports
Television and movies
Music
Money and financial issues
Metaphysical issues
Religion
Death and dying
Physical states and functions
Body states, symptoms
Sex and sexuality
Eating, drinking, dieting
Sleeping, dreaming
Grooming

Performance Rating Booklet

This Rating Booklet contains 9 facets of performance associated with the four student performance dimensions: Scholarship (effective management of academic potential, critical thinking skills), Leadership (leadership skills, leadership roles), Service (quality of student's service commitment), and Character (self-awareness, integrity, adaptability/resiliency, presence). Below the heading are the behavioral statements that describe examples of behaviors associated with various levels of student performance.

The Rating Process

1. Read the heading and the behavioral statements in each column.
2. Compare the *typical performance* of the student to the behavioral statements listed. Using the scale provided, determine where the student falls on the continuum. If the middle column of statements is more typical of the student, then rate the student a "4". If the behaviors in the "extremely effective" or "extremely high" levels column describe the student's typical behavior, then rate him or her a "7". If behaviors on the "needs improvement" column most accurately describe this student's typical behavior, then rate him or her a "1."
3. If the student behaves like the statements in the "Needs improvement" column *some* of the time, but like the statements on the "Effective" column *most* of the time, then rate the student a "3." Similarly if the student *occasionally* exhibits behaviors in the "Effective" column but the statements on the "Extremely Effective" column are most often descriptive, then rate the student a "6."
4. Record your rating on the rating form provided.
5. If you have had little or no opportunity to observe the individual on the particular behavior, please check the box labeled "Little or no opportunity to observe." However, please proceed to rate the student according to how you think he/she performs in this area, based on everything else you know about him or her.
6. Finally, you will be asked to rate the overall effectiveness of the student.

How to be an Accurate Rater

The most important thing when rating performance is to be as accurate as possible. The following tips will help ensure that you are rating the student fairly.

1. Read carefully. Failure to read the instructions, headers, or the behavioral statements will hinder your ability to give an accurate rating.
2. Try not to give a student the same rating on all dimensions. That is, most people have areas of strength and weakness, and the ratings should reflect that.
3. Try not to give all 3 of the students the same rating on a particular subdimension. Again, your ratings should allow for a distinction between students who are performing more or less effectively on the subdimensions.
4. A rating should reflect the student's typical performance on that subdimension only. Avoid being influenced by the student's looks, where they are from, and other personal characteristics that are not directly related to performance.
5. Please use your own judgment (do not confer with others). Do not share your ratings with other students or ask others how they rated after this exercise is over.

1. How effective is the student at managing his/her *academic* potential?		
Needs improvement	Effective	Extremely Effective
For example: **Fails to seek out learning opportunities; allows easily obtainable learning opportunities to pass by.** **Narrow academic focus; unwilling to take classes outside his/her main area of study, to the point of having a detrimental impact on long-term goals.** **Has no "plan" for the future and is making little or no progress toward developing one; PPD is disorganized and unfocused; does not develop resources to assist in building a plan.** **Allows special talents and interests to go unexplored; fails to take advantage of special talents and interests.**	**For example:** **Often explores outside learning experiences such as research, special projects or conferences.** **Regularly makes an effort to be broadly trained in area of interest: takes a variety of classes that support long-term goals.** **Regularly works toward developing his/her personal plan of development (PPD), either by developing specific plans to meet career goals or plans to clarify what goals are; frequently develops resources such as mentors to assist in reaching or defining goals.** **Frequently displays and cultivates special interests and aptitudes.**	**For example:** **Is extremely effective in exploring avenues of learning outside the classroom, even when busy.** **Always aspires to be broadly trained in area of study; explores classes that have the potential to be useful.** **Is on a clear path towards well-developed career goals; consistently utilizes existing resources and continually explores new potential sources of support.** **Always on the lookout for ways to incorporate special interests or aptitudes into a task or project.**
① ②	③ ④ ⑤	⑥ ⑦

2. How effective are the student's critical thinking skills?		
Needs improvement	Effective	Extremely Effective
For example: **Is intellectually stale; little or no interest in learning and growing.** **Has a narrow learning focus; fails to see or make connections among ideas or to integrate new ideas with existing knowledge; simply repeats back what others have said.** **Is unaware of his/her level of knowledge; seems comfortable in this lack of knowledge, and does little to remedy it.**	**For example:** **Is intellectually curious; has a desire to learn evidenced by asking questions and exploring new interests, talents, and ideas.** **Ability to see/make connections: regularly works to integrate existing knowledge with new ideas; often considers alternative perspectives.** **Has intellectual awareness and perseverance; is generally cognizant of when s/he doesn't know something and usually takes steps to find out, asks questions in class for verification, asks for help from appropriate sources.**	**For example:** **Has a burning desire to learn; consistently and thoroughly investigates new interests, talents, and ideas.** **Consistently sees the big picture; can almost immediately identify the relationship among even new ideas and theories.** **Is keenly aware of his/her level of knowledge; when unsure, immediately seeks information from sources both inside and outside the classroom to remedy the situation.**
① ②	③ ④ ⑤	⑥ ⑦

3. How effective are the student's leadership skills?		
Needs improvement	Effective	Extremely Effective
For example: **Is unable to identify the appropriate goals; pushes his/her way into leadership positions, even if others are more qualified.** **Takes an immature or self-serving approach to dealing with others; frequently has conflicts with others; fails to embrace diversity, to the point of being offensive.** **Is visibly uncomfortable in novel or unstructured situations; takes the "safe" route; afraid to step "out on a limb" to defend an idea or to investigate an issue; satisfied with small or shortsighted ideas and plans.** **Is closed and inattentive to others' ideas and feelings; pushes his/her own personal agenda in group situations.** **Is unable to articulate a persuasive message; unable to motivate others to take on a particular value or attitude, or to take action in a specific direction.**	**For example:** **Can often identify gaps and what needs to be done; knows when to step up as a forefront leader and when to take a behind-the-scenes role.** **Typically develops diplomatic and cooperative relationships with and between others; usually handles conflict appropriately; appreciates differences and can alter behavior according to what is needed.** **Is quite comfortable in novel or unstructured social settings; a risk-taker who is willing to champion new ideas; thinks big and can negotiate the real world.** **Generally listens and communicates well; balances personal goals with those of the group.** **Can usually move or encourage others to accept a particular value or attitude, or to take action in a specific direction.**	**For example:** **Has a particular talent for being able to focus a group on the appropriate goal; is always appropriately committed to the goals of the group and is willing to take whatever role is necessary to facilitate its achievement.** **Consistently develops strong cooperative relationships with and between others; diffuses conflict before it escalates; embraces diversity and creates an environment of acceptance.** **Thrives in new and unique settings; once identified as worthwhile, vigorously defends new ideas; goes straight to the top when seeking information or assistance.** **Is perceptive; consistently listens and communicates well; is extremely sensitive to the needs of others on the team.** **Is consistently able to persuade and motivate others to adopt the goals of the group as their own.**
① ②	③ ④ ⑤	⑥ ⑦

4. How effective is the student at seeking or accepting leadership roles?		
Needs improvement	Effective	Extremely Effective
For example: **Is unwilling to seek or take on forefront leadership positions <u>or</u> fails to seek or take on roles as a behind-the-scenes leader.**	**For example:** **Often volunteers for or is elected to forefront leadership positions <u>or</u> acts as a behind-the-scenes leader by influencing at a less visible level or by providing a good example for others.**	**For example:** **Is sought after as a forefront or behind-the-scenes leader by his/her peers; is perceived as a strong forefront or behind-the-scenes leader by others inside and outside the Park Program.**
① ②	③ ④ ⑤	⑥ ⑦

5. How effective is the *quality* of the student's service behavior?		
Needs improvement	Effective	Extremely Effective
For example: **Is unwilling to make a commitment to a service organization; fulfills service requirement solely as a means to fill the Park Program guidelines or his/her personal interests, needs, or agenda.** **Only offers the service organization skills that she/he already possesses.** **Would prefer not to do service work and will likely not engage in service work upon graduation.**	**For example:** **Attempts to identify gaps in a service organization.** **Works with the organization to fill gaps in innovative and creative ways that match his/her own interests and skills.** **Usually demonstrates the maturity and professionalism necessary to serve on the board for a nonprofit group.**	**For example:** **Consults multiple sources of information to identify need in the community.** **Fully embraces the goals and ideals of the organization; strives to develop a relationship with the organization that best serves their needs and the needs of the community served.** **Will likely be asked to serve on the board of a nonprofit group within the next 10 years.**
① ②	③ ④ ⑤	⑥ ⑦

6. How much self-awareness does the student have?		
Needs improvement	Effective levels of self awareness	Extremely high levels of self awareness
For example: **Is unaware of strengths and weaknesses; or aware but not open to improvement.** **Fails to see the relationship between choices and consequences; wastes personal and external resources, e.g., does not manage time well.** **Has a poor balance in activities; may not deviate from a rigid and narrow schedule to the detriment of his/her physical and emotional health.**	**For example:** **Is aware of strengths and weaknesses and is usually open to bettering him/herself.** **Often understands the ramifications of choices; manages self and resources well; seldom wastes time or effort.** **Finds a good balance in activities; often engages in physical activity or participates in activities "just for fun."**	**For example:** **Actively seeks feedback in order to identify areas of strength and weakness and better him/herself.** **Is able to accurately project ideas and possibilities into the future; extremely efficient in the use of resources; rarely wastes time or effort.** **Is extremely well rounded; consistently maintains a balance of activities that encourages physical and emotional health.**
① ②	③ ④ ⑤	⑥ ⑦

7. What level of integrity does the student display?		
Needs improvement	Adequate levels of Integrity	Extremely high levels of Integrity
For example: **Sees rules as "flexible"; may be dishonest.** **Is satisfied with submitting substandard work; often turns in group and individual assignments after the deadline, or fails to do them at all.** **Has a lack of substance in value system; does not recognize or stand up for what is right.** **Is unable to identify the salient issues in a situation; engages in risky behavior.**	**For example:** **Is honest; doesn't cheat or steal or help others do so; is true to his/her word** **Conscientious; goes out of his/her way to deliver products as promised** **Often stands up for values and for what is right; would likely assist a fellow student who was being badly-treated** **Knows the rules and boundaries; for the most part is able to assess situations accurately and to use good judgment.**	**For example:** **Is extremely honest and trustworthy; provides a role model for others.** **Consistently delivers products on time, even under difficult or extenuating circumstances.** **Is seen as consistently fair-minded and just by others; can always be counted on to come to the aid of fellow students in need.** **Can be counted on know what is right or wrong and to use good judgment, even in difficult or novel situations.**
① ②	③ ④ ⑤	⑥ ⑦

8. How adaptable and resilient is the student?		
Needs improvement	Adaptable and Resilient	Extremely Adaptable and Resilient
For example: **Makes the same mistakes time and time again; fails to learn from or respond to experiences or feedback; happy with him/herself "as is."** **Overreacts to situations; is unable to "brush him/herself off" and to try again; fails to develop a social support network of friends; has difficulty adjusting to being away from family.** **Requires constant clarification and instruction.**	**For example:** **Is adaptable; generally can profit from experience; usually recognizes the lessons in difficult situations; accepts feedback; shows improvement over time in areas of weakness.** **Is resilient; won't fall apart when faced with failure, difficulty, or change; can regroup with minimal disruption and distress; has good coping skills; has and uses a social network; handles separation from family appropriately** **Tolerates ambiguity.**	**For example:** **Is extremely adaptable; is proactive and consistently attempts to identify potential problems and avoid them; actively seeks feedback.** **Is consistently resilient; bounces back quickly from the most difficult situations; can consistently think the situation through, make changes where necessary and move on; has a well-developed network of social support; is making a smooth transition to adulthood.** **Functions extremely well, even when the problem or instructions are vague.**
① ②	③ ④ ⑤	⑥ ⑦

9. How effective is the student's presence?		
Needs improvement	Effective	Extremely Effective
For example: **Is unsure of him/herself; easily intimidated or swayed by others** **Can be rude; seeks to be the center of attention; is awkward in social situations; may be arrogant.** **Is antisocial and self-absorbed; may be critical and disrespectful of others.**	**For example:** **Is self-confident; generally adheres to appropriate views and values and can provide justification.** **Is usually sincere, well mannered, and possesses appropriate humility.** **Is sociable; generally gets along well with others; often looks out for welfare of classmates; frequently makes an effort to be supportive.**	**For example:** **Is extremely self-confident, even in stressful or challenging situations; can consistently provide strong support for appropriate views and values.** **Can be counted on to always be sincere, well mannered, and to exhibit appropriate humility.** **Is respected and well liked by almost all students; consistently shows concern for and is supportive of others.**
① ②	③ ④ ⑤	⑥ ⑦

10. Rate the *overall effectiveness* of each student, taking into account behaviors from all 9 of the previous questions.		
Needs improvement	Effective	Extremely Effective
For Example: **Performs poorly in important effectiveness areas; fails to meet standards and expectations for adequate Park Scholar performance**	**For Example:** **Performs effectively in important areas of performance; meets standards and expectations for effective Park Scholar performance**	**For Example:** **Performs to the highest standards in all or almost all areas of performance; regularly exceeds standards and expectations for Park Scholar performance.**
① ②	③ ④ ⑤	⑥ ⑦