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A Comparison of Big Five and Narrow Personality Traits

In Relation to Academic Performance

A Dissertation
Presented for the
Doctor of Philosophy
Degree

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Laura Lee Wright

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DEDICATION

This dissertation is dedicated to
my grandparents, Howard and Betty Gallahaire.

ABSTRACT

The present study investigated the relationship between the Big Five personality traits (Agreeableness, Conscientiousness, Emotional Stability, Extraversion, and Openness), as well as the relationship of more narrow personality traits, with academic performance. The issue of whether personality measures that have been contextualized to either school or work better predict academic performance than generalized measures is also addressed through the use of multiple personality instruments. Results from a correlation analysis indicated that Openness, Conscientiousness, Agreeableness, and Emotional Stability were all significantly positively related to academic performance, in this case, college course grade, while Extraversion was significantly negatively related. The same correlation analysis showed that for Openness and Agreeableness, the measure contextualized to academics predicted better than the generalized measures which in turn better predicted academic performance than the work-related measure. Emotional Stability, conversely, was best predicted by the work-related measure, in contrast to what was predicted. A stepwise regression was used to find what added significant variance for both Big Five and narrow traits for each measure used in this study. The findings of this study support the usefulness of both broad and narrow personality traits in predicting real-world outcomes. The relationships between general and contextualized measures and their predictions of academic performance are also shown. Furthermore, the relationship between academic performance and personality is demonstrated within this study.

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CHAPTER I: INTRODUCTION

Background

The five-factor model of personality, also known as the Big Five, which includes the personality traits of extroversion, openness, conscientiousness, agreeableness, and neuroticism, has become one of the more accepted approaches to personality research. The Big Five has been the subject of numerous empirical studies that have verified the overall factor structure and construct validity of its constructs in a wide variety of research settings (including college students) with generalizability across a broad spectrum of demographic and cultural characteristics of individuals studied (Costa & McCrae, 1994). Collectively, the five-factor model attempts to condense personality into five relatively independent categories. The very nature of the Big Five leads to the Big Five being referred to as a broad approach to personality. Some critics have countered that the Big Five is too simplistic given that it attempts to address the nature of personality as being a combination of five relatively independent factors.

In addition to being a widely accepted model of personality, the Big Five has also been found to explain academic performance. Thus, performance in the classroom has been researched in relation to the five-factor model (Paunonen & Ashton, 2001). For example, academic performance has been found to be related to openness (Paunonen & Ashton, 2001b); agreeableness (Rothstein, Paunonen, Rush, & King, 1994); both agreeableness and conscientiousness (Fritzche, McIntire, & Yost, 2002); and, most of all, conscientiousness (Goff & Ackerman, 1992; Musgrave-Marquart, Bromley, & Dalley, 1997; Paunonen & Ashton, 2001b; Busato, Prins, Elshout, & Hamaker, 2000). Sneed,

Carlson, and Little (1994) found that openness was significantly, positively related to academic success as well. Along similar lines, Furnham, Chamorro-Premuzic, and McDougall (2003) found that extroversion was negatively correlated to exam scores whereas conscientiousness was positively related to exam scores.

The critics of the Big Five argue that narrow traits are more useful in describing personality. This dilemma is often referred to as the bandwidth-fidelity dilemma. The bandwidth-fidelity dilemma marks a trade-off of sorts in that broad traits tend to be too general when describing personality whereas narrow traits are so specific that they are restrictive in their descriptions of personality.

The present study will attempt to help clarify the bandwidth-fidelity dilemma and the relationship between the Big Five traits of personality and academic performance. The present study does not aim to take a side in this debate but instead will make the assumption that one may not be any better than the other and that both, in fact, can be equally useful in describing personality. Thus, the overarching purpose of the present study is to investigate the relationship of the Big Five in conjunction with narrow traits as predictors of the academic performance of college students. More specifically, the following questions will be addressed: 1) How do the Big Five and narrow traits predict academic performance? 2) Do the Big Five and narrow personality traits add incremental validity in explaining the variance of college grade-point averages?

Paunonen and Ashton (2001b) addressed this issue. In their study, they examined whether sub-factors of the Big Five were related to academic performance. Conscientiousness and Openness, specifically, were examined in comparison with two

narrow sub-factors of the Big Five. The two narrow sub-factors were hypothesized to be nested within the two broader factors. The first of these narrow traits, need for achievement, was found to be nested within Conscientiousness while the trait need for understanding was found to be nested within Openness. The finding was that these two narrow traits predicted academic performance better than their respective broader traits. These findings argue for the utility of predicting academic performance using narrow traits rather than the Big Five-level traits.

In terms of predictors of academic performance, the Big Five have been demonstrated to significantly predict grade point average in high school and middle-school students (e.g., Lounsbury, Sundstrom, Loveland, & Gibson, 2003a; Lounsbury, Sundstrom, Loveland, & Gibson, 2003b). Both of these studies clearly demonstrate that the Big Five conceptualization of personality significantly predicted cumulative grade point average for adolescents. However, these studies did not address the question of whether or not narrow traits and abilities added incremental validity to the Big Five traits in the prediction of college grade point average.

Several studies have shown that the narrow personality traits contribute incremental validity above and beyond the Big Five traits when predicting academic performance. While Big Five traits comprise a global approach to personality, narrow traits are those that tap into more defined aspects of personality. The focus on much of the research in this area has been to see if narrow personality traits add incremental validity to the Big Five. Thus, Paunonen and Nicol (2001) found that the narrow traits of straightforwardness and self-discipline explained additional incremental variance above

and beyond the Big Five in the prediction of academic performance as measured by grade point average. Paunonen and Nicol's findings show the importance and validity of the proposition that narrow personality traits may add incremental validity in accounting for that variance found in GPA's, further expanding upon the link between personality and an explanation of academic performance.

Based on the ideas laid out previously, this study will attempt to assess the utility of using the Big Five to predict real-world outcomes. Specifically, the relationship between the Big Five and college course grade will be assessed. Subsequently, several narrow personality traits will be utilized to assess whether or not the narrow traits are able to add incremental validity to the Big Five in accounting for the variation in college students' course grades. A deliberate feature of our research design, using a single course grade as the criterion, controls for inter-professor differences in grading, as well as major and college differences. On the other hand, grade point average (GPA) represents an aggregated score across many courses, which leaves unmeasured differences in grading tendencies unaccounted for within the data.

In addition, the present study will address the issue of the use of general measures of personality versus the use of measures that have been contextualized to a specific area of life. The following questions will be addressed for this issue: 1) Will a measure that has been contextualized to academia predict academic performance better than both generalized measures and a measure contextualized to the work place? 2) Will a general measure of personality predict academic performance better than a work-related measure of personality?

Previous research found in the debate of generalized vs. contextualized measures has strongly leaned in the favor of using contextualized personality measures. Schmit et al (1995) found increased reliability and validity for their measure of Big Five personality traits that had been contextualized for school use. Significant correlations between Conscientiousness, Extraversion, and Openness and job performance were found when Hunthausen et al. (2003) used a contextualized personality measure that were not present when the participants used a generalized measure of personality. Based on these ideas, the present study will attempt to further clarify the utility of contextualized measures. The use of a measure contextualized to academics, two general measures of personality, as well as a work-related personality measure should offer evidence as to which type of personality measure is most useful.

CHAPTER II: LITERATURE REVIEW

Although the study of personality, which has been defined as a person's complex set of traits that impact an individual's behavior across both time and situation (Zimbardo & Gerrig, 1996), within several sub-fields of psychology, has waxed and waned throughout the twentieth century, never has interest been keener than at the present. Developed from psychopathological origins, personality as an area of research first gained prominence in the early 1900's within models proposed by Freud, Jung, Adler, and Horney. Thus, personality's theoretical underpinnings include an approach that is almost entirely based on identifying each individual's neuroses and the struggle of the individual to overcome these neuroses (Hogan & Roberts, 2001). Allport's and Stagner's textbooks (1937), although a minority voice, presented a different approach: personality could be considered a part of everyday life, de-coupled from analysis of the abnormal; in short, personality is not limited simply to psychopathology. While psychopathology's influence on personality remained strong, Allport's and Stagner's empirical and pragmatic view was very influential in establishing the psychology of personality as a discipline.

During the mid-twentieth century, the focus on personality was primarily one of identification and measurement. Questions revolved around identifying the personality features of interest, those stable and enduring aspects within an individual across time and situations; and how are they best measured came to the forefront. This era, roughly from the late 1930's through early 1960's, produced a large number of approaches toward personality assessment. Researchers developed varying models, each containing varying

numbers of personality dimensions and features to be measured. A common theme, however, was the use of factor analysis as a statistical method to identify personality dimensions. An individual who made great strides in personality research was Raymond Cattell who had, as early as 1943, developed what some have termed a “complex system” with a minimum of 16 primary factors and 8 sub-factors (Cattell, 1943; Cattell, et al, 1970). Hans Eysenck (1947) agreed that traits were the best way to describe normal personality and developed a two-factor model (Extraversion and Neuroticism), setting the stage with “The Big Two” and introducing the use of initials to denote each factor: E for Extraversion and N for Neuroticism. Eysenck later added a third factor, Psychoticism, or P (Eysenck, 1970), reflecting personality’s continuing tie to psychopathology. These three factors are framed as a bipolar dichotomy where every individual possesses varying degrees of each extreme on these three dimensions. The three pairs are extraversion – introversion, neuroticism – stability, and psychoticism – superego functioning. It is noteworthy that Eysenck included some of the psychodynamic dimensions that were previously discussed. In addition, it should also be noted that unlike his psychodynamic predecessors, Eysenck was committed to a rigorously empirical approach to quantifying personality, much as was Cattell. Leary (1957) also proposed a two-factor personality model (based in part on the work of Horney and consequently including echoes of psychopathology), organized in a circular pattern around two main axes, Love-Hate and Power.

By the 1960’s, many researchers had studied and proposed a wide variety of approaches in hope of being able to understand personality. The study of personality was

on the rise, but several researchers came together to try and reduce the popularity of personality research. Hogan and Roberts (2001) concluded that there were three major reasons why personality psychology experienced a decline during the 1960's and 1970's. First, there was a lack of consensus regarding conceptual underpinnings and therefore a unifying voice could not be found. Second, the purpose for personality assessment had yet to be agreed upon. The third issue that arose was the question of the content of assessment (i.e., *what* to measure). Also, an important debate in other sub-fields of psychology was gathering momentum at this time, and it contributed greatly to the setting aside of personality research: the persuasiveness of *situation* within the person-situation debate. Sparked by Hartshorne and May's (1928) study which found that while attitude and knowledge were not consistent predictors of (moral) behavior, moral behavior did appear to be situation specific, this debate reached its peak within the social reforms of the 1960's and 1970's. The debate is reminiscent of the age-old nature-nurture controversy: which factor more significantly impacts one's behavior – innate traits or the situation within which one finds oneself? Social psychologists and behaviorists such as Mischel (1968) and Peterson (1965) argued that environmental elements are far more influential, to the point that personality is essentially irrelevant. Furthermore, Mischel (1968) concluded that validity coefficients for personality measures were not significant. Personality research stalled during this period.

It must be questioned then, why personality has now returned to the forefront of psychological research. Hogan and Roberts (2001) contend that around 1990, the field of industrial and organizational (I/O) psychology rediscovered personality. Importantly, I/O

psychologists began to understand and demonstrate the usefulness of personality measures for selection (initial employment hiring decisions and promotions). I/O psychologists found personality assessments to be essentially discrimination-free, resulting in far less adverse impact than traditional cognitive tests on protected classes of job seekers. In addition, the Five-Factor Model (“The Big Five”) finally emerged as a unifying personality theory around which many noted personality and I/O researchers rallied. Although The Big Five had appeared several decades earlier (Tupes & Christal, 1961), the late 1980’s saw a resurgence of interest in and acceptance of personality trait constructs (McCrae & Costa, 1987; Brand & Egan, 1989; Costa & McCrae, 1988; Digman, 1985; McCrae, 1989). Three major works, however, broadened support for personality in general and The Big Five model in particular. Digman (1990) reviewed the Big Five literature and concluded that it is, indeed, a unifying theory for personality. Barrick and Mount (1991) and Tett, Jackson, and Rothstein (1991) conducted meta-analyses of 117 ($n = 23,994$) and 97 ($n = 13,521$) journal articles, respectively, which showed the validity in Big Five personality factors in applied I/O settings.

In addition, the rise of personality has been augmented by attempts to resolve the person-situation debate. Kendrick and Funder (1988) examined hypotheses advanced by situationists to account for any consistency that had been reported and found that none of them (e.g., attribution, semantic illusions, stereotypes) held up under scrutiny. A related contributing factor is the large amount of technological advancement experienced during the past decade in physiological studies, lending more weight toward biological bases for behavior. The idea that biology is a basis for behavior supports the nature position within

the nature vs. nurture debate. When considering the person-situation question, reinforcement of nature generally supports the concept of personality, or the person,

Further evidence of the revival of the role of personality in psychology is the recent American Psychological Association's (APA) information exchange between personality psychologists and I/O psychologists. The 1999 conference Applied Personality Psychology: The Intersection of Personality and I/O Psychology brought these two formerly separate sub-fields together in hopes that each could profit from advances made in their respective fields. Subsequently, within the APA's Science Directorate program, the book *Personality Psychology in the Workplace* (2001) was published, which contains a number of scientific articles authored by researchers in both personality and I/O sub-fields. With the current high level of interest and collaboration among those involved in these areas, it is likely that significant advances will continue in personality research.

Many researchers agree that we generally consider personality traits to be "broad" or "narrow" in their ability to describe individual behavior (Spector, 1996). Numerous terms are used to connote *broad*; while "broad" is perhaps the most widely used, researchers have also chosen to use the descriptors "global", "superordinate", "meta-traits", "factors", "higher-order factors", "higher-level factors", "common core construct", "general", "abstract", and "lumpers" (Judge, et al, 2002; Judge, et al, 1997; Digman, 1997; Moon, et al, 2003; Schneider, Hourh, & Dunnette, 1996). "Narrow," while generally referring to "traits" rather than "factors" as a result of Eysenck's (1947) foundational work, is also referred to as "fine-grained", "specific", "specifically defined",

“lower-level traits”, “concrete”, and “splitters” (Judge, et al, 2002; Judge, et al, 1997; Judge, et al, 1997; Ashton, 1998; Schneider, et al, 1996). While each of these terms is descriptive, this paper will use “broad” and “narrow”, the most commonly used terms, for consistency. In addition, while the term “trait” is sometimes used to describe narrow dimensions, as “factor” is sometimes used to describe broad dimensions, both of these terms are often used generically to refer to any personality dimension. Within this paper, “trait” and “factor” will be used in a generic fashion, applicable to either broad or narrow dimensions, unless otherwise noted.

The Big Five

Known both as the “Five-Factor Model” (FFM) and the “Big Five,” personality traits within this standard are generally identified as Extraversion, Agreeableness, Conscientiousness, Emotional Stability (formerly referred to as Neuroticism), and Openness to Experience or Intellect (Digman, 1997). Two studies published during the early 1960’s are usually credited with developing the beginnings of the Big Five: (1) Tupes and Christal’s (1961) American Air Force applied research, and (2) Norman’s (1963) derivation of Cattell’s natural language trait term reductions. Using personality data from eight large samples, the 1961 study by Tupes and Christal built upon the work of Cattell and Fiske and found the five recurring factors known today as the Big Five. This work, however, was not widely known as it was published in a little known Air Force journal that was not widely read by academia. Norman went on to replicate this work again in 1963 and again found five recurring personality traits. He called these

traits Surgency (what is today known as Extraversion), Agreeableness, Conscientiousness, Emotional Stability, and Culture (or Openness).

However, to continue tracing the Big Five's historical roots, Barrick and Mount (1991) report that systematic efforts to develop and organize the taxonomy of personality actually began shortly after McDougall (1932) wrote that "Personality may to advantage be broadly analyzed into five distinguishable but separate factors, namely intellect, character, temperament, disposition, and temper ...".

Today's Big Five descriptive trait names have evolved; while the exact terms have changed over time, the meanings attached within each of the five dimensions have been compatible and very largely overlapping. A full description of the definition of each of the five factors using common adjectives from Barrick and Mount's (1991) meta-analytic work may be found in Table 1.

Table 1
Big Five and Commonly Associated Traits

Big Five Trait	Common Traits Associated with Big Five Trait
Extraversion	Sociable, gregarious, assertive, talkative, active
Emotional Stability	Anxious, depressed, angry, insecure, emotional,
Agreeableness	Courteous, flexible, trusting, good natured,
Conscientiousness	Responsible, organized, hardworking, persevering
Openness	Cultured, curious, original, artistically sensitive

More importantly, the work by Barrick and Mount seems to underscore the utility of the five-factor model by concluding that it is a valid and reliable measure when used in many different contexts. Barrick and Mount (1991) also provide compelling evidence for the robustness of the Big Five--its validity has been established in different cultures, with a variety of samples, using different instruments, across different theoretical frameworks, and with ratings obtained from different sources.

As noted earlier, one sign of the revival of personality research is the emergence of the Big Five as a unifying personality theory. Certainly the sheer volume of published works, over 21,000 journal articles alone, generated from 1989 to the present is one indicator. In addition, it is significant that the Big Five has been embraced not only by the personality psychologists, but also by researchers in I/O, clinical, and developmental psychology as well (Paunonen & Jackson, 2000).

Turning to the question of the Big Five's comprehensiveness, many researchers hold that the primary usefulness of the Big Five model lies in its very structure. The Big Five is a hierarchical representation of personality attributes (Digman, 1990). Extending the previous work of Norman (1963), Digman (1990) described the hierarchy as follows: The top level, Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness are labeled "Level 4 traits" and subsume all underlying levels; "Level 3" includes characteristics, scales, and facets; "Level 2" includes habits, act frequencies, dispositions, and items; and "Level 1" includes responses. The tiered approach clearly touts the model's summarizing power of five broad orthogonal traits. Corroboration for

the hierarchical aspect of the model, that all or most significant aspects of personality can be subsumed within the Big Five, was offered by Goldberg (1993), John (1990), and Wiggins and Trapnell (1997). Saucier and Goldberg (1998) added further support with their study of dimensions which had been previously posited as “beyond the Big Five.” Their results showed that the Big Five would best be supplemented by a few cluster traits (for example, Religiousness or Attractiveness) *only* if one would wish to extend variable selection outside the conventionally defined domain of personality. Therefore, these researchers concluded that their study provided strong indirect evidence of the comprehensiveness of the Big Five within the realm of traditionally understood personality variables.

However, others have disagreed with the conclusion that the Big Five is a comprehensive theory. Paunonen and Jackson (2000) answered Saucier and Goldberg (1998) by re-analyzing the same data, using a different (“more realistic”) criterion to decide whether a variable falls in a particular factor space. In addition, Paunonen and Jackson used a more conservative communality (.20 compared to Saucier and Goldberg’s “more liberal”.09), and they eliminated variables “having to do with physical characteristics (e.g., short-tall), demographics (e.g., employed-unemployed), low base rate undesirable behaviors (e.g., evil, cruel), and variables otherwise not clearly related to traditional personality traits (e.g., lucky-unlucky).” Paunonen and Jackson concluded that there is much important variance in human behavior that is not accounted for within the Big Five. They argued, similarly to Saucier and Goldberg (1998), that various factors are “not well represented in the language of personality”; however, they also contended

that such lack of inclusion should be disregarded, and that incremental utility should be the true test of whether a variable should be considered as important to the understanding of human behavior: “If one can identify theoretically meaningful, internally consistent classes of behavior that are able to predict socially and personally significant life criteria, then such personality dimensions are important.”

While the comprehensiveness of the Big Five’s model continues to be debated, a more pragmatic argument for its utility is the empirical evidence that answers a critical research question: What important outcomes do the Big Five traits predict? Because of their prominence in the literature as reporting significant correlational relationships between Big Five traits and key dependent variables, the two meta-analyses conducted by Barrick and Mount (1991) and Tett, Jackson, and Rothstein (1991) are discussed first.

Prior to the meta-analytic studies conducted by Barrick and Mount (1991) and Tett et al (1991), a great deal of research had concluded that personality measures do not reliably predict job performance or personnel selection (Guion and Gottier, 1965). However, both 1991 studies pointed out significant weaknesses in the methodology of previous research. Barrick and Mount noted that there was no well-accepted taxonomy of personality that classified personality traits, and they proposed that recent convergence of opinion concerning the Big Five constituted a valid basis to review the validity of Big Five traits. Tett et al (1991) identified several corrections that were required for more accurate assessment of personality’s predictive value. First, while cognitive ability predicts job performance well regardless of type of job or situational factors (Schmidt & Hunter, 1998) personality is more diverse and less intercorrelated than intellectual

abilities. Therefore the use of job analysis might facilitate personality trait selection for measurement. According to Tett et al, this argument was also supported by the SIOP (1987) standards of psychological scale use, which emphasized the value of conceptual links between predictor and criterion. Also, this is related to Tett et al's choice of differentiating confirmatory from exploratory studies, as confirmatory would likely yield stronger relationships. Secondly, Tett et al identified several statistical methodologies used previously that should be corrected: errors of bias in the sampling of correlations, inflation of the mean validity by including only significant relationships were reported, and within-study averaging of absolute value correlations. Regarding the final method, Tett et al noted that observed values had been used rather than absolute values, and positive and negative values, either of which can support a scale's validity, can cancel one another out; the result is that the overall average is lowered. The impact felt here is especially true with exploratory studies because lower and/or negative validities are more likely to be obtained. Corrections of other methods would arguably alter meta-analytic results in varying directions.

Both Barrick and Mount (1991) and Tett et al (1991) focused on Big Five personality traits. In these studies, Barrick and Mount included only the Big Five; Tett et al meta-analyzed eight traits, and the Big Five were five of those eight. Both studies isolated Big Five traits from a number of well-validated personality scales. While Tett et al summarized from an overall perspective, Barrick and Mount focused on the Big Five's relationship to three I/O outcomes (job proficiency, training proficiency, and personnel

data) within five occupational groupings (professionals, police, managers, sales, and skilled/semi-skilled).

Tett et al's corrected estimate for the overall relation between personality and job performance is .24, a significant relationship; however, the researchers concluded that while this relationship is strong, it is probably understated, as confirmatory studies are higher than exploratory ($r = .29$ vs. $r = .12$, respectively); within confirmatory studies, the relationship is stronger when job analysis was used to select trait scales than when it was not used ($r = .38$ vs. $r = .29$, respectively); and when articles vs. dissertations are summarized ($r = .27$ vs. $r = .13$, respectively). Tett et al's primary findings regarding specific Big Five traits were that the mean validities for three of the five traits were significantly related to job performance: Neuroticism ($r = -.22$), Openness ($r = .27$), and Agreeableness ($r = .33$).

Barrick and Mount's overall corrected sample-weighted mean correlation between personality and job performance was .11 (compared to Tett et al's $r = .24$. Tett et al explained this difference as Barrick and Mount's use of observed values rather than absolute values, as discussed previously in this paper). Specifically, Barrick and Mount found that Conscientiousness predicted performance across occupations (with mean correlated ranging from $r = .20$ to $r = .23$). Openness and Extraversion was found to be related to training proficiency criterion ($r = .25$ and $r = .26$, respectively); and Extraversion related to two occupations involving social interactions ($r = .18$ for managers and $r = .15$ for sales). Barrick and Mount's and Tett et al's work was clearly

groundbreaking in its conclusion that personality traits, and in particular, the Big Five, predict important I/O outcomes.

While a great deal of attention has been focused on the Big Five's relationship with I/O criteria, it is important to note that the Big Five has also been embraced by educational psychology researchers. Personality is one class of individual differences that is currently being studied seriously with respect to academic performance (Paunonen & Ashton, 2001). One critical outcome in education--academic success as measured by specific grades or cumulative grade point averages--has been consistently linked to Big Five traits: Agreeableness and Conscientiousness (Fritzche, McIntire, & Yost, 2002); Conscientiousness (Busato, Prins, Elshout, & Hamaker, 2000; Goff & Ackerman (1992); Musgrave-Marquart, Bromley, & Dalley, 1997; Paunonen & Ashton, 2001, and Wolfe & Johnson, 1995); Openness (Paunonen & Ashton, 2001) and Agreeableness (Rothstein, Paunonen, Rush, & King, 1994).

In summary, convergence among researchers in personality within several sub-fields of psychology on the Big Five personality model has been noteworthy and has occurred relatively recently (early 1990's and forward). Agreement on taxonomy of personality to classify traits has provided a common language for consistency in approach and communication, and it has also facilitated more focus within personality studies and probably more consistent results in validation studies.

Narrow Personality Traits

It should be pointed out that not all researchers agree that broader conceptualizations are better. Looking at the other side of the coin, one can see that

narrow traits, those that typically refer to more specific traits rather than their global factor counterparts (Judge, et al, 2002; Judge, et al, 1997), may also have their benefits. Narrow personality traits such as need for understanding, need for achievement, (Paunonen and Ashton, 2001) and academic ethic (Rau and Durand, 2000) have been recently studied. Studies that use only narrow traits have yielded predictive validity in a multitude of criterion, including religiosity ratings, willingness to share money, grade point average, and numerical ability (c.f. Paunonen et al., 1999; Paunonen & Ashton, 2001; Paunonen & Nicol, 2001; Mershon & Gorsuch, 1988; Borman & Penner, 2001). To further augment this position, Moon, Hollenbeck, Humphrey, and Maue (2003) compared the predictive validity of broad and narrow traits. They found that when traits were considered individually, they had predictive validity, however, when those traits were combined into a higher order factor, the predictive validity shrank. In addition, it should also be noted that narrow traits added incremental validity to the much broader five-factor model indicating the important role that narrow traits play in the bandwidth-fidelity dilemma. Ashton (1998), while admitting that performance might be optimally predicted by broad measures for some jobs, concluded that narrow traits predict better for most jobs and most job performance criteria. Further evidence that narrow traits have higher predictive value has been provided by Paunonen and Ashton (2001); Jang et al (1998), Mershon and Gorsuch (1988); Borman and Penner (2001); and Paunonen and Nicol (2001).

Additional argument for narrow traits' predictive value is afforded by Moon, Hollenbeck, Humphrey, and Maue (2003). Considering the work of clinical

psychologists, who view Emotional Stability (Neuroticism) as two separate components (anxiety and depression) Moon, et al (2003) compared the predictive value of the broader factor to that of each narrow trait. The dependent variable was escalation of commitment, or the tendency to escalate behavior to the point of losing sight of one's course of action (an undesirable tendency and viewed as a decision error). This study found a curious suppression effect. The broad factor of Emotional Stability (ES) showed no relationship with escalation of commitment; however, this probably resulted from suppression created by the opposite significant relationships identified for each of the narrower traits with the outcome measure. That is, anxiety was significantly positively related to escalation of commitment, while depression was significantly negatively related to escalation of commitment. Moon et al's (2003) work calls for more research on ES, particularly as it has previously been viewed as having low predictive ability of organizational criteria (Hurtz & Donovan, 2000). The low predictive results found while looking at organizational criteria when using ES could simply be the result of viewing the construct too broadly, as narrower traits included in ES might have suppressing effects that would only be apparent with a more narrow analysis.

Narrow traits have been examined in a variety of contexts, including academics. Paunonen and Ashton's (2001) study concludes that two narrow traits, sub-factors of Big five traits, predict academic success (in one course) better than two broad Big Five traits. The two Big Five factors selected for study were Conscientiousness and Openness. One narrow trait, nested within each of these two broad factors, was selected: need for achievement (nested within Conscientiousness), and need for understanding (nested

within Openness). Paunonen and Ashton (2001) described need for achievement as a motivation to achieve high levels of performance in many domains, including academics; this overlaps with commonly held definitions of work ethic.

Turning to a narrower dimension of work ethic, Rau and Durand (2000) studied a related construct, academic ethic, defined as follows: “Students with a well-developed academic ethic place their studies above leisure activities; study on a daily or near-daily basis; and study in a disciplined, intense, and sober fashion.” Rau and Durand’s (2000) work found that academic ethic predicts college grades.

The Broad-Narrow Trait Controversy

Although issues surrounding the bandwidth-fidelity dilemma have generated a great deal of current discussion and controversy (Society for Industrial and Organizational Psychology 18th Annual Conference, Symposium 141, 2003), the dilemma itself is not new. Recent research and comment seems to have been energized by general acceptance of, as well as dissent from, the Big Five (Block, 1995); that being said, the debate about narrow vs. broad personality traits appears to be one next logical step in the evolution of personality following convergence on a taxonomy of personality (Stewart, 1999). Ones and Viswesvaran (1996) claim that renewed interest in this “old debate” of bandwidth-fidelity is the result of increased usage of personality inventories in personnel selection.

An important function of the concept of traits in general is to classify, describe, and summarize a person’s observable behaviors and internal experiences (John, Hampson, & Goldberg, 1991). It follows that when trait concepts are viewed as

categories; an organization or taxonomy may unfold and is instructive via its breadth of individual categories. Trait hierarchies have a long history in personality research; Cattell's influential model includes 16 "primary factors" and 8 sub-factors necessary to describe personality (Cattell, 1943; Cattell, et al, 1970). Eysenck's (1947) foundational work suggested four levels within a personality hierarchy, listed here in descending order: factor, trait, habitual response, and specific response. Eysenck's specific figure illustrating this hierarchy uses Conscientiousness as one factor level, with five traits contained within the factor: Responsibility, Orderliness, Ambition, Endurance, and Methodicalness. The habitual response and specific response levels were not labeled; they were depicted as boxes stemming from the level immediately above.

The Big Five presents yet another model of hierarchy, with numerous traits included in each of the five larger factors. Digman (1997), reviewing Eysenck's 1992 work and comparing it to the Big Five model, noted Eysenck's (1992) suggestion that two factors--Agreeableness and Conscientiousness--contained in his model are at a "lower level of abstraction" than his more basic Psychoticism, Extraversion, and Neuroticism factors. This is contrasted with the Big Five's inclusion of Agreeableness and Conscientiousness at levels equal to Extraversion and Neuroticism (generally understood as Emotional Stability). Digman (1997) developed an alternative hierarchy, based on his factor analysis of correlations reported in 14 separate studies. Digman's (1997) proposed hierarchy contains the two higher-order factors α (Agreeableness, Conscientiousness, and Emotional Stability) and β (Extraversion and Intellect).

Therefore, it is clear that universal agreement on one single hierarchical representational model of personality does not, as yet, exist. Unfortunately, this is also the case when a clear definition of “broad” and “narrow” traits is sought: such precision is simply not to be found (Schneider, et al, 1996). However, there is general guidance from John, et al (1991), in that relatively broad traits include a large number of distinct behaviors, whereas relatively narrow traits refer to a more limited range of behaviors. The simplicity of this distinction between broad and narrow seems to serve our purposes best at this time. In addition, Judge, Erez, Bono, and Thoresen (2002) offer an instructive pair of definitions: *splitters* are those who seek to make fine distinctions among psychological concepts by splitting them into constituent elements, while *lumpers* are those who seek to aggregate concepts by combining narrow concepts into broader ones.

The bandwidth-fidelity tradeoff issue appears entwined with the problem of defining “broad” and “narrow” traits. While exact definitions have not gained wide consensus, Hogan and Roberts’ (1996) analogy provides interesting insight and contributes to our understanding of this topic: the choice between binoculars and a microscope is similar to the choice between fidelity and bandwidth – one provides a wide field of vision and little detail, while the other offers a narrow field of vision with great detail. Ones and Viswesvaran (1996) describe the bandwidth-fidelity dilemma as the choice of careful measurement of a single narrowly defined variable and more cursory exploration of many separate variables. Murphy (1993) describes it as follows: “In psychological testing, there is an inevitable trade-off between attaining a high degree of

precision in measurement of any one attribute or characteristic, and obtaining information about a large number of characteristics.”

Within social science, Shannon and Weaver (1949) introduced these concepts as a tradeoff. Fidelity was viewed as quality of information, while bandwidth was viewed as complexity of information obtained. Greater fidelity may be achieved, but at the loss of bandwidth; with increased bandwidth, fidelity is lowered. Cronbach (1960) continued the discussion, interpreting Shannon and Weaver’s (1949) theory into four proposals: (1) a shift toward greater fidelity reduces bandwidth and conversely, an increase in bandwidth comes at the price of fidelity; (2) information from extremely large bandwidth assessments is unreliable and conversely, small bandwidth assessment is appropriate only when there is one question to be answered; (3) when many outcomes are important, assessment bandwidth must increase; and (4) low fidelity assessments are a problem only when they lead to costly errors or are used to make irreversible decisions.

One of Cronbach’s (1960) generalizations has been reinstated within current discussions and has evolved to a related sweeping contention: matching predictors with criteria always enhances validity (Hogan & Roberts, 1996). The previous flow of thought leads directly to the next topic within this section, do narrow or broad traits predict more accurately?

A number of researchers agree with Hogan and Roberts’ (1996) assertion that predictors and criteria must match, to the fullest extent possible, to maximize predictive value (Stewart, 1999). The work of Ones and Viswesvaran (1996), while ostensibly advocating the use of only broad traits, actually recommends that broad traits be used in

personnel selection research and applied purposes, while suggesting that narrow and more specific personality dimensions may be more appropriate for training and development interventions. While Schneider, et al (1996) agree in principle that predictors should match criteria in terms of specificity, they disagree with Ones and Viswesvaran (1996) in their view of how traits should be chosen to obtain the best possible prediction and explanation of a complex overall job performance criterion. Schneider, et al (1996) advocates the use of multidimensional measurement of job performance; therefore, they also recommend the use of narrow personality traits as well as the Big Five traits as predictors of these outcomes.

Departing from this view is the work spawned by Judge, Locke and Durham's (1997) dispositional theory, which combines four traits previously viewed as separate (neuroticism, locus of control, self-esteem, and generalized self-efficacy) into one broad "lumper" trait, core self-evaluation (CSE). Judge et al (1997) holds that these specific traits indicate a single, higher order factor (CSE). Using three independent samples, Judge, Locke, Durham, and Kluger (1998) demonstrated that CSE has direct and indirect relationships with job satisfaction and life satisfaction. CSE's predictive power was further studied by Judge, Bono, and Locke (2000) who found that subjective job characteristics and job complexity mediate the relationship between CSEs and job satisfaction. Erez and Judge (2001) validated that CSE is a higher order factor derived from neuroticism, locus of control, self-esteem, and generalized self-efficacy. In addition, the 2001 study showed both lab and field study results indicating that CSE is related to task motivation, productivity, and job performance. The meta-analysis

provided by Judge, Erez, Bono, and Thoresen (2002) provided new strength to establishing CSE as a valid trait; the authors conclude that each of the four individual traits are strongly related, that they display relatively poor discriminant validity, that each account for little incremental variance in predicting external criteria relative to the higher order construct, and that CSE explained the relationships among the four traits. Finally, Bono and Judge (2003) found that CSE is related to both job satisfaction and job performance; and various issues of CSE's potential relationships to the Big Five are explored, including the contention that CSE is probably a broader measure than Emotional Stability.

Indeed, support for broad factors as better predictors is often found within exploration of the Big Five model. As noted by Schneider, et al (1996), many researchers often view traits greater than or equal to the Big Five in breadth as "broad," while those considered less broad than the Big Five are "narrow." However, this raises at least two concerns. First, "narrow" may still be defined too broadly. Secondly, the traits that make up the Big Five are probably not equally broad. Saucier and Goldberg (1996) point out that extraversion, agreeableness, and conscientiousness have many more English adjectives associated with them than do emotional stability and openness. Digman's (1997) review of factor correlations from 14 studies supporting the Big Five model concluded that two higher-order factors (metatraits) emerge: one includes agreeableness, conscientiousness, and emotional stability; the other, extraversion and openness. Eysenck (1992) had previously taken a similar view, proposing that the Big Five are not

really “basic,” and that a level above the Big Five factors would include Eysenck’s own Psychoticism, Extraversion, and Neuroticism factors.

Several studies, however, have focused on the sole use of narrow traits. Using Ones and Viswesvaran’s (1996) data, Paunonen, et al (1999) claim that use of broad traits will produce two undesirable results: (1) prediction inaccuracy, and (2) compromising of psychological meaningfulness and interpretability of personality-job performance findings. Paunonen et al (1999) essentially contends that much important information is lost when performance is aggregated into a single, multidimensional, composite criterion (such as Ones and Viswesvaran’s 1996 global index of job performance). The discussion shall now turn to predicting outcomes, specifically academic performance using both broad and narrow traits.

Generalized vs. Contextualized Measures

Another dimension of the personality debate concerns the frame of reference for the items included in a personality scale. In the past, the items in personality scales were not referenced against a particular setting. Rather, they referenced general settings with questions about general preferences, activities, and so forth. In an effort to increase validity, a recent trend has been to design items that refer to a specific setting, such as work or school. For example, there are now measures that are contextualized for college academia, as well as measures that are specific for work and job performance, such as the PPRF (Personality-Related Position Requirements Form), developed by Raymark, Schmit, and Guion (1997). Roberts (2007) recommends that the study of personality psychology be contextualized towards social roles. Stryker (2007) defines social role as

being a set of behavioral expectations attached to a position in an organized set of social relationships. Roberts argues for the use of social roles for a few reasons: first, social roles are organized along the same breadth as traits; secondly, social roles can be organized in a few categories or dimensions; third, according to Roberts, social roles serve as the organizing system for behavior, and lastly, the expectations from one's social role may not mesh well with that person's own personality.

Schmit et al. (1995) tried to overcome these issues in testing by contextualizing a measure to college students using GPA as a criterion variable. The generalized version contained items like: *I strive for excellence in everything I do*. The contextualized measure contained items like the following: *I strive for excellence in everything I do at school*. They found that the contextualized items had a higher reliability and validity than the generalized measure. One explanation for the increase in validity was that participants represented themselves positively and accurately due to an increased frame of reference which allowed them to make more specific responses. Schmit et al. did not examine whether or not contextualized items added incremental validity over the generalized items, nor did they examine the correlation between the two measures. Schmit also neglected to look at any personality traits with a bandwidth narrower than the Big Five.

Hunthausen et al. (2003) expanded on Schmit's study by using a major U.S.-based airline to study the effects of an at-work frame of reference on the validity of a personality measure, the NEO-FFI. They found significant correlations between job performance and Conscientiousness, Extraversion, and Openness in the contextualized

measures which were not present in the original. The validity coefficient significantly increased for the Extraversion and Openness to Experience frame-of-reference measures over the general measure thus demonstrating that the predictive ability of these measures was increased by the addition of a frame-of-reference to a personality scale.

Two standpoints have been mentioned in previous research from which a generalized measure to predict better than a contextualized measure. Gatewood and Feild's (2001) powerful situation approach argues that personality will have relatively little effect on behavior that is guided by context and that adding a frame-of-reference such as work to a personality measure would lead only to reduced variance and lower validity. The second standpoint (Hunthausen et al, 2003) is that contextualizing a personality measure could lead to test transparency and greater faking which in turn would also reduce validity.

Personality and Academic Performance

Traditionally, the role of intellectual ability has been well documented in relation to academic performance. Mouw and Khana (1993) found a strong positive correlation between grades and cognitive ability. Lange (1974) also showed that the relationship between grades and cognitive ability is stronger than other subjective measures of academic performance, such as teacher evaluation of academic performance. Barnes, Potter and Fiedler, (1983) demonstrated that other variables aside from cognitive ability predict academic achievement or moderate the ability-performance relationship. They found that stress was significantly related to academic performance, but in an inverse manner. Although these studies show a relationship between academic performance and

cognitive ability, they also illustrate the notion that other factors might play a significant role in academic performance, either as moderator variables or direct predictors.

In this vein, investigators have examined the role of non-cognitive predictors of academic performance; notably personality traits. Rothstein, Paunonen, Rush, and King (1994) found that several personality traits are related to academic performance. First, they demonstrated that openness and agreeableness were significantly, positively related to grade point average. Additionally, they employed a measure of classroom performance to represent the student's verbal skills and ability to articulate various types of problems encountered in the business world everyday. Rothstein and his colleagues found that extraversion, agreeableness, and openness were all significantly, positively related to classroom performance. Taken together, the results of this study seem to indicate that the five-factor personality traits are related to various measures of academic performance.

The relationship between academic performance and personality variables has been frequently investigated and well-established by other researchers. Chamorro-Premuzic and Furnham (2003) used two longitudinal samples to show that personality is significantly related to academic performance. Specifically, their study employed the NEO-PI-R to determine the relationship between the Big Five, Eysenck Personality Questionnaire (Eysenck & Eysenck, 1976), and academic performance as assessed by exam performance. They found that neuroticism was negatively related to academic performance while conscientiousness was positively related to academic performance. Further, King (1998) demonstrated that GPA was negatively related to the Millon

Clinical Multiaxial Inventory – II (Millon, 1987) anti-social variable. Considered together, the above studies indicate that, regardless of the operationalization, the psycho-neurotic aspect of personality that is encompassed by these three constructs is consistently negatively related to grade point average.

In addition, McKenzie and Gow (2004) demonstrated that personality traits were related to another indicant of academic performance – retention. They examined the reasons for attrition among college students during the first two semesters. Measures of personality were significantly related to retention. Specifically, the first semester GPA was significantly correlated with agreeableness, conscientiousness, and openness positively; while being negatively related to extraversion. In the second semester, the variables that were related to GPA fell to only agreeableness and conscientiousness. Thus, these findings reinforce the notion that these two Big Five variables, agreeableness and conscientiousness, are significantly related to retention.

Similarly, McIlroy and Bunting (2002) articulated specific personality characteristics that were related to academic performance. They found that conscientiousness was significantly, positively related to academic performance. Several other researchers have supported the position that conscientiousness is significantly, positively related to academic performance (cf. Fritzche, McIntire, & Yost, 2002; Busato, Prins, Elshout & Hamaker, 2000; Paunonen & Ashton, 2001b). In a similar vein, Furnham, Chamorro-Premuzic, and McDougall (2003) found that Conscientiousness accounted for 19% of the variance in academic performance, a finding that underscores the predictive nature of the Big Five trait of Conscientiousness in relation to academic

performance. Further emphasizing the notion that conscientiousness is significantly and positively related to academic performance, Chamorro-Premuzic and Furnham (2003) reported a zero-order correlation of .29 for conscientiousness and academic performance. This would translate in to roughly 9% of the variance in academic performance being accounted for by conscientiousness alone. Additionally, Paunonen and Ashton (2001b) found openness to be significantly, positively related to academic performance. The five-factor model, being a somewhat broad measure of personality, has been illustrated by the previously cited studies as being related to academic performance. However, could narrow traits add incremental validity above and beyond the Big Five in relation to academic performance?

Paunonen and Ashton (2001b) addressed this issue. In their study, they addressed whether sub-factors of the Big Five were related to academic performance. Specifically, two of the broad Big Five traits, Conscientiousness and Openness, were examined in comparison with two narrow sub-factors of the Big Five. The two narrow sub-factors were narrow traits that were hypothesized to be nested within two of the broader five-factors. First, need for achievement was found to assess Conscientiousness within a narrower domain while need for understanding was found to be nested within Openness. Paunonen and Ashton (2001b) found that these two narrow traits, need for achievement and need for understanding, predicted academic performance better than their respective broader traits. These findings argue for the utility of predicting academic performance using traits that are narrower in scope than the Big Five-level traits.

In terms of predictors of academic performance, the Big Five have been demonstrated to significantly predict grade point average in high school and middle-school students (e.g., Lounsbury, Loveland, Sundstrom, & Gibson, 2003a; Lounsbury, Loveland, Sundstrom, & Gibson, 2003b). Both of these studies demonstrated clearly that the Big Five conceptualization of personality significantly predicted cumulative grade point average for adolescents. However, these studies did not address the question of whether or not narrow traits and abilities added incremental validity to the Big Five traits in the prediction of college grade point average, both of which will be reviewed below.

De Raad and Schouwenburg (1996) also examined the Big Five personality traits in regard to academic performance in their review of the literature. They argued that Agreeableness may have some positive impact on performance within learning environments by facilitating cooperation with the learning process. This position has been confirmed in later research, which found that Agreeableness is linked to compliance with teacher instructions, effort in school, as well as staying focused on learning tasks (Vermetten, Lodewijks, & Vermunt, 2001). De Raad and Schouwenburg (1996) cited a series of studies supporting the idea that Conscientiousness is linked with academic performance. Conscientiousness has been found to be correlated with both compliance with and concentration on homework (Trautwein, Ludtke, Schnyder, & Niggli, 2006), adding to the arguments for Conscientiousness having a positive association with academic performance. In their review of Emotional Stability, De Raad and Schouwenburg found that people who are low on Emotional Stability are more anxious and anxious individuals tend to focus on their emotional state and their self-talk, which

interferes with their ability to attend to academic tasks, thus reducing performance. With regards to Extraversion, De Raad and Schouwenburg (1996) suggested that it is obvious that more extraverted students will perform better academically because of their higher levels of energy, coupled with a positive attitude that leads to a desire to learn and understand. On the other hand, they also cited Eysenck (1992) who stated that extraverted students are more likely to socialize and pursue other activities rather than concentrating on their studies, thereby leading to lower levels of performance. In addition, the relationship between Extraversion and academic performance may be modified by the type of assessments used to determine course grade. Furnham and Chamorro-Premuzic (2005) found that Extraverts excelled in courses with an emphasis on oral exams and class participation. These conflicting findings leave the relationship between Extraversion and academic performance especially murky. Openness is a deep learning style (Vermetten, Lodewijks, & Vermunt, 2001), which has been proposed as a major contributor to academic performance. De Raad and Schouwenburg (1996) went so far as to state that the components of Openness appear to reflect “the ideal student” (p. 327), so it should be expected that Openness should also contribute to academic performance.

Given the utility of the Big Five in predicting real-world criterion, the bandwidth-fidelity dilemma suggests that other, narrower traits may also be valid predictors of real-world criterion. The best illustration of the notion of narrow traits being suitable predictors came from Paunonen and Ashton (2001). Paunonen and Ashton investigated the Big Five and other narrower traits in their predictability of real-world outcomes. Paunonen and Ashton used three measures to address this issue the Personality Research

Form – E (PRF; Jackson, 1984) and the Jackson Personality Inventory (JPI; Jackson, 1976) and the NEO-PI-R (Costa & McCrae, 1992). The PRF and JPI assess collectively 34 narrow traits. Paunonen and Ashton wanted to compare the Big Five against facets of the Big Five in an attempt to assess the predictive validity of broad vs. narrow traits. They had a group of judges rate the PRF, JPI, and NEO-PI-R to determine the degree to which each of the 40 criterion were representative of each of the Big Five facets. With respect to the PRF-JPI broad factor scales, they accounted for at least 10% of the variance in real-world variables such as: tobacco consumption, willingness to share money, parties attended, driving habits, and alcohol consumption. It is also noteworthy that these five broad factor scales also accounted for 9.6% of the variance in peer-rated intelligence and 7.4% of the variance in grade point average. What makes Paunonen and Ashton's study different is that unlike the previously cited studies examining the Big Five and grade point average, they also looked at other narrow traits in relation to the real-world criterion, setting up a head to head comparison related to the bandwidth-fidelity dilemma. At this point, the research question became, given the validity of the broader five predictors; can other narrower traits demonstrate criterion validity? The answer to this question was a definitive yes. Using five narrow traits to predict the same criterion that the broader five factor scales were used to predict, the narrower traits accounted for an even larger proportion of variance than did those broader factor scales. The narrow traits accounted for an average of 10.2% of the variance in 20 of the 40 criteria whereas the Big Five on average accounted for only 9.7% of the variance in 17 out of the 40 criteria. Of particular relevance to the current discussion, the narrow traits of achievement,

endurance, understanding, complexity, and organization as defined by both the PRF and JPI were significantly related to grade point average. The five narrow traits from Jackson accounted for 6.7% of the variance in grade point average. Paunonen and Ashton demonstrated that five narrow traits accounted for almost as much variance in grade point average as did the broader factor scales (7.4% vs. 6.7%), underscoring the utility of narrow traits as they relate to predicting grade point average.

Several studies have shown that the narrow personality traits contribute incremental validity to the prediction of academic performance above and beyond the Big Five traits. The Big Five traits comprise a global approach to personality. Narrow traits, on the other hand, are those that tap into more narrowly defined aspects of personality. The focus on much of the research in this area has been to see if narrow personality traits add incremental validity to the Big Five. Thus, Paunonen and Nicol (2001) found that the narrow traits of straightforwardness and self-discipline added significant incremental variance above and beyond the Big Five in the prediction of academic performance as measured by grade point average. Paunonen and Nicol's findings illustrate the importance and validity of the proposition that narrow personality traits may add incremental validity in accounting for that variance found in GPA's, further strengthening the relationship between personality and academic performance.

Summary

In conclusion, a review of current research in academic performance, the Big Five, and other narrow constructs revealed that much remains to be studied. The case has been made for the utility of predicting academic performance by looking at both broader

personality dimensions as well as narrower personality facets. Prior research has also delved into the idea that personality measures created with a frame-of-reference, or contextualized measures, are better predictors than generalized measures.

Owing to the ongoing issue of the bandwidth-fidelity dilemma, it would seem reasonable to approach it not as a dilemma, but rather in terms of a research strategy which encompasses both sides of the broad vs. narrow debate. Instead of thinking in either-or terms, one should consider examining both broad and narrow traits as jointly contributing to the validity of real-world criteria. It does not have to be case that broad is superior to narrow nor vice-versa; rather, we can think in terms of narrow augmenting broad traits. Thus, it would seem reasonable to consider using the Big Five, which have been found to be significantly related to academic performance and attempt to determine the incremental validity that narrow traits may exhibit as well as the aggregate validity of broad and narrow traits without assuming that broad traits have precedence. In other words, we can examine the joint and combined contributions of the Big Five and narrow traits in criterion-related validation.

A recent trend of designing personality measures that aim to invoke responses referring to a particular setting, such as academia or work, adds another facet to the puzzle that is personality. Using context-specific personality items allows the opportunity to better predict performance, in addition to adding depth to the present understanding of personality. Continued research on this topic is needed, as it may have significant implications for new personality inventory design.

For my dissertation, I propose studying both the Big Five and narrow traits in relation to performance in an academic setting. An approach of this nature could resolve the binocular – microscope dilemma articulated by Hogan and Roberts (2001). Continued research to examine these factors will also add to the ongoing discussion concerning broad vs. narrow traits, and, in addition, will provide further support for identifying valid predictors of academic success. In addition, I propose examining both general and contextualized measures of narrow and broad traits, in hopes of further clarifying which type of measures are better predictors of academic success. As a criterion, I will use a single college course grade as an indicator of academic performance. Using a single course grade will allow my study to be controlled for differences between instructors, majors, and even differences between colleges and universities.

Objectives of the Present Study

Hypotheses

1. The general purpose of this study is to compare general and contextualized measures; thus, it is predicted that:
 - a. Conscientiousness will be positively related to academic performance.
 - i. Conscientiousness scores from the measure contextualized to academics will be more highly positively related to course grade than Conscientiousness scores from both the general measure and the work-contextualized measure.

- ii. Conscientiousness scores from the generalized measure will be more highly positively related to course grade than Conscientiousness scores from the measure contextualized to work.
 - b. Openness will be positively related to academic performance.
 - i. Openness scores from the measure contextualized to academics will be more highly positively related to course grade than Openness scores from either the general measure or the work-contextualized measure.
 - ii. Openness scores from the generalized measure will be more highly positively related to course grade than Openness scores from the measure contextualized to work.
- 2) It is predicted that the total amount of significant variance in course grade accounted for by the set of Big Five traits will be largest for the academic frame of reference scales, followed by the general scales, and then the work-based scales.
- 3) It is predicted that the total amount of significant variance in course grade accounted for by the set of narrow personality traits will be largest for the academic frame of reference scales, followed by the general scales, and then the work-based scales.

Research Questions

1. Whereas the literature regarding Emotional Stability, Extraversion, and Agreeableness is more ambiguous, the following will be examined using a two-tailed non-directional approach:
 - a. Is there is a significant relationship between Emotional Stability and academic performance?
 - i. Will the Emotional Stability scores from the measure contextualized to academics be more highly related to course grade than Emotional Stability scores from the general measure and work-related measure?
 - ii. Will the Emotional Stability scores from the generalized measure be more highly related to course grade than Emotional Stability scores from the measure contextualized to work?
 - b. Is there is a significant relationship between Extraversion and academic performance?
 - i. Will Extraversion scores from the measure contextualized to academics be more highly related to course grade than Extraversion scores from the general and work-related measures?
 - ii. Will Extraversion scores from the generalized measure be more highly related to course grade than Extraversion scores from the measure contextualized to work?

- c. Is there is a significant relationship between Agreeableness and academic performance?
 - i. Will Agreeableness scores from the measure contextualized to academics be more highly related to course grade than Agreeableness scores from the general and work-related measures?
 - ii. Will Agreeableness scores from the generalized measure be more highly related to course grade than Agreeableness scores from the measure contextualized to work?

CHAPTER III: METHODOLOGY

Research Design

A field study of students in the same course taught by the same instructor during an eight year period. Big Five personality traits are measured by the TTC, a contextualized measure for college students and the NEO-PIR, a generalized Big Five measure. Narrow personality traits are measured by the TTC, a contextualized measure for college students and the 16PF, a generalized measure of narrow personality traits. Course grade is the criterion variable.

Participants

The sample for this study was comprised of college students in a senior level course in psychological testing at a major university in the Southeastern United States included in a data archive. The same professor taught this course each year using standard testing and grading criteria. 241 of the students participated in the 16PF, 230 took the NEO-PIR, 132 students took the TTC, and 225 of the students took the PSI. Of the participants, 36% were male and 64% were female. 87% of the participants were Caucasian, 3% were African American, 3% were Asian, 3% were Hispanic, and 4% classified themselves as “other”. 89% of the students were Seniors, 7% were Juniors, 3% were Graduate students, and 1% were college Sophomores.

Instruments

The instruments used in this study are as follows:

1. The Transition to College Inventory (TTC) has 118 items represented by statements in which respondents are asked to express agreement or disagreement on a five-point Likert

scale (1=Strongly Disagree; 2= Disagree; 3=Neutral/Undecided; 4=Agree; 5=Strongly Agree). A brief description of the personality traits measured by TTC involved in the present study is given below.

Agreeableness - being agreeable, participative, helpful, cooperative, and inclined to interact with others harmoniously.

Career Decidedness - the degree to which an adolescent knows what occupational field s/he wants to go into after leaving school.

Conscientiousness - being conscientious, reliable, trustworthy, orderly, and rule-following.

Emotional Stability - overall level of adjustment and emotional resilience in the face of stress and pressure. We conceptualized this as the inverse of neuroticism.

Extraversion - tendency to be sociable, outgoing, gregarious, warmhearted, expressive, and talkative.

Openness - receptivity and openness to change, innovation, new experience, and learning.

Optimism - having an optimistic, hopeful outlook concerning prospects, people, and the future, even in the face of difficulty and adversity as well as a tendency to minimize problems and persist in the face of setbacks.

Self-Directed Learning - Inclination to learn new materials and find answers to questions on one's own rather than relying on a teacher to provide answers; initiating and following through on learning without being required to for a course or prompted to by a teacher.

Sense of Identity - knowing one's self and where one is headed in life, having a core set of beliefs and values that guide decisions and actions; and having a sense of purpose.

Tough-Mindedness - appraising information and making decisions based on logic, facts, and data rather feelings, sentiments, values, and intuition.

Work Drive - being hard-working, industrious, and inclined to put in long hours and much time and effort to reach goals and achieve at a high level.

2. The 16 Personality Factors Questionnaire (16PF), a 187-item personality scale developed by Raymond Cattell (1949), was used to measure narrow personality traits for the purposes of this study (Cattell & Cattell, 1969). The 16PF measures one reasoning factor and 15 personality traits: warmth, emotional stability, dominance, liveliness, rule-consciousness, social boldness, sensitivity, vigilance, abstractedness, privateness, apprehension, openness to change, self-reliance, perfectionism, and tension.

3. The NEO-PIR, developed by Costa and McCrae (1992), is a widely used measure of the Big Five personality traits (Openness, Conscientiousness, Agreeableness, Extraversion, and Neuroticism). The following facets of each trait are also measured by the NEO-PIR: Openness: Fantasy, Aesthetics, Feelings, Actions, Ideas, and Values; Conscientiousness: Competence, Order, Dutifulness, Achievement Striving, Self-Discipline, and Deliberation; Agreeableness: Trust, Straightforwardness, Altruism, Compliance, Modesty, and Tendermindedness; Extraversion: Warmth, Gregariousness, Assertiveness, Activity, Excitement Seeking, and Positive Emotion; Neuroticism:

Anxiety, Hostility, Depression, Self-Consciousness, Impulsiveness, and Vulnerability to Stress.

4. An additional personality measure used in this data source to measure both Big Five and narrow personality traits was the Personal Style Inventory, a normal, work-based personality inventory which has been used in a variety of settings internationally, mainly for career development and preemployment screening purposes (Lounsbury et al., 2003a, b, 2004a, c; Pemberton et al., 2005; Williamson et al., 2005). Reliability and validity information on the PSI is provided by Lounsbury and Gibson (2006). A brief description of each of the personality constructs examined in the current study is given below along with the Cronbach's coefficient for that scale observed in the present dataset.

Assertiveness – a person's disposition to speak up on matters of importance, expressing ideas and opinions confidently, defending personal beliefs, seizing the initiative, and exerting influence in a forthright, but not aggressive manner.

Conscientiousness – dependability, reliability, trustworthiness, and inclination to adhere to company norms, rules, and values.

Customer Service Orientation – striving to provide highly responsive, personalized, quality service to (internal and external) customers; putting the customer first; and trying to make the customer satisfied, even if it means going above and beyond the normal job description or policy.

Emotional Resilience – overall level of adjustment and emotional resilience in the face of job stress and pressure.

Extraversion – tendency to be sociable, outgoing, gregarious, expressive, warmhearted, and talkative.

Image Management – reflects a person's disposition to monitor, observe, regulate, and control the self-presentation and image s/he projects during interactions with other people.

Openness – receptivity/openness to change, innovation, novel experience, and new learning.

Optimism – having an upbeat, hopeful outlook, concerning situations, people, prospects, and the future, even in the face of difficulty and adversity; a tendency to minimize problems and persist in the face of setbacks.

Teamwork Disposition – propensity for working as part of a team and functioning cooperatively on work group efforts.

Work Drive – disposition to work for long hours (including overtime) and an irregular schedule; investing high levels of time and energy into job and career, and being motivated to extend oneself, if necessary, to finish projects, meet deadlines, be productive, and achieve job success.

Visionary vs. Operational – personal style emphasizing creating an organizational vision and mission, developing corporate strategy, identifying long-term goals, and planning for future contingencies vs. a personal style that focuses on day-to-day activities and accomplishments, short-term goals, current problems, and implementation of plans.

5. The criterion variable in this study was the final course grade of the participants. Grades were given on a 4-point scale ranging from 0=F to 4=A, with half-point

intermediate scale values. The median course grade was 3.3. Grading was based primarily on performance on standardized tests (multiple choice and matching) scored by the graduate teaching assistant for the course using preset cutoffs for grades. The graduate student had no access to personality scores or results, which helped maintain independence of grades and personality scores.

CHAPTER IV: RESULTS

Analyses

The results were analyzed using the following statistical procedures: 1. Descriptive statistics were computed for all study variables. Pearson product moment correlations and tests for the difference between independent correlation coefficients (Guildford & Fruchter, 1979) were used to analyze Hypotheses 1a and 1b along with Research Questions 1a, 1b, and 1c. A test of two correlation coefficients along with a Hierarchical Regression were utilized to analyze Hypotheses 1a i-ii and 1b i-ii as well as Research Questions 1a i-ii, 1b i-ii, and 1c i-ii. Stepwise multiple regression analyses paired with a comparison of standardized Beta weights were used to examine Hypotheses 2 and 3.

Hypothesis 1

The result of the first phase of analyses, bivariate correlations of GPA with the Big Five traits of Conscientiousness and Openness, is presented in Table 2. Conscientiousness was found to be positively related to academic performance for three of the measures: the NEO-PIR ($r = .21, p < .01$); the PSI ($r = .11, p < .05$); and the TTC ($r = .15, p < .01$). The Conscientiousness measure in the 16PF ($r = -.03$) was negatively related to academic performance. In the case of Conscientiousness, the NEO-PIR, a generalized measure, was most highly positively related to academic performance, followed by the TTC, an academically contextualized measure, the PSI, a work related measure, and the 16PF, another generalized measure.

Table 2
Correlations between Conscientiousness and Openness and Academic Performance

	Frame of Reference			
	General		Work	School
	NEO	16 PF	PSI	TTC
Conscientiousness	.21**	-.03	.11*	.15*
Openness	.11*	.11*	.09	.26**

Note: * $p < .05$; ** $p < .01$

N= 230 (NEO-PIR), 241 (16PF), 225 (PSI), 132 (TTC)

Openness was also found to be positively related to academic performance in all four measures. The TTC ($r = .26, p < .01$), a measure contextualized to academics, was most highly related, followed by the two generalized measures, the NEO-PIR ($r = .11, p < .05$) and the 16PF ($r = .11, p < .05$) and the PSI ($r = .09$) a work related measure. The results for the trait of Openness follows the hypothesized model: academically contextualized measures were most highly positively related to academic performance followed by generalized measures which were more positively related to academic performance than work contextualized measures.

Hypothesis 2

A Stepwise regression was used to determine which measure of Big Five personality traits accounted for the largest amount of variance in course grade, the results of which are presented in Table 3. For the NEO-PIR, Conscientiousness, Extraversion, Emotional Stability, and Openness accounted for 17.6% variance. Extraversion, Emotional Stability explained 7.3% of the variance in course grade for the 16PF. For the work-related PSI, Extraversion and Emotional Stability explained 7.8% of course grade

Table 3
Stepwise Multiple Correlation Results Broad/Big Five Traits

	Frame of Reference			
	General		Work	School
	NEO	16 PF	PSI	TTC
Broad/Big Five	.42** (Conscientiousness, Extraversion, Emotional Stability, Openness)	.27** (Extraversion Emotional Stability)	.28** (Extraversion, Emotional Stability)	.33** (Openness, Extraversion)

Note: * $p < .05$; ** $p < .01$ N= 230 (NEO-PIR), 241 (16PF), 225 (PSI), 132 (TTC)

variance. For the academically contextualized TTC, the measures of Openness and Extraversion explained 10.9% of the variance in course grade.

Hypothesis 3

A Stepwise regression was used to determine which measure of narrow traits accounted for the largest amount of variance in course grade, the results of which can be seen in Table 4. When all narrow traits were entered for the NEO-PIR, Deliberateness, Ideas, and Altruism explained 12.96% of the variance in academic course grade. 5.8% of the course grade variance was explained by the 16PF factors PFF and PFQ4. For the PSI, Work Drive explained 6.3% of the variance. Work drive, Identity, and Aggression combined to account for 26% of the variance for the academically related TTC.

Research Question 1

The result of the first phase of analyses, involving bivariate correlations of GPA with the Big Five traits of Emotional Stability, Extraversion, and Agreeableness, is

Table 4
Stepwise Multiple Correlation Results for the Narrow Personality Traits

	Frame of Reference			
	General		Work	School
	NEO	16 PF	PSI	TTC
Narrow Personality Traits	.36** (Deliberateness, Ideas, Altruism)	.24** (PFF, PFQ4)	.25** (Work Drive)	.51** (Work Drive, Identity, Aggression)

Note: * $p < .05$; ** $p < .01$ N= 230 (NEO-PIR), 241 (16PF), 225 (PSI), 132 (TTC)

presented in Table 3. It was found that Emotional Stability was positively related to academic performance through the use off all four measures. The work related measure, the PSI ($r = .14, p < .01$), was most highly related, followed by the 16PF ($r = .11, p < .05$) and the NEO-PIR ($r = .10, p < .05$), both work related measures, and then the TTC ($r = .11$), an academically framed measure.

For the Big Five variable of Extraversion, the opposite was true. All four measures found Extraversion to be negatively related to academic performance. The NEO-PIR ($r = .21, p < .01$), one of the generalized measures was most negatively related to academic performance. The work related measure, the PSI ($r = .20, p < .01$) along with the TTC ($r = .19, p < .01$), the academically framed personality measure were both also significantly negatively related to academic performance for the trait of Extraversion. The 16PF ($r = .07$) was the least related of the four measures.

The final Big Five trait, Agreeableness, was found to be positively related to academic performance. In this case, the TTC ($r = .22, p < .01$), an academically contextualized measure, was most highly related. The 16PF ($r = .09$), a generalized

measure, was next in line followed by the generalized NEO-PIR ($r = .00$) and the work-related PSI ($r = .00$).

Table 5
Correlations between Emotional Stability, Extraversion, and Agreeableness and academic performance

	Frame of Reference			
	General		Work	School
	NEO	16 PF	PSI	TTC
Emotional Stability	.10*	.11*	.14**	.11
Extraversion	-.21**	-.07	-.20**	-.19**
Agreeableness	.00	.09	.00	.22**

Note: * $p < .05$; ** $p < .01$

N= 230 (NEO-PIR), 241 (16PF), 225 (PSI), 132 (TTC)

CHAPTER V: DISCUSSION

Discussion

One of the goals of this study was to examine the relationship between an important real-world criterion, the final grade received in a college course, and personality traits. In the context of the bandwidth-fidelity dilemma, both broad and narrow personality traits were examined. The existing literature is divided on whether to use broad or narrow traits. Both sides of the argument were addressed in the review of the literature, and support for both positions was documented.

A second goal of this study was to examine whether generalized or contextualized measures are better predictors of a criterion, in this case, college course grade. Research generally supports the use of contextualized personality measures in an effort to raise the reliability and validity of a measure by increasing the understanding of those participating.

Broad Personality Measures and Academic Performance

Four of the five factors (Agreeableness, Conscientiousness, Emotional Stability, and Openness) comprising the Big Five were significantly, positively correlated with college GPA. These findings align well with results reported by Lounsbury, Welsh, Gibson, and Sundstrom (2005), who found that the Big Five were related to cognitive ability.

The first hypothesis dealt with the relationship between Conscientiousness and Openness and academic performance, both of which were predicted to be positively related to academic performance. Research question 1 dealt with the relationship

between Emotional Stability, Extraversion, and Agreeableness and academic performance. As these are research questions, not hypotheses, no predictions were made as to the direction of these relationships; a question was posed only to determine whether or not a relationship exists.

Conscientiousness was found to be positively related to academic performance for three of the measures: the academically contextualized TTC, the general NEO-PIR, and work-related PSI. The 16PF, a generalized measure, displayed the only negative relationship in this case. The positive relationship between Conscientiousness and academic performance is greatly supported by the existing literature as Conscientiousness, most of all, has been found to be related to academic performance (Goff & Ackerman, 1992; Musgrave-Marquart, Bromley, & Dalley, 1997; Paunonen & Ashton, 2001b; Busato, Prins, Elshout, & Hamaker, 2000). Conscientiousness has been conceptualized in such a way (De Raad, 2000; Hogan & Ones, 1997) that students who are more conscientious are more likely to: attend class regularly, take careful notes, keep well organized study materials, prepare for tests in a disciplined manner, and generally strive to follow course guidelines and meet the teacher's expectations. All of these academic activities should contribute to doing well in a class and, therefore, making a good grade.

All four of the measures used in this study found Openness to be positively related to academic performance, adding further support to the existing body of literature. Sneed, Carlson, and Little (1994) along with Paunonen and Ashton (2001b) who also found that Openness was significantly, positively related to academic success. The

finding that Openness is positively related to academic performance may reflect that students who are more open and willing to learn new material and ideas tend to fare better in class than those who are more close-minded. In their 1996 work, De Raad and Schouwenburg stated that the components of Openness would appear to reflect “the ideal student” (p. 327) in that these students would be broadminded, analytical, and original. Based on the existing research, it is to be expected that Openness would be positively related to academic performance.

It was found in the present study that all four measures support a positive relationship between academic performance and the Big Five trait of Emotional Stability. The present study also supports Ridgell and Lounsbury’s (2004) finding that Emotional Stability was related to academic performance. The present results can be interpreted in terms of De Raad and Schouwenburg (1996) contention that those low on Emotional Stability are more anxious and therefore tend to focus on emotional state and self-talk, thus interfering with their ability to attend to academic tasks, which lowers performance. Another interesting proposition is that since Emotional Stability is a trait that has been found to be socially desirable to teachers and other authority figures (Funder & Colvin, 1991) and it has been observed that students with desirable qualities receive higher grades (Zahr, 1985), those who are emotionally stable may receive higher grades by simply possessing that quality.

The trait of Extraversion was, in the case of all four measures, significantly, negatively related to academic performance. That Extraversion was not significantly related to course grade in the present study, while in a previous study (De Raad &

Schouwenburg, 1996), it was related to a measure of cognitive ability, is the one difference between the present study and Lounsbury et al (2003). However, that Extraversion was negatively related to academic performance is consistent with a number of studies that show introverted students generally perform better on tests and in courses than extraverted students at the college level (Chamorro-Premuzic & Furnham, 2003; Furnham, Chamorro-Premuzic, & McDougall, 2003; Robyak & Downey, 1979). In their review of extraversion, arousal, and performance, Eysenck and Eysenck (1985), conclude that introverts perform better than extraverts on long, monotonous tasks, which may reflect the experience of term papers, class projects, and examinations in university-level courses. In addition, extraverts may be more readily distracted by increased opportunities for socialization and engagement in non-academic activities which are abundantly available in a university setting (e.g., Campbell & Hawley, 1982). The present findings regarding Extraversion were similar to those of Furnham, Chamorro-Premuzic, and McDougall (2003) who reported that Extraversion was negatively correlated with exam scores while Conscientiousness was positively related to exam scores. The finding that Extraversion is negatively correlated with academic performance contrasts with De Raad and Schouwenburg's results (1996). It may be that extraverted students perform more highly owing to a greater energy level combined with a positive attitude which should lead to a desire to learn and understand (De Raad & Schouwenburg 1996).

The present study found Agreeableness to be positively related to academic performance for three measures, the two general measures and the measure contextualized for academics. Agreeableness was negatively related to academic

performance in the work-related measure. In previous studies, academic performance has been found to be positively related to Agreeableness (Rothstein, Paunonen, Rush, & King, 1994). Both Agreeableness and Conscientiousness were found to be positively related to academic performance by Fritzche, McIntire, and Yost (2002). More agreeable students may find it easier to study cooperatively in addition to providing, and receiving, assistance from classmates. Their agreeableness may, in turn, earn them favor from their teachers in the form of more encouragement and personal attention, which may lead to a higher course grade. The negative relation between academic performance and Agreeableness in the work-related measure may be due to the frame-of-reference of the work related measure being so different from an academic frame-of-reference.

Generalized vs. Contextualized Measures

Previous studies, (e.g., Schmit et al, 1995) have shown that personality measures created with a frame-of-reference or those contextualized to a particular domain--in this case work and academics--predict academic performance better than generalized measures or measures that are contextualized to a different area of life. Schmit et al (1995) also determined that contextualized measures had greater reliability and validity due to an increase in honest and informed answers from the participants. Hunthausen et al. (2003) found significant correlations between three of the Big Five traits (Conscientiousness, Extraversion, and Openness) when a personality measure contextualized to the work place was used that were not present when a generalized personality measure was taken by the participants. In light of the previous research on generalized versus contextualized measures, the present study examined whether or not

the use of contextualized measures leads to a more significant relationship between personality and academic performance.

It was predicted in Hypothesis 1 that for the Big Five traits of Conscientiousness and Openness, the measure contextualized to academics, the TTC, would predict academic performance better than the generalized NEO-PIR and 16PF. In addition, it was predicted that the generalized measures would predict academic performance better than the work-related PSI. For the trait of Openness, I found that the measure contextualized to academics better predicted academic performance than the generalized measure, which in turn predicted better than the work-related measure, which supports Hypothesis 1. The present finding of Openness to be significantly, positively related to academic performance for three of the measures supports De Raad and Schouwenburg's (1996) view that the qualities found within the trait of Openness, being analytical, philosophical, contemplative, along with broadminded, characterize "the ideal student" (p. 327), thus leading to higher levels of academic performance. The present result also reinforces the idea that contextualized measures better predict within the frame-of-reference for which they have been designed. This was demonstrated when the academically contextualized measure best predicted academic success, though the only significant relationship in this regard was between Openness, and academic performance. Furthermore, the idea that a contextualized measure would predict less well outside of its frame-of-reference is also supported in that, for the trait of Openness, the work-related measure predicted academic performance at a lower level than either the academically contextualized or general measures.

Contrary to what was predicted in the first hypothesis, the NEO-PIR, a generalized measure, showed the strongest relationship between Conscientiousness and academic performance, followed by the measure contextualized to academics, then the work-related measure, and finally the second generalized measure, the 16PF which showed a negative relationship between Conscientiousness and academic performance. Given the highly positive relationships between Conscientiousness and academic performance found in the NEO-PIR, TTC, and PSI, it may be that Conscientiousness is a more enduring, context-independent trait that predicts success in academics as well as life in general and within the work place at similar levels of magnitude (De Neve & Cooper, 1998; Judge, Higgins, Thoresen, & Barrick, 1999).

The first research question dealt with generalized versus contextualized measures. I examined whether for the Big Five traits of Emotional Stability, Extraversion, and Agreeableness, the measure contextualized to academics, the TTC would predict academic performance better than the generalized NEO-PIR and 16PF. I also looked at whether the generalized measures better predict academic performance than the work-related PSI. Emotional Stability was best predicted by the work-related measure, followed by the generalized 16PF, then the TTC, an academically related measure, and the Neo-PIR, a second generalized measure. That the work-related measure showed the strongest relationship between Emotional Stability and academic performance may be attributed to the fact that some of the qualities of being highly emotionally stable such as, focusing not on self-talk and emotional state, but on tending to the task at hand, (De Raad & Schouwenburg, 1996) may improve performance in either an academic or work

setting. The qualities that make one successful in an academic setting may carry over and also lead to success in the work place. The findings for Emotional Stability do not necessarily support the use of contextualized measures, as in this case, Emotional Stability would have been predicted just as well by the generalized 16PF. The results of the present investigation undermine the proposition that contextualized measures perform less well outside of their frame-of-reference given that the only significant relationship between Emotional Stability and academic performance was for the PSI, a measure contextualized for the work place,

Extraversion, the lone Big Five measure negatively related to course grade, was best predicted by the TTC--the academic measure-- and a generalized NEO-PIR, followed closely by the second generalized measure and then the work-related inventory. The TTC's significantly negative relationship between Extraversion and academic performance could be explained by, and adds further to, research showing that extraverted students perform more poorly in a college academic setting than introverted students (Chamorro-Premuzic & Furnham, 2003; Furnham, Chamorro-Premuzic, & McDougall, 2003; Robyak & Downey, 1979). Based on the study by Furnham and Chamorro-Premuzic (2005), which found that Extraverted students performed best in courses that relied on oral presentations and class participation to determine final course grade, it would be no surprise that Extraverts did not fare well as the course in this study used standardized tests to determine the final grade. The relatively small difference between the best predictor--the TTC--and the worst predictor--the work-related PSI--calls into question the notion that if the tendency of a person is to overextend themselves in

social pursuits and extracurricular activities while in college, then that tendency may follow that person through life. As the Extravert leaves college and enters the work force, they may find themselves joining civic organizations, developing new hobbies, and becoming involved in a multitude of activities just as they did while in college. A person's continued overextension into social and extracurricular pursuits may possibly reduce the job performance of Extraverts as well.

For the trait of Agreeableness, it was found that the measure contextualized to academics better predicted academic performance than the generalized measures, which in turn predicted better than the measure that was work-related. The only significant relationship between Agreeableness and academic performance was for the TTC. The work-related PSI was the only measure showing a negative relationship between Agreeableness and academic performance. The difference between positive and negative relationships would reinforce the proposition that the use of measures designed with a specific frame-of-reference can make a significant difference in the results found (Hunthausen et al, 2003; Schmit, 1995). When applied to the present study, one would expect measures designed for an academic setting to predict better within that setting than a measure which was designed for another setting. It may be the case that students who are agreeable often fare better with their instructors due to their increased compliance with instructions than those who are not high on the trait of Agreeableness (Vermetten, Lodewijks, & Vermunt, 2001). In the workplace the opposite may be true as, one must, to some extent, take chances in order to succeed. It would be interesting to examine the effects on the relationship between Agreeableness and job performance in order to

ascertain whether or not it varies for jobs that involve following directions as opposed to jobs in which one is required to direct others.

The second and third hypotheses examined the amount of variance for Big Five and narrow traits that was accounted for by each type of measure: generalized, contextualized to academics, and work-related. It was predicted that, for both Big Five and narrow personality traits, the academically contextualized measure, the TTC, would add the largest amount of variance, followed by the generalized measures, the NEO-PIR and 16PF, and then the work-related PSI. While all four measures explained a significant amount of variance in predicting course grade, it was the generalized NEO-PIR that explained the most amount of variance for the Big Five traits. The academically contextualized TTC accounted for the second largest amount of variance. The third largest amount of variance was explained by the work-related PSI which was followed closely by the generalized 16PF. The amount of variance for Big Five traits did not prove the hypothesis to be true. One interesting question which could be addressed in future research is why a non-contextualized measure, like the general personality measure NEO-PIR, is a better predictor academic performance than a measure specifically adapted for use in an academic setting (Gatewood & Feild, 2001).

Once again all four measures accounted for a significant amount of the variance in academic performance for the narrow personality traits. The TTC, a measure contextualized to academics, accounted for the largest amount of variance in course grade for the narrow personality traits. The TTC was followed by the generalized NEO-PIR, the work-related PSI, and finally the 16PF, the second general measure of personality.

The TTC followed suit with the prediction that it would add the largest amount of variance. The NEO-PIR, a generalized measure, accounted for with the second largest amount of variance, also proving the prediction made in this study true. The 16PF, however, added the least amount of variance, even less than the work-related PSI. One possible explanation for the differences in the two generalized measures could be that the NEO-PIR (with a copyright of 1992) is a more modern measure of personality than the 16PF (copyright 1949), as is the PSI (copyright 2006).

Limitations

One limitation in this study was a lack of diversity in the sample, as the study was conducted in a single geographic area in the southern United States using college students who had been successful enough in their studies to be able to participate in a senior-level Psychology course. This leaves open the issue of whether the findings would be replicated to a more robust student sample, such as those who were participating in introductory or lower-level courses or taking classes in other areas of study. Other, more diverse regions of the country as well as international locations may potentially yield differing results. It would be interesting to replicate this study on a wider range of cultural diversity to see if these results are applicable to other cultural settings.

The second limitation of this study was the criterion. A deliberate feature of my research design, utilizing a single course grade as the criterion, leaves open the question of the generalizability of the present findings to the more global criterion of academic performance - grade point average (GPA). Because GPA represents an aggregated score across many courses, it contains unmeasured differences in grading tendencies between

professors. It would be interesting to see what validity estimates would be observed if grader difference effects could be minimized; for example, by converting all course grades to an equivalent metric such as z scores, although this method would not correct for professors giving all A's in a class, or by examining aggregated grades within majors, to control for inter-major differences in grades. The low variance in the criterion might be overcome using either of these approaches. Examining aggregated grades across multiple courses would presumably increase criterion variance and could lead to higher validities. (Nunnally & Bernstein, 1994). Validity estimates generated here are probably attenuated by relatively low criterion variance and may be under-estimates of the validities that could be observed using multiple courses.

Implications for Future Research

This study was limited in relation to its criterion, college course grade. Further investigation of the relationship between personality and academic performance could benefit from using other measures of academic performance such as cumulative GPA. In future studies it may be important to utilize a course with varying means of receiving a grade (i.e. two standardized tests, one oral presentation, and a class participation grade) as students with varied personality traits have been found to perform differently on these differing types of assessments (Furnham & Chamorro-Premuzic 2005). For example, in acting class where grading is based on acting might show stronger effects for Extraversion or courses with team projects may show stronger effects for Agreeableness. One might also look at college course grade from courses in areas of study besides Psychology in order to examine the relationships between personality and academic

performance in those academic arenas. It may be that the present results reflect attributes that enable Psychology students to perform well in a Psychology class and the observed relationships may not generalize to other majors in their area of study. In this light, another variation on the present study could have been to divide the participants between their declared majors to see if the present results were common to all majors taking a Psychology course or if they varied among those who were majoring in another discipline. In the future, it may be employ a longitudinal design and administer multiple personality instruments at various points through the participants' college career and even on into their work careers. Such a study may shed additional light onto the generalized versus contextualized measures debate as it may prove that different measures better predict performance at varying stages of life. Furthermore, a longitudinal aspect could be added if the present participants were followed through their college careers in order to use graduation rates and final college GPAs as additional measures of academic performance.

Further research on the Big Five trait of Extraversion would also be beneficial if it were to be added to the body of research. Adding to the research on Extraversion is a particular need as the current research is mixed as to whether Extraversion is positively or negatively related to academic performance. Researchers may want to focus on varying life stages, from elementary school to the levels of higher education and on into the work force as Extraversion and its relationship with performance has tended to develop and change as one ages.

Further study could help determine why the measures predicted as they did in the present study. Continued research using generalized and contextualized measures could shed light as to why certain types of measure predict better for certain traits. For the Big Five traits of Conscientiousness and Extraversion, the NEO-PIR predicted higher or at the same level, respectively, as the TTC. Also, for Conscientiousness, the 16PF, another generalized measure of personality, displayed a negative relationship between Conscientiousness and academic performance while the additional measures all found a positive relationship. In addition, the work-relevant PSI best predicted Emotional Stability. As these were the most dramatic differences in the study, further research may be warranted for these traits.

The present study was also limited demographically. Investigating the questions posed in this study using a more diverse sample would increase the external validity of the results. A wide-scale study with samples from several different geographic and cultural regions as well as from varying college grade levels and areas of study within the university setting would enhance the generalizability of results and the utility of the current research project. The addition of a group of minority students may also further add to the generalizability of the present results. Another study with participants pulled from the work force could add even more generalizability to the results of this study beyond the realm of academia.

Additionally, incorporating independent measures of academic performance would reinforce the study's validity. As the present study measures academic

performance, it would be helpful to have access to information such as the grades from multiple courses the official GPAs of the participants.

Further research using different narrow personality traits may also be useful in determining the predictive ability of both generalized and contextualized measures. The personality traits addressed within this study were examined independently, therefore future research may want to incorporate constructs previously validated against academic performance, such as Work Drive (Lounsbury et al., 2004) and Achievement Motivation (Atkinson & Feather, 1964) and examine how they affect the relationship between personality and academic performance. Other possible moderator variables could be explored in future research, such as marital status, holding a job, participating in a university sport. Age and gender are other variables with a possible effect on academic performance that were not examined within the present study. The question of whether there are different relationships between personality and academic performance for older students, even those returning to college after many years in the work force, could also be addressed in the future. There may also be a gender effect on the personality-academic performance relationship that could, and should, be examined.

Despite the above limitations, the present study clearly demonstrates the multiple indicants of a significant relationship between Big Five personality traits and academic performance. It also adds new and important information to the growing body of research on the relationship between personality and academic performance. Furthermore, previous research involving many participants has also supported the conclusions of this study, further emphasizing the utility of using both narrow and broad

personality traits to explain academic performance. The current study not only contributes to the pertinent body of literature, but may also encourage further research in this area. The present study supports the notion that personality can predict real-world outcomes as was demonstrated by the relationships between personality traits and academic performance.

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