Personality Assessment as an Indicator of Success Post High School

Angela Bermudez

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“Personality Assessment as an Indicator of Success Post High School”

Graduate Thesis/Project

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Of the School Psychology Program

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By

Angela Bermudez

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Approved: ____________________
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            ____________________
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Personality Assessment as an Indicator of Success Post High School

Angela J. Bermudez

Rochester Institute of Technology
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Abstract

According to a recent article published in the New York Times, although the United States is successful in enrolling students in colleges and universities, only half graduate with bachelor's degrees. Among wealthy countries, Italy is the only country with a larger dropout rate (Leonhardt, 2009). The results from the 16 Personality Factor Questionnaire (16 PF) previously given to undergraduate students from a technical institute in Western New York were analyzed to determine whether there were significant differences between students who were academically dismissed and then admitted into a college restoration program and students who were successfully passing. Perhaps by having the ability to identify students who may be at risk for academic dismissal from college, interventions could be put in place for these students before graduating high school to promote success in college. It was hypothesized that there would be significant differences in personality factors determined by the 16 PF questionnaire between the students in the college restoration program and the students in the control group.
Chapter 1
Introduction

Purpose of Study
According to a recent article published in the New York Times, although the United States is successful in enrolling students in colleges and universities, only about half graduate with bachelor’s degrees. Among wealthy countries, Italy is the only country with a larger dropout rate (Leonhardt, 2009). Why do so many students end up dropping out? Are many of them just not prepared well-enough for post-secondary education? The purpose of this study was to determine if there are differences in personality based on results from the 16 PF between those who fail out of college and those who do not. It was hypothesized that there would be significant differences in personality as determined by the 16 PF between the two groups of students. This study was aimed at using the results to improve high school transition planning into post-secondary education in an effort to increase college graduation rates.

Significance of Study
If significant differences in personality exist between those students who fail out of college and those who do not, the 16 PF could serve as a possible predictor of college success. It could be very beneficial to administer the 16 PF to students before they leave high school as part of the transition planning process to post-secondary education. This could mean faculty identifying students who may be at risk for failing out of college in the future. High School faculty might then be able to implement interventions prior to students graduating from High School to increase the likelihood that they will succeed in college.

Delimitations
The participants in this study were college aged undergraduate students. They were administered the 16 PF after already being enrolled in college. This is not to say that their personality would have changed from high school to college, but the results will not reflect personality prior to students entering college. In addition, this study looked at mean differences between each group on each of the primary and global factors of the 16 PF. This study did not look at whether having a certain personality causes college academic failure or success.

Definitions of Terms

The following terms and definitions are used throughout this study.

Measures of Normal Personality- Assessments geared at measuring normal-range of personality. For instance, what motivates people, how they interact with others, or factors that determine their behavior. Assessments of this kind do not measure psychopathology.

16 PF Questionnaire- a 185 questionnaire developed by Raymond Cattell aimed at measuring normal personality.

Global Factors of the 16 PF- Broad domains of personality based on the Big Five Factors of personality measured by the 16 PF.

School Faculty- Teachers, administrators, school psychologists, counselors, speech pathologists, and other related service professionals working directly with students in a school setting.

Transition Planning- A planning process geared at getting students ready for life post-high school. This is mandated by IDEIA 2007 for special education students and must begin when the student is 16 years of age.

Special Education- The educational program for students that provides extra support and is aimed at accommodating individual needs.
College Restoration Program- A program implemented at the Technical Institute where this study took place. The program took 170 students who had flunked out of the institute and aimed at reintegrating them back into college with the hopes that they would succeed the second time around with extra support.

Big Five Factors of Personality- Broad domains thought to make up personality. They include Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness (Noffle & Robins, 2007)

Post-secondary Education- Education following high school. This includes undergraduate education, graduate education, doctoral education, as well as vocational training.

IDEA 2004- Stands for Individuals with Disabilities Education Act. Was amended in 2007 and the name changed to Individuals with Disabilities Education Improvement Act, or IDEIA. This federal law was established to lay out various rights and accommodations that are required to be put in place for students with disabilities. IDEIA provides federal funding for schools who comply with the terms of the law.

Section 504- Part of the Rehabilitation Act of 1973 that mandates accommodations to be put in place in all public places for persons with disabilities.

Office of Disabilities- Office on all college campuses that aims at providing services and accommodations for students with disabilities, somewhat like special education in high school.
Transitions

Transitioning from high school is a critical time in the lives of young adults. This is the period in which they are leaving high school to either pursue a college education or to enter the workforce. Since the transitions are generally into vastly different environments, the steps involved in preparing young adults are crucial to their future success. This is especially true for individuals with learning disabilities. Those who are diagnosed and receive services in their high schools will not only need to adjust to their new environments, but may not receive the services they previously were getting to accommodate their disabilities. Under the law *Individuals with Disabilities Education Act 2004* (IDEA 2004), relatively recent modifications were made to aid students in transitioning to college (Madaus & Shaw, 2006). These recent modifications include transition planning, reevaluations, new criteria for diagnosing learning disabilities, and the summary of performance requirement (Madaus & Shaw, 2006). Transition planning must begin no later than when the student is 16 years of age.

Potential Problems

The 1997 version of IDEA stated that learning disabilities be diagnosed using the discrepancy model. Under this model, a learning disability could be determined if there was a large enough discrepancy between a student’s achievement and intellectual ability. In 2004, the US Department of Education proposed a research-based intervention alternative entitled Response to Intervention (RTI) (Madaus & Shaw, 2006). This method examines student ability and progress in learning measured by frequent local curriculum based assessments. Students not
making sufficient progress are provided with necessary instruction for a set period of time (Madaus & Shaw, 2006). One major reason RTI may be a beneficial method to incorporate in the schools is the fact that the model allows the ability to pick up emerging learning issues much earlier. This allows students to receive services earlier in their schooling, hopefully preventing them from becoming so far behind that catching up would be nearly impossible (Madaus & Shaw, 2006). However one problem relating to transitions is that some postsecondary institutions require standardized tests, and furthermore some require specific tests to be done prior to entering the institution. If a student was classified as Learning Disabled early on using the RTI model, he or she may not have the proper testing documentation and may need to obtain this documentation at his or her own expense (Madaus & Shaw, 2006). Since postsecondary institutions are covered under the regulations of Section 504 instead of IDEA (2004), they are not obligated to provide or pay for the cost of evaluations, meaning students would need to find an outside evaluator. This may not only place a financial burden on new students, but may also take additional time, causing them to potentially miss out on receiving services during the first semester of college. The first semester for any new student is a very critical time, which may have a large impact on his or her overall success at the college level (Madaus & Shaw, 2006).

In addition, IDEA (2004) does not require updated testing to be done prior to graduation whether the student is planning to attend a college or university or not. Instead the IDEA (2004) requires the stipulation of a Summary of Performance (SOP) (Madaus & Shaw, 2006). An SOP includes a summary of the student’s achievement and functional performance throughout their schooling as well as recommendations on how to help the student attain his or her postsecondary goals (Madaus & Shaw, 2006). The requirements differ depending on the state of residence, so there is some room for interpretation. Forms can be found on the internet including one
developed by the National Transition Assessment Summit. One interesting component is the optional section at the end where the student can give his or her perspective (Madaus & Shaw, 2006). The SOP should be completed over the course of a student's secondary education and then used in his or her transition portfolio. The SOP may be beneficial for students transitioning out of high school, however some postsecondary institutions require recent testing be done prior to receiving services. Since IDEA does not mandate testing be done at graduation, again students may need to invest in testing on their own, which may cause several issues (Madaus & Shaw, 2006).

Along with having the necessary testing completed when transitioning, having the necessary documentation may also pose as a problem. The National Joint Committee on Learning Disabilities discussed the issues of disconnect in documentation for students transitioning from high school to post-secondary education in a report issued in the fall of 2007. First, there is a lack of consistency in the documentation that is required in receiving special education services in both high school and post-secondary education. Second, there are differences in the laws that are aimed at students in high school and post-secondary educational programs with a learning disability. Lastly, high school and post-secondary education programs may differ quite drastically in their requirements and programs offered to students with disabilities (National Joint Committee on Learning Disabilities, 2007).

Considerations in Transition Planning

The Individuals with Disabilities Education Improvement Act of 2004 outlined several things to consider when assessing for what transition services may be needed (Sitlington &
Clark, 2007). The first is the interests of the student, for instance what the student enjoys doing in his or her spare time and what activities may be satisfying. In addition, what their preferences are and how involved their family will be in the choices they make. Cognitive Development and Academic Achievement Performance involves assessing how well students have performed academically over the course of their school career as well as how cognitively able they are. Adaptive Behavior is also assessed to determine how well the student can function in his or her daily lives pertaining to daily living skills like dressing, personal hygiene, basic food preparation, etc. Interpersonal Relationship Skills are analyzed during the assessment to determine how well the student can communicate and get along with others in their community. Another area that is assessed is the Emotional Development and Mental Health of the student to determine if he or she may require self-esteem building, therapy related to phobias, or help with various other mental health issues that may affect his or her postsecondary success.

Employability and vocational skills are also assessed to determine if the student has the necessary skills to attain and maintain a job. Finally, the last area that is assessed is Community Participation. This category includes how well the student can plan long and short-term goals, how well they can advocate for themselves, how well he or she can access community resources, and whether the student is independent in his or her mobility and living situations (Sitlington & Clark, 2007). These aforementioned areas are assessed by analyzing student background information, interviews, standardized tests, curriculum-based assessments, performance samples (i.e. individual writing samples, tests, projects, etc.), behavioral observations, and situational assessments (i.e. assessing how well students can handle situations in environments that are very similar to "adult living", such as work or school environments) (Sitlington & Clark, 2007).
Being sensitive to gender and cultural diversity is crucial when assessing the various transitions services described previously. As Sitlington and Clark (2007) pointed out, transition planning generally represents an assertive level of thinking associated with middle-class people. Not every student will have the same economic security or educational opportunities. In addition, different students may grow up in vastly different environments; some promoting education and future success, and others promoting daily survival. One study done by Trainor (2002) reported that there were vast differences in dropout rates among cultural groups. The study reported that in 1999 the dropout rate for Asians was 4.3%, for Whites 7.3%, for African-Americans, 12.6%; and for Hispanics, 28.6%. Trainor found during her study that various cultural values may differ from what is expected in school and during transition planning. It is crucial for faculty to be aware of these differences.

A study conducted by Hogansen, et al. (2008) found that males and females with disabilities differ in terms of what they hope to achieve in their adult lives. This study was done with participants from two large urban school districts in the western United States. Data was collected via surveys filled out by either the students or the parents. Both female students and parents of daughters felt that safety was a big concern when transitioning out of high school. This might have an impact on the activities that parents would allow their daughters to engage in as well as issues of transportation. Female students also seemed to be more concerned with finding adequate health insurance. This information might be helpful for faculty to know regarding what issues to bring up with parents during transition planning. Male students on the other hand reported feeling less support from their family members during the transition from high school (Hogansen, et al., 2008). So knowing this, faculty members involved in transition planning might want to encourage family members to take an active role in the process and show...
the student that they are there to support him or her. This is another important piece of information for educators to keep in mind when working with students during transitions.

**Parties Involved in Transition Planning**

Many stakeholders are involved in the transition assessment process. They include the student, the families, as well as school professionals (Sittington & Clark, 2007). Parents and families are encouraged to become involved in the process and advocate for their child’s needs and students are encouraged to provide their own perspectives on what works for them. Active involvement may help to promote and increase locus of control in students as well as increase the amount of satisfaction students and families experience from the entire transition process (Sittington & Clark, 2007). Who within the school system is involved is dependent on the district; however, there is a long list of possible participants including guidance counselors, school psychologists, school social workers, occupational therapists, speech-language pathologists, physical therapists, and several other possible professionals in addition to teachers. So depending on the local district’s protocol, a certain individual or individuals should be in charge of coordinating the transition assessments. These people should be aware of the ongoing process at all times (Sittington & Clark, 2007).

**Assessments**

As previously mentioned, various assessment methods are used during the transition process. These methods include a thorough analysis of background information, interviews,
standardized tests, curriculum-based assessment techniques, and situational assessment (Sitlington & Clark, 2007). Some of the background information that is analyzed includes observations of previous teachers, support staff, as well as any other staff, including mental health providers or vocational rehabilitation professionals who have worked with the student over the years. In addition, past Individualized Education Plans should be studied, as well as any formal or informal assessments that have been conducted. This information should be included in the student’s cumulative file, but unfortunately sometimes this is not the case. This information needs to be gathered from multiple sources (Sitlington & Clark, 2007). It is important to not only analyze past data, but it is also vital to have current observation information as well as self-reports from the student.

Interviews also have the potential to provide pertinent information for the transition process. The best sources are generally people who have witnessed the student functioning in the real world such as teachers, family members, friends, counselors, former employers, as well as the student. Interviews can also help to uncover a student’s long-term goals for the future. In addition, interviews can help clarify or validate any of the information determined in any one of the other assessment methods (Sitlington & Clark, 2007). Person-centered planning, a form of life planning with persons with disabilities, is not viewed by everyone as an assessment process, but is often incorporated in the transition process as it closely relates to interviews. Students should be aware of their strengths and interests. This process enables the student to incorporate his or her interests into the transition process (Sitlington & Clark, 2007).

Standardized and other informal types of tests may seem like they do not apply to the transition process, but in fact there are many tests designed especially for the transition process. These include academic achievement tests, vocational interest, functional living skills, self-
concept, and learning styles (Sitlington & Clark, 2007). Many times these assessment instruments are used as a starting point and may lead to ideas of other assessment activities that may be helpful for the individual (Sitlington & Clark, 2007).

Curriculum-based assessment techniques are simply assessments based on material covered in the curriculum. These assessment measures can be developed by teachers or other faculty (Sitlington & Clark, 2007). One specific type of curriculum-based assessment is criterion referenced testing, which compares a student’s current performance to a pre-established level of performance as opposed to being compared with a set of norms. Domain-referenced testing is another type of curriculum-based assessment, which allows assessment of a student’s performance on a sample of items to be generalized to that area of content being measured. Curriculum-based measurement, is another assessment technique for the areas of reading, written expression, spelling, and math, which involves assessing graphic data based on student performance on various samples of work collected every week or so. Lastly, portfolio assessment can be used. This is another form of curriculum-based assessment, which is mainly used in the areas of fine arts, career and technical education programs and can be made up of vocational interest inventories, essays written by the student, and samples of projects done for class (Sitlington & Clark, 2007).

Situational Assessment is the observation of behaviors that are in environments that are similar to those in the adult world. This form of assessment can provide valid and reliable data given that behaviors are systematically recorded. The data can be used to collect the student’s interests, abilities, and social and interpersonal skills, as well as accommodations that may be necessary for the student (Sitlington & Clark, 2007).
Career assessments can also be used in conjunction with these other types of assessments for students in transition. Career assessments include measures of career interests as well as measures of normal personality. Personality assessment such as Cattell’s 16 PF (Conn & Rieke 1994) has been previously speculated to actually have the ability to predict achievement, but it is not generally a mandated part of transition planning. Being able to predict post high school achievement would be very beneficial during transition planning. By identifying those who may struggle in post-secondary educational settings, interventions could be designed in advance and put in place to prevent students from underachieving.

**Personality Assessment as a way of Predicting Achievement**

An early study by Holland (1960) found that Factor G of the 16 PF, which back in 1960 was a measure of persistence, was correlated with achievement in conjunction with the National Merit Student Survey and the Vocational Preference Inventory. In this study, freshman college grades or honor point ratio (similar to a grade point average) were used as measures of scholastic achievement. Although Factor G is no longer a measure of persistence, the 16 PF still aims to measure similar personality factors that are thought to correlate with academic achievement.

The 16 PF can also be used in predicting individuals who will make valuable employees. Barrick and Mount (1991) conducted a meta-analysis on personality and job performance. Their analysis focused on the Big Five personality traits and several different occupations including police, managers, salespeople, professionals, and skilled workers. They found through their meta-analysis that personality was predictive of job performance in several of the various jobs included (Cattell & Schuerger 2003). Around the same time several other meta-analyses were...
conducted and found a relationship between personality and job performance (Hough, Eaton, Dunnette, Kamp, & Mccloy 1990; Salgado, 1997; Tett, Jackson, & Rothstein, 1991). The basic conclusions from all three studies indicate that personality is a useful predictor of job performance. Being that personality is useful in predicting job performance, it may suggest that it would also be useful in predicting academic achievement post high school.

One recent study by Noftle and Robins (2007) focused on the Big Five Personality Traits as predictors of achievement. In this study, achievement was measured using SAT math and verbal scores as well as grade point averages of high school and college students. The Big Five Personality Traits include Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness (Noftle & Robins, 2007). Four samples were gathered and data was collected from each of the four samples. Three groups totaling 11,392 undergraduate students were gathered from the psychology department at the University of California, Davis, and 475 participants were gathered from the University of California at Berkeley. In sample 1, the 44 item Big Five Inventory (John & Srivastava, 1999) was used to measure personality traits. In sample 2, the 60 item NEO-Five Factor Inventory (Costa & McCrae, 1992) was used. In sample 3, the 208 item HEXACO-Personality Inventory (Lee & Ashton, 2004, 2006), and in sample 4, the Conscientiousness and Openness to Experience scales of the NEO-Personality Inventory (96 items: Costa & McCrae, 1992) was used. In all of the samples, the participants reported their own SAT scores as well as their own high school and college grade point averages. In sample 2, the SAT scores and college GPA’s were also reported by the university, which correlated highly (r = .92) with self-reports. The results of this study found that Openness was consistently related to higher SAT verbal scores, as predicted by Noftle and Robins (2007). The most consistent finding regarding grade point average was that Conscientiousness was positively correlated with
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both high school and college grade point averages. Openness was also found to be significantly related to college grade point average, but not high school. In addition, the study found a slight negative correlation between Extraversion and college GPA and a slight positive correlation between Agreeableness and high school GPA; however, these findings were not consistent among all four samples (Noftle & Robin). Three HEXACO Conscientiousness facets were significantly correlated with college GPA including diligence, prudence, and perfectionism. Additionally, three NEO-PI-R facets were significantly correlated with college GPA including Achievement striving, Competence, and Self-discipline. Noftle and Robin (2007) also looked at the effects of two possible mediating variables, academic effort, which was hypothesized to be correlated with Conscientiousness because of having perceived academic ability, and Openness is associated with SAT verbal scores because it is associated with perceived verbal intelligence. It was determined from the results that Conscientiousness was significantly correlated with Academic effort. Perceived academic ability was significantly correlated with both Conscientiousness and college GPA. Perceived verbal intelligence was significantly associated with both Openness and SAT verbal scores (Noftle & Robin, 2007). Overall Noftle and Robin (2007) believe personality factors to be established predictors of academic achievement, and thus personality assessment would be an important component of Transition Planning in high school.

Similar results were found by Busato, Prins, Elshout, and Hamaker (1999). Their study looked at intellectual ability, learning style, personality, and achievement motivation and how they are related to academic achievement in higher education. The results indicated that there is a positive correlation with intellectual ability and achievement motivation, and academic achievement. Conscientiousness was the only Big Five Personality Factor that was significantly related to academic achievement, and the only factor to be significantly related to specific academic achievement in higher education.
related to achievement. Extroversion was only negatively associated with academic achievement in one part of the study (Busato, Prins, Elshout, & Hamaker in 1999).

Chamorro-Premuzic and Furnham (2008) completed a study examining the predictive ability of personality, learning approaches, and intelligence relating to academic achievement. Again personality was assessed with the Big Five Personality Traits and quantified using the NEO-Personality Inventory. The results indicated strong positive correlations with Conscientiousness and Openness with academic performance, which was operationalized using second year exam scores. Mediating variables were also assessed in this study. Results found that those who scored higher on Conscientiousness actually had lower fluid reasoning intelligence scores suggesting lower fluid reasoning intelligence led to higher Conscientiousness, which in turn led to higher academic performance. Additionally, Chamorro-Premuzic and Furnham (2008) found that Openness was found to mediate between the variables of intelligence and academic performance, which suggested to the authors that those with higher Intelligence Quotients only do better academically because they are more open to new changes and experiences (Chamorro-Premuzic & Furnham, 2008).

Another study by Conard (2005) looked at behavior and personality and their ability to predict the academic achievement of 300 undergraduate students in the authors' various general psychology classes. In this study, academic ability was controlled for and determined by SAT scores. Personality was again measured using the Big Five Personality Traits and quantified using the NEO- Five Factor Inventory. Course performance was operationalized using the percentage of points the participants earned. College grade point average and SAT scores were self-reported and behavior was assessed by documenting class attendance/reasons for absences. Conard (2005) found that Conscientiousness was significantly related to GPA, course
performance, and attendance. Therefore, Conscientiousness is a strong predictor of academic achievement that manifests itself in other components such as class attendance. In addition, Conard claimed that identifying those who score low on measures of Conscientiousness are students who may not end up high achievers post high school, so these individuals may be good candidates for various interventions aimed at student success. If there are differences in personality between achievers and non-achievers, school faculty could use that information and identify those students with disabilities transitioning to post-secondary education and predict those who may be at risk for academic failure based on their personality.

Another study done by Farsides, and Woodfield (2001) once again looked at the roles of the Big Five Personality factors, as well as intelligence and application in predicting undergraduate academic success. Farsides and Woodfield used the NEO-Five Factor Inventory (NEO-FFI: Costa & McCrae, 1989) to assess the Big Five Personality Factors on 432 University of Sussex students. The results from this study indicated that Openness to experience is positively correlated with academic success, meaning the more open to new experiences the student is, the more likely they are to achieve higher success in school. Agreeableness also was found to be positively correlated with academic success. Farsides and Woodfield (2001) found that after analysis, Agreeableness aided application in school in the form of class attendance, which in turn led to higher final grades. This study also suggested that knowing a student’s personality could aid in helping to tailor classes and activities to the individual’s needs. Although this would be a lot of work and time consuming for teachers, it could potentially help with student success (Farsides & Woodfield, 2001).
Underachievers are students who display a severe discrepancy between cognitive ability (scores on intelligence measures) and academic achievements (school GPA). In other words, these students have the ability to do well in school, but for whatever reason do not. One qualitative study done by Balduf (2009) aimed to determine what factors students attribute their underachievement to, and what types of interventions they felt would have been beneficial in remediating their failure. The participants in this study were freshman college students at Queen Mary College who were on academic probation after their first semester (received less than a 2.0 GPA). The average high school GPA of this freshman class was a 4.0 and combined SAT scores of ranging from 1240 to 1440. Balduf stated that essentially these students went directly from earning A's to earning D's and F's. Balduf (2009) found three major themes after analyzing the results. The first theme was that high school did not prepare students for the demands of Queen Mary College. They reported essentially not really having to work very hard to achieve good grades in high school. The second was lack of time management skills and with that, lack of study skills. Some of the students claimed that when they got to college, they really did not know how to study and would wait until the night before to begin to study for tests. Others said that they did not know how to pace their studies. The third and final theme Balduf found was a lack of internal motivation. Since these students did not have to work very hard to achieve their grades in high school, they did not associate the grades with something they needed to work for.

The participants in this study determined that interventions addressing their attitudes and behaviors would have been helpful in remediating or preventing their failure. Overall, these students were not prepared to succeed when they began college. If the faculty at their high
schools could have predicted they would underachieve in college, then perhaps some of these skills could have been taught prior to their graduation to prevent these student failures.

**Aims of Study**

The purpose of this study was to determine if there is a personality profile that can predict if a student is going to underachieve once they enroll at a post-secondary institution. Specifically, are there personality differences that can be measured using personality assessments that can differentiate those who achieve success in college and those who fail? There is already evidence in the literature suggesting that this may be possible. If personality can predict underachievement, it may be beneficial to include measures of normal personality in transition planning. That way, transition planning teams can be aware of potential students who may struggle to achieve in college and then put in place interventions before they even graduate from high school. This could potentially strengthen the effectiveness of transition planning and ultimately benefit students.

It was hypothesized that there are personality differences between students who are successful in college and university, and those students who “fail out” that can be measured by personality assessments. Additionally, these personality differences were hypothesized to effect the way in which students will deal with the various difficult challenges post-secondary education places on them.
Archival data was used in this study. Data was gathered on undergraduate students from a technical institute in western New York. A sample of 170 students ($n=170$) who had been academically dismissed from the institute participated in a college restoration program were used in this study. The institute had invited these students to enroll in the program to attempt helping them succeed in college the second time around with extra support. An additional sample of 70 students ($n=70$) who had volunteered to participate in the study was used as a control group. Overall, out of the 240 participants, 98% of them were Caucasian and 2% identified with a minority culture, further 68% of the participants were male and 32% were female. Confidentiality was maintained by assigning each participant a number. A coding sheet associating the names with the numbers of the individuals has since been destroyed, maintaining the anonymity of the participants. Institutional Review Board (IRB) approval was obtained prior to collecting the data, and additional approval was sought for the purposes of this study in analyzing the data.

**Instruments**

The 16 PF is a questionnaire used to assess measures of normal personality in persons 16 years of age and older. Raymond B. Cattell, the author of the 16 PF based the assessment on the broad domains of personality known as the Big Five Factors of personality. First published in 1949, and revised several times, the fifth edition of the 16 PF, published in 1993, is the most recent version available. This edition was restandardized in 2001 on a stratified random sample
consisting of more than 10,000 people, reflecting the 2000 US census regarding race, sex, and age.

The factors included on the fifth edition of the 16 PF include Factor A (warmth), Factor B (reasoning), Factor C (emotional stability), Factor E (dominance), Factor F (liveliness), Factor G (rule-consciousness), Factor H (social boldness), Factor I (sensitivity), Factor L (vigilance), Factor M (abstractness), Factor N (privateness), Factor O (apprehension), Factor Q1 (openness to change), Factor Q2 (self-reliance), Factor Q3 (perfectionism), and Factor Q4 (tension) (Cattell, Schuerger, 2003). These primary factors contribute to five global factors. These global factors relate to the Big Five Factors of personality (Cattell & Schuerger, 2003). They are Extraversion, Anxiety, Tough-mindedness, Independence, and Self-Control. Each of these broad domains of personality are made up of a variety of the 16 primary factors assess using the questionnaire.

The first global factor, Extraversion refers to how comfortable and/or enjoyable socializing is to an individual. This global factor is made up of five primary scales assessed by the questions of the 16 PF. These primary scales include Factor A, Warmth which is a measure of how attentive to others an individual is, Factor F, Liveliness, a measure of how enthusiastic about various things an individual is, as well as Factor H, Social Boldness, a measure of how socially adventurous an individual might be. Also contributing to Extraversion, Factor N, Privateness, a measure of how private or discrete an individual is, and finally Factor Q2, Self-reliance, which is a measure of how group oriented versus self-reliant an individual is.

Anxiety refers to how anxious or perdurable an individual is. This broad domain is made up of Factor C, Emotional Stability, a measure of how emotionally stable or mature a person is, Factor L, Vigilance, a measure of how trusting versus how suspicious an individual is regarding
others, Factor O, Apprehension, a measure how self-assured a person is, and finally Factor Q4, Tension, which is a measure of how relaxed an individual is.

Tough-mindedness refers to how open-minded and intuitive a person is. This global factor of the 16 PF is made up of Factor A, Warmth which was previously mentioned, Factor I, Sensitivity, a measure of how sensitive or unsentimental a person is, Factor M, Abstractedness, a measure of how imaginative an individual is, and finally Factor Q1, Openness to Change, a measure of how traditional versus how open to new ideas a person is.

The global factor Independence measures how agreeable or how independent one is. This broad domain is contributed by Factor E, Dominance, a measure of how assertive one is, Factor H, Social Boldness, previously mentioned, Factor L, Vigilance, previously mentioned, and Factor Q1, Openness to change, also previously mentioned.

The fifth and final global factor measured by the 16 PF is Self-Control. This broad domain is a measure of how inhibited an individual is. Self-Control is made up of Factor F, Liveliness, previously described, Factor G, Rule-Consciousness, a measure of how conforming one is, Factor M, Abstractedness, previously mentioned, and Factor Q3, Perfectionism, which is a measure of how self-disciplined and orderly a person is.

The 16PF is made up of 185 multiple choice questions, and it has been translated into 35 different languages. The questions are written at a fifth grade reading level. The average internal consistency reliabilities for the primary scales are .76 in the normative sample. Test-retest reliabilities were also calculated for the primary scales. After two weeks, the interval ranged from .69 to .87 with a median of .80. After two months the interval of the primary scales ranged from .56 to .79 with a median of .69. The reliability of the global factors are even higher. After two weeks, the interval for the global factors ranged from .84 to .91, with a mean of .87,
and after two months the interval ranged from .70 to .82, with a median of .80. The results of the 16 PF are expressed in standard-ten scores, also known as sten scores. Sten scores are expressed on a standard scale of 10 with a mean of 5.5 and a standard deviation of 2. These are based on the most recent normative sample (Cattell & Schuerger, 2003) Scores ranging from 1-3 are considered low, 4-7 are considered average, and scores ranging from 8-10 are considered high.

Since Cattell developed the factors of the 16 PF through factor analysis, construct validity has been confirmed in numerous research studies over the years. It was ranked among the highest regarding the amount of research based on it back in the 1980’s and has been used in profiles and prediction equations for things such as occupation performance and coping patterns. For many years the 16 PF has been regarded as a prominent instrument in practice by professionals. A recent study done by Goldberg (in press) as cited in Cattel & Schuerger (2003) found that the 16 PF had the highest predictive validity when compared to other popular measures of normal personality.

Procedures

To determine whether there are differences in personality determined by the 16 PF between those who were academically dismissed from college and those who were academically successful, archival data was used and analyzed. The students enrolled in the restoration program (academic underachievers) completed the 16 PF questionnaire in group format as part of a program requirement during the 2007-2008 school year. The students in the control group (academic achievers) volunteered to take the 16 PF in one of their introductory psychology classes over the 2008 summer quarter and also were administered it in group format. The volunteers were offered an incentive of extra credit points in their general psychology class as
well as a gift certificate to Ben and Jerry's. The questionnaires were then scored by a school psychology faculty member and his research assistants who were school psychology students trained in using the 16 PF.

Data Collection and Analysis

Archival data was entered into SPSS to be analyzed. Descriptive statistics including mean and standard deviation are reported for both the group of students in the college restoration program as well as the control group. Mean differences were used on the 16 PF primary factors and global factors to compare the two groups. Data was then analyzed by conducting a MANOVA to determine any significant differences overall between any of the primary or global factors. Because a significant difference was determined by the overall MANOVA, subsequent univariate testing was done to determine which of the factors were significantly different between the two groups.
A one-way MANOVA was performed which resulted in a significant difference among the primary factors on the 16PF-5 ($\lambda=.791$, $F(16, 198) = 3.26$, $p=.000$).

Shown in Table 1 are the mean, and standard deviations for both the academic achievers and the academic underachievers on each of the primary factors of the 16 PF-5. Subsequent univariate analysis revealed mean differences between the groups for 6 of the primary factors: Factor B ($F(1, 214) = 7.57, p=.006$); Factor C ($F(1, 214) = 7.66, p=.006$); Factor G ($F(1, 214) = 9.22, p=.003$); Factor M ($F(1, 214) = 17.92, p=.000$); Factor O ($F(1, 214), p=.036$); Factor Q3 ($F(1, 214) = 16.33, p=.000$).

Effect sizes were calculated for the 6 primary factors that were found to have significant mean differences between groups and are shown in Table 2. Effect sizes ranged from $d=.32$ (Factor O) to $d=1.02$ (Factor Q3). The most notable effect sizes were found for both Factor M and Factor Q3. Factor M indicated a moderate effect size ($d=.63$), and Factor Q3 indicated a large effect size ($d=1.02$). According to Cohen’s $d$, an effect size of $.20$ indicates a small effect, $.50$ indicates a moderate effect, and $1.0$ indicates a large effect.

A second MANOVA was performed which resulted in a significant difference between the Global Factors of the 16 PF ($\lambda=.903$, $F(5, 210) = 4.50$, $p=.001$).

Shown in Table 3 are the descriptive statistics for both the academic achievers and the academic underachievers on the 16 PF Global Factors. Subsequent univariate analyses revealed significant mean differences between the groups for 2 of the 5 global factors: Tough-Mindedness, $F(1, 214) = 4.18, p=.042$; Self-Control, $F(1, 214) = 19.46, p=.000$. 


Effect sizes were calculated for the 2 global factors that were found to have significant mean differences between groups and are shown in Table 4. Effect sizes ranged from $d=.31$ (Tough-Mindedness) to $d=.64$ (Self-Control).
The present findings reinforce as well as add to current research on the relationship between personality and post-high school success. Data indicates significant differences between a sample of students who underachieved academically and a sample of students who achieved academically on several factors on the 16 PF-5.

**Reasoning (Factor B) and Achievement**

The group of academic underachievers scored significantly higher on Reasoning (Factor B) than the control group. Reasoning (Factor B) indicates one’s ability to perform higher complex thinking. A small effect size was calculated for Factor B ($d=0.38$). Although it would make sense that this would lead to academic achievement, the results indicate that Reasoning may actually relate to underachievement in some way. The inference that can be derived from these findings is that adequate reasoning ability may not be enough for students to achieve academically in college. Other factors may play a more significant role.

The fact that even cognitively able students may be at risk of underachieving in college relates to a study conducted by Balduf (2009), which gathered qualitative information from 7 (4 females, 3 males) first year college students who graduated from high school with a 4.0 GPA and a high SAT score. These students who had nearly perfect SAT scores were put on academic probation after their first semester in college. So although they proved to be cognitively able, other factors were inferred to inhibit their level of success. The same inference may be applied to the present study. The students here also proved to be cognitively able, scoring high SAT scores upon entering their first year of college, but like the students in Balduf’s (2009) study, did not achieve academically.

**Emotional Stability (Factor C) and Achievement**
Running Head: PERSONALITY AS INDICATOR OF SUCCESS

The academic achievers scored significantly higher in relation to Emotional Stability (Factor C) than the underachievers. Emotional Stability indicates one's ability to regulate emotions regardless of the severity of life stressors. A small effect size was calculated for Factor C ($d = .41$). This indicates that not being able to control and regulate one's emotions may somewhat relate to underachievement. It may be inferred from the results that one's ability to handle emotionally challenging situations may play a role in the ability to achieve academically. The group who were not successful in college scored lower indicating that they may have more difficulty regulating and controlling their emotions in stressful situations. Although, no previous research was found regarding the relationship with Emotional Stability on the 16 PF and academic achievement, there is research regarding emotional disturbance and academic underachievement. A review done by Rutter (1974) concluded that although it cannot be said definitively that emotional difficulties leads to underachievement, there is likely a relationship. Rutter (1974) stated that not being able to control anxiety levels as well as other intense emotions is likely impairing to the learning process.

Rule Consciousness (Factor G) and Achievement

The academic achievers scored significantly higher in relation to Rule Consciousness (Factor G) than the underachievers. Rule Consciousness refers to one's willingness to follow societal rules and social norms. A small effect size was calculated for Factor G ($d = .43$). This indicates that not having the urge to follow societal rules may somewhat relate to underachievement. It may be inferred from the results that those who are more apt to follow rules and norms may also be more apt to succeed academically. Those who are not as rule conscious may be more apt to struggle academically. In this context, rules and norms might include things like attending class, being on time, paying attention to the professor, completing
assignments, etc. Rule Consciousness is somewhat related to the Big Five Factor of Conscientiousness since both involve self-discipline. Aspects of Rule Consciousness are included under this Big Five Factor of personality. Conscientiousness was found to be predictive of achievement in almost all of the studies included in the literature review.

Abstractness (Factor M) and Achievement

The academic underachievers scored significantly higher regarding Abstractness (Factor M) than the academic achievers. Abstractness refers to one's ability to think abstractly. A moderate effect size was calculated for Factor M ($d=0.63$). Since the academic underachievers scored higher, it may be inferred that they may have an easier time thinking abstractly than the academic achievers. Research was found regarding the Big Five Factor Openness, which relates somewhat to the 16 PF factor Abstractness since similar characteristics are included in this factor of personality. Previous studies found that scoring high regarding Openness was actually indicative of higher academic performance. In addition to being able to think more abstractly, Openness includes being open to new experiences. It makes sense theoretically for people who are more open to the new experience of college living to do better academically. However simply having the ability to think abstractly may not constitute having the skills necessary to be successful.

In addition, the academic achievers scored significantly higher than the academic underachievers regarding Tough-Mindedness. Tough-Mindedness includes the primary scales of Warmth (A-), Sensitivity (I-), Abstractness (M-), and Openness to Change (Q1-) and refers to having little interest in people or social situations, an unsentimental approach to life, practical and concrete in thinking, and being stubborn and set in his or her ways. A small effect size was calculated for Tough-Mindedness ($d=0.31$). This implies that those who are at risk to
underachieve academically in college tend to be more social, sentimental about life, less practical, and less stubborn than those who are academically successful. These results are consistent with other studies as previously stated.

**Apprehension (Factor O)**

Regarding Apprehension (Factor O), the results determined that the academic achievers scored significantly lower than the academic underachievers. Apprehension refers to one’s feelings of cautiousness when approaching tasks or situations. A small effect size was calculated for Factor O \((d = 0.32)\). This indicates that Apprehension somewhat relates to college achievement. It may be inferred from these results that the academic underachievers may be a bit more hesitant when approaching various tasks or situations than the academic achievers due to their personality. They may be more apprehensive and therefore not as confident and aggressive when faced with challenges.

**Perfectionism (Factor Q3)**

The academic achievers scored significantly higher than the academic underachievers regarding Perfection (Factor Q3). Perfectionism refers to being very self-disciplined, thorough, and goal-oriented. A large effect size was calculated for Factor Q3 \((d = 1.02)\). This indicates that Perfection strongly relates to academic achievement. It may be inferred from the results that the academic achievers may be more concerned with completing school work more thoroughly and may be more self-disciplined when it comes to studying for tests as well as completing assignments for school. Perfectionism relates somewhat to the Big Five Factor Conscientiousness, since aspects of perfectionism are included under this factor. As stated previously, Conscientiousness was found to be a consistent predictor of academic achievement, so the current results of this study were consistent.
Self-control

The academic achievers scored significantly higher than the academic underachievers regarding Self-Control. This global factor includes the primary scales of Rule-Consciousness (G+), Perfectionism (Q3), Liveliness (F-), and Abstractness (M-) and refers to the ability to control impulses in order to follow the rules of society as well as to accomplish various activities in the best way possible. A moderate effect size was calculated for Self-Control (d=.64). This implies that 16 PF Global factor Self-Control relates to academic achievement. It may be inferred that the academic achievers are better able to control their impulses and delay gratification to achieve bigger long term goals, which may relate to their academic success.

Implications

Based on this study, it might be beneficial for high school transition planning teams to have their students complete the 16 PF questionnaire in order to try to identify whether students may be at risk for underachieving academically in college. This would allow for more preventative measures to be taken. For instance, individualized interventions could be developed and implemented prior to high school graduation in an effort to get students prepared for the demands of college academics. Skills like time-management, study skills, organization, and planning may be possible things that students may need to be taught prior to beginning college and the earlier these deficits are identified, the better. Being preventative may allow for not only an increased chance of future academic success, but also a possible increase in college graduation rates.

Limitations

One limitation of this study was that the sample of students was selected based on convenience. Whenever a convenience sample is used, it is less likely that the sample will be
accurately representative of the population. The sample that was used primarily consisted of male participants, with the majority of them being Caucasian. Results may not generalize to all college students. Another major limitation was that the control group was substantially smaller than the experimental group. It could be possible that the overall results of the data from control group might have looked differently had more people been included in the sample.

Furthermore, the way the participants answered the questions may have been different given the circumstances of each group. Each group may have answered the questions more or less honestly based on their circumstances for participating in the study. For example, those who opted to take the questionnaire may have been genuinely interested in discovering their personality profile, and thus may have answered the questions more honestly. On the other hand, those who were in the college restoration program and required to take the questionnaire may have answered more honestly because they were genuinely interested in determining their personality profile to try to gain an understanding of what factors may hinder their ability to be successful. Additionally, the assessment was given while the students were attending college, so the results may not be indicative of how they would have responded in high school.

Future Research

For future studies, it is recommended that a more comprehensive sample be attained if possible, as this was one of the greater limitations of the current study. In addition, it may be beneficial to have a greater control sample in order to have a more accurate representation of the population. In order to determine how the results from the 16 PF are indicative of college academic performance, it might be interesting to assess the students while they are still in high school, then again when they are in college and compare the results with their first semester Grade Point Averages.
References


<table>
<thead>
<tr>
<th>16 PF Primary Factors</th>
<th>Academic Underachiever</th>
<th>Academic Achievers</th>
<th>Mean Differences</th>
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<tr>
<td>Warmth: A</td>
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<td>4.83 1.61</td>
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<td>5.79 2.00</td>
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<td>Emotional Stability: C</td>
<td>4.08 1.84</td>
<td>4.79 1.59</td>
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<td>Dominance: E</td>
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<td>Self-Reliance: Q2</td>
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<td>Tension: Q4</td>
<td>5.50 1.35</td>
<td>5.56 1.26</td>
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*p<.05, **p<.01, ***p<.001
Table 2

<table>
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<tr>
<th>16 PF Primary Factors</th>
<th>Academic Underachievers</th>
<th>Academic Achievers</th>
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<td>6.47 1.54</td>
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<td>5.01 1.60</td>
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*small effect size, **moderate effect size, ***large effect size
### Table 3

*Descriptive Statistics of the Groups on the 16 PF Global Factors*

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<tr>
<th>16 PF Global Factors</th>
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<th>SD</th>
<th>M</th>
<th>SD</th>
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*p<.05, **p<.01, ***p<.001
Table 4

Effect Sizes for the 16 PF Global Factors with Significant Mean Differences

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<th>16 PF Global Factors</th>
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*small effect size, **moderate effect size