ABSTRACT

Title of Dissertation: COGNITIVE AND NONCOGNITIVE PREDICTORS OF ACADEMIC PERFORMANCE FOR COLLEGE STUDENTS WITH LEARNING DISABILITIES

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The purpose of this study was to investigate if there are differences in how cognitive and noncognitive variables predict academic performance for college students with learning disabilities. In particular, this study examined the extent to which the cognitive variables of high school grade point average and SAT (combined verbal and math) or ACT score as well as noncognitive variables, contribute to cumulative college grade point average at the end of students' freshman, sophomore, and junior years of college. Participants were 88 college students with learning disabilities at a large, public university and a private, mid-sized, university located in the mid-Atlantic area of the United States. Using Sedlacek's (2004) Noncognitive Assessment method as a conceptual framework for this study, participants completed the Noncognitive Questionnaire (NCQ), an instrument that was developed to assess eight noncognitive variables.

Hierarchic multiple regression analyses were performed on the data in order to determine the variables that best predict the academic performance of college students with learning disabilities. The findings of this study could not be used make a determination as to whether or not the noncognitive variables of the NCQ predict college performance alone or add to the prediction of college performance beyond the HSGPA, beyond the SAT, and beyond both HSGPA and SAT due to the poor internal consistency that was found for the eight NCQ subscales. At the same time, support was found that while HSGPA is a good predictor of academic performance for this population of students, not standardized test scores were not.

COGNITIVE AND NONCOGNITIVE PREDICTORS OF ACADEMIC PERFORMANCE FOR COLLEGE STUDENTS WITH LEARNING DISABILITIES

By

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Dissertation submitted to the Faculty of the Graduate School of the
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Dedication

This dissertation is dedicated to the memory and life of my father, Lorenzo (Larry) Scarfone, who taught me to never be afraid to reach beyond my hopes in order to achieve what I thought I could not accomplish. It is the persistence, strength and tenacity I learned from him that carried me through to the completion of this doctoral journey. Without his influence in my life, this dissertation would not have come into existence.

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Chapter One: Introduction

There has been an increase in the number of students with disabilities on college campuses (Heiman & Precel, 2003; Henderson, 2001; Newman, Wagner, Cameto, & Knokey, 2009). Of those with disabilities, 61.3 percent (or 226,600) of students enrolled in a postsecondary educational setting reported they had a disability during the 2007-2008 academic year (National Center for Education Statistics, 2009). Although this population of students is growing on college campuses, they are not graduating at the same rate as their nondisabled peers. Indeed, Murray, Goldstein, Nourse, and Edgar (2000) reported that 80 percent of the students with a learning disability had not graduated from college compared to 56 percent of those without learning disabilities who had. For students with disabilities, completing college is the best approach to obtaining a meaningful career (Madaus & Shaw, 2006; Wehman, 2001). This is particularly critical since individuals with disabilities, but without a postsecondary degree, are more likely to be unemployed than those without disabilities (Fuller & Wehman, 2003; Wehman, 2001). Since the number of students with learning disabilities attending college is increasing but their graduation rate is not comparable to students without learning disabilities, identifying variables that lead to the successful academic performance of this historically underserved population is crucial. Thus, the purpose of this study was to investigate if there were differences between cognitive and noncognitive variables in predicting the academic performance of college students with learning disabilities.

Definition of Learning Disability

It is important to define what a learning disability is for the purposes of this study. At the same time, this is not a straightforward task as various definitions of learning

disability exist, these different definitions can apply to different age groups of those with learning disabilities, and there is a discontinuity in agreement of appropriate disability documentation between the secondary and postsecondary settings (Brinkerhoff, McGuire, & Shaw, 2002; Denhart, 2008; Gregg, 2007; Hamblet, 2009; Katsiyannis, Zhang, Landmark, & Reber, 2009; Kavale, 2002; Madaus & Shaw, (2006); NJCLD, 2007; Shaw, Keenan, Madaus, & Banerjee, 2010; Siegel, 2003; Sparks & Lovett, 2009). In general, the term learning disability is often used as an all-encompassing phrase that involves a disruption in general information processing and learning processes within an individual (Corley & Taymans, 2002). However, college students with learning disabilities are a heterogeneous population with academic strengths and weaknesses that widely vary depending on the type and severity of the disability (Lerner, 2000; Sparks & Lovett, 2009).

Individuals with Disabilities Education Act (IDEA 2004). Learning disability definitions have been influenced by several legislative acts (Cawthorn & Cole, 2010; Katsiyannis et al, 2009; Madaus & Shaw, 2006; Rothstein, 2002; Shaw et al., 2010). One of the most common definitions has been posited by the reauthorization of the Individuals with Disabilities Education Act (2004). The Individuals with Disabilities Education Act was signed into law in 1990. Prior to this time, it had been called the Education of All Handicapped Children Act of 1975 (Rothstein, 2002). In 1997 and 2004, it was amended and reauthorized. It is currently known as the Individuals with Disabilities Education Act (2004) or IDEA 2004. IDEA 2004 is federal legislation, which establishes specific minimal standards and procedural safeguards for educating children with disabilities with the legal and financial burden falling on the school system. IDEA 2004 covers education

only through secondary school and the services and support received through this statute do not follow them into college or employment. IDEA 2004 is can be likened to affirmative action legislation in that it guarantees special programming and services to children with disabilities from birth to age 21 (Rosenfeld, 2003). The goal is to boost positive educational outcomes for students, and it requires that special education services ensure a meaningful benefit for students from education (Janiga & Costenblader, 2002; Simon, 2001). IDEA 2004 fines a learning disability as:

> The term "specific learning disability" means those children who have a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in imperfect ability to listen, think, speak, read, write, spell or to do mathematic calculations. The term includes such conditions as perceptual handicap, brain injury, minimal brain dysfunction, dyslexia and developmental dysphasia. The term does not include a learning problem which is primarily a result of visual, hearing, or motor handicap, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage (p. 13).

This definition, however, only covers children in the elementary, middle and secondary school setting. Under this law, students with disabilities must be identified by school districts in order that they are provided with a free and appropriate education, with related services at no charge to the parents and their educational placement must be designed to meet their unique needs (Rothstein, 2002). This is closely connected to another important feature, that of Least Restrictive Environment (LRE). This concept suggests

that children with disabilities should, to the extent appropriate, be instructed with students without disabilities. The goal of this is to promote normalization and inclusive experiences in general society for those with disabilities (Lerner, 2000). Another important tenet is the "zero-reject" principle. This refers to the notion that no child is too disabled to learn and to be provided with educational services. Therefore, school districts are required to have the proper procedures to guarantee that all children with disabilities are identified and assessed so they may receive the benefit of full educational opportunity regardless of the level of their disability or their current placement setting (e.g., juvenile detention facilities, hospitals, etc.) (Jacob, Decker, & Hartshorne, 2010; Simon, 2001). These three principles are fundamental concepts to the legislation.

IDEA 2004 is prescriptive in terms of the roles of the educational staff involved, scope of provision of services, and the strict time lines educators must follow in the development of each students' Individual Education Plan (IEP) (Stodden, Jones & Chang, 2002). The IEP is a legal document that guides the delivery of education to the child as well as any related services the child might receive (Jacob, et al., 2010). It is the school district's responsibility to identify and assess children with disabilities, to provide an academic evaluation without charge using appropriate and technically sound instruments, have an interdisciplinary team at the child's school determine students' eligibility for special education services and to then create and annually review the child's IEP (Rothstein, 2002).

Related services are an integral part of the provision of special education. If a child needs supplementary supportive services to benefit from special education, then these services must be provided. Such services include transportation, speech and language

therapy, physical and occupational therapy, psychological and counseling services, and parent counseling (Jacob, et al., 2010). These services are provided at no cost to parents and can be above and beyond what students without disabilities receive (Simon, 2001). However, IDEA 2004 covers education only through secondary school and the services and support received through this statute do not follow them into college or employment.

Section 504 of the Rehabilitation Act of 1973: In the post-secondary setting, the scenario is quite different. There are different laws that guide the way services are provided to college students with disabilities, which include those students with learning disabilities (Cawthorn & Cole, 2010; Newman, 2005; Katsiyannis et al., 2009; Rothstein, 2002; Shaw et al., 2010). Section 504 of the Rehabilitation Act of 1973 states:

> No otherwise qualified individual with a disability in the United States, as defined in section 7(20), shall, solely or by reason of her or his disability, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance . . . (Rehabilitation Act of 1973, § 504, 29 U.S.C. 794).

This law holds that an individual must be able to meet the essential eligibility requirements of a program with or without reasonable accommodations, regardless of the disability (Thomas, 2000). This is referred to as being "otherwise qualified." Additionally, the otherwise qualified individual must have physical or mental impairment which causes "substantial limitation" in one or more major life activities which include walking, seeing, speaking, breathing, learning and working. Although this law does not mention the term "specific learning disability," for students with learning disabilities, the

mental impairment clause applies to them. Mental impairment relates to a mental or psychological disorder that can include mental retardation, mental illness, and specific learning disabilities (Jacob, Decker, & Hartshorne, 2010). This is quite the opposite of the zero-reject principle of IDEA 2004 which holds that a student with any level of disability be provided an education; he or she does not have to be "otherwise qualified.)

American Disabilities Act of 1990 (ADA). Another law that covers postsecondary students with learning disabilities is the American Disabilities Act of 1990 (ADA) and the Americans with Disabilities Act Amendments Act (ADAA) of 2008 (Cawthorn & Cole, 2010; Katsiyannis et al., 2009; Rothstein, 2002; Shaw et al., 2010; Zirkel, 2009). It is federal legislation geared toward protecting the rights of individuals with disabilities. The portion of this law that applies to this population of students is Title III, Public Accommodations, which holds that "reasonable" auxiliary aids and services must be provided to those with disabilities but without placing "undue burden" on the institution. Such services can include interpreters, readers, listening devices or large print materials. This law supplements Section 504 as it further defines that students with disabilities who are otherwise qualified are eligible for reasonable accommodations. Reasonable accommodations are adaptations to the learning environment that are designed to allow academic material to be accessible to students with a disability and to reduce the effect of the disability (Norton, 1997). Reasonable accommodations can include extended time on tests, note takers for classes, use of a tape recorder to record class lectures, and audio books (Hamblet, 2009; Heyward, 1993; Stodden, et al., 2002).

Although Section 504 and the ADA do apply to all individuals with disabilities including those in elementary, middle, and secondary school, IDEA 2004 more

specifically covers these students; however, IDEA does not affect the postsecondary setting in any way. As outlined earlier, while IDEA 2004 prescribes the details of a child's educational programming and mandates services that are more extensive and driven by the school system, Section 504 and the ADA's regulations are not as detailed so specific procedures regarding students' academic programming under this law are not stipulated for the institution. This is due to the fact that Section 504 and the ADA are actually civil rights statutes whereas IDEA is an education statute (Vickers, 2010). Once students enter college, they now must take on the onus of responsibility in determining their educational plan and accessing the resources they need at the postsecondary level and this difference often results in a major disconnect in services for postsecondary students (Gregg, 2007; Kirst, 2004; NCLJ, 2007; Ness, 1989; Rothstein, 2002). Instead of students being identified in elementary, middle, and high school in order to receive special programming, if necessary, and be provided additional services other than those children without disabilities would receive that that children be, Section 504 and the ADA does not require that postsecondary students be identified by the institution. Instead, otherwise qualified students with a disability must self-identify to the appropriate office on campus, which typically is the Disability Support Services (DSS) office (Stodden et al., 2002). Likewise, postsecondary institutions are not required to provide additional services (above and beyond those that students without disabilities receive) to assist students with their coursework. In fact, an institution does not have to provide a specific accommodation if it may cause an undue hardship on the university or fundamentally alters an academic program ((Rehabilitation Act of 1973, § 504, 29 U.S.C. 794). Furthermore, postsecondary students no longer have an educational plan, are not

monitored for academic progress, and needed accommodations are no longer coordinated for them. Students are responsible for accomplishing these tasks independently (Gregg, 2007; Kirst, 2004). What Section 504 and the ADA do mandate is that all qualified college students with documented disabilities who self-identify and provide the appropriate documentation to substantiate their disability become eligible to obtain any reasonable accommodations they might need to ensure that they receive an equal opportunity to participate in courses and activities (Scott, 1991; Simon, 2001). Details of how this occurs will be addressed in the next section. Due to the stipulations of Section 504 and the ADA, these laws are actually more like anti-discrimination laws that level the playing field for students with disabilities (Hamblet, 2009; Rosenfeld, 2003).

National Joint Committee on Learning Disability (NJCLD, 1998). The definition of learning disability that is most commonly used at the postsecondary level comes from the National Joint Committee on Learning Disability (NJCLD, 1998):

> Learning disabilities is a general term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical skills. These disorders are intrinsic to the individual, presumed to be due to central nervous system dysfunction, and may occur across the life span. Problems in self-regulatory behaviors, social perception, and social interaction may exist with learning disabilities but do not, by themselves, constitute a learning disability. Although learning disabilities may occur concomitantly with other disabilities (e.g., sensory impairment, mental retardation, serious emotional disturbance), or with extrinsic influences

> (such as cultural differences, insufficient or inappropriate instruction), they are not the result of those conditions or influences. (NJCLD, 1998, p. 1)

Typically, the learning profile of these students shows a major discrepancy between what they are *capable* of achieving and what they *actually* achieve. This discrepancy would be the result of a deficit in one of the "basic psychological processes" that has interfered with the acquisition of this knowledge. Examples of basic psychological processes include memory, auditory perception, visual perception, or oral language. Most colleges and universities require evidence that a student has a learning disability in the form of a psychoeducational or neuropsychological evaluation based on guidelines developed by the Association for Higher Education and Disability (AHEAD) and which reflects the abovementioned discrepancy (AHEAD, 2007; Denhart, 2008; NJCLD, 2007; Ofiesh & McAfee). This documentation has usually included current results (within three years of attendance to the college) of the following: a comprehensive cognitive/information processing and academic achievement assessment, a diagnostic interview, a diagnosis, a description of functional limitations, as described by the NJCLD, and suggestions for accommodations. However, in April of 2012, AHEAD created an updated conceptual framework for guiding documentation practices for students with disabilities at the postsecondary level as a result of 2008 amendments and updates to Titles II and III of the ADA. These amendments considerably reduced the threshold to receive reasonable accommodation (Vickers, 2010). In particular, a student's self-report, observation by higher education professionals or external documentation may be enough to support an accommodation request (AHEAD, 2012). Regardless, it is the responsibility of the

student to present an acceptable source of documentation to the appropriate office on campus in order to receive any accommodations they may need (Hamblet; 2009; Janiga & Costenbader, 2002; Stodden et al, 2002).

Obstacles Facing College Students with Learning Disabilities

Over the past few decades, it has been acknowledged that the difficulties that students with learning disabilities face do not disappear when they become adults (Brinckerhoff, 1994; Polloway, Schewel, & Patton, 1992; Price, 2002; Skinner & Lindstrom, 2003; Turkington & Harris, 2006; Vogel, 1986). Although they may have gained study strategies to assist themselves in their academic activities, this group of students continues to show academic deficits in areas such as spelling, written language reading, and quantitative processing (Sattler, 2002). At the same time, it is important to understand that students with learning disabilities are typically bright, capable, hard-working students with cognitive processing issues that cause them to take in and comprehend information in a different way than those without learning disabilities. In fact, in one study Hall, Spruill, and Webster (2002) found that students with learning disabilities had a higher level of personal initiative, goal-directedness, and a higher need to achieve regarding academics than those without learning disabilities. This suggests that while academics do not come easily to them, they can be academically successful in college.

If students with learning disabilities have a higher level of personal initiative, goal-directedness, and a higher need for academic achievement than those without learning disabilities, why is the retention rate for students with learning disabilities so much lower than that for students without learning disabilities? There are two issues that may

contribute to this predicament. First, students with learning disabilities experience difficulty with the transition from high school to college since the nature of support changes so drastically (Brinckerhoff, 1994, 1996; Dalke & Schmitt, 1987; Hadley, 2006; Hamblet, 2009; Izzo & Lamb, 2002; Scott, 1991). The second issue may be related to the traditional credentials that have historically been used to evaluate students' potential college performance. These two notions, transition difficulties and traditional admissions credentials, are further explored in the next two sections.

Transition Issues for All Students. The transition to college is difficult for any student (Brinckerhoff, 1994; 1996; Gregg, 2007; Gross, 2002; Ness, 1989). There are a variety of issues that college freshmen encounter that on their new campus environment.

Academic Challenges. All incoming freshmen must adjust to changes in academics upon entering college. First, the amount of class time decreases once students reach college. Instead of being in class 25 to 30 hours a week, students are typically in class 12 hours a week. Second, learning becomes more individually focused instead of teacher focused and students are expected to spend much more time studying outside of the classroom than they did in high school. Third, there is a reduction in the number of course assignments. As a result, more weight is put on fewer assignments and students may not receive feedback on their work until well into the semester. Furthermore, the decrease in class time also leads to a decrease in direct instructor contact, especially since in many instances the number of students in a class may be ten times larger than what students experienced in high school. Finally, the instructional approach of faculty can be quite different between high school and college. In high school, students were often expected to memorize information and then restate this information on tests. In college,

professors often expect students to possess higher-level thinking skills in order to analyze and synthesize information. These skills include making inferences, analyzing conflicting explanations, and solving complex problems. Many students have not yet fully developed these abstract thinking abilities (Brinckerhoff, 1996; Conley, 2010; Dalke & Schmitt, 1987; Gregg, 2007; Hadley, 2006; Janiga & Costenbader, 2002).

Personal Challenges. Additionally, there are differences between high school and college that relate to students' social sphere. Students often experience homesickness and miss the familiarity of their prior circle of friends; they must create a new personal support network and, they experience a loss of the protective environment they once had (Shepler & Woosley, 2012). They often experience feelings of seclusion and insecurity. Also, students may experience a lack of control over their new environment given that they have lost the previous roles they have played and the reality they once knew. This can result in disorientation and emotional distress (Risquez, Moore, & Morley, 2007). And while students may have positive anticipation and excitement about their new college environment, quite often fear or anxiety are associated with it. These are typical experiences for entering freshmen, with and without learning disabilities (Risquez, et al., 2012).

Transition Issues for Students with Learning Disabilities. Students with learning disabilities not only contend with the above-mentioned issues, but face additional challenges related to their disability.

Legal Differences. As a result of the different laws that cover students once they leave the K-12 school system, the nature of the services and the process for receiving them changes dramatically as they no longer receive the extensive amount of assistance

they once did (Hadley, 2006; Hamblet, 2009; Scott, 1991; Vickers, 2010). Although colleges and universities do not have the stringent requirements to provide the same level as academic support as does the K-12 system, they are required to provide meaningful access to qualified students who have a documented disability so the student receives an equal opportunity to take part in courses and activities. For this to happen, however, students must reveal their disability to the designated office on campus that serves students with disabilities, as colleges and universities are not responsible for identifying students with a disability attending their institutions. This can be a daunting task in itself as students can have concerns about how they are viewed since disability has commonly been viewed as deviant from the dominant culture (Szymanski & Trueba, 1999).

The primary support that students with learning disabilities receive are course accommodations that are designed for their specific learning needs and which can include extended time on tests, note takers for class lectures, approval to record class lectures, tests in alternative formats (oral administration, use of a computer, use of scribes), an alternative location for tests, and audio books (Heyward, 1993; Vickers, 2010). However, students do not receive these accommodations automatically; typically, after they identify themselves to the appropriate office on campus, they must provide the required documentation. Typically students then meet with an individual from the disabilities office and appropriate accommodations are determined. Students receive approval for accommodations in the form of a letter that they need to provide to each of their professors; their professors are not provided a copy from the disabilities office. The letter does not indicate what the students' disability is, only the approved

accommodations. This means that they have to meet with each their professors to discuss their implementation (Vickers, 2010).

Ability to Understand and Articulate One's Disability. To obtain the supports one needs to be academically successful at the postsecondary level requires that students have specific skills which include the ability to describe their learning disability and how it affects their learning, to navigate the system, to assess their own academic needs, take initiative regarding their academic needs, and effectively implement the accommodations to which they are entitled (Brinkerhoff, 1994; Stodden, Jones, & Chang, 2002). Unfortunately, it is often the case that college students with disabilities have never had to discuss their disability before, much less describe what assistance they might require to be academically successful (Marshak, Van Wieren, Ferrell, Swiss, & Dugan, 2010). This is due to the fact that often, in the past, parents and teachers tended to take the lead when it came to a student's educational planning; students with learning disabilities may not have been involved in this process (Brinckerhoff, 1994; Cawthorn & Cole, 2010). This, in turn, may have inadvertently created a learned helplessness type of situation and dependency on others for these students in getting their academic needs met (Durlak & Rose, 1994). Further, failed attempts to make changes in one's learning environment can result in negative self-attributions (Powers, 1990). The more students have had the opportunities to make decisions, affect successful outcomes, and become self-aware of their learning styles, the easier the college transition process will be.

Disclosure of Disability Status. At the same time, students with learning disabilities, even if they understand and can articulate their academic needs, may choose not to in order to avoid disapproval, stigmatization, or negative reactions from other

students, staff and faculty (Hibbs & Pothier, 2006; Katsiyannis et al., 2009; Marshak, et al., 2010; Troiano, 2003). This is often the case for students with "hidden "disabilities who often feel pressure to explain or justify their disability. They are also at risk of facing doubt or suspicion about their disability and are fearful of appearing to be cheating or trying to avoid work (Adams & Proctor, 2010; Denhart, 2008; Lock & Layton, 2001). Indeed, Troiano (2003) found that self-identifying was a critical issue for the students in his study due to the fact that most students with learning disabilities do not look like they have a disability. By choosing not to self-identify, they could veil the fact that they had a disability. At the same time, by not self-identifying, they did not have access to the accommodations they needed. This is a balance each student faces in terms of self-disclosing. However, overall college adjustment for students with learning disabilities increases with self-disclosing or perceived visibility of their learning disability (Adams & Proctor, 2010). So, students' changing role from the secondary to the postsecondary environment as well as the struggle as to whether to disclose disability status can be potential obstacles to their receiving the resources they need to do well in college (Denhart, 2008; Scott, 1991; Simon, 2001).

Academic challenges for college students with LD. Students with learning disabilities may experience academic challenges in college above and beyond those that are experienced by students without learning disabilities. While they typically have average to an above average intelligence level, by virtue of their disability they may still have deficits in writing, reading and math. This can result in slow reading speed, problems comprehending textbooks at the college level, difficulties with grammar, punctuation and spelling, and performing basic math computations or solving math word

problems (Dalke, 1999). They may also experience limitations in strategic knowledge such as study skill habits; time management skills; preparing for exams; and the organization of multiple assignments (Borkowski, 1992; Hadley, 2006; Lock & Layton, 2001; Skinner & Lindstrom, 2003).

Because a learning disability can affect one or more areas of learning, students may show what can be considered "splintered skills." This refers to the fact that they may excel in certain areas but perform below what they would be expected to achieve in one or more other areas. As a result, the learning profile of every student with a learning disability is unique; so, the academic challenge each student faces is also unique to him or her. This is why it is critical college students with learning disabilities be able to articulate specifically how their learning disabilities impact their academics and seek the assistance they need. Without this support, they may be at risk of not being able to academically integrate into their new environment (Troiano, 2003).

Personal challenges for college students with LD. While academic integration is a predictor of college persistence for college students with learning disabilities, social integration may be even more influential (DaDeppo, 2009). Unfortunately, college students with learning disabilities have reported dissatisfaction with social adjustment on campus (Ryan, 1994). Furthermore, they often have a poor self-concept, often due to years of struggling with their schoolwork, as well as dealing with the stigma of having the learning disability label (Adams & Proctor, 2010; Aune & Friehe, 1996; Brinckerhoff, 1996; Denhart, 2008; Gerber, Reiff, & Ginsberg, 1996; Troiano, 2003). To be sure, Hoy, et al., (1997) found that college students with learning disabilities exhibit more anxiety-related symptoms than students without learning disabilities. Furthermore,

these anxiety-related symptoms can be exacerbated once students arrive on campus. Troiano (2003) found that all the participants in his study had experienced some form of stigmatization, which sometimes even began in childhood which later affected their self-confidence in their studies. Such difficulties can make the transition process for students with learning disabilities particularly problematic and create additional barriers to academic success.

In sum, college students with learning disabilities experience additional challenges above and beyond those that students without learning disabilities face. Their new legal status puts them in a position they have never encountered (Scott, 1991). Students with learning disabilities must learn to navigate an unfamiliar system of disability support on the campus to which they have arrived. They also must identify themselves as having a disability so they can receive the academic support they need. This creates a dilemma for these students as they may want the academic support but may be fearful of the consequences of revealing their disability. Furthermore, concerns of how their learning disability impacts their academic performance and feelings of self-doubt or low self-concept related to academics are further transition hurdles. Indeed, college student with learning disabilities face challenges during the college transition above and beyond those without learning disabilities (Brinckerhoff, 1994; 1996; Dalke and Schmitt, 1987; DuChossois & Michaels, 1994; Hadley, 2006).

College Selection Process. As mentioned earlier, another issue that may be related to the low retention rate for college students with learning disabilities are the traditional credentials used to evaluate students' potential academic performance and, in turn, college admittance. Although the practices of college admissions offices can greatly

vary depending on the types of institutions and mission statements, they tend to share the desire to choose students who are most likely to be successful on their college campuses (Bollinger, 2005; Soares, 2012; Willingham, 1990). Indeed, there is stiff competition between institutions to be seen as the best according to national and regional rankings such as in *U. S. News & World Report*. Furthermore, with stakeholders such as parents, legislators, and students demanding accountability by postsecondary institutions in the way college admissions decisions are made, college admission is becoming more selective (American College Personnel Association & National Association of Student Personnel Administrators; 2004; Camara & Kimmel, 2005; Laird, 2005; Woodard, Love, & Komives, 2000).

Components of the College Application. There are many prospective student characteristics that are taken into consideration by admissions officers when making college admissions decisions, and they can be divided into two different groups: cognitive and noncognitive predictors. Cognitive predictors are defined as predictors that objectively measure academic capability, include a numerical score, and are traditionally used to assess potential academic performance for incoming freshmen (Breland, Maxey, Gernand, Cumming, & Trapani, 2002; Linn, 1993; Reason, 2003; Reason, 2009; Rothstein, 2004). The typical college admissions application includes the following cognitive items: high school grades and rank, semester and cumulative grade point averages (GPA), indication of Advanced Placement (AP), International Baccalaureate (IB) credits, or honors credits and standardized test scores.

Noncognitive predictors relate to the, “adjustment, motivation, and perceptions, rather than the traditional verbal and quantitative (often called cognitive) areas typically

measured by standardized tests" (Sedlacek, 2004, p. 36). The noncognitive items that have traditionally been included in the college admissions application include the university application itself, an essay and/or a personal statement, letters of recommendation from counselors and teachers, statement regarding community service, and other descriptions of activities (Laird, 2005; Schmitt, et al., 2009; Stemler, 2012; Tam & Sukhatme, 2004).

Admissions officers must review student application materials that contain all of the above listed components and make fair and reasonable admissions decisions that produce a strong freshman class that boosts the universities' rankings (Camara & Kimmel, 2005; Stern & Briggs, 2001). Although no one aspect of the college admission application can summarize all characteristics about a student, the emphasis has been on the cognitive materials in the application (Schmitt, 2012; Noble & Camara, 2003). The 2005 National Association for College Admission Counseling survey found that the primary components in college admissions applications that are used in making admissions decisions are cognitive predictors: grades in college preparatory courses, scores from standardized tests, and overall high school grade point average (Hawkins & Clinedinst, 2006). The survey also shows the percent of institutions that assign "considerable importance" to cognitive materials in students' college applications: college preparatory course grades, 74 percent; standardized test scores, 59 percent; and overall grade-point average, 54 percent (Hawkins & Clinedinst, 2006). Indeed, the most persuasive pieces of the application package historically have been the high school grade point average and standardized test scores, often before other parts of the admissions application have even been considered (Soares, 2007).

Discontent with the College Selection Process. In the past, the cognitive components of prospective students' application materials have been seen to be fair and accurate tools for use in predicting academic performance for the incoming freshmen class. Soares (2012) called this the "old regime" of evaluating admissions application, which he described as, " … the 20th-century formula in the United States of using high school records and one of two standardized tests, either the SAT or the ACT, to predict grades in the 1st year of college (p. 66)." Indeed, the emphasis of traditional cognitive predictors in the college admissions review process has begun to be questioned (Atkinson, 2001; Burdman, 2001; Chait, 2007; Crouse, 1985; Crouse & Trusheim, 1988; Gose, Selengo, & Brownstein, 2001; Schmitt, 2012; Sedlacek, 2003; Stemler, 2012; Kyllonen, 2012; Soares, 2012; Stern & Briggs, 2001; Tam & Sukhatme, 2004).

Chimes (2003) argued that the college application process, in general, has the potential to be an unfair one. It benefits those who have had private tutors for the SAT or essays, privileged schools/backgrounds and an "insider's knowledge" of how to navigate the admissions process. Camara and Kimmel (2005) pointed out that some groups of students may receive extra assistance on essays they write and their recommendations may be written by teachers and counselors who do not know the students well.

Grade inflation. Regarding high school grade point averages, grade inflation has been recognized as a problem. Grade inflation is a noted increase in high school grades over time that is not related to the academic performance of students (Kuhn, et al., 2011). Woodruff and Ziomek (2004) compared high school grade point average data with ACT scores and found that between 1991 and 2003, students' scores in math and English significantly increased when compared to their corresponding ACT scores. Whether this

occurs as a result of teachers including effort and behavior in the grading process or to prevent a large amount of students from failing, it is detrimental on many fronts. Grade inflation occurs differentially across subjects, disciplines, and schools and tends to defeat the purpose of grading (Kuhn et al., 2011). Although grade inflation can contribute too many problems, during the college admissions process, it prevents exceptional students from standing out, penalizes students from schools that have strict grading policies, and makes it impossible to compare students based on grades.

Standardized entrance exams scores. Concerns about standardized tests, such as the SAT and ACT, are also at the heart of the growing interest in moving away from the focus cognitive variables as predictors of college academic performance. The ACT and SAT are timed, multiple choice, college entrance exams that measure verbal and mathematical ability and involve a substantial amount of reading. These tests are taken under prescribed conditions and are administered and scored by the companies that own them (Noble, Camara, & Fremer, 2002; Rothstein, 2004).

Soars (2012) particularly takes umbrage with the focus on standardized test scores in that he posited that it decreases the racial and socioeconomic diversity in the pool of prospective applicants. Indeed, standardized tests often present a challenging hurdle for underrepresented students including those with learning disabilities (Fuller & Wehman, 2003; Wehman, 2001). Although the SAT and ACT do predict first-year performance for White upper-middle class and upper middle class males, these tests are not as reliable when predicting college GPA and retention for nontraditional students such as African Americans, student athletes, Asian Americans, Hispanic students, females and first-generation students (Ancis & Sedlacek, 1997; Fleming, 2002; Fuertes & Sedlacek, 1995;

Hoffman & Lowitzki, 2005; Kirby et al., 2007; Lawlor, et al., 1997; Nasim, et al., 2005, Steele, 1997; Powell & Steelman, 1996; Sedlacek & Adams-Gaston, 1992; Steele, 1997; Steele & Aronson, 1995; Ting, 2003; Zwick & Sklar, 2005).

Social inequality. Another reason that has been posited in the literature to explain why standardized tests are not as good a good measure of true academic ability for under-represented groups of students is that of stereotype threat (Steele, 1997). Stereotype threat affects individuals of marginalized groups to which negative stereotypes have been attached. When put in situations where these students may perform in a way that strengthens a negative stereotype, they will under-perform due to concerns of proving the stereotype. This occurs because it is a distraction and usurps mental resources needed for the task at hand (Walton & Spencer, 2009). So, when students of color or other marginalized groups take the SAT or ACT, stereotype threat may occur resulting in the final results of these standardized tests not being true predictors of academic performance. This corresponds with the findings of Heiman and Precel (2003), who found that college students with learning disabilities experienced more stress, nervousness and helpless during tests than students without learning disabilities.

Indeed, the social inequalities that negatively affect marginalized groups and nontraditional learners are more prevalent in the campus population when colleges and universities rely on cognitive predictors of college performance (Soares, 2012). Sedlacek (2004) elucidated upon the nontraditional learner:

> The implication of the term nontraditional is that we need to think of the cultural context and experiences of some people differently from those of the group in power if we wish to be fair to them. Nontraditional people

> have some experiences that are not typical of those in traditional power groups. Those nontraditional experiences should be considered in evaluating the potential of people who have had them (p. 5).

College students with learning disabilities are a group of nontraditional students. As they have had experiences that are not typical of those of the dominant group such as discriminatory attitudes and behaviors as well as institutional and legal constraints (Denhart, 2008; Scotch & Schriner, 1997). For example, this population of students has been a historically underrepresented group in four-year colleges and universities (Gregg, 2007). As such, they also often experience prejudice when entering the college setting. McQuilkin, Freitag, and Harris (1990) found that faculty and student attitudes as well as the classroom climate can be unwelcoming for students with learning disabilities. Beilke and Yssel (1998) found that students with learning disabilities often encountered professors who were skeptical and minimally amenable to allowing students their accommodations. Furthermore, even if faculty members have positive attitudes about students with learning disabilities, they often did not understand the laws around disability nor what their responsibilities are in allowing accommodations to students (Murray, Flannery, & Wren, 2008; Scott & Gregg, 2000, Vasek, 2005). Additional difficulties can stem from faculty members who do not believe that a student who looks physically normal can have a disability or believe that accommodations for students with learning disabilities create an unfair situation for nondisabled students (Kravets, 1997; Vickers, 2010). These variables support that college students with learning disabilities can be seen as a “nontraditional” group, or a historically underrepresented population,

which then calls into question the use of standardized test scores as a valid means of predicting the academic performance of these students.

It should be noted that while although these students are being called a nontraditional group of students, it is not to be confused with individuals with learning disabilities being seen as a cultural group. A cultural group refers to a group of individuals that share values, beliefs, language, rituals and behaviors. Often these components are generationally passed on and provide a set of values to the group to which they identify with (Helms & Cook, 1999). Students with learning disabilities do not share a common set of values, beliefs and language based around their learning disabilities and they certainly do not intentionally pass on these traits from generation to generation. Conversely, many individuals in this group do not want to publicly share their disability status in order to avoid its stigma (Denhart, 2008; Troiano, 2003).

Problem Statement

This leads us back to the discussion as to why the retention rate for students with learning disabilities tends to be poorer than students without learning disabilities. Often it is the cognitive items of the admissions package on which admission decisions are made, sometimes even before other characteristics are evaluated (Soares, 2012). So in the situation where those students with LD manage to be admitted to college, their application may reflect that they possess the needed cognitive credentials to be admitted to college; at the same time, this does not mean that they possess the adaptive, noncognitive skills, such as effective study skills, self-monitoring skills, or a positive self-concept, needed to be successful at the postsecondary level (Ashton-Coombs, 1993).

Without these skills, all students are at risk for failure, regardless of the cognitive credentials they possess as they enter college.

The converse side to this is that, students with learning disabilities who do not meet the cognitive criteria according to their standardized test scores that may under predict their college performance, yet possess the ability to be successful in college based on the adaptive academic and noncognitive skills they have cultivated to compensate for their learning disabilities, will be overlooked in the admissions process (Wilczenski & Gillespie-Silver, 1992). This begs the question of might we be using the wrong set of prognosticators to evaluate the potential academic performance of these students, particularly those with learning disabilities? If this is the case, it calls attention to the fact that the use of cognitive predictors presents an equity issue in the college admissions process. Or, as argued by Logel, Walton, Spencer, Peach and Mark (2012), "Using such biased measures without addressing the bias inherent in them would institutionalize discrimination against the stereotyped group and reproduce inequality." If we as student affairs practitioners, who have a commitment to equity, continue to allow this to occur, then we are complicit with institutional discrimination, regardless of our intentions.

Noncognitive variables have been shown to predict academic performance in nontraditional groups of college students such as students of color (Kirby, White, & Aruguete, 2007; Lanham, Schauer, & Osho, 2011; Nasim, Roberts, Harrell, & Young 2005; Tracey & Sedlacek, 1984), student athletes (Sedlacek & Adams-Gaston, 1992), Asian Americans (Fuertes & Sedlacek, 1994), females (Ancis & Sedlacek, 1997), first-generation college students (Ting, 2003), transfer students (Perkhounkova, Noble, & McLaughlin, 2006), unconditionally admitted freshmen (Adebayo, 2008), students with

disabilities (Lombardi, Gerdes, & Murray, 2011), students from low socioeconomic backgrounds (Deil-Amen & Tevis, 2010) and community college students (Noonan, Sedlacek, & Veerasamy, 2005). Furthermore, DaDeppo (2009) found that high school GPA and SAT scores were not a significant predictor of college GPA in college students with learning disabilities. Therefore, it is critical that noncognitive factors, in addition to cognitive factors, of academic performance be explored as potential predictors of academic performance for college students with learning disabilities.

Purpose of the Study

The purpose of this study was to investigate if there were differences between cognitive and noncognitive variables in predicting the academic performance of college students with learning disabilities. To this end, the Sedlacek's (2004) Noncognitive Questionnaire (NCQ) was the instrument used in this study. The NCQ was developed in reaction to the observation that underrepresented students have not been well served by the admissions tools that have been in place at college and universities for decades. It has been used in numerous studies over that time to predict academic performance and the retention of nontraditional students entering college such as African Americans, student athletes, Asian Americans, Hispanic students, females and first-generation students (Ancis & Sedlacek, 1997; Fuertes & Sedlacek, 1995; Nasim, et al., 2005; Sedlacek & Adams-Gaston, 1992; Ting, 2003). The instrument consists of 29 questions was administered online. It consists of eight noncognitive measures which include Positive Self-Concept, Realistic Self-Appraisal, Understanding and Ability to Deal with Racism, Preference for Long Term Goals, Availability of a Strong Support Person, Successful Leadership Experience, Demonstrated Community Service, and Knowledge Acquired in

a Field. Sedlacek (2004) has encouraged that additional research be performed using the NCQ on nontraditional populations and, to date, this instrument has not been used in any studies with this population of students. The research questions are:

1. Do traditional, cognitive (academic) indicators predict college grade point average at the end of the freshman, sophomore, and junior year for students with learning disabilities based on:
    a. High school GPA (HSGPA) alone?
    b. SAT (combined Verbal and Math) or SAT equivalent alone?
    c. High school GPA (HSGPA) and the SAT (combined Verbal and Math) or SAT equivalent used as joint predictors?
2. Do noncognitive variables predict college grade point average at the end of the freshman, sophomore, and junior year for students with learning disabilities?
3. Do noncognitive variables add to the prediction of college grade point average at the end of the freshman, sophomore, and junior year for students with learning disabilities based on:
    a. HSGPA alone?
    b. SAT (combined Verbal and Math) or SAT equivalent alone?
    c. HSGPA and SAT (Verbal and Math) or SAT equivalent as joint predictors?

Theoretical Framework

The theoretical framework which this study was drawn from two models of disability in the disability theory literature: the minority model of disability and disability as human variation (Scotch & Schriner, 1997). The minority group model of disability

and holds that disability has been socially constructed as an internal trait or flaw that limits an individual's ability, when in reality, the limits on the individual's ability are actually located in the environment (Hahn, 1999). Troiano (2003) described this notion very well by stating that the limits, "experienced by people with disabilities in society are not necessarily caused by our disabilities, but are rather the result of living in a society that is designed by and for non-disabled people" (p. 2).

Disability as human variation is another model of disability. Smith and Hutchinson (2004) described disability as a form of human variation in that disabilities can be multiple, of different types, and differentially affect individuals. It also means an individual can be both disabled and nondisabled, depending upon the condition to which one is referring. Both models of disability call for implementation of universal design which, when applied to the learning environment, provides flexible and equal access to for all individuals regardless of ability (Bremer, Clapper, Hitchcock, Hall, & Kachgal, 2002). In the case of college students with learning disabilities, these students face an institutional barrier in the admissions process if their college applications are evaluated by the traditional college admissions practices that were put into place by those without disabilities. Additionally, they possess a heterogeneous group of disabilities that can manifest themselves various ways but they only have the disability in the context of the particular environment in which it manifests. For this group of students, it manifests in the standardized testing process. The inclusion of noncognitive predictors of academic performance during the admissions process can provide flexible and equal access for all individuals regardless of learning differences. Thus, the rationale for the present study emerges from this theoretical framework as well as the literature, which is reviewed in

Chapter 2, regarding cognitive and noncognitive predictors of academic performance for college students.

Significance of this Study

There are several issues that speak to equity issues and the practical significance of this study. First, access to higher education is an issue for marginalized populations (Kirst, 2004). Marginalized populations such as students of color, nontraditional students, or students with disabilities already face obstacles to and within higher education such as lack of preparation in their K-12 environment, unequal access to educational resources, lack of cultural capital, financial barriers, and navigating a new educational system. But if traditional cognitive variables are not accurate in predicting the academic performance of these students, this assessment becomes another barrier to accessing college (Kirst). Therefore, if noncognitive variables are determined to be important predictors of academic performance for students with learning disabilities, more students with learning disabilities and from historically underrepresented populations may be more likely to be able to be admitted to college if these predictors are included during the college admission process.

Furthermore, since student diversity benefits the entire student body by contributing to enhanced learning both in and out of the classroom, all students can benefit from the presence of students with learning differences on campus (American College Personnel Association & National Association of Student Personnel Administrators, 2004; Chang, Denson, Saenz, & Misa, 2006; Gurin, Dey, Hurtado, & Gurin, 2003; Hurtado et al., 1999; Pascarella, 2006). Indeed, the use of noncognitive measure in the admissions process would reduce racial and ethnic differences that emerge

based on standardized test performance (Soars, 2012; Schmitt, et al., 2009). Finally, the literature reflects that students with learning disabilities who have graduated college have just as good outcomes as students without learning disabilities who attend college, but students with learning disabilities who do not attend college have poorer outcomes (Madaus & Shaw, 2006). Therefore, universities have a responsibility to help prepare students with learning disabilities for future careers (Hall & Belch, 2000). The findings of this study could lend support to these intents.

Chapter 2: Review of Literature

There are two broad areas of predictors for academic performance for college students: cognitive and noncognitive predictors. Cognitive predictors are defined as predictors that objectively measure academic capability, include a numerical score, and are traditionally used to assess academic success for incoming freshmen (Reason, 2003). These include high school grade point average (HSGPA) and standardized college entrance exams. Noncognitive predictors are variables that are typically not measured by standardized tests and relate more to individuals' adjustment, motivation and perceptions (Sedlacek, 2003). Although there is a wide body of literature on the academic performance of college students with learning disabilities, much of it is opinion or informational pieces (Brinckerhoff, 1994, 1996; Dalke & Schmitt, 1987; Dudley-Marling, 2004; Hadley, 2006; Madaus & Shaw, 2004; Sitlington & Payne, 2004), program descriptions (Barbaro, 1982; Barbaro, Christman, Holzinger, & Rosenberg, 1985), interventions (Algozzine, Browder, Karvonen, Test & Wood, 2001; Field & Hoffman, 1994; Gerber et al., 1996; Izzo & Lamb, 2002), or best practices (Browder, Wood, Test, Karvonen, & Algozzine, 2001; Field & Hoffman, 1994). Conversely, there are a limited number of empirical studies regarding the academic performance of students with learning disabilities and, while these are often fraught with methodological problems, the focus of this literature review will be on this body of research. The literature review is organized in the following way. First, to provide a context for the review of literature regarding existing studies on predictors of academic performance for college students with learning disabilities, the history of cognitive and noncognitive predictors for all students is reviewed. Second, the manner in which cognitive variables

are used today and studies that support cognitive variables to predict academic performance in college students are discussed. Third, criticisms of cognitive predictors are put forth and studies that have used noncognitive predictors of academic performance for students without learning disabilities are evaluated. Fourth, the Noncognitive Assessment Model (NAM) and associated Noncognitive Questionnaire (NCQ) designed by William Sedlacek (2004) are introduced and studies using this instrument on students without learning disabilities are reviewed. Finally, empirical studies regarding the academic performance of students with learning disabilities that use noncognitive predictors of academic performance for college students are examined.

Cognitive Predictors of Academic Performance

There is much support in the literature for the use of the cognitive predictors of standardized tests and high school grade-point-average (HSGPA) to predict the academic performance of college students. Again, cognitive variables are defined within the literature as predictors that objectively measure academic capability, include a numerical score, and are traditionally used to assess academic success for incoming freshmen (Reason, 2003). How the academic success of college students is defined has also been debated. It has been seen as one of the following: college cumulative GPA, freshman GPA, or college graduation. The College Board has performed decades of research on predictors of college success, which include high school GPA, high school class rank, and SAT scores (Camara & Echternacht, 2000). These studies show that cognitive predictors, especially high school GPA and standardized tests scores, are the best predictors of freshman GPA. As a result, first-year college GPA tends to be the outcome that the College Board labels academic success in college (Camara & Echternact, 2000).

However, it is important to recognize that the College Board acknowledges that African American, Native American, Mexican American and Hispanic students receive significantly lower scores on the ACT and SAT than do Caucasian American students (Noble & Camara, 2003).

This section reviews eight studies that support the use of cognitive variables to predict academic success or retention in college. It is important to point out that three of the studies only use cognitive predictors (Gayles, 2006; Noble & Sawyer, 2004; Tross, et al., 2000), and the rest not only include cognitive predictors but various noncognitive predictors of academic success (Astin, Korn, & Green, 1987; Beck & Davidson, 2001; Deberard, 2004; Lawlor, et al., 1997; Nauman, Bandalos, & Gutkin, 2003). These studies are placed in this section as their findings attribute cognitive predictors versus noncognitive predictors with the largest amount of variance in college success. The studies will be reviewed and a summary is provided of these studies at the end of this section.

In an early study, Astin et al. (1987) used the Cooperative Institutional Research Program (CIRP) data to look at retention issues at several different types of colleges and universities. The participants were students who completed the fall 1981 CIRP freshman survey (over 275,000 students), student responses to a follow-up survey in the summer of 1985 (over 8,000), and additional data provided by campus staff regarding degree completion and current enrollment status. The goals of the study were to determine the best predictors for students receiving their bachelor's degree by 1985 (within four years), and for those that were still enrolled after four years of college. In looking at cognitive predictors of retention, it was found that students' high school grade point average and

their SAT or ACT scores were the two strongest predictors of retention at their respective institutions. Although strengths of this study included the number of participants and the use of three data collection methods, there is no mention about race, disability or other statuses that could be potential variables affecting student retention.

Lawlor et al. (1997) at Wake Forest University used race as one of the variables in their study. These researchers wanted to determine if the SAT is an unbiased predictor of academic success as well as to identify the strongest predictors of academic success of college students attending this university. The participants were 348 students and the data for this study was gathered from their student files. The independent variables were ethnicity (black or white), high school class rank, high school GPA, and three scores from the SAT: Verbal, Math, and Total score. The dependent variables were college grade point average and college class rank. A correlational analysis was performed and it was revealed that there were no differences in cumulative college GPA and college class rank for the black and white students based on high school class rank, high school GPA, and SAT verbal scores. SAT verbal scores and high school GPA had the strongest correlation for both groups' college class rank and GPA. However, there was a statistically significant difference between white and black students' total SAT scores. Black students' total SAT scores were, on the average, 80 points lower than the white students' SAT scores. Although there was no difference in the SAT verbal scores between the two groups, there was a significant difference between their SAT math scores. In sum, high school class rank and GPA were significant predictors of college GPA and college class rank for both groups of students, but only the verbal portion of the SAT was a good predictor of college GPA and class rank for white students. Since this

study was performed at a small, private college, its results can only be cautiously applied to student in different institutional contexts. However, its strength is its comparison of cognitive variables between black and white students. This study suggests that some cognitive predictors of college success appear to be valid (high school GPA and high school class rank) for both black and white students but the SAT is questionable for use as an admissions criteria for black students.

Tross et al. (2000) acknowledged that there may be factors outside of traditional cognitive variables that can predict college performance. Their study examined the ability of two cognitive predictors (HSGPA and SAT scores) and three noncognitive predictors to predict college GPA and retention. The three noncognitive factors were achievement, conscientiousness and resiliency. The participants consisted of 844 first-year students in different sections of a psychology course at a large, public university who were administered the College Adjustment Inventory (CAI) during the first week of their course. College performance was assessed at the end of their freshman year (up to a maximum of four semesters). Two step-wise multiple regression analyses were performed with the independent variables mentioned above but each had a different independent variable. It was found that HSGPA accounted for 25 percent, SAT 4 percent, and conscientiousness, a scale that measured a student's purposefulness of academic activities such as studying, taking notes, turning assignments on time, and similar constructs, accounted for 7 percent for the variance in college GPA However, for college retention, only conscientiousness remained in the final model of the regression, accounting for 3 percent of the variance. HSGPA, total SAT, and resiliency and achievement were not significant. This study supports that in the prediction of

college GPA, HSGPA and SAT are significant predictors. However, SAT didn't account for near the amount of variance in college GPA that HSGPA did. It also supports that the noncognitive predictor of conscientiousness was a better predictor than SAT scores, but not as good of a predictor as HSGPA, in predicting college GPA. However, when retention is the dependent variable, the only significant predictor was conscientiousness.

These results show that both cognitive and noncognitive variables have predictive utility, depending on the outcome being examined. However, HSGPA appears to be the best cognitive predictor for college GPA, and the noncognitive predictor of conscientiousness had predictive utility for both college GPA and retention. However, these results are not totally generalizable. The university at which the study was performed was a selective institution and the population was very homogenous as the majority of students were white, so this analysis may not be able to be generalized other types of institutions or to underrepresented students. They did not attempt an analysis of students of different ethnicities, social-economic status, or other under-represented groups. This study, however, supports that a noncognitive variables explained more of the variance in college retention than the cognitive variables, but they both have predictive utility in predicting college GPA.

Beck and Davison (2001) created an instrument called the Survey of Academic Orientations (SAO) to predict first-semester freshman grades. The goal for this survey was to be able to establish an "early warning system" (p. 709) that could identify students at risk of academic failure. The study was administered to 536 first-semester freshmen in introductory psychology courses at a large university in the southeastern United States. Of this group, 397 were females and 139 were males; ninety-four percent of the students

were white, 1 percent was Hispanic, 3 percent were African American, 1 percent was Asian, and 1 percent were nonresident aliens. The SAO consists of six scales that included Structure Dependence (the dependence of students on the instructor for explicit detailed instructions on assignments, tests, etc.); Creative Expression; Reading for Pleasure; Academic Efficacy (how strongly students feel that they can competently complete college work); Academic Apathy (how much effort students put into their academics); and Mistrust of Instructors. The authors provided Cronbach's alpha coefficients for the scales ranging from .59 to .86. The scales of the SAO were the independent variables, in addition to SAT-V, SAT-M and high school percentage rank (HSPR). HSPR was operationalized as individual student rank, divided by the number of graduating students, multiplied by 100. Students took the SAO between their first and seventh week of the semester. Two multiple regression analyses were run. The first one regressed the six variables of the SAO onto freshman, first-semester college GPA and the second regressed the same six variables of the SAO as well as SAT-V, SAT-M, and HSPR onto freshman, first-semester college GPA. In the first regression, the variables which most significantly contributed to the variance in college GPA were Academic Efficacy, Structure Dependence, and Mistrust of Instructors (in that order). Academic Apathy was a negative predictor of college GPA. However, when HSPR, SAT-V, and SAT-M entered the model, HSPR became the variable that accounted for the most variance in college GPA, with Academic Efficacy next, then the SAT-V, Structure Dependence, and Academic Apathy (which was a negative predictor).

These results are interesting as they are consistent with studies reviewed so far in which a variable including HSGPA (HSPR in this study) seemed to account for the most

variance in college GPA when college GPA was the criterion variable. This study also is consistent with Lawlor, et al., (1997) who did not only use SAT total as a predictor variable, but also used SAT-V and SAT-M which revealed that SAT-V is a significant predictor of college GPA but SAT-M was not. This study supports the use of cognitive variables to predict first-year GPA along with several noncognitive variables. However, the cognitive variable of high school percentile rank was still the best predictor of them all. There are several limitations to this study. First, the student population was racially homogenous so these findings may not generalize to a more diverse group of students. Also, to be consistent with the body of research regarding academic performance for college students, HSGPA should have been included as one of the independent variables. Third, only first-semester freshmen in introductory psychology course were used. These students do not represent a random sample of the college student population nor do the results of this study provide any information about college performance beyond the first semester of the freshman year.

Naumann, Bandalos, and Gutkin (2003) conducted a study to compare self-regulated learning variables to traditional college admission test scores for first-generation and second-generation college students as well as to determine how self-regulated variables relate to academic performance. The participants were 155 students enrolled in a university foundations class at large Midwestern university. The students completed the Motivated Strategies for Learning Questionnaire (MSLQ) which was comprised of nine self-regulated learning variables: goal orientation, task values, expectancy for success, control beliefs, and self-efficacy (considered motivational variables); and study strategies, seeking assistance, goal setting, and time management

(considered strategy variables). Also, generational status and ACT scores were independent variables. The dependent variable was college GPA. A step-wise multiple regression analysis was performed on each generational group. For the first-generation students, the variable of "expectancy of success beliefs" was the most significant predictor of college GPA followed by the ACT and these accounted for 50 percent of the variance of college GPA; for second-generation students, the ACT was the most significant predictor of college GPA followed by the variable of the variable of "expectancy for success beliefs" and "goal setting." The authors conclude that although these learning variables and the ACT predicted college GPA for both groups of students, they better predicted college GPA for first-generation students as those variables accounted for more of the variance in college GPA than they for second-generation students' college GPA. In other words, for traditional students, the traditional cognitive variable was a better predictor of academic success, but for first-generation students, a noncognitive variable was a better predictor of academic success. A strength of this study is that the authors examined differences in first- and second-generation students with an awareness that noncognitive variables may be better predictors of college success than traditional cognitive variables. However, there were several limitations of this study. First, they authors did not use HSGPA as a predictor variable in their research and there is no mention of why not. Given HSGPA appears to account for more variance in the academic performance of college students than standardized test scores, it would be important to tease out the variance related to HSGPA instead of ignore it. They also did not provide racial or gender data for this group of students, nor did they control for these or other background characteristic variables. However this study does afford some

support for cognitive and noncognitive variables differentially predicting academic success for different groups of college students.

Deberard et al. (2004) also examined cognitive and noncognitive predictors of academic success (freshman GPA) and retention for college freshmen. The noncognitive predictors were the following psychosocial predictors: gender, smoking behavior, drinking behavior, social support, physical health, mental health, acceptance-focused coping and escape-focused coping. The cognitive predictors were total SAT score and high school GPA. The participants were 204 undergraduate students in different sections of introductory psychology courses. Of the participants, 72 percent were women, 84 percent were white, 8 percent were Asian, 2 percent were Hispanic, and 1 percent was African American. Ages of students ranged from 17.8 to 26.3 years of age, with a mean of 18.9 years of age. Students completed three questionnaires: the Multidimensional Perceived Social Support Scale (MPSSS); the Ways of coping Checklist, Revised (WOC); and the Short-Form Health Survey-36 (SF-36). Also, their total SAT scores and high school GPAs were obtained from the university registrar to be included as independent variables. Finally, students were asked questions about their smoking and drinking behavior. Two simultaneous-entry multiple regression analyses were performed for college GPA and for retention with the cognitive and noncognitive variables as predictor variables. The multiple regression analyses for college GPA revealed that HSGPA was the best predictor of college GPA, followed by Acceptance Coping (a negative predictor), SAT total, Social Support and Escape Coping, all of which accounted for 56 percent of the variance in college GPA. The results of the second multiple

regression with retention as the criterion variable were not reported as the authors report that the model was not statistically significant.

In line with the studies reviewed thus far, this study supports the use of cognitive variables to predict first-year GPA with HSGPA being the strongest. SAT total also had predictive value to a lesser extent. It also lends support of noncognitive, psychosocial variables as predictors of college students' freshman GPA. Although this study shows similar results to previous studies reviewed, it does have some limitations. Its findings may be limited as the study was performed at a small, selective, private university and the participants were students in an introductory psychology course. Also, this study does not explore the prediction of college performance beyond the freshman year. Finally, the student population was racially homogenous so, overall, these findings may not generalize to a more diverse group of students but they provide support for the predictive value of cognitive predictors as well as select noncognitive predictors of college performance.

Noble and Sawyer (2004) studied the ability of high school GPA and ACT score in predicting differential levels of college GPA**.** The baseline data for the study came from 219,435 first-year students from 301 postsecondary institutions who provided high school GPAs from 30 college preparatory courses at the time they took the ACT for the 1996-1997 school year. These researchers also gathered cross validation-year data by identifying 214,924 first year students from 294 colleges and universities for 1997-1998. There were no noncognitive variables in this study. Three logistical regression models were created based on ACT score, high school GPA, and both the ACT and high school GPA coming together to predict success in the students' freshman year. Noble and

Sawyer found that HSGPA was not as able to predict high (a college GPA above 3.50) or low (a college GPA below 2.00) levels of achievement during the first year of college as the ACT, but it was more able to predict first-year college GPAs between 2.50 and 3.00 than the ACT. However, together, both high school GPA and ACT scores were better able to predict college GPA than either one alone. The authors stated that their finding support the conclusions of other studies that noncognitive factors due impact college performance, but with less impact at higher achievement levels. Overall, this study does shows the benefit of the cognitive variables of high school GPA and ACT as good predictors of college GPA, but no noncognitive variables were included in this study and racial differences were not considered in any way.

Gayles (2006) conducted a study to determine the usefulness of high school GPA, SAT score, and the freshman index (FI) in predicting graduating GPA at Georgia State University. The FI is the primary factor used in admissions decisions at this university and it consists of the following formula: high school GPA x 500 + SAT Math + SAT Verbal = FI. All Asian, Black and White students (1365 students) entering the university fall 1998 and graduating in spring 2004 were included in the study. Multiple regressions were performed for all graduates as well as graduates in the 75^{th} percentile or higher. The independent variables were FI, HSGPA, and SAT. The dependent variable was "graduating" college GPA. For all graduates, it was found that the SAT was the weakest of the three predictors for all racial groups and both graduating groups while the FI was the strongest in predicting graduating GPA; however, the FI only accounted for 5.2 percent more of the variance than high school GPA and HSGPA accounts for more than twice the amount of variance in graduating GPA than the SAT. However, for graduates

in the 75th percentile or higher, high school GPA accounted for more of the variance in graduating GPA than FI for Black and White students. This was not the case for Asian students as total SAT accounted for more variance in graduating GPA than the other variables.

This study is consistent with others reviewed so far, which support that HSGPA is a strong predictor of college GPA than SAT. Unlike many studies that tend to use freshman first-semester or end-of-year college GPAs as outcome variables, this study used graduating GPA as the dependent variable which is a better measure of college success than freshman GPA. One methodological concern regarding this study is that the freshman index is operationalized by being comprised of HSGPA and the SAT, it would seem that multicollinearity would be an issue since FI would be highly correlated with both HSGPA and SAT scores. This issue is not addressed by the researchers. Another limitation is the results of this study are particular to Georgia State University, and may not be generalizable to the overall population as not all colleges use an FI as an admissions criterion. However, this study lends support to the trend that is being revealed thus far in the literature review: It supports the notion that HSGPA is a more solid predictor of college student academic performance than the SAT, especially for underrepresented student populations.

The eight studies discussed above investigated cognitive (and some included noncognitive) variables of academic success of college students. In some ways, they can be compared with each other. All studies showed cognitive variables to contribute to the academic success of college students; however, of cognitive variables investigated, six of the eight studies found HSGPA accounted for most of the variance of academic success

beyond other cognitive variables, including standardized test scores (Astin et al., 1987; Deberard et al., 2004; Gayles, 2006; Lawlor et al., (1997); Noble & Sawyer, 2004; Tross et al., 2000). In one of the two studies that did not use HSGPA but high school percentile rank (HSPR) (Beck & Davidson, 2001), HSPR was still found to account for the largest amount of variance in academic success. Naumann et al., (2003) did not use high school GPA as an independent variable in her study.

SAT total score, used in five of the eight studies (Astin et al., 1987; Deberard et al., 2004; Lawlor et al., (1997); Noble & Sawyer, 2004; Tross et al., 2000), also accounted for a significant amount of variance in college performance and in the two studies that did not use SAT total score, SAT-V (Beck & Davidson, 2001) and ACT (Naumann et al., 2003) had the same effect. Only three of the studies compared different student groups such as those of different races, abilities, SES or other statuses that can contribute to the marginalization of students except for Lawlor, et al., (1997), (Gayles (2006), and Naumann et al. (2003). Gayles' research showed that SAT was the weakest predictor and freshman index (FI) for college success for blacks, whites, and Asians except for Asian students graduating from college at the 75^{th} percentile in their class or higher. The SAT was a better predictor of college success for this group of students than the freshman index. Naumann's (2003) research revealed that the ACT was a better predictor of academic success for second-generation college students whereas the noncognitive variable of Expectancy of Success was a better predictor for first-generation college students.

An important point to note about these studies is that they each had different definitions of college student success and they include retention, college GPA, college

first-semester GPA, first year GPA, and college graduating GPA. Five of the studies also included noncognitive predictors (Beck & Davidson, 2001; Deberard et al., 2004; Lawlor et al., (1997); Naumann, et al., 2003; Tross et al., 2000). It is difficult to compare these noncognitive variables in each study with each other, however, as each of these studies used different instruments that had differing noncognitive constructs. At the same time, each of these five studies did find several noncognitive predictors significant in predictor academic success. These noncognitive predictors include Conscientiousness (Tross, et al., 2000), Gender, Smoking (lack of), Mental Health Issues (lack of), Social Support, Acceptance-Focused Coping, Academic Efficacy, Academic Apathy (lack of) (Deberard, et al., 2004), Expectancy of Success, Goal Setting (Naumann, et al., 2003), and Mistrust of Instructors (lack of) Beck & Davidson, 2001).

Cognitive predictors of academic success indeed have support in the literature regarding the academic performance of college students. At the same time, many researchers have provided criticisms of these cognitive predictors. The next section will discuss these criticisms, which will provide a backdrop for the following section, which reviews noncognitive predictors of academic success for college students.

Criticisms of Cognitive Predictors of College Success

Although cognitive predictors of academic success of college students have traditionally been used to determine college admission, they recently have been called in to question (Atkinson, 2001; Burdman, 2001; Chait, 2007; Crouse, 1985; Crouse & Trusheim, 1988; Crouse & Trusheim, 1991; Gose, et al., 2001; Schmitt, 2012; Sedlacek, 2003; Stemler, 2012; Kyllonen, 2012; Soares, 2012; Stern & Briggs, 2001; Tam & Sukhatme, 2004). Stern and Briggs (2001) analyzed the societal climate that is fueling

this debate and posit four premises from which this debate stems. First, economic change has brought increasing number of students to college. This is due to the rising demand that employers are demonstrating for college graduates as a result of the increased pace of economic and technological growth. This growth has also contributed to rising salaries associated with earning a bachelor degree. Second, admissions procedures are being questioned as many students who enter college never graduate. There is still a lot of variance in college success that is not explained when using only traditional college predictors. There is a growing interest in improving admissions procedures due to this issue as well as due to the advancement of improved evaluation techniques. Third, high school exit requirements have been changing over the past decade. Proficiency standards and exit exams have been put into place and these standards do not necessarily connect with college admissions standards. Finally, schools are changing their curriculum and/or the way they document student outcomes. For example, many admissions offices are receiving transcripts that are unconventional which makes it difficult for admissions officers to evaluate them. There are also a growing number of students who have been home-schooled. While these students may be prepared for college upon completion of their home schooling program, they will not have the traditional transcript with grade-point averages and Carnegie units (Stern & Briggs).

Although the traditional cognitive predictors of college success have been questioned, the use of standardized tests has most often been at the heart of the debate (Atkinson, 2001; Burdman, 2001; Chait, 2007; Crouse, 1985; Crouse & Trusheim, 1988; Crouse & Trusheim, 1991; Gose, et al., 2001; Sedlacek, 2003; Stern & Briggs, 2001; Tam & Sukhatme, 2004). While the SAT does what it purports to do, i.e., predict

freshman-year GPA, predicting freshman-year grades is not the ultimate goal of college admissions staff (Crouse & Trusheim, 1988). The SAT can further be helpful if it can assist colleges to admit students that it would typically not admit based on other application information or vice versa. Crouse and Trusheim (1988) state that out of every one hundred admissions decisions using the high school record, only one to three decisions are more accurate when including the SAT as a predictor of college success. These researchers also state that the SAT is not a tool that helps students select colleges appropriate for them. Applicants typically base their selection decisions on such thing as their academic records, family influences, information they receive from various colleges, and other variables. The decisions they make without using their SAT score is basically the same as if they did not (Crouse & Trusheim).

Others accuse the SAT as not being aligned with the high school curriculum (Gose et al., 2001). As a result, it is not clear how to study for the exam. High school teachers often take time away from their curriculum to try to prepare students for the SAT which takes away from their teaching higher level skills such as critical thinking. Or, students feel the need to take expensive preparatory courses for the SAT. This, of course, can lead to test score differences between those students who have the money to do this and those who do not (Gose et al., 2001). This contributes to one of the major criticisms of the SAT: different racial groups perform differentially well on this test. Indeed, data shows that over the past two decades, African Americans have scored between .45 and .81 of a standard deviation lower than the total group of students who took the SAT (Kobrin, Sathy, & Shaw, 2007). Sedlacek (2004) suggested that although the SAT does what it purports to do, which is predict freshman year grades for white

students, it cannot predict: grades after a student's freshman year, graduation or retention for any student, or grades and retention for women and students of color.

The following section will review studies that have not found cognitive predictors, particularly standardized tests, to be the best predictor of academic success. In fact, the upcoming review of studies that investigate noncognitive predictors of academic success will demonstrate that noncognitive predictors are superior to cognitive predictors alone.

Noncognitive Predictors of Academic Success

A number of studies have been performed to support the premise that the SAT is not as good of a predictor of academic success as some other cognitive variables and noncognitive variables. This section reviews six such studies and they are placed in this section as their findings attribute noncognitive predictors versus cognitive predictors with the largest amount of variance in college success.

Britton and Tesser (1991) performed a study to determine what effect time-management skills have on college grades. Ninety students enrolled in an introductory psychology class completed the Time Management Questionnaire. The questionnaire had three scales: short-range planning, time attitudes, and long-range planning. Each of the scales was considered an independent (noncognitive) variable. The SAT was also an independent (cognitive) variable. Cumulative college GPA (that was collected three years after they took the time management questionnaire) was the dependent variable. A multiple regression analysis was performed. The SAT accounted for 4 percent of the variance in cumulative college GPA and was nonsignificant. However, the scales of time attitudes and short-term planning accounted for 21 percent of the variance. The authors

conclude that self-reports of time management are related to college performance and are stronger than SAT scores. While this lends further support to the predictive value of noncognitive predictors of college performance, the authors did not include HSGPA as a variable and from the studies reviewed thus far, HSGPA is often a stronger predictor than SAT (Deberard et al., 2004; Noble & Sawyer, 2004; Lawlor et al., 1997). So, in this study, the variance that would have been accounted for by HSGPA as a predictor was not part of the model. Also, the researchers did not control for any background characteristics of the sample. Finally, it is unclear how the time management questionnaire originated and no reliability or validity data were reported by the authors. However, the study provides contrasting results to others reviewed thus far in that the SAT had very little value as a predictor of college grades while in many other studies it does, even if it is shadowed by other variables.

In a study designed to determine the best predictors of freshman academic performance and retention, Pickering, Calliote, and McAuliffe (1992) performed a study using demographic, cognitive, and noncognitive variables. The sample included 2116 new freshmen at a mid-sized, metropolitan public university located in the southeastern part of the United States. The demographic variables included gender, race, SES, generational status. The cognitive variables included high school GPA, high school percentile rank, and scores from both the SAT-V and SAT-M. To measure noncognitive variables, the researchers developed The Freshman Survey which was designed to measure noncognitive variables that have been associated with academic success in college according to the literature. These variables included reasons for attending college; reasons for choosing the university they attended, the number of hours spent in

activities per week as a senior in high school, self-ratings on personal traits, and prediction of academic, extracurricular and social situations. In addition to noncognitive variables, the demographic variables of age, gender, need for financial aid, SES, ethnicity and parent' level of income were included as independent variables. The cognitive variables were HSGPA, high school percentile rank (HSPR), and the SAT-V and SAT-M scores. The two dependent variables were academic difficulty or academic success and attrition or retention into second year of college. Discriminant analyses were performed to determine how each of the three grouped independent variables (noncognitive, cognitive and demographic) predicted the two dependent variables. The best predictors of academic difficulty or success were the combination of cognitive and noncognitive predictors; however, if using any of the three types of predictors alone, noncognitive variables were the best predictors of academic difficulty or success. The best predictors of attrition or retention were the combination of cognitive, demographic, and noncognitive predictors; however, noncognitive predictors, again, were the best of any type if used alone.

This study included the independent variables that are most often used cognitive variable to predict academic success in college (high school GPA, SAT-V, SAT-M) and a variety of noncognitive independent variables not typically investigated. The results supported the value of noncognitive variables in predicting college academic performance both with and without the traditional cognitive predictors. Although they listed the specific variables that comprised "noncognitive," "cognitive," and "demographic," variables, their analysis did not include how each sub-variable individually impacted the two dependent variables of academic difficulty or academic

success and attrition or retention into second year of college. They also did not discuss reliability or validity information regarding their instrument, The Freshman Survey, nor the gender and ethnicity data of their sample. So while this study this study supports the importance of using noncognitive predictors alone or with cognitive predictors of academic success for college students, there is no data on which cognitive, noncognitive, and demographic variables contribute to college performance and retention.

Richardson and Sullivan (1994) investigated noncognitive variables that influence the academic success of freshmen that were academically underprepared, which included students who had a high school GPA below 1.7 or those who were referred to remedial English courses. The study took place at a small, private liberal arts college in the northeastern United States. The sample was 199 traditional age freshmen. This was an ex post facto study and the data came from the College Student Inventory (CSI) which the participants of this study took earlier in the year. The noncognitive independent variables that came from the CSI were desire to finish, study habits, academic confidence, attitude toward educators and initial impression. The independent variables also included the cognitive variable of HSGPA. The dependent variable was students' end-of-freshman-year GPA (FGPA). A multiple regression analysis was performed on the data and it was found that study habits, initial impression of the college, and academic confidence were the strongest predictors of FGPA, accounting for 36 percent of the total variance. High school GPA did not predict FGPA. The authors concluded that, for this group of students, motivation and attitude are better at determining academic success that the traditional cognitive predictors. These findings need to be taken with caution, however. This study was performed at a small, four-year, liberal-arts campus in New

England, the total enrollment of which was approximately 900 students so the results may not be generalizable. The authors did not provide gender or ethnicity data about their sample and failed to control for background characteristics. At the same time, this study is valuable in that it used a sample of at-risk college students, a group not typically included in studies examining predictors of college performance. Based on the findings, it may very well be that noncognitive predictors are important for this group. This would be consistent with the discussion in Chapter 1 regarding traditional cognitive variables not being good predictors for nontraditional groups of students.

Noncognitive predictors of academic success in college have also been used to compare college success for traditional and nontraditional aged students. Spitzer (2000) sought to determine the variables that might predict college GPA and career decidedness in these two populations of students. The goal was to determine if academic performance and career development were related. The participants were 355 full-time students (freshmen through seniors) at a private, liberal arts college. Of this group, 267 were under 23 (traditional age) and 88 were over 25 (nontraditional age). Students were administered seven questionnaires, five of which were used in this study. The dimensions investigated were five personal dimensions (Academic Self-Efficacy, Global Self-Worth, Social Acceptance, Career Decision-making Self-Efficacy and Social Support) and two learning dimensions (Intrinsic Motivation and Self-Regulation). These seven dimensions along with gender and traditional/nontraditional status were the independent variables. The dependent variables were averaged college GPA for the fall and spring semesters in which the data was gathered and career decidedness. A step-wise multiple regression analysis was performed for each dependent variable. For the

prediction of college GPA, all five personal dimensions and both learning dimensions were independent variables. For all students, findings revealed that Self-Efficacy was the strongest predictor but Self-Regulation and Social Support also contributed to the variance in college GPA. Also, females with high Self-Regulation or nontraditional students were more likely to have high GPA. For career decidedness, all five personal dimensions, both learning dimensions, and college GPA were independent variables. Findings revealed that Career Decision-making was the strongest predictor of Career Decidedness. At the same time, nontraditional students or females with high Self-Regulation were more likely to be more decisive in determining their careers. The authors conclude that career development and academic performance are not interdependent yet theyfall may grow simultaneously.

Although the focus of this study was to determine if career development and academic success were separate processes, it is similar to the other studies in this section that used noncognitive variables to determine academic success (college GPA). To be sure, it was determined that some noncognitive variable contribute to success in college. It also is significant in that it showed that nontraditional students did differ from traditional students in GPA, although what contributes to this was not determined by this study. However, there were several limitations to the study. The independent variables did not include high school GPA or standardized tests scores. As these have been shown to be predictors of academic success for college students (Astin et al., 1987; Deberard, et al., 2004; Lawlor, et al., 1997: Tross, 2000), it seems these variables should have been included. The age range of the nontraditional students was unknown; all that was provided about this population was that they were undergraduates over 25 years of age.

Another interesting variable that could have been included in this study was whether two years of community college completion or employment impacted college GPA since the authors state that many of the students in the sample completed two years of coursework at local community colleges and that 80 percent of students were employed 15 hours a week or more. Although it does provide support for noncognitive variables affecting college success, the results cannot be interpreted in the context of the comparison of cognitive and noncognitive variables.

Shivpuri et al. (2006) examined how cognitive and noncognitive variables of college success predict outcomes over time. There were 537 freshmen from a large Midwestern university in this longitudinal study. Seventy-eight percent of the participants were white, 10 percent were black, and 11 percent were other ethnic minorities. Seventy-three percent were females. The noncognitive variables were developed from a bio-data measure as well as a situational judgment inventory one of the authors developed from a previous study and they reflected twelve dimensions of college performance, five of which they used in this study as the authors felt that these were the most relevant to academic growth. These dimensions included Knowledge, Continuous Learning, Perseverance, Adaptability, and Interpersonal Skills. The cognitive independent variable was standardized test scores. Cumulative college GPA was the outcome measure for academic growth and this data was gathered in the fall and spring of the participants' freshman and sophomore years in college. Latent Growth Modeling (LGM) was the procedure used to analyze the data. The authors found that SAT/ACT scores were a good predictor of a student's initial standing as in those that had higher SAT/ACT scores when entering college were initially more successful than those

students with lower scores. However, the noncognitive factor of Knowledge added to the prediction of initial academic success. On the other hand, the Continuous Learning and Adaptability Dimensions were found to negatively predict academic growth over time. The authors felt the reason for these findings was that those who seek out additional knowledge in general mastery learning may sacrifice their grades for this learning and for those who had to adapt to sudden and novel problems may receive lower grades than those who do not until they eventually adjust.

This study does reflect evidence that noncognitive variables can add to the predictive value of traditional cognitive variables in determining college student academic success. Also, the longitudinal design of the study added value to this body of work in that student grade point averages were accurately tracked over four semesters. At the same time, this study presented several limitations. However, it would have been appropriate to include high school GPA as a cognitive, independent variable along with SAT/ACT score since HSGPA has been shown to account for the majority of variance in college performance (Astin et al., 1987; Deberard, et al., 2004; Lawlor, et al., 1997: Tross, 2000). Also, the authors might have considered using all 12 dimensions of college performance for a richer picture of student success. Regardless, several noncognitive variables in this study were shown to be worthy of consideration in the prediction of academic success of college students.

Matteson (2007) explored the predictive ability of the noncognitive variables of entry age, gender, ethnicity, first-generation status, language spoken in the home, and leadership experience for at-risk students in a special support program at a private, highly-selective university. Students are automatically placed in this program upon

admission as their high school GPAs and SAT scores are lower than the entering class' average high school GPAs and SAT scores. In this correlational study with 591 participants, high school GPA, gender, and leadership experience (as defined as individuals who held a position of leadership in clubs and organizations, not merely members) positively correlated with first-semester and first-year college GPA. Interestingly, gender was a significant variable as females significantly earned better first-semester and first-year college GPAs than males. The SAT scores did not correlate with any variables except high school GPA.

Unlike the studies reviewed to this point, this study had the most diverse sample of students. Thirty-nine percent of the students were white, 20 percent were black, 20 percent were Hispanic and 9 percent were Asian. Unfortunately, they did not include race as one of the variables or acknowledge it in any way. Another strength of this study is that at-risk students were the sample, unlike the samples of traditional students that have been used in the studies reviewed to this point. This study's findings supports that HSGPA is a significant correlate of college performance for this group. This contrasts with Richardson and Sullivan's (1994) finding of HSGPA which was not a significant predictor of college success for an at-risk group of college students. It also revealed that SAT scores were not a significant predictor for this nontraditional population. These findings would be consistent with the discussion in Chapter 1 regarding traditional cognitive variables not being good predictors for nontraditional groups of students. Results must be taken with caution, however, as this was a correlational study; subsequently, the most that can be said is the variables that correlated with first-year

college GPA have a relationship; it cannot be said that these variable predict first-year college GPA.

Schmitt, et al., (2009) investigated the use of cognitive and noncognitive variables to predict the performance college students at the end of their fourth year in college at 10 different colleges in this longitudinal study. The colleges were five Big Ten universities, two historically African American colleges, a large school in the West, a state university in the South and a large private college in the Midwest. The instruments included the Situational Judgment Test (SJT) in which students judge a behavior in response to a group of academic and social situations, and a biographical data measure that evaluates a student's background, interests, hobbies and behaviors in a variety of academic and life circumstances. The noncognitive, independent variables that resulted from these instruments included Knowledge, Continuous Learning, Artistic Appreciation, Multicultural Appreciation, Leadership, Responsibility, Health, Career Orientation, Adaptability, Perseverance, and Ethics. High school GPA and SAT/ACT scores were cognitive independent variables. The study started with 2,771 incoming freshmen who took the SJT and bio-data measure. Three and a half years later a follow-up survey, the Behaviorally Anchored Rating scale (BARS), in which students had to respond to self-report outcome measures, was taken by 593 of the original 2,771 students. The BARS was constructed from student performance goals that the authors found to be important to universities. The outcome measures, or dependent variables, were cumulative college GPA, class attendance, organizational citizenship behaviors, and the BARS.

A hierarchical regression analysis was performed. Results showed that the cognitive variables of high school GPA and SAT/ACT scores and the noncognitive

variables of continuous learning and physical and psychological health significantly contributed to college cumulative GPA. However, the cognitive variables did not contribute to the other outcomes. At the same time, several of the noncognitive variables significantly contributed to other outcomes. Multicultural appreciation, physical and psychological health, perseverance and ethics contributed to the BARS outcome measure; artistic appreciation, multicultural appreciation, leadership, responsibility and adaptability/life skills significantly contributed to organizational citizenship behavior; and leadership, physical and psychological health, and ethics negatively impacted absenteeism. This study supports that noncognitive variables provide an additional contribution, above and beyond cognitive variables, to the prediction of college student performance. This study had its limitations, however. It lost a large portion of its sample by the end of the participants' fourth year in college. Also, the outcome variables of the BARS, class absenteeism and organizational citizenship behaviors were based on the self-report of students. Finally, other than college cumulative GPA, this study's outcome variables were quite unusual compared to other similar studies.

The seven studies discussed above focused on noncognitive variables of academic success of college students. Also, all except one (Pickering, et al., 1992) included the cognitive predictors of SAT, high school GPA, or both as control variables. What is interesting about this group of studies, as opposed to the previously reviewed section of studies which focused on cognitive variables as academic predictors of college, is that standardized test scores were not always significant in accounting for variance in academic success outcomes. The cognitive predictor of high school GPA was found significant in one of the studies (Matteson, 2007); SAT and ACT scores were found

significant in two studies (Matteson, 2007; Schmitt, et al., 2009; Shivpuri, et al., 2006); and high school GPA and SAT/ACT scores were found significant on one of four outcome variables in another (Schmitt, et al., 2009). At the same time, all of the eight studies had some significant findings when it came to noncognitive predictors. The noncognitive predictors that were found to be significant in these studies included Short-Range Planning and Time Attitudes (Britton & Tesser, 1991); Study Habits, Initial Impression of College, Academic Confidence (Richard & Sullivan, 1994); Self-Efficacy, Self-Regulation, and Social Support (Spitzer, 2000); Knowledge (Shivpuri, et al, 2006); Gender and Leadership (Matteson, 2007); and Multicultural Appreciation, Physical and Psychological Health, Perseverance, Ethics, Continuous Learning, Artistic Appreciation, Leadership, Responsibility and Adaptability/Life Skills (Schmitt, et al., 2009). These results must be interpreted cautiously. First, each study used different instruments to define noncognitive predictors. Second, the student populations sampled were different across studies. Some were with at-risk students (Matteson, 2007; Richard & Sullivan, 1994) and the rest were not (Britton & Tesser, 1991; Pickering, et al., 1992; Schmitt, et al., 2009; Spitzer, 2000). Also, different instruments were used to measure noncognitive predictors. What makes this group of studies different from the previous group of studies reviewed is that some did not find any cognitive predictors significant of academic success (Britton & Tessor, 1991; Richard and Sullivan, 1994; Spitzer, 2000), and for those that did (Pickering et al., 1992; Matteson, 2007) they found high school GPA as significant in predicting college success, not standardized test scores. The exception to this was Schmitt, et al, (2009) who found standardized test scores predicted cumulative college GPA, but none of the other outcome variables.

The next sections will continue to discuss noncognitive predictors of academic success in college; however, these studies all have used the Noncognitive Questionnaire (NCQ), an instrument developed by William Sedlacek. This is the only group of studies identified investigating noncognitive predictors over decades using the same instrument and variables. The next section will give a brief history about the noncognitive questionnaire and will review a selection of studies that have utilized the NCQ.

History of the Noncognitive Questionnaire (NCQ)

William Sedlacek has performed a substantial amount of research regarding noncognitive variables of academic success for what he terms "nontraditional students" (Lanham et al., 2011). Although in higher education the label of nontraditional students typically connotes students who do not begin college directly after high school, Sedlacek (2004) used the term nontraditional to describe individuals whose cultural background and experiences are quite different than those in the dominant group. Sedlacek reasoned that, "if a group experiences prejudices and demonstrates abilities in ways differing from those with traditional experiences, it is useful to define that group operationally as nontraditional" (Sedlacek, 2004, p. 5). Over the years, he has developed a Noncognitive Assessment Model (NAM) that contains eight noncognitive variables that are predictors of academic performance for underrepresented populations. These eight variables include Positive Self-Concept, Realistic Self-appraisal, Ability to Successfully Handle the System, Preference for Long-Term Goals, Availability of a Strong Support Person, Leadership Experience, Community Involvement, and Knowledge Acquired in a Field. Based on this model, the Noncognitive Questionnaire (NCQ) was developed. The NCQ consists of 29 items as follows: Six items are demographic questions and are not part of

the scoring of the instrument; eighteen items are Likert-type statements that are to be rated on a 1 to 5 scale; two items are multiple choice questions that pertain to educational expectations; and three are open-ended items that relate to goals, accomplishments, and leadership positions held. Tracey and Sedlacek (1984) demonstrated internal consistency for all eight variables with Cronbach's jAlpha estimates ranging from .73 to .90 for the NCQ variables (Sedlacek, 1999). He and others have performed many studies regarding the effect of noncognitive variables on the academic success of nontraditional students (Ancis & Sedlacek, 1997; Fuertes & Sedlacek, 1994; Fuertes & Sedlacek, 1995; Noonan et al., 2005; Sedlacek, 1999, 2003, 2004; Sedlacek & Adams-Gaston, 1992; Tracey & Sedlacek, 1984). It also has been used in the context of admissions, awarding financial aid and scholarships, first-year seminars, curriculum change, advising and counseling, and evaluating/designing campus programs. Indeed, such organizations such as the Gates Millennium Scholars use it, as well as college campuses such as East Carolina School of Dental Medicine and Oregon Coast Community College. While the review of the use of the NCQ in all of these arenas is beyond the scope of this dissertation, the next study will review studies in which NCQ was used in the context of predicting academic performance of college students.

Studies Employing the Noncognitive Questionnaire (NCQ)

Tracey and Sedlacek (1984) conducted a foundational study to examine the construct validity and predictive validity of seven noncognitive predictors of academic success that had been put forth by Selacek and Brooks (as cited in Tracey & Sedlacek, 1984). These predictors included positive-self-concept, realistic self-appraisal, understanding of and ability to deal with racism, preference for long-term goals, availability of a strong support

person, successful leadership experience, and demonstrated community service. Two cohorts of freshmen, one-year apart, took the NCQ. The sample for each cohort was comprised of those freshmen who took the NCQ and for whom SAT scores were available. This resulted in 1,529 students (1339 white and 190 black) in the first cohort, and 444 students (355 white and 89 black) for the following year's cohort. The construct validity of the NCQ was examined using factor analysis which resulted in support for six variables (leadership, understanding of and ability to deal with racism, realistic self-appraisal, preference for long-term goals, self-confidence and support for college plans). The predictive validity was examined using multiple regression analyses for first-semester, third-semester, and enrollment status for black and for white students (a total of eight multiple regressions). The results revealed that there was a significant increase in the prediction first-semester, third-semester, and enrollment status for black and white students when the NCQ items were added to SAT scores. NCQ was found to be more predictive of first-semester grades for white students than for black students in both cohorts. This was a foundational study upon which multitudes of research has been based. The instrument evolved and currently is comprised of eight scales versus the seven that were identified in this early study (Tracey & Sedlacek, 1985). The use of the NCQ has been broadened to include prediction of academic performance on a multitude of nontraditional populations of college students.

The NCQ has been used to predict the academic success of student athletes. Sedlacek and Adams-Gaston (1992) sought to compare the SAT and noncognitive variables as predictors of academic success for this population of students. One hundred and five incoming freshman athletes in a NCAA Division I athletic program completed

the NCQ during their freshman orientation. The racial composition of the sample was 80 percent white, 15 percent black and 4 percent Hispanic. The internal consistency for the NCQ ranged between .73 and .90 for the eight scales. A step-wise multiple regression analysis was performed on the variables in the NCQ and the SAT. Significant predictors for first semester grades included strong support person, community involvement, and positive self-concept. The SAT was not significant. The authors conclude that the SAT is a poor predictor of first-semester grades for student athletes. This study is introduces athletes as a nontraditional population and supports that this population's first-semester GPA cannot be predicted by traditional cognitive means.

The NCQ has been used to predict the grades and retention rate of Asian American students (Fuertes & Sedlacek, 1994). Random samples of Asian American freshmen took the NCQ at orientation at the beginning of each semester over a 10-year period. In total, 431 students made up the sample with 58 percent male and 42 percent female. The NCQ scales and SAT Verbal and Math scores were the independent variables with college cumulative GPA as the dependent variable. Cumulative GPA and retention status were checked at semester 1, 3, 5, and 7. A step-wise multiple regression analysis was used to predict GPA. Furthermore, multiple discriminant analysis was used to predict retention over seven semesters. For this population, the SAT Math was found to be the best predictor of GPA; however, self-concept, realistic self-appraisal and community service were good predictors for GPA in students' first-, third-, and fifth-semester cumulative GPA. Nontraditional knowledge (the variable that is currently known in the NCQ as Knowledge Acquired in a Field) was found to be a good predictor of students' third and fifth semester cumulative GPAs. Regarding retention status,

Sedlacek and Fuertes found that, in the fifth semester, all of the predictors were significant; however, in the seventh semester, handling racism was related to retention but the variables of leadership, self-concept, and the SAT-V were not related to retention. The authors conclude that both cognitive and noncognitive variables are important predictors for Asian American students. Furthermore, this group of students does share characteristics of other nontraditional student groups. The strength of this study is that the authors gathered data for this group of students over a 10-year period and used a rigorous statistical analysis. . Overall, this study further supports the NCQ as a valuable predictor of student success and persistence in addition to traditional cognitive measures.

The NCQ has also been used to predict the academic success of female students. Although female students are not considered nontraditional, studies have shown that the SAT under predicts women's academic performance in college (Kobrin, et al., 2007; Leonard & Jiang, 1999; Rooney, 1998). In a longitudinal study, Ancis and Sedlacek (1997) administered the NCQ to a random sample of 1,930 female students during their freshman orientation program. The variables on the NCQ and SAT Math and Verbal were the independent variables. Cumulative GPA was the dependent variable and each student's GPA was checked in the first, third, fifth, and seventh semesters. Stepwise multiple regressions were performed. The NCQ variables were entered first with the SAT Math and Verbal subsequently entered. The authors recommend this method when exploring more established measures such as the SAT and less established measures such as the NCQ. Community service, realistic self-appraisal and nontraditional knowledge were found to be significant predictors of cumulative GPA in all semesters reviewed. Leadership experience predicted cumulative GPA in the fifth semester only and

availability of a strong support person predicted cumulative GPA in the seventh semester only. SAT scores predicted grades in all semesters.

Again, as in other studies performed with the NCQ, both cognitive and noncognitive predictors were found to be accurate predictors of academic success for nontraditional students. Interestingly, for this population in this study, both the SAT Verbal and Math scores went beyond predicting only first-year academic success but it also predicted academic success for all semesters reviewed. The strengths of this study were the large sample size and that it followed the same group of students throughout their college career. However, it is necessary to note that for all the variables in all the semesters, the SAT Verbal and Math scores each accounted for more variance then each of the NCQ variables. This study is of value as it does show that for traditional populations, the NCQ has predictive validity for student success. It also shows that a combination of cognitive and noncognitive variables together have predictive validity.

Ting (2003) conducted a longitudinal study using the NCQ to predict the academic success and retention of first-generation college students at a large public university. During new student orientation, 215 first-generation students completed the NCQ. Seventy-four percent of the students were white, 26 percent were students of color. The independent variables were the NCQ scales, SAT Math score, and the Admissions Index used by the university. The dependent variable was first and third semester cumulative GPAs. Step-wise multiple regression analyses were performed to predict both first- and third-semester cumulative GPAs for all first-generation students, then for all first-generation white students, and then for all first-generation students of color. For all students, coping with racism was a significant predictor for first-semester GPA.

Significant predictors of first-semester GPA were leadership experience and admission index for White students and SAT Math for students of color. To predict third semester GPA for both white and students of color, community service was significant. Additionally, the admission index was also significant for white students and the SAT Math was also significant for students of color. A discriminant analysis was performed on retention for this population of students and it was found that overall NCQ score was a significant predictor of retention for students of color their third, fifth, sixth, and eighth semester. The SAT Math was not a predictor of retention for first-generation students of color and the SAT Math and NCQ were not predictors of retention for first-generation white students. This study provides support that noncognitive variables are key predictors of retention for students of color most likely due to the additional challenges this group of students face in such as discrimination and lack of role models (Sedlacek, 2004). It also calls into question using the SAT alone as a predictor of retention for under-represented students. One of the strengths of this study was that it not only looked at first-generation students, but also broke down this population by race. This was important as obviously the differential analyses yielded differential results for the different groups. It also explored both retention as well as cumulative GPA. Both are compelling in predicting academic success and many of the previously reviewed studies only look at one of these variables. At the same time, this study was performed at a land-grant university with strong science and technology programs. The results may not be generalizable or may reflect students with especially strong math skills. Also, the variance of cumulative GPA that was explained for first and third semester for the different groups was relative small. Except for students of color with community service

and SAT Math accounting for 30 percent of the total variance of cumulative GPA the third semester, none of the other variables accounted for more than 21 percent of the total variance for cumulative GPA. However, this study continues to provide support that the NCQ can be a good supplement to traditional cognitive measures of academic success for under-represented groups of students.

Noonan et al. (2005) investigated the use of the NCQ to advise and select students applying for a health science program at a western community college. Traditionally for entrance into this program, cumulative GPA had been used. Two hundred, sixty-three students currently in the health sciences program at this community college took the NCQ. Scales of the NCQ were the independent variables and cumulative GPA was the dependent variable. SAT scores were not used as students did not need to take the SAT to attend the community college. Multiple regression analysis revealed community service, strong support person and, and leadership were, by far, the most important predictors of cumulative GPA. This study is unlike the others reviewed in so far as it was performed at a community college for the purpose of determining how noncognitive variables can assist in admission and advising for a program on that campus. It does provide support for noncognitive variables being used for this purpose; however, there were several weaknesses in the study. First, no demographic information on the sample was provided. The breakdown of the population in terms of gender, race and age are unknown nor were these variables controlled for. Age would be a particularly critical demographic as community college students are typically not always of traditional college student age. It would be interesting to know this information and to have included these variables in this analysis. Also, even though SAT data is not available for

community college students, HSGPA data may be so this would have been an important variable to include in this study. Also, the methodology section is very sparse so it would be difficult to replicate this study. It is also unknown how the sample was obtained. Was it a random sample from the health science program or did every student take it, and under what circumstances? Using the NCQ to predict success in admitting and advising students in a specialized program within a community college seems an compelling undertaking; further studies need to be performed to support the use of the NCQ in this manner.

Nasim et al. (2005) investigated the use of noncognitive indicators of academic success for African American students. The participants were 250 African American students from two historically Black colleges (118 students) and universities (HBCUs) and from two predominantly White institutions (PWIs) (132 students) in the northeastern and mid-Atlantic regions of the United States. These researchers wanted to determine if noncognitive predictors of academic success differed across HBCUs and PWIs as well as to determine which noncognitive predictors were the best at predicting academic success at HBCUs and PWIs. The students were administered the NCQ and the Multidimensional Inventory of Black Identity (MIBI). Independent sample t-tests were performed and significant differences were found between the means between type of college for high school GPA, Oppressed Minority (from the MIBI) and Understanding Racism, Academic Support Person and Long-Term Goals (from the NCQ). A second analysis was performed on the data. Two step-wise multiple regression analyses were performed for each institution type. The independent variables included noncognitive variables (from the NCQ, block 1), racial ideology variables (block 2) from the MIBI,

and cognitive variables (high school GPA and SAT score; block 3). College cumulative GPA was the dependent variable. For students attending the PWIs, Understanding and Dealing with Racism and Availability of an Academic Support Person (from the NCQ), Humanist racial ideology variable (from the MIBI) and high school GPA accounted for 31 percent of the variance in cumulative GPA. Of those, Understanding and Dealing with Racism accounted for16 percent of that variance. For students attending the HBCUs, Positive Self-Concept (from the NCQ) and high school GPA accounted for 21 percent of the variance in cumulative GPA. Of these two variables, Positive Self-Concept accounted for 12 percent of that variance. Besides high school GPA, no other variables generalized across the two types of institutions. Standardized tests did not significantly account for variance in college GPA for this group of students. The authors concluded that institutional context does differentially affect the noncognitive predictors of academic success for students of color at either PWIs or HBCUs.

This study is methodologically sound, used instruments with well-established validity and reliability, and used a large sample size of participants. It supports that traditional, cognitive variables of academic success were not good predictors for this population of students. It also sheds light on how noncognitive predictors may vary across institutions.

Adebayo (2008) examined the ability of cognitive and noncognitive measures in predicting the academic success of students who were admitted to a Conditional Admission Program at a university. To be regularly admitted to the university, students had to have completed 16 units of college preparatory curriculum, have the required scores on a standardized test, and have a designated combined index score (based on high

school percentile rank, class size, and the national percentile rank of the ACT score). The conditional admission program was for students who did not meet these criteria, yet showed strong credentials in other areas such as high school GPA or standardized test score. In the 2006 school year, 2,601 were admitted to university, of those, 147 were admitted through the Conditional Admissions program. Seventy-eight percent of students were white and 11 percent were African American. The author did not state what racial identification the other 11 percent were. Of the conditionally admitted group, 143 students completed the NCQ in the fall of their freshman year in order to determine if cognitive or noncognitive variables are better predictors of success for the conditionally admitted students. The cognitive variables include cumulative first-semester GPA, high school class rank, ACT index score, and high school GPA. The noncognitive variables were the eight noncognitive dimensions on the NCQ. A stepwise multiple regression analysis revealed that high school GPA and two of the noncognitive variables, Self-Appraisal and Understanding and Coping with Racism were found. These two noncognitive variables along with high school GPA, accounted for 21 percent of the variance in the prediction of first-semester grades in college whereas high school GPA alone accounted for 14 percent of the variance. The authors conclude that more emphasis should be given to high school GPA than the other cognitive variables and that a new admission index be developed to include the significant noncognitive variables.

This study continues to support that, in general, noncognitive variables enhance the predictive power of certain cognitive variables, i.e., high school GPA and, in particular, the NCQ provided an additional source of variance in the academic success of nontraditional students. Gathering cumulative college GPAs at the end of students' first,

second, and third years determine if other variables of the NCQ became predictive of academic success at later points in the students' academic careers would have added value to the study. Also, since this study was only limited to a single group of conditionally admitted students, administering the NCQ to other cohorts or similar groups of student at other colleges might yield more informative, comparaitve results. Finally, it is curious that out of a group of students, 78 percent of which were white, the variable Understanding and Coping with Racism was significant. It would have been helpful if the author addressed this issue and/or described the 11 percent of the participants for which a race was not defined.

Ting (2009) examined the impact of noncognitive variables of academic success and persistence among students who were first-year National Collegiate Athletic Association (NCAA) Division I athletes. Although Sedlacek and Adams-Gaston (1992) performed a similar study with college student athletes, Ting (2009) points out that a regression was not performed in this study, only a Pearson zero-order correlational analysis. Also, student persistence was not studied and academic performance was only measured after their first semester in college. Ting has deepened this area of research with his study. This study took place at a southeastern college in the United States with freshmen who were attending an NCAA Division I public university. A total of 109 students participated. The categories of athletes included those from football, basketball, tennis, swimming, and baseball. The Noncognitive Questionnaire (NCQ) was administered to the students at the beginning of their freshman year. The eight scales of the NCQ were the noncognitive, independent variables. The SAT scores on math and critical reading were the cognitive, independent variables. Dependent variables were cumulative college

GPA from fall and spring of the students' first semester and registration status (intent to register for or drop out of college the students' second year of school).

A stepwise multiple regression analysis was conducted. All eight NCQ scale scores were put into the equation first. The SAT-math and the SAT reading scores were input next. Ting (2009) stated that Tracey and Sedlacek recommend this procedure when a less-established measure like the NCQ is used with a well-established measure such as the SAT. For first-semester grades, it was found that Acquired Knowledge in a Field, Demonstrated Community Service, and SAT-math scores significantly contributed to the variance. For second-semester GPA, Positive Self-Concept, Preference for Long-Term Goals, and SAT-math scores significantly contributed to the variance. For the outcome variable of Intent to Persist, only Acquired Knowledge in a Field was found to be a predictor. This study supports that noncognitive variables add predictive value to variables that contribute to student academic success. Additionally, it supports the use of the NCQ as a measure that can be successfully used with nontraditional populations.

Lanham et al. (2011) investigated the use of noncognitive variables to predict graduation for African American students who graduated from a historically black university (HBU) in southern Texas. The participants were 126 African American and one Hispanic student who completed Sedlacek's NCQ as part of the process when registering for placement in the residence halls their freshman year. The researchers were seeking to discover if noncognitive variables would correlate with college success (as defined by graduation), if noncognitive variables would improve the predictive accuracy of the traditional cognitive predictors such as high school GPA and standardized test scores, and if noncognitive variables would be better predictors for African American

students at an HBCU. The independent variables were the eight noncognitive variables of the NCQ as well as several other noncognitive variables which included college hours earned, college hours attempted, college hours attended, gender, race, and major (a complete list of these were not included in the article). Cognitive independent variables that were included were SAT, ACT, high school GPA and college GPA. A correlational analysis showed that college hours earned, college hours attempted, college hours attended, and college GPA were correlated with graduation. ACT and SAT had a weak negative correlation with graduation. All scales of the NCQ had a weak positive correlation with graduation except for "Availability of a Strong Support Person" and "Demonstrated Community Service." Additionally, a block-entry, forward step logistic regression analysis was used to analyze the data and it was found that none of the noncognitive items from the NCQ held predictive value for graduation for the participants. The authors report that only HSGPA seemed to approach a level of significance in predicting college graduation however it did not quite reach it. The authors conclude that ACT and SAT scores for minority students are not adequate predictors of academic success (graduation) for college students; however, HSGPA is. They also suggest that the NCQ appears to be a weak predictor of academic success for minority students. Although this study does provided limited support for the NCQ and noncognitive variables, there are several problematic issues with it. First, several of their noncognitive variables (college hours earned, college hours attempted, college hours attended, and college GPA) have extreme multicollinearity so it is impossible to separate their individual effects. The authors do note this. Another issue is the authors did not find any truly significant statistical results so their suggestions about the predictive value

of their independent variables rests on *near* significant results. It is noteworthy that graduate has not been used as the dependent variable in any of the prior studies reviewed. It is possible that the noncognitive variables in this study have less impact Regardless, it is of note that the NCQ is an instrument that is being used in current research.

Although this review of the literature using the NCQ to predict cumulative GPA and retention does not cover all studies performed in this area, it is representative of its use on a broad range of student populations including black students (Nasim et al., 2005; Tracey & Sedlacek, 1984), student athletes (Sedlacek & Adams-Gaston, 1992), Asian Americans (Fuertes & Sedlacek, 1994), females (Ancis & Sedlacek, 1997), first-generation college students (Ting, 2003) and community college students (Noonan, et al., 2005). In most of the studies, particular scales of the NCQ were predictive of college student cumulative GPA or retention at differing point in students' academic careers, often more so than the SAT later in students' academic careers (Fuertes & Sedlacek, 1994; Ancis & Sedlacek, 1997). At the same time, the SAT held no predictive validity of college cumulative GPA in one study (Nasim, et al., 2005). However, in many studies, SAT still remained an important predictor of college cumulative GPA for these groups of students. Often there was enhanced prediction of college GPA and retention resulted from the use of both the SAT and the NCQ variables together (Ancis & Sedlacek, 1997; Ting, 2003; Tracey & Sedlacek, 1984). This was not so much the case for the prediction of retention. The NCQ seemed to be better able to predict long-term retention than the SAT alone (Fuertes, 2003; Ting, 1994). One glaring omission in the NCQ studies reviewed in this section is that only three (Adebayo, 2008; Lanham, 2011; and Nasim, 2005) of ten of them used HSGPA as an additional cognitive variable. Since HSGPA

tends to account for the most variance in college performance in many studies (Astin et al., 1987; DeBerard, et al., 2004; Lawlor, et al., 1997: Tross, 2000), this would have been an essential predictor variable to have included. In summarizing the literature review regarding studies conducted on the NCQ, the NCQ adds value to the prediction of college student performance.

Predictors of Academic Success for College Students with Learning Disabilities

One group of students that could also be considered nontraditional on the college campus is those students with learning disabilities. Sedlacek (1996) defined a nontraditional group as one that experiences prejudice. He defines prejudice as, "some negative attributions or consequences of being a member of a certain group" (p. 200). In fact, McQuilkin, et al., (1990) surveyed students about their attitudes toward individuals with disabilities and found that this sample of student saw those with disabilities in an unfavorable light. This is consistent with the findings of Beilke and Yssel (1998) who conducted a qualitative study with students with a variety of disabilities. These students, especially those students with hidden disabilities such as learning disabilities, reported hostility from faculty and prejudicial attitudes from students. Furthermore, in a more recent study, May and Stone (2010) found that both LD and non-LD participants believed that the general public thought students with learning disabilities had lower intelligence that those without disabilities. For those that did not believe students with learning disabilities had lower intelligence, it was found that a portion of them believed having a learning disability was an insurmountable problem and/or that students with learning disabilities take advantage of the system. Although this group can indeed be viewed as nontraditional, no studies to date have been performed with them using the NCQ. At the

same time, there have been studies performed on variables related to the academic success of college students with learning disabilities. This section will outline those studies.

Vogel and Adelman (1990) performed a descriptive study on individuals with and without a learning disability. Participants were 110 college students with learning disabilities and 153 college students without learning disabilities. The two groups were compared on high school experiences, ACT scores, college GPA and college graduation rates. The low correlation of ACT subtest scores and college exit GPA for students with learning disabilities indicated that ACT scores were not good predictors for this population of students; however, the ACT score was correlated to college exit GPA for students without learning disabilities. Also, the two groups differed in high school experiences. In particular, English and math courses were examined for these two groups and it was found that students with learning disabilities tended to have lower scores in these courses. As far as college performance was concerned, the students with learning disabilities tended to have lower college GPAs than those students without learning disabilities but there was no significant difference in college graduation rate between these two groups. These researchers recommend that ACT scores or other such standardized test scores be supplemented with nonacademic information for careful analysis when applications from students with learning disabilities are being reviewed for college admission. This study is compelling as it compares performance of students with and without learning disabilities prior to and during college and it is one of the first studies performed that indicated standardized entrance exams may not be the best predictor of college performance for students with learning disabilities.

In a later study, Vogel and Adelman (1992) analyzed the records of 62 college students with learning disabilities to a matched sample 58 students without learning disabilities at a small, private, competitive Midwestern college to examine these students' educational attainment and determine the role the ACT played in predicting college student success. All students had attended the college for at least one semester between 1980 and 1988 and were between the ages of 18 and 25. College GPA was compared for each group at the end of each academic year and upon graduation from college. No significant differences were found in GPA at the end of any of the academic years but the LD students demonstrated a slightly higher GPA upon leaving college. Furthermore, when ACT scores were compared to college graduation GPA, there was almost no correlation for students with learning disabilities and a slight correlation for student without learning disabilities. In viewing their high school transcripts, the authors found that high school English courses with a grade of C or better predicted college GPA better than any other predictor. The authors conclude that the ACT was not a valid predictor for academic success for students with learning disabilities. The authors conclude that the ACT was not a valid predictor for academic success for students with learning disabilities. The implication for these two studies (Vogel & Adelman, 1990 and Vogel, 1992) indicate that traditional academic factors that are used to predict success in the general college population do not seem to be fully applicable in special populations of students, e.g., students with learning disabilities.

Wilczenski and Gillespie-Silver (1992) performed a study to determine whether SAT scores and high school percentile rank in class are good predictors of college for success for students with and without learning disabilities. The sample was 428 students

(179 with learning disabilities and 249 without) who attended a large, competitive, public university in the northeastern part of the United States. Comparative and predictive analyses were performed. The comparative analysis was performed using SAT scores, high school rank, and first year college GPA for each group at the end of students' freshman year and upon graduation from college. Although SAT scores, high school rank, and first year college GPA for group of students with learning disabilities was approximately .5 standard deviations lower than those without learning disabilities at the end of their freshman year, there was no significant difference in cumulative college GPA upon graduation. For the predictive analysis, a stepwise multiple regression was performed with SAT-V, SAT-M and high school rank as the independent variables and first-year college GPA as the dependent variable. The analysis revealed that for the low-achieving students with learning disabilities, high school percentile rank predicted their academic performance but SAT did not assist in the prediction of academic performance for this group. However, for high-achieving students with learning disabilities, high school percentile rank under predicted their academic performance while SAT-V score added to the prediction of academic performance. For students without learning disabilities, high school rank tended to over predict academic achievement and the SAT-V slightly added to the prediction of academic performance. This study is aligned with those that have shown support for the premise that standardized test scores are not good predictors for nontraditional students. The significance of this study is that the authors show support that the under prediction of college academic performance for students with learning disabilities can mislead college admissions officers to denying admissions for students with learning disabilities that are otherwise qualified to attend the university, a

premise discussed in Chapter 1. This study provides evidence that for some students with learning disabilities, traditional cognitive predictors of academic success may be misleading.

Ashton-Coombs (1993) investigated the noncognitive variable of work habits (related to academics) to determine its contribution to the academic success of 25 college students with learning disabilities registered with the Disabled Student Services office at California State University, San Diego. The author interviewed the students using a 10-item questionnaire that the authors adapted from a list in a study by Salend and Salend (1996). The section was entitled Exhibits Appropriate Work Habits and assessed such work habit competencies (mentioned below). The questions were presented to each student in person during an interview. The questions were closed-ended and students either provided a yes or a no answer. The authors stated that the students answered only 4 of the 10 questions positively. These included if the student attended class regularly, brought the necessary materials with them, completed their homework, and paid attention in class. Fifty-six percent of the students admitted beginning assignments promptly and the ability to remember more than one direction at a time. Forty-eight percent admitted giving up easily on difficult tasks. Forty-four percent felt comfortable asking their professors for help and only 28 percent were able to explain to teachers or tutors how they can best be helped with class assignments. The students also rated themselves from 1 to 10 on the quality of their study skills. Twenty-two out of twenty-five student felt they had a medium level of study skills and three felt they had a high level of study skills. The author suggests that one of the problems that students face in college with learning disabilities is their lack of acquired study skills. This study is valuable in that it explores

what could be a very significant variable that contributes to the success of college students with learning disabilities. If these authors would have gathered HSGPA, cumulative college GPA, standardized entrance exam data for the participants in order to compare this data to participants' responses to the questionnaire, important data related to the academic performance of this group of students may have emerged. However, this was most likely not possible as the sample size was very small and the authors did not calculate validity or reliability data for the questionnaire. The study does provide a stepping stone for further exploration of the study habits of college students with learning disabilities.

Ryan (1994) performed a comparative study of college freshmen with and without learning disabilities using behavioral and affective characteristics to determine life adjustment characteristics. The study took place at a community college in the Midwest and 72 students participated (39 were students with learning disabilities and 33 were students without learning disabilities). There were four surveys designed for this study and they were field-tested before administered to the students. The four areas which were questioned included motivations for attending college, perceptions of academic adjustment, perceptions of social adjustment, and expectations for academic achievement and the students answered these surveys at the beginning of the fall, winter and spring terms. A chi square analysis was performed on the data. Findings revealed that there were no differences any term between the students with and without learning disabilities in motivations for attending college or expectations of social or academic adjustment. However, students' with learning disabilities expectations of academic success were significantly more negative at the beginning of each term than students' without learning

disabilities expectations even though there were no differences between either groups' self-reported GPA. In terms of the debate of cognitive and noncognitive predictors of academic success for college students with learning disabilities, this study found that even though this group of students may experience more trepidation about their future grades, this did not impact their actual GPA which was equivalent to their nondisabled peers.

On a different note, Keim, McWhirter and Bernstein (1996) were interested in determining if the use of academic support services was related to the academic success for college students with learning disabilities. The participants were 125 students with learning disabilities registered with the support services office at a large southwestern university. The independent variables included the number of times students were advised, number of hours students used the computer laboratory in the support services office, the number of hours students were tutored, number of test accommodations used and class standing. The dependent variable was cumulative college GPA. The students were separated into three groups of those who did not use services, those who were low utilizers and those who were high utilizers. ANCOVAs were performed on each of the variables. It was determined that students who had a lower number of contact hours with their advisor and a higher number of hours using the computer laboratory had higher GPAs than those who had a higher number of contact hours with their advisor and lower number of hours using the computer laboratory. There were not significant results for tutoring or test accommodation variables and no interactions occurred for class standing and the other variables. This study explored a set of noncognitive variables that has not been discussed up until now: that of seeking specialized support services. Indeed this set

of noncognitive variables is a subset of adaptive skills that can impact the academic performance of college students with learning disabilities and reflects an aptitude of students to understand the system when it comes to receiving support for their learning disabilities. While these noncognitive variables were not compared with pre-college predictors, this study does provide some substantiation for their importance.

Murray and Wren (2003) examined cognitive, academic, and attitudinal predictors of academic success of college students with learning disabilities. The participants were 84 students diagnosed with a learning disability and receiving support services at who a large private university in the Midwest. The independent variables were high school GPA, academic achievement (according to the Wide Range Achievement Test-Revised (WRAT-R) that assesses written language and mathematics skills), cognitive ability (full-scale IQ, performance IQ and verbal IQ as assessed with the Wechsler Adult Intelligence Scale—Revised (WAIS-R), and the four scales on the Survey of Study Habits and Attitudes (SSHA) which include Delay/Avoidance (of studying), Work Methods (related to student planning and work habits), Teacher Approval (related to students perceptions of their instructors), and Educational Acceptance (related to student acceptance of their academic tasks). College GPA was the dependent variable. A step-wise multiple regression was performed and the results revealed that full-scale IQ and Delay/Avoidance were significant predictors of college GPA accounting for 14 percent of the variance in college GPA.

In this study, the Delay/Avoidance scale was a better predictor than HSGPA; however, standardized test scores were not included in the model, and these scores do have limited support in the literature for accounting for some variance in college GPA

(Wilczenski & Gillespie, 1992). Interestingly, the use of intelligence test and achievement test scores was a departure from other variables in studies previously discussed in this literature review until now, but they are variables that are not going to be easily accessible to most investigators. Additionally, these researchers should have also included standardized test scores to determine their contribution to the variance in college GPA. Regardless, this study's merit is that it examined predictors of college GPA across a wide range of variables (cognitive, academic and attitudinal). This study is aligned with similar studies that have supported the contention that noncognitive may have better predictive value in the prediction of college performance than the traditional cognitive predictors for college students with learning disabilities.

Summary

The research on factors of success for college students with learning disabilities is inconclusive. The studies vary widely in the types of independent and dependent variables that are used as well as the analyses that are used. Of the studies reviewed, only three studies looked at traditional cognitive predictors of college success. Vogel, (1992) and Vogel and Adelman (1990) explored ACT and college GPA and Wilczenski and Gillespie-Silver (1992) explored SAT and college GPA. All three of these studies did not find standardized test scores as the best predictor of academic success for college students with learning disabilities. At the same time, they used very few and only cognitive variables in their studies. The rest of the studies looked at a variety of potential predictors of success such as study habits (Ashton-Coombs, 1993; Murray & Wren, 2003), accommodations (Keim, McWhirter & Bernstein, 1996), attitudes (Ryan, Nolan, Keim, & Madsen, 1994) and nontraditional cognitive factors (IQ score). None of the

studies looked at other demographic factors such as race or SES. Furthermore, none of them applied the NCQ to college students with learning disabilities.

Based on the review of prior research presented in this chapter, applying the NCQ on this population of students would fill a gap in the literature. Using the NCQ, which has been widely used with marginalized populations, could provide a new framework with which to view predictors of academic success for students with learning disabilities. College students with learning disabilities are considered a marginalized population. They face challenges above and beyond students without disabilities at the postsecondary level. Due to the severity of these issues and the growing population of students with learning disabilities attending college, it is essential that appropriate predictors of academic success be used in assessing college potential for students with learning disabilities (Brinckerhoff, Shaw & McGuire, 1992; Brinckerhoff, 1994, 1996; Dalke & Schmitt, 1987; Hadley, 2006; Izzo & Lamb, 2002; Lewis, Farris, & Greene, 1999). Furthermore, student affairs practitioners have a responsibility to diverse groups of students that can benefit from higher education (Hall & Belch, 2000). Therefore, it is critical that noncognitive variables of academic success be explored as potential predictors for academic success for college students with learning disabilities.

This chapter has provided a brief review on this history of traditional, cognitive predictors of academic success for college students. Next, it reviewed the manner in which cognitive variables are used today and studies that support cognitive variables to predict academic success in college students. It also examined studies that show support of noncognitive predictors of academic success of college students. Furthermore, a discussion was provided of Sedlacek's (2004) NCQ and the NAM model from which it

was derived. Finally, this chapter examined studies of predictors of academic success for college students with learning disabilities. The next chapter presents the method that will be used to perform the study. Participants, recruitment, the instrument, the procedure, the design and data analysis procedures will be included in the next chapter.

Chapter 3: Methodology

This chapter describes the research methods implemented in this study to investigate variables that contribute to the academic performance of college students with learning disabilities. First, the purpose of the study will be reviewed and the research questions will be delineated. Next, the cognitive and noncognitive measures are described, as well as additional materials used. Following is a description of the participants and settings, with the procedures subsequently detailed. Finally, an overview of the data analyses is included.

Purpose of the Study

The purpose of this study was to investigate if there are differences in how cognitive and noncognitive variables predict academic performance for college students with learning disabilities. This study used Sedlacek's (2004) Noncognitive Assessment Model as a conceptual framework to examine the extent to which the cognitive variables of High School Grade Point Average (HSGPA) and SAT (combined verbal and math) or ACT score, as well as the noncognitive variables of: Positive Self-Concept, Realistic Self-Appraisal, Understands and Deals with Discrimination, Preference for Long-Range Goals to Short-Term or Immediate Needs, Availability of a Strong Support Person, Successful Leadership Experience, Demonstrated Community Service, and Knowledge Acquired in a Field from the Noncognitive Questionnaire (NCQ, Sedlacek, 2004), contribute to any variance in cumulative college grade point average at the end of students' freshman, sophomore and junior years of college.

This study adds to both the research on predictors of academic performance for students with learning disabilities as well as the research on the usefulness of

noncognitive variables to predict the academic performance of college students. There are numerous studies that employ various instruments to examine the predictors of academic performance for college students with and without learning disabilities, as well studies that examine the noncognitive predictors of academic performance for college students using the NCQ; however, to date, there are no studies that have used the NCQ to predict the academic performance of college students with learning disabilities.

Research Questions

The framework of this investigation is undergirded by the following research questions:

1. To what degree do traditional, cognitive (academic) indicators predict college grade point average at the end of the freshman, sophomore, and junior year for students with learning disabilities based on:
    a. High school GPA (HSGPA) alone?
    b. SAT (combined Verbal and Math) or SAT equivalent alone?
    c. High school GPA (HSGPA) and the SAT (combined Verbal and Math) or SAT equivalent used as joint predictors?
2. To what degree do noncognitive variables predict college grade point average at the end of the freshman, sophomore, and junior year for students with learning disabilities?
3. To what degree do noncognitive variables add to the prediction of college grade point average at the end of the freshman, sophomore, and junior year for students with learning disabilities based on:
    a. HSGPA alone?

b. SAT (combined Verbal and Math) alone?

c. HSGPA and SAT (Verbal and Math) as joint predictors?

Design

As the goal of this study was to investigate if cognitive and noncognitive variables predict academic performance for students with learning disabilities, a simple descriptive, correlational design was used in order to determine if the independent variables of SAT, HSGPA, and the eight scales of noncognitive variables from the NCQ contribute to any variance in cumulative college grade point average (CCGPA) at the end of each students' freshman, freshman and sophomore, or freshman, sophomore and junior years of college, which are the dependent variables. Because these variables cannot be manipulated by the investigator, this study is considered nonexperimental research (Lomax, 2001). Multiple regression was chosen as the statistical analysis to analyze the relationship between the dependent and independent variables for each of the research questions. Multiple regression allows multiple variables to be combined to make the best predictions about the dependent variable. It also allows for the effects of the independent variables to be separated so that the unique contribution of each variable can be examined (Lomax, 2001). In particular, in hierarchical regression, the researcher chooses the order of entry. Typically, the first variable entered is the one accounting for the most variance in the independent variable, the next variable entered is the one accounting for the next largest amount of variance in the independent variable, and so on (Lomax, 2001). Because there is an established body of research that supports that high school grade point average (HSGPA) and standardized test scores account for the largest portion of variance in CCGPAs (Astin et al., 1987; Beck & Davidson, 2001; Camara & Echternact,

2000; Deberard, 2004; Lawlor et al., 1997; Nauman et al., 2003; Noble & Camara, 2003; Tross, 2000), it was important that the variables in this study be entered into the equation in the same manner. This method would also ensure that any variance contributed by the noncognitive variables was above and beyond that of the cognitive variables (Lomax, 2001).

Participants

The participants in this study were undergraduate students who had a documented a learning disability and were registered with the disability support office at a large, public flagship university (Setting 1) or an academic support center at a mid-sized, private university (Setting 2), both of which are located in the Mid-Atlantic region of the United States.

Settings. The participants for this study were recruited from two universities in the Mid-Atlantic region. Upon meeting with personnel from the offices on each of the campuses that work with students with learning disabilities, it was discussed and suggested that more than one university campus be used to recruit participants. This is due to the fact that past researchers have typically received a poor response rate from this particular group of participants (personal communication, Jo Hutchinson, 9/14/2011; personal communication, Kathy Schwartz, 2/8/2011; DaDeppo, 2007). Therefore, two settings were chosen from which to recruit participants. These two settings were selected as this researcher has professional connections to each of them that enabled this study to be performed. The following sections describe the settings of each of these universities.

Setting 1. Participants were recruited from a large, four-year research university situated in an urban/suburban area in the Mid-Atlantic region of the United States. It enrolls approximately 26,000 undergraduates and 10,000 graduate students. It offers 127 undergraduate majors and 112 graduate degrees. Ninety-three percent of new freshman live on campus and 42 percent of all undergraduates live on campus. Fifty-seven percent of the total student population is white, 15 percent Asian, 12 percent African American or Black, 7 percent Hispanic, 3 percent multi-racial, 2 percent international, less than 1 percent American Indian/Alaskan Native and 3 percent unknown. Men comprise 53 percent of the undergraduate population, while women make up 47 percent of the undergraduate population. The mean high school grade point average was 3.98 while the middle 50 percent for combined SAT was 1190 to 1390 for undergraduates. This setting is this researcher's home campus.

Setting 2. Participants were also recruited from a mid-sized, private, doctoral institution situated in an urban, residential area in the mid-Atlantic region of the United States. It enrolls approximately 13,000 undergraduates and 6,600 graduate students. Freshman enrollment fall of 2010 was 6,657. It offers 57 bachelor degrees and over 53 graduate degrees housed within six colleges and schools. The student body is cosmopolitan and globally diverse and is comprised of students from all over the United States and 146 other countries. Seven percent of undergraduates and 10 percent of graduate students are international. The middle 50 percent range of high school grade point averages for fall 2010 was 3.6 to 4.1. The middle 50 percent for combined SAT was 1220 to 1390 and for the ACT it was 27-31.

Access. This section describes how the participants at each setting were obtained. Although participants were obtained in a similar manner at each setting, the details for each setting slightly differ**.**

***Access to Setting 1*.** To obtain a sample of students with learning disabilities, a meeting was arranged with the assistant director of Disability Support Service at the large, public university to discuss the study and to get approval to invite students with a learning disability who were registered with this office to participate in this study. The assistant director received verbal approval from the director that an email invitation letter with a link to the NCQ could be sent to every student registered with the office who has a learning disability. The number of students in this group was approximately 600. After IRB approval was obtained for this study, a Counseling Center Research Committee application was completed, submitted, and approved before the study began**.**

***Access to Setting 2*.** To obtain a sample of students with learning disabilities, a meeting was arranged with the director of the academic support center at the mid-sized, private university to discuss the study and to get approval to invite students with a documented learning disability to participate in this study. The director discussed the study with the counselors of the center and approval was received that an email invitation letter with a link to the NCQ could be sent to every student registered with the office who has a learning disability. The number of students in this group was approximately 300. IRB approval was also obtained from the IRB office on this campus.

Sample. The sample of undergraduate participants with learning disabilities was recruited from the entire population of undergraduate students with a documented learning disability registered with the offices which serve these students at two

universities discussed above. The entire population of students with learning disabilities, which was about 900 (600 from Setting 1 and 300 from Setting 2), was invited to participate in this study in order to obtain as large a sample as possible.

Determination of Needed Sample Size. In order to determine the potential sample size needed to detect the degree to which the noncognitive variables can predict college performance above and beyond the cognitive variables in this study, a power analysis was performed. Power is the ability of a statistical test to detect the phenomenon or effect that is being investigated (Cohen, 1998). In other words, it is the probability of being able to reject the null hypothesis when it is false in order to not make Type I error. The complement to a Type I error is a Type II error, which occurs when a false null hypothesis is not rejected. Because the power of a statistical test is based upon the relationship between the statistical significance level (alpha), the number of participants, the effect size, and power, any one of these variables can be calculated when the three other variables are constant. Effect size is a measure of the magnitude of phenomenon being researched. So while statistical significance informs us that an effect has occurred, it does not inform us of the strength of that effect; effect size provides the strength of the effect. Cohen (1988) suggested that .35 is a large effect size, .15 is a medium effect size, and .02 is a small effect size. Therefore, before proceeding with a study, it is also important to determine the desired effect size and statistical significance level. As suggested by Cohen (1988) a power level of .8 is most commonly. Without enough power, a statistical test loses its ability to detect an effect size and could lead to a Type II error. For this study, a statistical significance level of $\alpha = .05$ was chosen.

An a priori power analysis was performed using G*Power 3.1. G*Power 3.1 is a power analysis software program designed to perform a variety of analyses in the social, behavioral and biomedical sciences (Faul, Erdfelder, Lang & Buchner, 2007). This tool was used to determine the appropriate sample size needed for this study. It was hoped that a medium effect size (.15) could be identified because the detection a small effect of the independent variables in the context of this study was not considered crucial in this exploratory study. Because the more variables that are in a multiple regression equation, the bigger the sample is needed, the research question which had the most variables was chosen to determine what the overall sample size for this study should be. Research Question 3c contained 6 variables in Block 1 and 8 variables in Block 2. This information was entered into G*Power 3.1 and it was determined that a minimum 46 participants were needed for an effect size of .35; a minimum of 98 participants were needed to obtain an effect size of .15, and a minimum of 688 participants were needed to obtain an effect size of .02. Therefore, the goal was to recruit a minimum of 98 participants for this study.

Demographic Information. For Setting 1, 24 percent of the population (146 potential participants) viewed or attempted to complete the survey. For Setting 2, 16 percent of the population (47 potential participants) viewed or attempted to complete the survey. For Setting 1, 14 percent (86 participants) of the population completed the survey. For Setting 2, 9 percent of the population (28 participants) completed the survey. This represents a 13 percent (114 participants) overall response rate. Unfortunately, 26 of these surveys were ineligible to be included in the study and had to be removed. Reasons for ineligibility included participants for whom no HSGPA and standardized test

score could be obtained, as well as those participants who had graduate student status, concurrent high school student status, post-baccalaureate student status, or students who had completed the survey more than one time. After removing ineligible participants, the final number of participants from both settings consisted of 88 participants, 62 from Setting 1 and 26 from Setting 2.

A descriptive analysis was performed to gather the demographic information of the sample. The majority of participants were from Setting 1 (72%), primarily white (63%), and the mostly female (70%). The range of ages of the participants was 18 to 24, except for 1 student who was 31. Over half the participants reported that their parents had received a graduate degree or higher and over 80 percent of the participants reported that both parents had graduated from college. Finally, the majority of participants were freshmen, sophomores, or juniors (82%) with only 16 seniors participating. Although it had been this researcher's intention to include seniors in the study, there were not enough seniors based on the minimum number required for sufficient power to include the seniors. Subsequently, only freshmen, sophomores and juniors were included in this study. Complete descriptive statistics for the sample are presented in Table 3.1.

Table 3.1

Demographic Information

	Both Settings		Setting 1		Setting 2	
	n	%	*n*	%	*n*	%
Gender						
Male	33	37.5	21	33.9	12	46.2
Female	55	62.5	41	66.1	14	53.8
Ethnicity						
African American	4	4.5	4	6.5	0	0
White	63	71.6	44	71.0	19	73.1
Asian	5	5.7	3	4.8	2	7.7
Hispanic	6	6.8	4	6.5	2	7.7
Multiracial	8	9.0	6	1.6	1	3.8
Other/Prefer not to say	2	2.3	2	9.7	2	7.7
Age						
18	1	1.1	1	1.6	0	0
19	24	27.3	17	27.4	7	26.9
20	22	25.0	14	22.6	8	30.8
21	24	27.3	17	27.4	7	26.9
22	11	12.5	8	12.9	3	11.5
23	3	3.4	2	3.2	1	3.8
24	2	2.3	2	3.2	0	0
31	1	1.1	1	1.6	0	0
Class Year						
Freshman	20	22.7	12	19.4	8	30.8
Sophomore	26	29.5	19	30.6	7	26.9
Junior	26	29.5	23	37.1	3	11.5
Senior	14	15.9	6	9.7	8	30.8
Senior 5th Year	2	2.3	2	3.2	0	0
SES Father's Level of Ed						
High School grad or less	5	5.7	5	.81	0	0
Some college	8	9.1	6	9.7	2	7.7
College graduate	29	33.0	23	37.1	6	23.1
Some Graduate School	2	2.3	0	0	2	7.7
Graduate Degree or Higher	44	50.0	28	45.2	16	61.5
SES Mother's Level of Ed						
High School grad or less	2	2.3	2	3.2	0	0
Some college	7	8.0	5	8.1	2	7.7
College graduate	30	34.1	23	37.1	7	26.9
Some Graduate School	4	4.5	2	3.2	2	7.7
Graduate Degree or Higher	45	51.1	30	48.4	15	57.7

Measures

This study contained three cognitive measures and a measure that included eight noncognitive variables. The eight noncognitive variables were scales from the Noncognitive Questionnaire (NCQ) (Sedlaceck, 2004) and are detailed in the next section.

Cognitive Measures. The three cognitive measures were standardized entrance exam scores from the SAT-I or ACT (an independent variable), overall high school grade point average (an independent variable) and cumulative college grade point average (CCGPA) (the dependent variable).

SAT I. The SAT I is a three-hour and 45-minute, standardized, multiple choice, college entrance exam that measures critical reading, mathematical reasoning and writing skills which is typically taken by junior and/or seniors in high school (Kobrin, Camara, & Milewski, 2004; SAT, 2011). The SAT I is taken under prescribed conditions and is administered and scored by the College Board (Noble et al., 2002; Rothstein, 2004). The scores of each of the sections of the SAT I range from a 200 to 800 point scaled score, with the total point score being 2,400. The results of the SAT I, in conjunction with high school GPAs and transcripts, are used by college admission officers to determine students' eligibility for admissions to a college or university (Bridgeman, Pollack, & Burton, 2008; Camara & Echternact, 2000). It also is used to predict first-year, college grades (Gayles, 2006). Prior to 2005, the SAT I did not contain the writing skills test, only the reading and mathematical sections with a total point score being 1,600. Most colleges today do not place the same value on the writing skills section of the test as they do on the reading and mathematical sections (Wertheimer, 2007). Due to this, only the

composite score of critical reading and mathematical reasoning sections were used as a cognitive independent variable for the purpose of this study.

ACT. The ACT is a standardized, 3 hour and 25 minutes college entrance exam. It is comprised of four multiple-choice tests on the topics of English, mathematics, reading and science and an optional writing test, the latter of which was added in 2005. The ACT is also taken under prescribed conditions and is administered and scored by ACT. Students receive scores for each of the tests that range from 1 to 36, as well as a composite score. The ACT, in conjunction with high school records, is also used to facilitate college admissions decisions (Noble, 2004). Often, students take the ACT in lieu of the SAT. In this study, if a participant did not take the SAT, but took the ACT, the composite ACT score was converted to an SAT score by using a concordance table designed for this purpose (see Appendix A). Admissions offices at colleges and universities regularly do this when evaluating admissions applications (College Board, 2009).

High School Grade Point Average (HSGPA). High school grade point average (HSGPA) is a number derived from dividing the amount of grade points earned for all classes by the total amount of credits a student attempted while in high school. HSGPA is the most common variable evaluated in college admissions decisions, typically in conjunction with standardized test scores (Camara & Echternacht, 2000; Tross et al., 2000). Also, HSGPA seems to be predictive of academic performance in college (Noble & Sawyer, 2004; Reason, 2003). High school GPAs can be weighted, based on a 0 to 5.00 scale, or unweighted, based on a 0 to 4.00 scale. A weighted high school GPA is a GPA in which additional points for honors, Advanced Placement (AP), or more rigorous

courses are given. Students who participate in this extra rigorous coursework can achieve much higher grades; however, not all high schools participate in weighted grading systems and those who do often have varying policies about which courses are weighted or when students can take weighted courses. This can result in inconsistency between students' high school GPAs, weighted or unweighted (Manzo, 1998). Because either all weighted or all unweighted HSGPAs were not available for every participant, an analysis was performed to determine if there were significant differences between the participants with weighted and participants with unweighted HSGPAs (described in more detail in the Data Analyses section at the end of this chapter).

Cumulative College Grade Point Average. Cumulative College Grade Point Average (CCGPA) is a number derived from dividing the amount of grade points earned for all classes by the total amount of credits a student attempted while in college. CCGPA is a measure of the academic performance of a college student and can range from 1 to 4.00. For the purpose of this study, CCGPA is the grade point average at the end of each student's freshman (FCCGPA), sophomore (SCCGPA), and/or junior (JCCGPA) year of college and is the criterion or dependent variable.

Noncognitive Measures. The NCQ was designed to examine eight noncognitive variables. Accordingly, there are eight scales to this instrument and they are described in the next sections. Sample items from each of the NCQ scales, see table 3.1.

Positive Self-Concept. This variable can be defined by confidence, strength of character and determination. A positive self-concept is important for all students; but, for students of color and other under-represented groups, it is especially important, as these students have to deal with a system that was not designed for them. They often

experience setbacks related to racial and cultural prejudices. Students who have a strong self-concept are better able to deal with these issues and persist through college. This scale consists of 5 items and the score that can be received on this scale ranges from 7 to 26.

Realistic Self-Appraisal. This variable relates to how a student views his or her abilities in order to monitor self-growth. Students of color and other marginalized groups often experience differential reinforcement from their environment; therefore, these students cannot rely on this feedback for accurate appraisal of the self. Therefore, if one can view one's strengths and weaknesses regardless of external reinforcement, one is more likely to be successful. This scale consists of 3 items and the score that can be received on this scale ranges from 4 to 14.

Understands and Deals with Racism. Students come into contact with many aspects of the campus while they are students. They deal with faculty and advisors, financial aid officers, administration, personnel from clubs and organizations, residence life staff and a whole host of others. The system can be difficult enough for traditional students but nontraditional students have the added burden of dealing with discrimination and racism on many of these fronts. Those students who understand the system and can identify with and combat racism are more likely to have a successful college experience. This scale consists of 5 items and the score that can be received on this scale ranges from 5 to 25.

Preference for Long-Range Goals. Again, this is an important predictor for all students, but even more so for nontraditional students. Often, this group of students has not had role models to pattern themselves after. Additionally, nontraditional students

tend to have a more intense adjustment period upon entering college must put much energy into dealing with adjustment issues. If students do not have long-term plans in place, they may not feel that these difficulties are worth the fight and, in turn, leave college. This scale consists of 3 items and the score that can be received on this scale ranges from 3 to 13.

Availability of a Strong Support Person. It is important that students have an individual or individuals who can provide knowledge and advice. This support system can be a family member, a mentor, or someone within the educational community. Because students of color and nontraditional students face additional barriers above and beyond those that white students face when coming to college, additional support is critical, especially from the perspective of someone of color. This scale consists of 3 items and the score that can be received on this scale ranges from 3 to 15.

Successful Leadership Experience. Nontraditional students and students of color who have leadership experience are more likely to be academically successful in college. They typically do not have as many supports built into the system but being able to take initiative to overcome adversity can counteract this issue. Sedlacek (2004) pointed out, however, that leadership experience does not need to take the same form that it takes with white students such as being a student body president or an office in a club. Being a leader within the family or through a religious organization can also provide leadership experience. Assertiveness, a trait that is associated with leadership, is critical. Because students of color often operate in a college system that was not designed for them, they may need assertiveness to seek out the resources that they need. This scale consists of 3 items and the score that can be received on this scale ranges from 3 to 13.

Demonstrated Community Service. It is important that nontraditional students and students of color be active in an organization or a group with which they identify. This can aid students in receiving support and assistance in negotiating obstacles they may face. Community experience is also related to variables previously mentioned such as handling the system, self-concept, and leadership experience. Because traditional students can more easily find support than students belonging to under-represented groups, this variable is not as powerful for them. This scale consists of 2 items and the score that can be received on this scale ranges from 2 to 8.

Knowledge Acquired in a Field. Under-represented students will have different experiences than traditional students, which may have contributed to knowledge that is not within the educational system. Therefore, students learning styles may be less traditional and more related to culture and gender. This knowledge can also be a foundation for further learning during their postsecondary years. This scale consists of 2 items and the score that can be received on this scale ranges from 2 to 6.

Table 3.2

NCQ Scales and Sample Items

NCQ Scales	Sample Items
Positive Self- Concept	My high school grades don't really reflect what can do.
	When I believe in something, I act on it.
Realistic Self-Appraisal	It should not be very hard to get a B (3.0) average at this school.
	I am as skilled academically as the average applicant to this school.
Understands and Deals with Discrimination	The University should use its influence to improve social conditions in the state.
	I expect I will encounter discrimination at this school.
Preference for Long-Term Goals	I get easily discouraged when I try to do something and it doesn't work.
	Once I start something, I finish it.
Availability of a Strong Support Person	If I run into problems concerning school, I have someone who would listen to me and help me.
Leadership Experience	In groups where I am comfortable, I am often looked to as leader.
Community Involvement	There is no use in doing things for people; you only find that you get taken advantage of in the long run.
Knowledge Acquired in a Field	Please list office held and/or groups belonged to in high school or in your community.

Crohnbach's Alpha. For this study, a Cronbach's alpha coefficient was calculated for each of the eight scales of the NCQ in order to determine their internal consistency. Cronbach's alpha coefficients were developed to provide a measure of

internal consistency for a scale. Each coefficient is a number between 0 and 1 (Tavakol & Dennick, 2011). As this instrument has not been used with the population of this study, these values were important to gauge to determine the internal consistency of the items within each scale for college students with learning disabilities. The Crohnbach's alpha values for the present study are in Table 3.3.

Table 3.3

Cronbach's Alpha for each NCQ Scale

NCQ Scales	Cronbach's Alpha Coefficient	Number of Items per Scale
Positive Self- Concept	α =.14	6
Realistic Self-Appraisal	α = 23	3
Understands and Deals with Discrimination	α =.13	5
Preference for Long-Term Goals	α =.36	3
Availability of a Strong Support Person	α =.08	3
Leadership Experience	α =.48	3
Community Involvement	α =.16	2
Knowledge Acquired in a Field	α = -.37	2

The Cronbach's alpha coefficients that are considered acceptable as reflecting internal consistency are those ranging from .70 to .95 (Tavakol & Dennick, 2011). As can be seen, none of the scales had a Cronbach's alpha over .48, and many of the scales were quite lower than that. Due to the poor Cronbach's alpha coefficients, closer scrutiny of the scales was called for.

Positive Self-Concept. This scale consisted of six items and Cronbach's alpha for this scale was .14. In viewing the Item-Total Statistics on the SPSS printout, it appears that if Item 28R was removed, which was "My high school grades don't really reflect what I can do," the Cronbach's Alpha would increase to .28. Although still not in an acceptable range, this particular item may have been difficult for this population of students to interpret. In order to get highest amount of points (5 points) for this item,

participants had to agree with this statement, meaning that they did not believe their high school grades were representative of their ability. But for those whose high school grade point averages were a much better indicator of their academic ability than their SAT scores were (which is often the case for college students with learning disabilities), they may have disagreed with this question, believing their high school grades were a much better indicator of their academic ability than other traditional academic predictors. This would confound this item in this scale for this group of students.

Realistic Self-Appraisal. This item consisted of only three items and the Cronbach's alpha for this scale was .23. In viewing the Item-Total Statistics on the SPSS printout, if Item 9 was removed, which was a multiple-choice type question regarding what the cause would be if a student dropped out of college, the Cronbach's alpha coefficient for the scale would only increase to .26. However it is possible that because there was a poor correlation between all of the three items in this scale (Item 9 and Item 21 (r = .042); Item 9 and Item 12 (r = .09); and Item 12 and Item 21 (r = .15)), it may have resulted in the low Cronbach's Alpha coefficient (Yu, 2013).

Understands/Deals with Discrimination. This scale consisted of five items and Cronbach's alpha for this scale was .13. In viewing the Item-Total Statistics on the SPSS printout, it appears that if Item 18 was removed, which was "I expect to have a harder time then most students at this school" the Cronbach's alpha would increase to .53, but this is still not in the acceptable range for internal consistency. The inter-item correlations related this item were negative (Item18 with: Item 11 (r = -.009), Item 22 (r = -.294 Item 26 (r = -.29) and Item 27 (r = -.22). It appears that many students agreed with this statement, as the mean for this particular item is one of the lowest compared to the others.

This question may mean something different to students with a learning disability. This group of students may believe they expect to have a harder time at their university due to their learning disability. Subsequently, their interpretation of the question may be unrelated to discrimination. This is a plausible explanation as to why, if Item 18 is removed, there would be the dramatic increase in the Cronbach's alpha coefficient.

Prefers Long-Range Goals. This scale consisted of three items and the Cronbach's alpha was .36. In viewing the Item-Total Statistics on the SPSS printout, there were no items that, if removed, would increase this alpha by more than .02. The two of the inter-item correlations moderate, while one was very low (Item 8A and Item 13 (r = .24); Item 8A and Item 19 (r = .024); and Item 13 and Item 19 (r = .24)). This scale could be affected by its length in the context of this study's population. A low number of items can reduce the value of alpha (Tavakol & Dennick, 2011).

Availability of a Strong Support Person. This scale consisted of three items and the Cronbach's alpha was .08. In viewing the Item-Total Statistics on the SPSS printout, if Item 24 was removed, the alpha would increase to .18 which does not even the acceptable range. The inter-item correlations were very low or negative (Item 15 and Item 24 (r = -.08); Item 15 and Item 25 (r = .12); Item 24 and Item 25 (r = .07)) which may have contributed to the low alpha coefficient.

Successful Leadership Experience. This scale consisted of three items and the Cronbach's alpha was .48. In viewing the Item-Total Statistics on the SPSS printout, if Item 29A was removed, the alpha would increase to .69, approaching the acceptable range. Item 29A is the coded mean of scores provided to the open-ended question which asked participants to identify three offices or groups that they belonged to in high school.

The other two items in the scale (Item 14 and Item 17 (r = .52)) were more highly correlated than those with Item 29A (Items 14 and Item 29A (r = -.021) and Item 17 and Item 29A (r = .141)).

Demonstrated Community Service. This scale consisted of two items and the Cronbach's alpha was .16. Because this scale is two items, the Item-Total Statistics table in SPSS does not give a Cronbach's alpha value if an item is deleted. The correlation between the two items in the scale was poor (r = .092). Additionally, the alpha coefficient for this scale could be affected by its length in the context of this study's population. A low number of items can reduce the value of alpha (Tavakol & Dennick, 2011).

Knowledge Acquired in a Field. This scale consisted of two items and the Cronbach alpha was -.37. Because this scale is two items, the Item-Total Statistics table in SPSS does not give a Cronbach's alpha value if an item is deleted. The correlation between the two items in the scale was negative (r = -.092), which accounts for the negative alpha value. Again, the low number of items in the scale may have reduced the alpha value.

Interestingly, Chung (1996) found Cronbach's alpha coefficients for the eight NCQ scales similar to the Cronbach's Alpha coefficients found in the present study, in a study conducted for his doctoral dissertation. The purpose of his study was to identify predictors of career motivation for black college students. He used seven measures which examined demographic variables; locus of control, racial identity attitudes and perceived opportunity; as well as the eight noncognitive scales from the NCQ and compiled them into one questionnaire which was mailed to a random sample of Black,

undergraduate students. His final sample was comprised of 231 students. A multiple regression was used to analyze the ability of the eight noncognitive variables to predict career commitment. Although the open-ended questions had a high inter-rater reliability and the Likert-type items had high test-retest reliability, the Cronbach's Alpha coefficients were very low. They also follow a very similar pattern per scale as those in the present study (with the exception of Availability of a Strong Support Person). This comparison is presented in Table 3.4.

Table 3.4

Cronbach's Alphas for the Dissertations of Scarfone (2013) and Chung (1996)

Scale	Scarfone (2013)	Chung (1996)
Positive Self-Concept	.14	.12
Realistic Self-Appraisal	.23	.26
Understands/Deals with Discrimination	.13	.17
Preference for Long-Range Goals	.36	.26
Availability of Strong Support Person	.08	.44
Successful Leadership Experience	.48	.47
Demonstrated Community Service	.16	.16
Knowledge Acquired in a Field	-.37	-.06

Chung (1996) reported that the intercorrelations between the eight NCQ scales ranged from -.06 to .47, whereas the Cronbach's Alpha coefficients in the present study ranged from -.08 to .35 (see Table 4.4 for the intercorrelations of the NCQ scales for the present study). Chung (1996) concluded that the low alpha coefficients may have been due to the fact that six items on the NCQ had been slightly modified for his study; however, he did not change the content of the questions, only the tense of the verb. Two items on the NCQ were slightly modified for the present study and are discussed in the next section. Regardless, the similarity of the Cronbach's Alpha coefficients in both studies is an interesting finding. At the same time, this weakness of the internal

consistency for the noncognitive variables in the present study was taken into account when interpreting the results of the data analyses.

Materials

The NCQ was administered online via Survey Monkey. The content of the survey and additional materials are described in this section.

Instrument. An online administration of the Noncognitive Questionnaire (NCQ) at Surveymonkey.com was used to examine the contribution of noncognitive variables to the academic performance of college students with learning disabilities. This instrument consists of 29 items. The first six items are demographic questions and are not used in the scoring of the NCQ. The first item asks for the student's social security number. For privacy purposes, this was changed to ask for the student's school identification number. The next items ask gender, age, father's occupation, mother's occupation, and race. It should be noted that each of the items about father's and mother's occupation were slightly changed for this study. These items are on the NCQ to gather information about the participant's family's socioeconomic status (SES). However, Fowler (1995) posited that occupation is not the most accurate way to learn about a person's SES. Individuals in some occupations that may not require an education earn a higher salary than those in occupations that do require an education. Instead of asking a question about an individual's occupation, Fowler suggested creating a question about the highest level of education an individual has completed. As a result, Items 4 and 5 on the NCQ have been changed so participants are asked to provide highest level of education for each parent (see Appendix K). The information for the participants' fathers' and mothers' levels of education is contained in Table 3.4.

The remainder of the items on the NCQ is used in the scoring of the NCQ. There are two multiple-choice type questions that ask how much education the participant thinks he or she will get in his or her lifetime, and if the participant were to drop out of college, what does he or she think the reason might be. There are three open-ended questions that require three answers regarding things one is proud of having done; goals one has for him or herself; and offices held or groups belonged to in high school. Finally, there are 18 items are statements that are to be rated from 1 to 5 on a Likert-type scale. Of these 18 items, two were slightly changed to reflect more up-to-date language or to be more accurate for population of students in the present study. On the NCQ, Item 16 reads, "There is no use in doing things for people; you only find that you get it in the neck in the long run." This item has been changed to, "There is no use in doing things for people; you only find that you get taken advantage of in the long run." This item contributes to the Community Involvement scale. The meaning of the changed item is consistent with the meaning of the original statement.

Item 22 was also changed from, "I expect I will encounter racism at this school" to "I expect I will encounter discrimination at this school." This item contributes to the Ability to Successfully Handle the System scale. The word "discrimination" implies unequal treatment, as does "racism," although the term racism is specific to race. Sedlacek (2011) reasoned that the term racism can have many connotations in the context of the scale, Ability to Successfully Handle the System, and it relates to all types of "'isms" (e.g., sexism, ageism, "disability-ism"). As students with learning disabilities often experience discrimination related to their learning disability, the term "discrimination" seems to be an appropriate substitution for the word "racism" for this

item on the NCQ in the context of the participants of this study. Furthermore, Sedlacek (2004) has encouraged ongoing continuing research on the NCQ instrument and supports these changes as such (Sedlacek, personal communication, December 15, 2011).

As the NCQ is used to determine noncognitive variables that contribute to the academic performance of students, it is typically administered at the beginning of a school year and the participants' responses are then compared to college grade point averages at a later date. However, that was not the case in this study. Participants were administered the NCQ after having been in college two or more semesters. To compensate for this issue, the use of a retrospective pre-test model was used. Participants were asked to respond to the questions or statements on the NCQ according to what their feelings or expectations of how things were going to be *at the time they entered college*. The retrospective pre-test model has been used in multiple studies pre-test/post-test studies (Drennan & Hyde, 2008; Howard & Daily, 1979; Pratt, McGuigan & Katzev, 2000). The logic of self-report, pre-test/post-test studies is based on the assumption that when participants respond to a pre-test, their understanding of the concept being measured does not change between the pre-test and the post-test. However, often after an intervention, the participants' understanding of the concept itself may change so responses on a post-test are no longer based on the original understanding of the concept being measured or, a response-shift bias has occurred. In other words, the meaning of a concept that participants' responded to on the pre-test has internally been altered so the participants' self-reported responses to the post-test are now confounded because, in effect, the same concept is no longer being measured by each test. The participants have a different internal perspective of the concepts being measured that evolved from pre-test

to post-test. To prevent response-shift bias, many studies have used retrospective pre-testing where both the pre-test and the post-test are given at the same time, after the intervention Although this current study does not have a pre-test, post-test design, studies support the use of retrospective pre-testing as a reliable indicator of individuals' reports of earlier self-assessment (Drennan & Hyde, 2008; Howard & Daily, 1979; Pratt, McGuigan & Katzev, 2000).

Informed Consent. This was the first document participant encountered upon entering SurveyMonkey to participate in the study (Appendices F and G). The informed consent introduced the researcher and described why they, as participants, were contacted. Students from Setting 1 and Setting 2 viewed the same versions of the informed consent except where it referred back to the respective university each participant attended. The informed consent presented the study's purpose, procedures, confidentiality statement, potential risks and benefits, and the drawing. After reading through the informed consent, participants could choose to participate or not participate in the study by clicking on the appropriate button. If they chose to not participate in the study, they were led to a Thank-You page (Appendix O), after which they were exited out of the survey. If students chose to participate, they were taken to the next page which was the Permission to Access Educational Records.

Permission to Access Educational Records. This was the second page participants encountered before taking the NCQ. It required them to grant permission that their cumulative college grade point averages at the end of <u>each</u> year they completed college, SAT score, and overall high school grade point average be released to this researcher. The forms were the same for Setting 1 and Setting 2 except where they

referred to the university and disability office for each university (Appendices H and I). Participants had to check a box to choose either to grant or not grant permission to this request. If the participant chose to not grant permission, they were led to a Thank-You page (Appendix O), after which they were exited out of the survey. If they chose to grant permission to release their cumulative college grade point average(s), SAT score, and their overall high school grade point average, they were directed to a Learning Disability Status Form (Appendix J).

Learning Disability Status Form. The Learning Disability Status form (Appendix J) was the third form participants encountered before taking the NCQ. It was included as part of what participants must complete, regardless of which university they attended. It was designed to ensure that participants who responded to this study had a diagnosis that included a learning disability. Participants had the option to choose whether or not they had a learning disability. If they chose that they did not have a learning disability, they were directed to a Thank-You page (Appendix K), after which they were exited out of the survey. If they chose that they had a learning disability, they were directed to the next page where they were asked to self-report HSGPA and standardized test scores.

Self-Reported HSGPA and Standardized Test Scores. This was the fourth form participants encountered before they took the NCQ. Participants were provided the option to self-report their unweighted HSGPA and standardized test scores on this page in case this data was not available via university records. Whether or not they entered this data, they were next directed to the first page of the NCQ (Appendix K).

Online Version of the Noncognitive Questionnaire (NCQ). After participants indicated that they had a documented learning disability, they were directed to the first page of the NCQ (Appendix K). The first six demographic questions were presented on three web pages, the next four questions (which were either open-ended or multiple choice) were presented on four web pages, the last 18 Likert-type questions were presented on six web pages, and the last open-ended question was presented on one web page. The top of each page had a progress bar which reflected how far the participant had progressed toward the end of the study. Each page also had a button labeled "Exit this survey" that they could click to exit the survey any time they wanted. The settings in SurveyMonkey were set so that participants could only respond once to those questions that required only one response, they could not continue the survey if they had left a question blank, they could not go back and change existing responses, and there could be multiple responses per computer. Participants were not allowed to go back to change their responses so that they would not skip certain questions or skip to the end without completing the survey. Multiple responses per computer were allowed in case a participant responded earlier on a public computer, such as a computer in the library or campus computer lab, others could use that same computer to respond to the survey.

In the process of entering the NCQ items into SurveyMonkey, concepts of universal design as well as graphic design were used. Originally the concept of universal design comes from the field of architecture, however, recently it has been applied to learning in order to create an environment which is flexible and provides equal access to all individuals regardless of ability (Bremer, et al., 2002). The following considerations were incorporated into the visual composition of the survey on SurveyMonkey: The

background color of the survey was a pale blue because blue provides a sharp contrast to monotone shades, such as black text. Arial was the font chosen for the survey as it is considered simple and clean (Jacobs & Mueller, nd). Balance is also important in graphic design so a consideration of weight as well as positive and negative space was considered. Weight relates to color and density of text and images. The darker the color and the denser the characters, the more the page feels "heavy" (Jacobs & Mueller, nd). A bold font was used for the questions to emphasize them, whereas a non-bold font was used for the responses from which the participants chose. Balancing the bold and non-bold font assisted creating graphic balance on a page. In conjunction with weight, positive and negative space was considered for each page. Positive space is where the text is and negative space is where there are no visual images. A page that contains more negative space than positive space provides more balance (Jacobs & Mueller, nd). Indeed, this was the case for how the questions were arranged on each page of the survey in SurveyMonkey. No more than three questions were placed per page. That there were three questions per page also assisted in making each page predictable, developing a consistent rhythm throughout the survey, and allowing the participant to not feel overwhelmed by the content of each page. Each page had a progress bar to let the participant know what percentage of the survey had been completed so the end of the survey could be anticipated. Finally, question numbers were provided at the top of each page (e.g., "Questions 17-19), so each participant could compare the question numbers displayed with the percentage of the survey completed.

Drawing Information, Entry Form, and Thank You Page. Once participants completed the NCQ, they had the option of entering the drawing. A page with the drawing information was presented to them (Appendix L). It provided details about the drawing and informed them they would need to provide their email address to be entered into the drawing. It also gave an approximate time frame for when the drawing would be held. If they chose not to be entered into the drawing, they were directed to the Thank-You page (Appendix O). If they chose to be entered into the drawing, they were directed to the Drawing Entry Form (Appendix M) where they could enter their email address. The drawing entry form was the last page for participants to complete. If they did not choose to enter the drawing, they could skip this page. Either way, they were then directed to the Thank-You page, after which they could exit the survey.

Procedure

Pilot Study. A pilot study was conducted with a convenience sample selected by this researcher. The respondents were differentially selected according to their age, known disability status, knowledge of student affairs and knowledge of survey research. They were asked to take the survey for each University Setting and check for spelling, grammar, punctuation, survey flow, reading comfort level, the overall look of each page, page background color (as one survey had a pale yellow background and the other had a pale blue background), and to note the amount of time it took to complete the surveys.

The respondents of the pilot study provided feedback of their experience. Most respondents reported the survey took 5 to 10 minutes to complete. One respondent suggested that the amount of money offered for the incentive drawing be increased. The prizes were originally going to be one of three $50 debit cards. After this suggestion, the

dollar amount was increased to $200 for each of the three debit cards. Another suggestion was that a confirmation page appears once a participant entered the drawing. This suggestion was incorporated. Another recommendation was made that as part of the drawing information page, an approximate timeline be provided to participants who entered the drawing. This was also incorporated. There were no glitches reported in the way the survey was presented or flowed. Finally, all respondents preferred the pale blue background for the survey. Since this corroborated earlier researched information about pale blue being a preferred color according to design principles for surveys (Jacobs & Mueller, nd) pale blue was used for both surveys.

Recruitment. The entire population of undergraduate students with a documented learning disability registered with the offices which serve these students on the above-mentioned campuses were invited, via an invitation letter sent by email from their respective campus' disability support offices, to participate in this study.

Data Collection. Data was collected via email through an invitation email and two follow-up emails and the data was then reviewed and organized in MS Excel and uploaded into IBM SPSS Statistics 20 for coding in preparation for statistical analysis.

Invitation email. The disability support offices at each campus agreed to e-mail this invitation letter to all students registered with their offices as having a learning disability. The content of the invitation letter included a brief description of the study and its purpose, criterion to participate in the study, that they were under no obligation to participate in the study, that their identities would remain anonymous, the services they received from their disability support office would not be affected whether or not they participated in the study, the survey would not be returned to the disability support office,

and contact information for the researcher. To encourage students to participate in the study, they were told in the invitation e-mail (as well as the informed consent) that they could choose to be entered into a drawing to receive one of three debit cards worth $200.

The office from Setting 1 had one list serve that was comprised of all students with any disability and this e-mail was sent to this entire group since they did not have a separate list serve for students with a diagnosis that included a learning disability. The office from Setting 2 had a list of students with a diagnosis that included a learning disability and the invitation e-mail was sent to only those students. Therefore, the students from each campus were e-mailed one of two of these versions of the invitation e-mail (Appendices B and C). The only other difference between the two invitation letters was the link that they clicked on to participate in the study. The link led each group of students to the separate versions of the same survey content except for the informed consent, the first paragraph of which referenced the students' respective universities and which office students were registered (as discussed earlier in the Materials section).

Data collection at each institution took place over six weeks. The first set of invitation letters were sent to the potential participants of Setting 1 about a week before Setting 2 as the personnel at Setting 1were ready to send the letters before the personnel from Setting 2.

Follow-up email. The entire population of students with learning disabilities from Settings 1 and 2 were sent follow-up e-mails after two weeks and after four weeks from the initial mailing in order to remind them that they were invited to participate in this research project (Appendices D and E). They all were sent these follow-up emails as there was no way to determine who has actually completed the survey

Upon viewing the data from the completed surveys from the first set of invitation emails, it was noticed that many transfer students were responding. It was then discovered that the admissions office of Setting 1 does not require high school GPAs (HSGPAs) or standardized test scores be part of transfer students' admissions applications. Therefore this critical data would not be part of students' records and would not be able to be obtained as data for this study. Without this data, this group of participants' surveys would not be able to be used. In order to address this problem in future mailings at both settings, an extra page was added to the survey that asked participants to self-report their HSGPA and standardized test scores if they had not submitted this information to the university (Appendix T). The students who received the next two mailings at Setting 1 received this version of the survey. Because the survey had not been sent to the students at Setting 2 before this issue was identified, all students at Setting 2 were able to receive this revised version of the survey. Two weeks after the third mailing of the invitation letters, the survey was closed on the Survey Monkey site.

Follow-up Request for Self-Report of Missing Data. After the survey closed, the data for each of the university settings was downloaded into two separate Excel spreadsheets and reviewed for completeness. Survey data that was incomplete were removed. In order to protect the confidentiality of the participants, an assistant at each university was hired to access participants' college records. Each assistant was sent an Excel spreadsheet that contained each participant's university identification number and the data requested for the study. This data included participants' HSGPAs, standardized test scores, cumulative college GPA for each year that they attended college (for example, a junior could have 3 college GPAs, one each for their freshman, sophomore,

and junior year of college), year entered college, and their most recent class standing. Once the assistant extracted this information from each university's records and entered it into the spreadsheet, each spreadsheet was then returned to this researcher. Upon review of this data, it was found that approximately 20 percent of the 86 participants from Setting 1 were transfer students for whom HSGPA and SAT data could not be gathered. For Setting 2, two of the 28 participants who completed the survey did not have HSGPA or standardized test scores.

In an attempt to not lose these participants, a simple procedure was developed to request that participants self-report this data (this was after the survey had closed). The procedure consisted of emailing participants for whom we had no HSGPA and SAT data in order to ask if they would be willing to answer two additional questions related to the survey which were "What was your unweighted high school GPA?" and "If you took the SAT, what were your verbal, quantitative and overall score" or "If you took the ACT, what was your overall score?" (Appendix U). This would occur when contacting participants to inform them of the drawing results. If they agreed, they would be directed to indicate so by positively responding to that email. If they responded, they would be emailed the two questions. If they did not respond, they would not be contacted again. For the participants for whom we had the necessary data, they would receive a letter informing them of the drawing results without asking for additional data (Appendices R and S). Because additional contact with the participants was not planned, nor included in the original IRB application, an addendum was submitted to the IRB to request approval of this procedure and approval was granted. Participants for whom we needed HSGPA and standardized test score data were contacted in the manner described above. Only two

participants responded and they were emailed the two questions. Only one student returned her HSGPA and standardized test score data. This data was subsequently entered into the appropriate Excel spreadsheet.

Organization of the Data. Once this final data set was entered into the appropriate spreadsheet, each of the two spreadsheets was reviewed to further determine participant eligibility and for those that were ineligible, their survey data was discarded. As mentioned under the section of Demographic Information, most of those removed were transfer students for whom HSGPA and SAT scores could not be obtained. Other reasons for participant ineligibility included participants who had graduate student status, concurrent high school student status, post-baccalaureate student status, or participants who had completed the survey more than one time. After removing ineligible participants, Setting 1 had 62 eligible participants and Setting 2 had 26 eligible participants. This resulted in a final total number of participants from both settings of 88. The two spreadsheets were merged into one spreadsheet. Upon further review of the data, it was determined that the number of seniors who completed survey was too low for any analyses to be performed on this group. As a result, analyses were only performed on freshmen, sophomores, and juniors.

The data was then scored and coded according to the scoring key for the NCQ (Sedlacek, 2004) (Appendix V). As mentioned earlier, the NCQ consists of 29 questions. The first six are demographic questions and were coded as categorical variables. Two of the questions (regarding expected lifetime education and potential reasons for leaving the university) were multiple choice and coded according to the NCQ coding directions. There are three open-ended questions, numbers 8, 10, and 29 that required three

responses for each question. Question 8 was coded twice as per the instructions, once in the context of Long Range Goals and once in the context of Knowledge Acquired in a Field. Question 10 is coded once in the context of Self-Concept criteria. Question 29 was coded three times, as per the instructions, in each of the following contexts: Leadership, Community Service, and Knowledge Acquired in a Field. Once the necessary items were scored or coded, the data was then imported into IBM SPSS Statistics 20. The last step to data coding was do address the reverse coding issues. As mentioned earlier, there are 18 statements that participants rated on a 1-5 Likert-type scale. Of these statements, 13 of them are "negative" items and per the NCQ scoring instructions, were required to be reversed that 1 = 5, 2 = 4, 3 = 3, 4 = 2, and 5 = 1. This was performed in SPSS. The scores for the five positive items were not reversed.

Data Analyses

Correlations of Noncognitive Independent Variables. A correlation analysis was performed to determine the relationship between the control variables, cognitive variables and noncognitive variables (see Table 4.4).

Multiple Regression Analyses. A total of 21 multiple regression analyses were performed on the data to address the research questions. As mentioned earlier, an alpha level of $p < .05$ was considered statistically significant for all analyses in this study. Research question 1 explores the degree to which traditional academic indicators predict college grade point average for students with learning disabilities based on high school GPA (HSGPA) alone, SAT (combined Verbal and Math) or SAT equivalent (which will be referred to hereafter as SAT) alone, and HSGPA and the SAT used as joint predictors. While controlling for background characteristics of age, gender, ethnicity, and university

setting attended, multiple regression analyses were performed with the cognitive predictor variables of HSGPA, SAT, and HSGPA and SAT jointly for freshman, sophomore, and junior cumulative college GPA for a total of nine multiple regression analyses to address the first research question and the data was entered in blocks as shown in Tables 3.5.

Table 3.5

Regression Blocks for Research Question 1 for Freshmen, Sophomores, and Juniors

Block	Variable	Description
	Research Question 1a for Freshmen, Sophomores, and Juniors	
Block 1	Age	Age of participant at the time of survey
	Gender	Gender
	Ethnicity	Ethnicity
	Setting	The university the participant attends
Block 2	HSGPA	Cumulative high school grade point average
	Research Question 1b for Freshmen, Sophomores, and Juniors	
Block 1	Age	Age of participant at the time of survey
	Gender	Gender
	Ethnicity	Ethnicity
	Setting	The university the participant attends
Block 2	SAT	Standardized SAT score or SAT score equivalent
	Research Question 1c for Freshmen, Sophomores, and Juniors	
Block 1	Age	Age of participant at the time of survey
	Gender	Gender
	Ethnicity	Ethnicity
	Setting	The university the participant attends
Block 2	HSGPA	Cumulative high school grade point average
	SAT	Standardized SAT score or SAT score equivalent

The second research question explores the degree to which noncognitive variables predict cumulative college grade point average at the end of the freshman, sophomore, and junior years of college for students with learning disabilities. There were three multiple regression analyses performed to address research question 2. These analyses all had the same general structure as those for research question 1, with the same control

variables entered into Block 1, but with the NCQ variables entering into Block 2 instead of HSGPA and/or SAT scores. The data was entered in blocks as shown in Tables 3.6:

Table 3.6

Regression Blocks for Research Question 2 for Freshmen, Sophomores, and Juniors

Block	Variable	Description
Block 1	Age	Age of participant at the time of survey
	Gender	Gender
	Ethnicity	Ethnicity
	Setting	The university the participant attends
Block 2	NCQ	Positive Self- Concept
		Realistic Self-Appraisal
		Understands and Deals with Discrimination
		Preference for Long-Term Goals
		Availability of a Strong Support Person
		Leadership Experience
		Community Involvement
		Knowledge Acquired in a Field

The last research question explores the degree to which noncognitive variables add to the prediction of cumulative college grade point average at the end of the freshman, sophomore, and junior years of college for students with learning disabilities beyond the predictions based on cognitive variables. There were nine multiple regression analyses performed to address research question 3. These analyses all had the same general structure as those for research question 1, with the same control variables entered into Block 1, but with the HSGPA and NCQ variables, SAT and NCQ variables, and HSGPA, SAT and NCQ variables respectively entering into Block 2 per analysis instead of HSGPA and/or SAT scores. The data was entered in blocks as shown in Tables 3.7:

Table 3.7

Regression Blocks for Research Question 3 for Freshmen, Sophomores, and Juniors

Block	Variable	Description
Regression Blocks for Research Question 3a for Freshmen, Sophomores and Juniors		
Block 1	Age	Age of participant at the time of survey
	Gender	Gender
	Ethnicity	Ethnicity
	Setting	The university the participant attends
	HSGPA	Cumulative high school grade point average
Block 2	NCQ	Positive Self- Concept
		Realistic Self-Appraisal
		Understands and Deals with Discrimination
		Preference for Long-Term Goals
		Availability of a Strong Support Person
		Leadership Experience
		Community Involvement
		Knowledge Acquired in a Field
Regression Blocks for Research Question 3b for Freshmen, Sophomores and Juniors		
Block 1	Age	Age of participant at the time of survey
	Gender	Gender
	Ethnicity	Ethnicity
	Setting	The university the participant attends
	SAT	Standardized SAT score or SAT score equivalent
Block 2	NCQ	Positive Self- Concept
		Realistic Self-Appraisal
		Understands and Deals with Discrimination
		Preference for Long-Term Goals
		Availability of a Strong Support Person
		Leadership Experience
		Community Involvement
		Knowledge Acquired in a Field
Regression Blocks for Research Question 3c for Freshmen, Sophomores and Juniors		
Block 1	Age	Age of participant at the time of survey
	Gender	Gender
	Ethnicity	Ethnicity
	Setting	The university the participant attends
	HSGPA	Cumulative high school grade point average
	SAT	Standardized SAT score or SAT score equivalent

Regression Blocks for Research Question 3c for Freshmen, Sophomores and Juniors, continued

Block	Variable	Description
Block 2	NCQ	Positive Self- Concept Realistic Self-Appraisal Understands and Deals with Discrimination Preference for Long-Term Goals Availability of a Strong Support Person Leadership Experience Community Involvement Knowledge Acquired in a Field

Multicollinearity. Next, analyses were performed to ensure that ensure that multicollinearity did not exist among any of the independent variables using the procedures described by Keith (2006). Multicollinearity occurs when there is a strong linear relationship between several independent variables (Keith, 2006; Lomax, 2001). In order to determine if multicollinearity was a problem, Variance Inflation Factors (VIF) were computed for each of the independent variables. Lomax (2001) describes the VIF as, "…the inflation that occurs for each regression coefficient above the ideal situation of uncorrelated predictors." VIF values over 10 indicate that multicollinearity has occurred. Indeed, no variables had a VIF over 10. An additional collinearity statistic, Tolerance, was also computed. Tolerance is actually the reciprocal of the VIF. Keith (2006) posited, "Tolerance is a measure of the degree to which each variable is independent (does not overlap with) the other independent variables." A tolerance can range between 0 and 1but a tolerance below.1 is considered unacceptable as it may be a sign of multicollinearity. The independent variables in the current study had no tolerances below .10. Based on these two analyses, none of the independent variables violated the assumption multicollinearity must not exist.

Supplemental Analyses. Although each participant received the same version of the NCQ, a question was added after its first administration which asked if participants were willing to provide their HSGPA and/or SAT scores if they were transfer students. As mentioned in the Procedures section, many transfer students responded to the first administration of the survey and their HSGPA and/or SAT data was not archived in their university's records because they were not required to provide this information to be admitted to the university. Two independent sample t-tests were performed in order to test if there was a significant difference between the means of: 1) Self-reported and university-archived HSGPAs; and 2) Self-reported and university-archived SAT scores. Additionally, because for some participants weighted HSGPAs were collected, whereas for the others unweighted HSGPAs were collected, an independent sample t-test was performed to test if there was a significant difference between the means of weighted and unweighted HSGPAs.

In order to determine if there was a significant difference between college students of different class standing, two Analyses of Variances (ANOVAs) were performed to determine if there was a significant difference between 1) Freshmen's, sophomores' and juniors' mean HSGPA, and 2) Freshmen's, sophomores' and juniors' mean SAT scores**.**

Summary

This chapter began by restating the purpose of and the research methods implemented in this study, which was to investigate variables that contribute the academic performance of college students with learning disabilities. This study used a simple descriptive, correlational design and the details of this design, along with the

materials used in the study, were delineated. Included in this, the instrument was explained and the cognitive and noncognitive variables were defined. The participants were chosen from two different universities in the mid-Atlantic region and sample details and demographic information of the sample were presented. Subsequently, procedures related to data collection, organization, and coding were described. Finally, the details of the procedure and a description of the data analysis were provided. The results of the data analyses are presented in the next chapter.

Chapter 4: Results

The purpose of this study was to investigate if there are differences in how cognitive and noncognitive variables predict academic performance for college students with learning disabilities. In particular, this study examined the extent to which the cognitive variables of High School Grade Point Average (HSGPA) and SAT Total (combined verbal and math) or ACT score as well as noncognitive variables, contribute to cumulative college grade point average at the end of each sophomore, junior and senior years of college. In this section, the results of the data analyses performed in the context of the research questions are presented. These results include descriptive statistics for the cognitive and noncognitive variables, correlations of the NCQ variables, the hierarchical regression analyses, and post-hoc tests.

Descriptive Statistics

Although there were 88 participants in this study as described in Chapter 3, it should be noted that a HSGPA or a SAT score was not able to be collected for every student. For example, transfer students at University Setting 1 did not have to provide their HSGPA or SAT scores to apply to the university, so this data was not available to be collected for some participants. University Setting 2 has a "test-optional" admissions option in which prospective students do not have to provide standardized test scores as part of the application for admission. Participants had to have at least a HSGPA or a standardized test score. If participants were missing both of these pieces of data, their surveys were eliminated from the participant pool; however, if a participant had one or the other of these pieces of data, their surveys remained in the participant pool. As a result, there were participants have one and not the other of these pieces of data.

Additionally, each participant could have one or more cumulative college GPAs, (CCGPAs) in addition to having or not having one or both HSGPA or SAT scores. So, for example, although there were only 20 freshmen who participated in the study, 82 freshman cumulative college GPAs were obtained. This is because sophomores, juniors and seniors also reported freshmen CCGPAs (FCCGPAs). Likewise, even though there were only 26 sophomores that participated in the study, there were 60 scores collected for sophomore cumulative college GPAs (SCCGPAs) (the criterion variable). Since CCGPA at each of the three year levels is the criterion variable for every multiple regression analysis, the sample size for each of the multiple regression analyses is based on the number of students with complete data for each respective analysis. This impacted the sample size per multiple regression analysis. The sample size for each research question is presented in table 4.4.

Cognitive variables. The two cognitive, independent variables were cumulative high school grade point average (HSGPA), standardized entrance exam score from the SAT or ACT (converted to an SAT score), and cumulative college grade point average (CCGPA) at the end of each student's freshman, freshman and sophomore, or freshman, sophomore and junior year of college (a dependent variable). Complete descriptive statistics for the cognitive variables per participant are presented in Table 4.1.

Table 4.1

Descriptive Statistics for Cognitive Variables by Class Standing

Variable	*n*	Mean	*SD*	Range
HSGPA				
Freshmen	20	3.63	.398	2.83 – 4.18
Sophomores	24	3.73	.465	2.95 – 4.58
Juniors	26	3.74	.484	2.70 – 4.53
Seniors	16	3.79	.461	2.77 – 4.74
SAT Total				
Freshmen	15	1295	119.813	1070 – 1450
Sophomores	21	1286	149.116	1010 – 1540
Juniors	26	1230	151.960	890 – 1470
Seniors	14	1296	175.394	790 – 1500
CCGPA				
Freshmen	20	3.31	.586	1.41 – 4.00
Sophomores	26	3.12	.486	2.00 – 3.95
Juniors	25	3.40	.485	2.00 – 3.97
Seniors	10	3.39	.339	2.76 – 3.92

Noncognitive variables. There were eight noncognitive, independent variables, which were the eight scales of Noncognitive Questionnaire (NCQ, Sedlacek, 2004). Complete descriptive statistics for the Noncognitive Variables per participant are presented in Table 4.2.

Table 4.2

Descriptive Statistics for Noncognitive Variables all Participants

Variable	Number of Items per Variable	Mean	*SD*	Range
Positive Self-Concept	6	18.68	2.55	12 - 24
Realistic Self-Appraisal	3	10.58	2.00	5 - 14
Understands/Deals with Discrimination	5	16.56	2.68	10 - 24
Preference for Long-Range Goals	3	8.21	1.95	3 – 11
Availability of Strong Support Person	3	13.67	1.35	8 – 15
Successful Leadership Experience	3	9.13	2.19	4 – 13
Demonstrated Community Service	2	5.14	1.32	1 – 8
Knowledge Acquired in a Field	2	3.67	.96	1 - 6

Note: $n = 88$ for all variables.

As mentioned earlier, since CCGPA is the criterion variable for every multiple regression analysis, the descriptive statistics for each of the multiple regression analyses is based on CCGPA, not actual participant number. So while Tables 4.2 and 4.3 provide descriptive statistics for the cognitive and noncognitive variables *per participant*, they do not reflect the descriptive statistics for the cognitive and noncognitive variables *per multiple regression analysis*. This data is presented in Table 4.3.

Table 4.3

Descriptive Statistics for Cognitive Variables per Research Question

Variable	*n*	Mean	*SD*
RQ 1a: HSGPA as a Predictor of College Performance for CCGPA:			
Freshmen Cumulative GPA	82		
HSGPA		3.73	.451
FCCGPA		3.18	.515
Sophomore Cumulative GPA	66		
HSGPA		3.74	.467
SCCGPA		3.12	.522
Junior Cumulative GPA	41		
JCCGPA		3.23	.467
HSGPA		3.77	.473
RQ 1b: SAT Total as a Predictor of College Performance for CCGPA:			
Freshmen Cumulative GPA	71		
SAT Total		1267.89	152.755
FCCGPA		3.19	.487
Sophomore Cumulative GPA	60		
SAT Total		1266.50	157.25
SCCGPA		3.13	.534
Junior Cumulative GPA	39		
SAT Total		1256.66	161.967
CCGPA		3.22	.474
RQ 1c: HSGPA and SAT Total Variables as a Predictor of College Performance for CCGPA:			
Freshmen Cumulative GPA	70		
HSGPA		3.72	.450
SAT Total		1269.57	153.192
FCCGPA		3.17	.480

Descriptive Statistics for Cognitive Variables per Research Question, continued

Variable	*n*	Mean	*SD*
Sophomore Cumulative GPA	58		
HSGPA		3.72	.468
SAT Total		1265.86	157.94
SCCGPA		3.11	.531
Junior Cumulative GPA	39		
HSGPA		3.78	.4788
SAT Total		1256.67	161.967
JCCGPA		3.22	.474
RQ 2: NCQ Variables as a Predictor of College Performance for CCGPA:			
Freshmen Cumulative GPA	83		
Positive Self-Concept		18.75	2.429
Realistic Self-Appraisal		10.64	1.910
Deals with Discrimination		16.70	2.612
Preference Long-Range Goals		8.35	1.840
Support Person Available		13.65	1.374
Leadership Experience		9.22	2.159
Community Service		5.14	1.317
Knowledge in a Field		3.72	.915
FCCGPA		3.19	.520
Sophomore Cumulative GPA	68		
Positive Self-Concept		18.53	2.469
Realistic Self-Appraisal		10.65	2.057
Deals with Discrimination		16.18	2.515
Preference Long-Range Goals		8.20	1.956
Support Person Available		13.63	1.392
Leadership Experience		9.00	2.185
Community Service		5.28	1.256
Knowledge in a Field		3.68	1.014
SCCGPA		3.14	.524
Junior Cumulative GPA	41		
Positive Self-Concept		18.85	2.438
Realistic Self-Appraisal		10.73	2.074
Deals with Discrimination		16.61	2.469
Preference Long-Range Goals		8.20	1.891
Support Person Available		13.59	1.284
Leadership Experience		8.98	2.162
Community Service		5.15	1.370
Knowledge in a Field		3.54	1.027
JCCGPA		3.23	.467

Descriptive Statistics for Cognitive Variables per Research Question, continued

Variable	*n*	Mean	*SD*
RQ 3a: HSGPPA and NCQ Variables as a Predictor of College Performance for CCGPA:			
Freshmen Cumulative GPA	82		
HSGPA		3.7267	.45182
Positive Self-Concept		18.71	2.422
Realistic Self-Appraisal		10.66	1.913
Deals with Discrimination		16.74	2.595
Preference Long-Range Goals		8.37	1.841
Support Person Available		13.65	1.382
Leadership Experience		9.24	2.158
Community Service		5.13	1.322
Knowledge in a Field		3.72	.920
FCCGPA		3.1825	.51507
Sophomore Cumulative GPA			
HSGPA	66	3.7391	.46768
Positive Self-Concept		18.46	2.469
Realistic Self-Appraisal		10.70	2.068
Deals with Discrimination		16.29	2.467
Preference Long-Range Goals		8.29	1.880
Support Person Available		13.64	1.410
Leadership Experience		9.08	2.172
Community Service		5.27	1.272
Knowledge in a Field		3.70	1.007
SCCGPA		3.1244	.52241
Junior Cumulative GPA	41		
HSGPA		3.7651	.47345
Positive Self-Concept		18.85	2.438
Realistic Self-Appraisal		10.73	2.074
Deals with Discrimination		16.61	2.469
Preference Long-Range Goals		8.20	1.891
Support Person Available		13.59	1.284
Leadership Experience		8.98	2.162
Community Service		5.15	1.370
Knowledge in a Field		3.54	1.027
JCCGPA		3.2285	.46687
RQ 3b: HSGPPA and SAT Total Variables as a Predictor of College Performance for CCGPA:			
Freshmen Cumulative GPA	71		
SAT Total		1267.89	152.755
Positive Self-Concept		18.77	2.547
Realistic Self-Appraisal		10.63	1.907
Deals with Discrimination		16.82	2.647

Descriptive Statistics for Cognitive Variables per Research Question, continued

Variable	*n*	Mean	*SD*
Preference Long-Range Goals		8.32	1.875
Support Person Available		13.56	1.422
Leadership Experience		9.21	2.216
Community Service		5.15	1.215
Knowledge in a Field		3.72	.897
FCCGPA		3.1855	.48671
Sophomore Cumulative GPA	60		
SAT Total		1266.50	157.252
Positive Self-Concept		18.54	2.544
Realistic Self-Appraisal		10.60	2.044
Deals with Discrimination		16.33	2.549
Preference Long-Range Goals		8.09	2.025
Support Person Available		13.53	1.432
Leadership Experience		8.90	2.245
Community Service		5.20	1.232
Knowledge in a Field		3.63	1.008
SCCGPA		3.1262	.53424
Junior Cumulative GPA	39		
SAT Total		1256.67	161.967
Positive Self-Concept		18.79	2.486
Realistic Self-Appraisal		10.85	1.981
Deals with Discrimination		16.69	2.494
Preference Long-Range Goals		8.22	1.929
Support Person Available		13.54	1.295
Leadership Experience		8.97	2.206
Community Service		5.10	1.373
Knowledge in a Field		3.56	1.046
JCCGPA		3.2192	.47442
RQ 3c: HSGPPA, SAT Total, and NCQ Variables as a Predictor of College Performance for CCGPA:	70		
HSGPA		3.72	.45
SAT Total		1270	153.19
Positive Self-Concept		18.73	2.542
Realistic Self-Appraisal		10.66	1.910
Deals with Discrimination		16.87	2.6266
Preference Long-Range Goals		8.35	1.878
Support Person Available		13.56	1.431
Leadership Experience		9.24	2.216
Community Service		5.14	1.219
Knowledge in a Field		3.71	.903
FCCGPA		3.17	.480

Descriptive Statistics for Cognitive Variables per Research Question, continued

Variable	*n*	Mean	*SD*
Sophomores	58		
HSGPA		3.72	.468
SAT Total		1266	157.94
Positive Self-Concept		18.47	2.546
Realistic Self-Appraisal		10.66	2.057
Deals with Discrimination		16.47	2.487
Preference Long-Range Goals		8.20	1.950
Support Person Available		13.53	1.454
Leadership Experience		8.98	2.236
Community Service		5.19	1.249
Knowledge in a Field		3.66	1.001
SCCGPA		3.11	.531
Juniors	39		
HSGPA		3.22	.474
SAT Total		1257	161.967
Positive Self-Concept		18.79	2.486
Realistic Self-Appraisal		10.85	1.981
Deals with Discrimination		16.69	2.494
Preference Long-Range Goals		8.22	1.929
Support Person Available		13.54	1.295
Leadership Experience		8.97	2.206
Community Service		5.10	1.373
Knowledge in a Field		3.56	1.046
JCCGPA		3.78	.478

Correlation Analyses

Intercorrelations Between All Variables. A correlation analysis was performed to determine the relationship between the control variables (gender, age, ethnicity, university setting), cognitive dependent variables (HSGPA and SAT Scores), in dependent variables (eight noncognitive scales) and the dependent variables (FCCGPA, SCCGPA, and JCCGPA). Intercorrelations between all variables are presented in Table 4.4. As would be expected, HSGPA and SAT scores were highly correlated ($r = 44$, $p < .01$). Of the remainder of the cognitive variables, HSGPA was also significantly correlated with FCCGPA ($r = .23$, $p < .05$), SCCGPA ($r = .38$, $p < .01$), and JCCGPA (r

= .52, $p < .01$). SAT Total was significantly correlated with FCCGPA ($r = .24$, $p < .05$), SCCGPA ($r = .28$, $p < .05$), and JCCGPA ($r = .50$, $p < .01$). As far as correlations between the noncognitive and cognitive variables Positive Self-Concept was correlated with SCCGPA ($r = .29$, $p < .05$); Realistic Self-Appraisal was correlated with HSGPA ($r = .22$, $p < .05$); Availability of a Strong Support Person was correlated with FCCGPA ($r = .25$, $p < .05$), and SCCGPA ($r = .32$, $p < .01$). Successful Leadership Experience was correlated with FCCGPA ($r = .30$, $p < .01$), SCCGPA ($r = .48$, $p < .01$), and JCCGPA ($r = .37$, $p < .05$); Demonstrated Community Service was correlated with FCCGPA ($r = .29$, $p < .01$); and Knowledge Acquired in a Field was correlated with HSGPA ($r = .24$, $p < .05$). Table 4.4 presents the entire correlation matrix for the independent variables.

Intercorrelations between the Noncognitive Scales. A correlation analysis was performed to determine the relationship between the eight NCQ scales. While Availability of a Strong Support Person and Demonstrated Community Service did not correlate with any other scales, there were several significant correlations. There was a significant positive relationship between Positive Self-Concept and Realistic Self-Appraisal ($r = .24$, $p < .05$), Understands/Deals with Discrimination ($r = .29$, $p < .01$), Preference of Long-Range Goals ($r = .29$, $p < .01$), and Successful Leadership Experience ($r = .35$, $p < .01$). There was a significant positive relationship between Realistic Self-Appraisal and Preference of Long-Range Goals ($r = .29$, $p < .01$) and Successful Leadership Experience (r = .24, $p = .05$). There was a significant positive relationship between Successful Leadership Experience and Understands/Deals with Discrimination ($r = .22$, $p < .05$), Preference of Long-Range Goals ($r = .35$, $p < .01$), and Availability of a Strong Support Person ($r = .26$, $p < .05$). Finally, there was a significant

positive relationship between Preference for Long-Range Goals ($r = .28$, $p < .01$), Successful Leadership Experience ($r = .31$, $p < .01$), and Demonstrated Community Service ($r = .35$, $p < .01$). Table 4.4 presents the entire correlation matrix for the independent variables.

Table 4.4

Intercorrelations Among Predictor and Criterion Variables

	Age	Ethnicity	University Setting	HSGPA	SAT Total	FCCGPA	SCCGPA	JCCGPA	Positive Self-Concept	Realistic Self-Appraisal	Understands Discrimination	Preference of Long-Range Goals	Support Person Available	Successful Leadership Experience	Demonstrated Community Service	Knowledge Acquired in a Field
Gender	.00	.01	.12	.09	.13	.13	.26*	.31*	.06	.07	.07	.02	.00	.21	.03	.13
Age	---	.12	.08	.09	.14	.05	.08	.21	.05	.06	-.04	.03	.04	-.14	.10	-.20
Ethnicity6	---	---	.03	.17	.21	.19	.24	.10	.03	.03	.21	.05	.12	-.15	.09	-.09
Setting?	---	---	---	.14	.19	.16	.27*	.43**	.01	.09	.00	.08	.09	.15	.03	.07
HS GPA	---	---	---	---	.46**	.23*	.38**	.52**	.10	.22*	-.09	.17	.00	.18	.11	.24*
SAT Total	---	---	---	---	---	.24*	.28*	.50**	.22	.05	-.17	.05	.04	-.04	-.05	.07
Freshman GPA	---	---	---	---	---	---	.84**	.63**	.14	.05	-.08	.13	.25*	.30**	.29**	.06
Sophomore GPA	---	---	---	---	---	---	---	.88**	.29*	.12	-.11	.17	.32**	.48**	.14	.06
Junior GPA	---	---	---	---	---	---	---	---	.25	.09	-.01	.05	.07	.37*	-.01	.23
Positive Self-Concept	---	---	---	---	---	---	---	---	---	.24*	.29**	.29**	.17	.35**	.01	-.06
Realistic Self-Appraisal	---	---	---	---	---	---	---	---	---	---	.09	.29**	.10	.24*	.03	.17

Intercorrelations Among Predictor and Criterion Variables, Continued

	Age	Ethnicity	University Setting	HSGPA	SAT Total	FCCGPA	SCCGPA	JCCGPA	Positive Self-Concept	Realistic Self-Appraisal	Understands Discrimination	Preference of Long-Range Goals	Support Person Available	Leadership Experience	Demonstrated Community Service	Knowledge Acquired in a Field
Understands and Deals with Discrimination	---	---	---	---	---	---	---	---	---	---	---	.11	-.03	.22*	-.19	-.08
Preference of Long-Range Goals	---	---	---	---	---	---	---	---	---	---	---	---	.13	.35**	.13	.28**
Availability of Strong Support Person	---	---	---	---	---	---	---	---	---	---	---	---	---	.26*	.08	.08
Successful Leadership Experience	---	---	---	---	---	---	---	---	---	---	---	---	---	---	.19	.31**
Demonstrated community service	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	.35**

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

Multiple Regression Analyses

Once the above analyses were accomplished, a total of 21 of multiple regression analyses were performed on the data to address the research questions (as will be presented below). An alpha level of $p < .05$ was considered statistically significant for all analyses in this study. However, it is recognized that there is a weakness in the internal consistency for the noncognitive variables in the present study and this will be addressed when interpreting the results of the data analyses in the Discussion section.

Research Question 1. Three sets of three multiple regression analyses were conducted to explore the degree to which traditional academic indicators predict college grade point average at the end of their freshman, sophomore, and junior years for students learning disabilities based on high school GPA (HSGPA) alone, SAT Total (combined Verbal and Math) alone, and HSGPA and SAT TOTAL used as joint predictors while controlling for background characteristics of age, gender, ethnicity, and university attended. Regression results for FCCGPA are presented in Table 4.5. Associated regression coefficients are presented in Table 4.6.

Research Question 1a. There were three multiple regression analyses performed to address research question 1a. Each analysis had the same independent variables, but the dependent variable is different for each analysis: Freshman college cumulative grade point average (FCCGPA), sophomore college cumulative grade point average (SCCGPA), and junior college cumulative grade point average (JCCGPA). The first analysis explored the degree to which traditional cognitive indicators predict college grade point average for college freshmen with learning disabilities based on high school GPA (HSGPA) alone. The variables entered into first block the regression equation were

the control variables Age, Gender, Ethnicity, and University Setting. The second block entered into the analysis was HSGPA. After both blocks were entered, the full model approached significance, but it did not significantly contribute to the variance in FCCGPA, $F(5,76) = 2.315$ $p = .052$. Additionally, Block 1 was not significant ($R^2 = .086$, $p = .137$) nor were any of the variables themselves significant within Block 1. The addition of HSGPA in Block 2 significantly increased R^2 (R^2 change = .047, $p = .047$) accounting for an additional 4.7 percent of the variance in FFCGPA. Of the variables in Block 2, University Setting (β = 228, p = .040) and HSGPA (β = .224, $p = .047$) were significant, positive, predictors of FCCGPA. These results show that for freshmen, HSGPA alone is a significant predictor of FCCGPA. Regression results for FCCGPA are presented in Table 4.5. Associated regression coefficients are presented in Table 4.6.

The second analysis was identical to the first, but with sophomore cumulative college (SCCGPA) as the dependent measure. The full model was significant, accounting for 35 percent of the variance in SCCGPA, $F(5,60) = 6.362$, $p < .001$. Block 1 was significant ($R^2 = .245$, $p = .002$), contributing 24.5 percent of the variance in SCCGPA. The variables of University Setting (β = .369, $p = .002$) and Gender (β = .314, $p = .008$) in Block 1 were significant positive predictors of SCCGPA. The addition of HSGPA in Block 2 significantly increased R^2 (R^2 change = .101, $p = .003$), accounting for an additional 10 percent of the variance in SCCGPA. Of the variables in Block 2, Gender (β = .273, $p = .014$), University Setting (β = .383, $p = .001$), and HSGPA (β = .331, $p = .003$) were significant positive predictors of SCCGPA. These results show that HSGPA alone is a significant predictor of SCCGPA. Regression results for FCCGPA are presented in Table 4.5. Associated regression coefficients are presented in Table 4.6.

The third analysis was also identical to the first, but with junior cumulative college GPA (JCCGPA) as the dependent measure. The full model was significant, accounting for 51 percent of the variance in junior college cumulative grade point average (JCCGPA) $F(5,35) = 7.283$, $p < .001$. Block 1 was significant ($R^2 = .325$, $p = .006$), accounting for 32.5 percent of the variance in JCCGPA. Of the four variables in Block 1, Gender ($\beta = .328$, $p = .023$) and University Setting ($\beta = .425$, $p = .004$) were significant positive predictors of JCCGPA. The addition of HSGPA in Block 2 significantly increased R^2 (R^2 change =.185, $p = .001$), accounting for an additional 18.5 percent of the variance in JCCGPA. Of the variables in Block 2, Gender ($\beta = .265$, $p = .035$), University Setting ($\beta = .417$, $p = .001$), and HSGPA ($\beta = .452$, $p = .001$) were significant positive predictors for JCCGPA. These results show that HSGPA alone is a significant predictor of JCCGPA. Regression results for FCCGPA are presented in Table 4.5. Associated regression coefficients are presented in Table 4.6.

Table 4.5

Regression Summary Table, Research Question 1a

	R^2	F	Sig. F	ΔR^2	$F\ \Delta R^2$	Sig. ΔR^2
Freshman GPA (n = 82)						
Block 1: Control Variables	.086	1.801	.137	---	---	--
Block 2: HSGPA	.132	2.315	.052	.047	4.081	.047*
Sophomore Cumulative GPA (n = 66)						
Block 1: Control Variables	.245	4.954	.002**	---	---	--
Block 2: HSGPA	.346	6.362	< .001**	.101	9.298	.003**
Junior Cumulative GPA (n = 41)						
Block 1: Control Variables	.325	4.328	.006**	---	---	--
Block 2: HSGPA	.510	7.283	.001**	.185	13.22	.001**

Note. Control Variables were: Age, Gender Ethnicity, University; * $p < .05$, ** $p < .01$

Table 4.6:

Regression Coefficients, Research Question 1a

Variable	B	*SE* β	β	*t*	*p*
Freshman Cumulative GPA (*n* = 83					
Block 1					
Gender	.150	.116	.142	1.295	.199
Age	-.002	.033	-.006	-.059	.953
Ethnicity	-.059	.035	-.188	-1.711	.091
University	.213	.121	.194	1.760	.082
Block 2					
Gender	.133	.114	.126	1.168	.247
Age	.005	.033	.017	.152	.879
Ethnicity	-.047	.034	-.151	-1.382	.171
University	.251	.120	.228	2.086	.040*
HSGPA	.255	.126	.224	2.020	.047*
Sophomore Cumulative GPA (*n* = 66)					
Block 1					
Gender	.345	.126	.314	2.745	.008*
Age	-.006	.034	-.021	-.183	.855
Ethnicity	-.069	.035	-.222	-1.981	.052
University	.422	.130	.369	3.241	.002*
Block 2					
Gender	.300	.119	.273	2.523	.014*
Age	.007	.033	.024	.229	.820
Ethnicity	-.051	.033	-.165	-1.546	.127
University	.439	.122	.383	3.586	.001**
HSGPA	.370	.121	.331	3.049	.003**
Junior Cumulative GPA (*n* = 44)					
Block 1					
Gender	.319	.134	.328	2.371	.023*
Age	-.033	.035	-.133	-.960	.344
Ethnicity	-.036	.039	-.125	-.904	.372
University	.442	.143	.425	3.086	.004**
Block 2					
Gender	.257	.117	.265	2.194	.035*
Age	-.006	.031	-.025	-.203	.840
Ethnicity	-.023	.034	-.0880	-.662	.513
University	.435	.124	.417	3.510	.001**
HSGPA	.446	.123	.452	3.636	.001**

Note. *$p < .05$, **$p < .01$

Research Question 1b. There were three multiple regression analyses performed to address research question 1b. These analyses all had the same general structure as those for research question 1a, with the same control variables entered into Block 1, but with SAT Total entering into Block 2 instead of HSGPA. For the first analysis, the dependent measure was freshman cumulative college GPA (FCCGPA). The full model was significant, accounting for 19.8 percent of the variance FCCGPA, $F(5,65) = 3.211$, $p = .012$. Block 1was significant ($R^2 = .161$, $p = .014$) accounting for 16 percent of the variance of FCCGPA. Of the four variables in Block 1, University Setting ($\beta = .346$, $p = .003$) was a significant positive predictor of FCCGPA. The addition of SAT Total in Block 2 did not significantly increase R^2 (R^2 change = .027, $p = .145$). However, of the variables in Block 2, Gender ($\beta = .227$, $p = .049$) and University Setting ($\beta = .314$, $p = .008$) were significant positive predictors. These results show that SAT alone is not a significant predictor of FCCGPA. Regression results for FCCGPA are presented in Table 4.7. Associated regression coefficients are presented in Table 4.8.

The second analysis was identical to the first, but with sophomore cumulative college GPA (SCCGPA) as the dependent measure. The full model was significant, accounting for 25 percent of the variance in SCCGPA, $F(5,54) = 3.654$, $p = .006$. Block 1 was significant ($R^2 = .220$, $p = .008$), accounting for 22 percent of the variance of SCCGPA. Of the four variables in Block 1, University Setting ($\beta = .385$, $p = .003$) and Gender ($\beta = .274$, $p = .036$) were significant positive predictors of SCCGPA. The addition of SAT Total in Block 2 did not significantly increase R^2 (R^2 change = .033, $p = .13$). However, Gender ($\beta = .296$, $p = .024$) and University Setting ($\beta = .146$, $p = .007$) were significant positive predictors of SCCGPA. These results show that SAT alone is

not a significant predictor of SCCGPA. Regression results for FCCGPA are presented in Table 4.7. Associated regression coefficients are presented in Table 4.8.

The third analysis was also identical to the first, but with junior cumulative college GPA (JCCGPA) as the dependent measure. The full model was significant, accounting for 52 percent of the variance in JCCGPA, $F(5,33) = 7.146$, $p = < .001$. Block 1 was significant ($R^2 = .375$, $p = .002$). Of the four variables in Block 1, University Setting ($\beta = .446$, $p = .002$) was a significant positive predictor, accounting for 44.6 percent of the variance of JCCGPA. The addition of SAT Total in Block 2 significantly increased R^2 (R^2 change = .145, $p = .003$), accounting for an additional 14.5 percent of the variance in JCCGPA. Of the variables in Block 2, University Setting ($\beta = .397$, $p = .003$) and SAT Total ($\beta = .414$, $p = .003$) were significant positive predictors of JCCGPA. These results show that SAT alone is a significant predictor of JCCGPA. Regression results for FCCGPA are presented in Table 4.7. Associated regression coefficients are presented in Table 4.8.

Table 4.7

Regression Summary Table, Research Question 1b

	R^2	F	Sig. F	ΔR^2	$F\ \Delta R^2$	Sig. ΔR^2
Freshman SAT Total (n = 71)						
Block 1: Control Variables	.161	3.410	.014**	---	---	--
Block 2: SAT	.198	3.211	.012**	.0272	2.173	.145
Sophomore SAT Total (n = 60)						
Block 1: Control Variables	.220	3.876	.008**	---	---	--
Block 2: SAT	.253	3.654	.006**	.033	2.378	.129
Junior SAT Total (n = 39)						
Block 1: Control Variables	.375	5.100	.002**	---	---	--
Block 2: SAT	.520	7.146	.001**	.145	9.955	.003**

Note. Control Variables were: Age, Gender Ethnicity, University; * $p < .05$, ** $p < .01$

Table 4.8

Regression Coefficients, Research Question 1b

Variable	B	*SE* β	β	*t*	*p*
		Freshman SAT Total (*n* = 71)			
Block 1					
Gender	.212	.112	.216	1.891	.063
Age	-.042	.045	-.109	-.927	.357
Ethnicity	-.028	.034	-.096	-.818	.416
University	.358	.118	.346	3.042	.003**
Block 2					
Gender	.224	.111	.227	2.005	.049
Age	-.033	.045	-.086	-.733	.466
Ethnicity	-.021	.034	-.071	-.601	.550
University	.324	.119	.314	2.728	.008
SAT	.001	< .001	.172	1.474	.145
		Sophomore SAT Total (*n* = 60)			
Block 1					
Gender	.301	.141	.274	2.144	.036*
Age	-.025	.059	-.054	-.427	.671
Ethnicity	-.067	.039	-.208	-1.711	.093
University	.452	.145	.385	3.122	.003*
Block 2					
Gender	.325	.140	.296	2.328	.024*
Age	-.010	.059	-.021	-.163	.871
Ethnicity	-.050	.040	-.157	-1.263	.212
University	.406	.146	.346	2.782	.007**
SAT	.001	.001	.197	1.542	.129
		Junior SAT Total (*n* = 39)			
Block 1					
Gender	.221	.143	.227	1.550	.130
Age	-.122	.066	-.279	-1.848	.073
Ethnicity	-.011	.041	-.041	-.281	.780
University	.464	.141	.446	3.287	.002**
Block 2					
Gender	.214	.127	.219	1.683	.102
Age	-.089	.060	-.202	-1.482	.148
Ethnicity	.021	.038	.074	.551	.585
University	.414	.127	.397	3.267	.003**
SAT	.001	.001	.414	3.155	.003**

Note. * $p < .05$, ** $p < .01$

Research Question 1c. There were three multiple regression analyses performed to address research question 1c. These analyses all had the same general structure as those for research question 1b, with the same control variables entered into Block 1, but with HSGPA and SAT Total entering into Block 2 instead of SAT Total only. For the first analysis, the dependent measure was freshman cumulative college GPA (FCCGPA). The full model was significant, accounting for 22 percent of the variance in FCCGPA, $F(6,63) = 2.890$, $p = 015$. Block 1 was significant ($R^2 = .178$, $p = .012$), accounting for 17.8 percent of the variance of FCCGPA. Of the four variables in Block 1, University Setting ($\beta = .367$, $p = .002$) was a significant positive predictor of FCCGPA. The addition of both HSGPA and SAT Total in Block 2 did not significantly increase R^2 (R^2 change = .038, $p = .226$). However, University Setting ($\beta = .343$, $p = .027$) still remained a positive predictor of FCCGPA. These results show that SAT and HSGPA are not significant predictors of FCCGPA. Regression results for FCCGPA are presented in Table 4.9. Associated regression coefficients are presented in Table 4.10.

The second analysis was identical to the first, but with sophomore cumulative college GPA (SCCGPA) as the dependent measure. The full model was significant, accounting for 33.8 percent of the variance in SCCGPA, $F(6,51) = 4.331$, $p = .001$. Block 1 was significant ($R^2 = .246$, $p = .004$), accounting for 24.6 percent of the variance in SCCGPA. Of the four variables in Block 1, Gender ($\beta = .293$, $p = .026$) and University Setting ($\beta = .422$, $p = .001$) were significant positive predictors of SCCGPA. The addition of HSGPA and SAT Total in Block 2 significantly increased R^2 (R^2 change = .091, $p = .037$), accounting for an additional 9.1 percent of the variance in SCCGPA. Of the variables in Block 2, University Setting ($\beta = .409$, $p = .001$) and HSGPA ($\beta =$

.304, p = .040) were significant positive predictors of SCCGPA. These results show that although the addition of SAT and HSGPA increased the prediction of sophomore cumulative GPA, when both measures were used as predictors, only HSGPA was a significant predictor. Regression results for FCCGPA are presented in Table 4.9. Associated regression coefficients are presented in Table 4.10.

The third analysis was also identical to the first, but with junior cumulative college GPA (JCCGPA) as the dependent measure. The full model was significant, accounting for 59.4 percent of the variance in junior college cumulative grade point average (JCCGPA) $F(6,32) = 7.801$, $p = .001$. Block 1 was significant ($R^2 = .375$, $p = .002$), accounting for 37.5 percent of the variance in JCCGPA. Of the four variables in Block 1, University Setting ($\beta = .446$, $p = .002$) was a significant positive predictor of JCCGPA. The addition of HSGPA and SAT Total to Block 2 significantly increased R^2 (R^2 change = .219, p = .001), accounting for an additional 21.9 percent of the variance in JCCGPA. Of the variables in Block 2, University Setting ($\beta = .416$, p = .001) and HSGPA ($\beta = .340$, $p < .022$) were significant positive predictors of JCCGPA. These results show that although the addition of SAT and HSGPA increased the prediction of sophomore cumulative GPA, when both measures were used as predictors, only HSGPA was a significant predictor. These result show that SAT and HSGPA together were not positive predictors of SCCGPA but HSGPA alone was a significant predictor of JCCGPA. Regression results for FCCGPA are presented in Table 4.9. Associated regression coefficients are presented in Table 4.10.

Table 4.9

Regression Summary Table, Research Question 1c

	R^2	*F*	Sig. *F*	ΔR^2	*F* ΔR^2	Sig. ΔR^2
Freshman Cumulative GPA and SAT Total (*n* = 70)						
Block 1: Control Variables	.178	3.516	.012*	---	---	--
Block 2: SAT Total & HSGPA	.216	2.890	.015*	.038	1.524	.226
Sophomore Cumulative GPA and SAT Total (*n* = 58)						
Block 1: Control Variables	.246	4.330	.004**	---	---	--
Block 2: SAT Total & HSGPA	.338	4.331	.001**	.091	3.512	.037**
Junior Cumulative GPA and SAT Total (*n* = 39)						
Block 1: Control Variables	.375	5.100	.002**	---	---	--
Block 2: SAT Total & HSGPA	.594	7.801	.001**	.219	8.625	.001**

Note. Control Variables were: Age, Gender Ethnicity, University; * $p < .05$, ** $p < .01$

Table 4.10

Regression Coefficients, Research Question 1c

Variable	B	*SE* β	β	*t*	*p*
Freshman Cumulative GPA and SAT Total (*n* = 70)					
Block 1					
Gender	.194	.111	.201	1.753	.084
Age	-.039	.044	-.103	-.876	.384
Ethnicity	-.025	.034	-.088	-.749	.457
University	.372	.116	.367	3.212	.002**
Block 2					
Gender	.197	.111	.203	1.768	.082
Age	-.031	.044	-.082	-.689	.494
Ethnicity	-.015	.034	-.052	-.436	.664
University	.348	.120	.343	2.912	.027*
HSGPA	.073	.143	.068	.508	.613
SAT Total	.001	.001	.160	1.160	.251
Sophomore Cumulative GPA and SAT Total (*n* = 58)					
Block 1					
Gender	.321	.140	.293	2.298	.026*
Age	-.032	.058	-.069	-.551	.584
Ethnicity	-.040	.038	-.128	-1.059	.295
University	.488	.143	.422	3.417	.001**
Block 2					
Gender	.267	.138	.243	1.930	.059

Regression Coefficients, Research Question 1c, continued

Variable	B	*SE* β	β	*t*	*p*
Sophomore Cumulative GPA and SAT Total (*n* = 58), continued					
Age	-.032	.058	-.069	-.551	.584
Ethnicity	-.040	.038	-.128	-1.059	.295
University	.474	.141	.409	3.367	.001
HSGPA	.345	.164	.304	2.106	.040*
SAT	<.001	.001	.014	.094	.926
Junior Cumulative GPA and SAT Total (*n* = 39)					
Block 1					
Gender	.221	.143	.227	1.550	.130
Age	-.122	.066	-.279	-1.848	.073
Ethnicity	-.011	.041	-.041	-.28	.780
University	.464	.141	.446	3.287	.002**
Block 2					
Gender	.170	.120	.174	1.413	.167
Age	-.085	.056	-.194	-1.522	.138
Ethnicity	.015	.035	.054	.432	.669
University	.433	.118	.416	3.654	.001**
HSGPA	.337	.140	.340	2.416	.022**
SAT Total	.001	.00	.214	1.443	.159

Note. * $p < .05$, ** $p < .01$

Research Question 2. Three sets of three multiple regression analyses were conducted to explore the degree to which, while controlling for background variables, noncognitive variables added to the prediction of CCGPA at the end of their freshman, sophomore, and junior years for college students with learning disabilities. Each analysis had the same independent variables, but the dependent variable is different for each analysis: Freshman college cumulative grade point average (FCCGPA), sophomore college cumulative grade point average (SCCGPA), and junior college cumulative grade point average (JCCGPA).

The first analysis explores the degree to which Noncognitive Variables predict college grade point average for college freshmen with learning disabilities. The variables entered into first block the regression equation were the control variables of Age, Gender,

Ethnicity, and University Setting. The eight Noncognitive Variables were entered into the second block of the analysis. The full model was significant, accounting for 26 percent of the variance in FCCGPA, $F(12,70) = 1.994$, $p = .038$). Block 1 was not significant ($R^2 = .086$, $p = .132$) nor were any of the variables in Block 1significant predictors. The addition of the eight NCQ variables in Block 2 did not significantly increase R^2 (R^2 change = .169, $p = .061$). Although the variable of Community Service ($\beta = .302$, $p < .012$) as a single NCQ scale in Block 2 was a significant predictor, the NCQ scales, taken collectively, did not increase predictive power for FCCGPA. Regression results for FCCGPA are presented in Table 4.11. Associated regression coefficients are presented in Table 4.12.

The second analysis was identical to the first, but with sophomore cumulative college grade point average (SCCGPA) as the dependent measure. The full model was significant, accounting for 45 percent of the variance in SCCGPA, $F(12,55) = 3.801$, $p = .001$. Block 1 was significant ($R^2 = .224$, $p = .003$), accounting for 22.4 percent of the variance in SCCGPA. Of the four variables in Block 1, Gender ($\beta = .295$, $p = .012$) and University Setting ($\beta = .337$ $p = .004$) were significant positive predictors of SCCGPA while Ethnicity ($\beta = -.0236$, $p = .038$) was a negative predictor of SCCGPA. The addition of the NCQ variables in Block 2 significantly increased R^2 (R^2 change = .229, $p = .009$), accounting for an additional 22.9 percent of the variance in SCCGPA. Of the variables in Block 2, Gender ($\beta = .224$, $p = .046$), University Setting ($\beta = .290$, $p = .009$), and Leadership Experience ($\beta = .342$, $p = .015$) were significant positive predictors of SCCGPA. Also, Knowledge in a Field ($\beta = -.233$, $p = .07$) and Deals with Discrimination (both a negative relationship) ($\beta = -.224$, $p = .055$) approached significance. These results

show that although addition of the NCQ increased the prediction of sophomore cumulative GPA, Leadership Experience was the only significant predictor of the individual scales. Regression results for SCCGPA are presented in Table 4.11. Associated regression coefficients are presented in Table 4.12.

The third analysis was also identical to the first, but with junior cumulative college GPA (JCCGPA) as the dependent measure. The full model was not significant F (12,28) = 1.852, p = .088. Block 1 was significant (R^2 = .325, p = *.006*). Of the four variables in block 1, Gender (β = .328, p = .023) and University Setting (β = .425, p = .004 were significant positive predictors of JCCGPA. The addition of the NCQ variables in Block 2 did not significantly contribute to R^2 (R^2 change = .118. p = .656). Although the variable of Positive Self-Concept (β = .458, p = .005) as a single NCQ scale in Block 2 was a significant predictor, the NCQ scales, taken collectively, did not increase predictive power for JCCGPA. Regression results for JCCGPA are presented in Table 4.11. Associated regression coefficients are presented in Table 4.12.

Table 4.11

Regression Summary Table, Research Question 2

	R^2	F	Sig. F	ΔR^2	$F\ \Delta R^2$	Sig. ΔR^2
Freshman NCQ (n = 83)						
Block 1: Control Variables	.086	1.829	.132	---	---	--
NCQ	.255	1.994	.038*	.169	1.984	.061
Sophomore Cumulative NCQ (n = 68)						
Block 1: Control Variables	.224	4.556	.003**	---	---	--
NCQ	.453	3.801	.001**	.229	2.880	.009**
Junior Cumulative NCQ (n = 41)						
Block 1: Control Variables	.325	4.328	.006**	---	---	--
NCQ	.443	1.852	.088	.118	.740	.656

Note. Control Variables were: Age, Gender Ethnicity, University; * p < .05, ** p < .01

Table 4.12

Regression Coefficients, Research Question 2

Variable	B	*SE* β	β	*t*	*p*
		Freshman NCQ (*n* = 83)			
Block 1					
Gender	.164	.17	.153	1.407	.164
Age	-.004	.033	-.012	-.113	.910
Ethnicity	-.061	.035	-.193	-1.761	.082
University	.201	.122	.180	1.648	.103
Block 2					
Gender	.163	.116	.153	1.411	.163
Age	-.021	.033	-.069	-.631	.530
Ethnicity	-.061	.036	-.191	-1.706	.092
University	.171	.122	.153	1.401	.166
Positive Self-Concept	-.001	.026	-.004	-.031	.975
Realistic Self-Appraisal	-.008	.030	-.030	-.267	.790
Deals with Discrimination	-.006	.023	-.029	-.245	.807
Preference Long-Range Goals	.032	.034	.112	.936	.353
Support Person Available	.055	.042	.146	1.331	.188
Leadership Experience	.033	.032	.137	1.034	.305
Community Service	.119	.046	.302	2.575	.012*
Knowledge in a Field	-.091	.069	-.161	-1.327	.189
		Sophomore NCQ (*n* = 68)			
Block 1					
Gender	.324	.125	.295	2.585	.012*
Age	-.007	.035	-.022	-.197	.844
Ethnicity	-.074	.035	-.236	-2.114	.038*
University	.391	.132	.337	2.973	.004**
Block 2					
Gender	.247	.121	.224	2.041	.046*
Age	-.019	.033	-.060	-.574	.568
Ethnicity	-.043	.035	-.136	-1.215	.229
University	.337	.124	.290	2.711	.009**
Positive Self-Concept	.038	.024	.179	1.573	.122
Realistic Self-Appraisal	.001	.029	.003	.031	.975
Deals with Discrimination	-.047	.024	-.224	-1.958	.055
Preference Long-Range Goals	.027	.031	.100	.858	.395
Support Person Available	.034	.041	.091	.829	.410
Leadership Experience	.082	.033	.342	2.508	.015
Community Service	.029	.047	.068	.609	.545
Knowledge in a Field	-.120	.065	-.233	-1.845	.070

Regression Coefficients, Research Question 2

Variable	B	*SE* β	β	*t*	*p*
Block 1					
Gender	.319	.134	.328	2.371	.023*
Age	-.033	.035	-.133	-.960	.344
Ethnicity	-.036	.039	-.125	-.904	.372
University	.442	.143	.425	3.086	.004**
Block 2					
Gender	.261	.152	.268	1.719	.097
Age	-.013	.040	-.053	-.331	.743
Ethnicity	-.001	.053	-.004	-.019	.985
University	.476	.157	.458	3.036	.005**
Positive Self-Concept	.048	.031	.252	1.572	.127
Realistic Self-Appraisal	.014	.036	.060	.375	.711
Deals with Discrimination	-.012	.031	-.061	-.375	.710
Preference Long-Range Goals	-.027	.043	-.111	-.637	.529
Support Person Available	-.034	.056	-.094	-.609	.548
Leadership Experience	.035	.041	.163	.865	.395
Community Service	-.066	.065	-.194	-.1021	.316
Knowledge in a Field	.061	.105	.133	.578	.568

Note. * $p < .05$, ** $p < .01$

Research Question 3. Three sets of three of three multiple regression analyses were conducted to explore the degree to which, while controlling for background variables, noncognitive variables added to the prediction of CCGPA beyond HSGPA, beyond the SAT scores, and beyond both HSGPA and SAT scores at the end of their freshman, sophomore, and junior years for college students with learning disabilities.

Research Question 3a. There were three multiple regression analyses performed to address research question 3a. Each analysis had the same independent variables, but the dependent variable is different for each analysis: Freshman college cumulative grade point average (FCCGPA), sophomore college cumulative grade point average (SCCGPA), and junior college cumulative grade point average (JCCGPA). The first analysis explores the degree to which Noncognitive Variables predict college grade point

average for college freshmen with learning disabilities beyond HSGPA alone. The variables entered into first block of the regression equation were the control variables of Age, Gender, Ethnicity, and University Setting. HSGPA was also entered into the first block. The eight Noncognitive Variables were entered into the second block of the analysis. The full model was significant, accounting for 29 percent of the variance in FCCGPA $F(13,68) = 2.131$, $p = .023$. Block 1 was approached significance ($R^2 = .132$, $p = .052$.). However, of the five variables in Block 1, University Setting ($\beta = .228$, $p = .040$) and HSGPA ($\beta = .224$, $p = .047$) were significant. The addition of the eight NCQ variables in Block 2 did not significantly increase R^2 ($R^2 = .157$, $p = .077$) but the variable of Community Service Experience in Block 2 was significant ($\beta = .274$, $p = .022$), accounting for 27.4 percent of the variance in FCCGPA. These results show that although Community Service as a single NCQ scale in Block 2 was a significant predictor, the NCQ scales, taken collectively, did not increase predictive power for FCCGPA beyond HSGPA. Regression results for FCCGPA are presented in Table 4.13. Associated regression coefficients are presented in Table 4.14.

The second analysis was identical to the first, but with sophomore cumulative college GPA (SCCGPA) as the dependent measure. The full model was significant, accounting for 56 percent of the variance in SCCGPA $F(13,52) = 5.014$, $p = .001$. Block 1 was significant ($R^2 = .346$, $p = .001$), accounting for 34.6 percent of the variance in SCCGPA. Of the five variables in Block 1, Gender ($\beta = .273$, $p = .014$), University Setting ($\beta = .383$, $p = .001$) and HSGPA ($\beta = .331$, $p = .003$) were significant positive predictors of SCCGPA. The addition of the eight NCQ variables in Block 2 significantly increased R^2 (R^2 change = .210, $p = .007$), accounting for an additional 21 percent of the

variance in SCCGPA. In Block 2, the variables of Gender (β = .211, p = .044), University Setting (β = .339, p = .001), HSGPA (β = .287, p = .007), and Successful Leadership (β =.347, *p* = .008) were significant positive predictors. Knowledge Acquired in a Field (β = -.259, *p* = .029) was a significant negative predictor. These results show that the addition of the noncognitive variables, in addition to HSGPA, were significant predictors of SCCGPA. Regression results for SCCGPA are presented in Table 4.13. Associated regression coefficients are presented in Table 4.14.

The third analysis was identical to the first, but with junior cumulative college GPA (JCCGPA) as the dependent measure. The full model was significant, accounting for 68 percent of the variance in JCCGPA $F(13,27) = 4.308$, $p = .001$. Block 1 was significant ($R^2 = .510$, $p = .001$), accounting for 51 percent of the variance in JCCGPA. Of the five variables in Block 1, Gender (β = .265, *p* = .035), University Setting (β = .417, *p* = .001) and HSGPA (β = .452, *p* = .001) were significant positive predictors. The addition of the eight NCQ variables in Block 2 did not significantly increase R^2 (R^2 change = .165, *p* = .142) but the variables of University Setting (β = .494, p < .001), HSGPA (β =.563, *p* < .001) and Positive Self-Concept (β = .367, *p* .008) were significant positive predictors of SCCGPA. Although the NCQ variable of Positive Self-Concept as a single NCQ scale in Block 2 was a significant predictor, the NCQ scales, taken collectively, did not increase predictive power for JCCGPA. Regression results for FCCGPA are presented in Table 4.13. Associated regression coefficients are presented in Table 4.14.

Table 4.13:

Regression Summary Table, Research Question 3a

	R^2	*F*	Sig. *F*	ΔR^2	*F* ΔR^2	Sig. ΔR^2
Freshman NCQ Beyond HSGPA (*n* = 82)						
Block 1: Control Variables	.132	2.315	.052	---	---	---
NCQ	.289	2.131	.023*	.157	1.882	.077
Sophomore Cumulative NCQ Beyond HSGPA (*n* = 66)						
Block 1: Control Variables	.346	6.362	.001**			
NCQ	.556	5.014	.001**	.210	3.072	.007**
Junior Cumulative NCQ Beyond HSGPA (*n* = 41)						
Block 1: Control Variables	.510	7.283	.001**			
NCQ	.675	4.308	.001**	.165	1.710	.142

Note. Control Variables were: Age, Gender Ethnicity, University; * $p < .05$, ** $p < .01$

Table 4.14:

Regression Coefficients, Research Question 3a

Variable	B	*SE* β	β	*t*	*p*
Freshman NCQ Beyond HSGPA (*n* = 82)					
Block 1					
Gender	.133	.114	.126	1.168	.247
Age	.005	.033	.017	.152	.879
Ethnicity	-.047	.034	-.151	-1.382	.171
University	.251	.120	.228	2.086	.040*
HSGPA	.255	.126	.224	2.020	.047*
Block 2					
Gender	.136	.114	.128	1.194	.237
Age	-.012	.033	-.042	-.382	.704
Ethnicity	-.051	.035	-.164	-1.463	.148
University	.219	.121	.199	1.811	.074
HSGPA	.211	.130	.185	1.620	.110
Positive Self-Concept	-.002	.027	-.010	-.077	.939
Realistic Self-Appraisal	-.009	.030	-.032	-.291	.772
Deals with Discrimination	.002	.023	.009	.077	.939
Preference Long-Range Goals	.034	.033	.121	1.017	.313
Support Person Available	.055	.041	.146	1.345	.183
Leadership Experience	.035	.032	.146	1.098	.276
Community Service	.107	.045	.274	2.350	.022
Knowledge in a Field	-.107	.067	-.191	-1.587	.117

Regression Coefficients, Research Question 3A, continued

Variable	B	*SE* β	β	*t*	*p*
	NCQ Beyond HSGPA (n=66)				
Block 1					
Gender	.300	.119	.273	2.523	.014*
Age	.007	.033	.024	.229	.820
Ethnicity	-.051	.033	-.165	-1.546	.127
University	.439	.122	.383	3.586	.001**
HSGPA	.370	.121	.331	3.049	.003**
Block 2					
Gender	.232	.112	.211	2.069	.044*
Age	-.006	.030	-.021	-.212	.833
Ethnicity	-.027	.033	-.087	-.829	.411
University	.389	.114	.339	3.405	.001**
HSGPA	.321	.115	.287	2.790	.007**
Positive Self-Concept	.024	.024	.112	.995	.324
Realistic Self-Appraisal	-.004	.027	-.017	-.158	.875
Deals with Discrimination	-.035	.023	-.167	-1.575	.121
Preference Long-Range Goals	.034	.030	.121	1.121	.267
Support Person Available	.040	.038	.107	1.045	.301
Leadership Experience	.083	.030	.347	2.736	.008**
Community Service	.014	.043	.033	.316	.754
Knowledge in a Field	-.134	.060	-.259	-2.247	.029*
	Junior NCQ Beyond HSGPA (*n* = 41)				
Block 1					
Gender	.257	.117	.265	2.194	.035*
Age	-.006	.031	-.025	-.203	.840
Ethnicity	-.023	.034	-.080	-.662	.513
University	.435	.124	.417	3.510	.001**
HSGPA	.446	.123	.452	3.636	.001**
Block 2					
Gender	.231	.118	.238	1.956	.061
Age	.011	.032	.045	.356	.724
Ethnicity	-.005	.042	-.016	-.112	.912
University	.514	.122	.494	4.202	.001**
HSGPA	.555	.126	.563	4.390	.001**
Positive Self-Concept	.070	.024	.367	2.875	.008**
Realistic Self-Appraisal	.032	.028	.141	1.122	.272
Deals with Discrimination	-.037	.025	-.195	-1.497	.146
Preference Long-Range Goals	-.037	.034	-.148	-1.089	.286
Support Person Available	-.056	.044	-.154	-1.272	.214
Leadership Experience	.016	.032	.075	.507	.616
Community Service	-.030	.051	-.087	-.580	.567
Knowledge in a Field	-.026	.084	-.058	-.315	.755

Note. * $p < .05$, ** $p < .01$

Research Question 3b. There were three multiple regression analyses performed to address research question 3b. These analyses all had the same general structure as those for research question 3a, with the same control variables entered into Block 1, but with SAT Total entering into Block 1 instead of HSGPA. For the first analysis, the dependent measure was freshman college cumulative grade point average (FCCGPA). The full model was significant, accounting for 36 percent of the variance in freshman college cumulative grade point average (FCCGPA) $F(13,57) = 2.463$, $p = .01$. Block 1 was significant ($R^2 = .198$, $p = .012$), accounting for 19.8 percent of the variance in FCCGPA. Of the five variables in Block 1, Gender ($\beta = .227$, $p = .049$) and University Setting ($\beta = .314$, $p = .008$) were significant positive predictors. The addition of the eight NCQ variables in Block 2 did not significantly increase R^2 (R^2 change = .162, $p = .096$) but the variable of SAT ($\beta = .250$, $p = .036$) was significant. These results show that SAT was a significant predictor of FCCGPA but the noncognitive variables did not add predictive power to the model. Regression results for FCCGPA are presented in Table 4.15. Associated regression coefficients are presented in Table 4.16.

The second analysis was identical to the first, but with sophomore cumulative college GPA (SCCGPA) as the dependent measure. The full model was significant, accounting for 49.7 percent of the variance in SCCGPA $F(13,46) = 3.495$, $p < .00$. Block 1 was significant ($R^2 = .253$, $p = .006$). Of the five variables in Block 1, Gender ($\beta = .296$, $p = .024$) and University Setting ($\beta = .346$, $p = .007$) were significant positive predictors. The addition of the eight NCQ variables in Block 2 significantly increased R^2 (R^2 change = .244, $p = .013$), accounting for an additional 24.4 percent of the variance in SCCGPA. Of the variables in Block 2, Gender ($\beta = .270$, $p = .031$), University Setting (β

= .245, p = .043), SAT Total (β =.291, p = .019), and Successful Leadership Experience (β =.337, p = .023) were significant positive predictors. These results show that although the addition of the NCQ increased the prediction of SCCGPA beyond SAT Total, only the Successful Leadership Experience scale uniquely contributed to its variance. Regression results for FCCGPA are presented in Table 4.15. Associated regression coefficients are presented in Table 4.16.

The third analysis was identical to the first, but with junior cumulative college GPA (JCCGPA) as the dependent measure. The full model was significant, accounting for 67.9 percent of the variance in JCCGPA $F(13,25) = 4.066$, $p < .001$. Block 1 was significant (R^2 = .520, p = .001), accounting for 52 percent of the variance in JCCGPA. Of the five variables in Block 1, University Setting (β = .397, p = .003) and SAT Total (β = .2414, p = .003) were significant positive predictors. The addition of the eight NCQ variables in Block 2 did not significantly increase R^2 (R^2 change = .159, p = .191) but the variables of University Setting (β = .417, p = .003), SAT Total (β =.497, p = .001), and Positive Self-Concept (β =.338, p = .02) were positive predictors. These results show that while the variable of Positive Self-Concept as a single NCQ scale in Block 2 uniquely contributed to the variance in JCCGPA, taken collectively, the NCQ scales did not increase predictive power for JCCGPA. Regression results for FCCGPA are presented in Table 4.15. Associated regression coefficients are presented in Table 4.16.

Table 4.15

Regression Summary Table, Research Question 3b

	R^2	*F*	Sig. *F*	ΔR^2	*F* ΔR^2	Sig. ΔR^2
Freshman NCQ Beyond SAT Total (*n* = 71)						
Block 1: Control Variables	.198	3.211	.012*			
NCQ	.360	2.463	.010*	.162	1.799	.096
Sophomore NCQ Beyond SAT Total (*n* = 60)						
Block 1: Control Variables	.253	3.654	.006**			
NCQ	.497	3.495	.001**	.244	2.790	.013*
Junior NCQ Beyond SAT Total (*n* = 39)						
Block 1: Control Variables	.520	7.146	.001**			
NCQ	.679	4.066	.001**	.159	1.548	.191

Note. Control Variables were: Age, Gender Ethnicity, University; * $p < .05$, ** $p < .01$

Table 4.16

Regression Coefficients, Research Question 2

Variable	B	*SE* β	β	*t*	*p*
Freshman NCQ Beyond SAT Total (*n* = 71)					
Block 1					
Gender	.224	.111	.227	2.005	.049*
Age	-.033	.045	-.086	-.733	.466
Ethnicity	-.021	.034	-.071	-.601	.550
University	.324	.119	.314	2.728	.008*
SAT Total	.001	<.001	.172	1.474	.145
Block 2					
Gender	.221	.111	.225	1.991	.051
Age	-.029	.045	-.075	-.634	.529
Ethnicity	-.027	.036	-.094	-.769	.445
University	.226	.120	.219	1.887	.064
SAT Total	.001	< .001	.250	2.144	.036*
Positive Self-Concept	.002	.024	.011	.084	.933
Realistic Self-Appraisal	-.025	.029	-.100	-.867	.390
Deals with Discrimination	.006	.022	.035	.295	.769
Preference Long-Range Goals	-.003	.032	-.011	-.093	.926
Support Person Available	.072	.039	.209	1.839	.071
Leadership Experience	.054	.030	.244	1.789	.079
Community Service	.089	.050	.222	1.775	.081
Knowledge in a Field	-.101	.072	-.186	-1.400	.167

Regression Coefficients, Research Question 2, continued

Variable	B	*SE* β	β	*t*	*p*
Sophomore NCQ Beyond SAT Total (*n* = 60)					
Block 1					
Gender	.325	.140	.296	2.328	.024*
Age	-.010	.059	-.021	-.163	.871
Ethnicity	-.050	.040	-.157	-1.263	.212
University	.406	.146	.346	2.782	.007*
SAT Total	.001	< .001	.197	1.542	.129
Block 2					
Gender	.297	.133	.270	2.227	.031*
Age	-.013	.056	-.029	-.239	.812
Ethnicity	-.028	.041	-.088	-.686	.496
University	.288	.139	.245	2.077	.043*
SAT Total	.001	< .001	.291	2.423	.019*
Positive Self-Concept	.045	.026	.216	1.775	.082
Realistic Self-Appraisal	-.011	.032	-.042	-.345	.732
Deals with Discrimination	-.038	.026	-.182	-1.473	.148
Preference Long-Range Goals	.035	.032	.133	1.080	.286
Support Person Available	.051	.044	.138	1.173	.247
Leadership Experience	.080	.034	.337	2.355	.023*
Community Service	.042	.058	.097	.721	.475
Knowledge in a Field	-.133	.081	-.250	-1.639	.108
Junior NCQ Beyond SAT (*n* =39)					
Block 1					
Gender	.214	.127	.219	1.683	.102
Age	-.089	.060	-.202	-1.482	.148
Ethnicity	.021	.038	.074	.551	.585
University	.414	.127	.397	3.267	.003*
SAT Total	.001	< .001	.414	3.155	.003*
Block 2					
Gender	.148	.131	.152	1.128	.270
Age	-.041	.063	-.094	-.649	.522
Ethnicity	.061	.045	.217	1.366	.184
University	.434	.129	.417	3.357	.003*
SAT Total	.001	< .001	.497	3.756	.001*
Positive Self-Concept	.064	.026	.338	2.484	.020*
Realistic Self-Appraisal	.003	.032	.013	.094	.926
Deals with Discrimination	-.015	.025	-.078	-.586	.563
Preference Long-Range Goals	-.040	.035	-.163	-1.155	.259
Support Person Available	-.039	.045	-.108	-.878	.388
Leadership Experience	.044	.033	.204	1.333	.195
Community Service	-.064	.056	-.186	-1.144	.263
Knowledge in a Field	.061	.086	.134	.707	.486

Note. * $p < .05$, ** $p < .01$

Research Question 3c. There were three multiple regression analyses performed to address research question 3c. These analyses all had the same general structure as those for research question 3b, with the same control variables entered into Block 1, but with both HSGPA and SAT Total also entering into Block 1 instead of only SAT Total. For the first analysis, the dependent measure was FCCCGPA. The full model was significant, accounting for 39 percent of the variance in freshman college cumulative grade point average (FCCGPA) $F(14,55) = 2.515$, $p = .008$. Block 1 was significant ($R^2 = .216$, $p = .015$), accounting for 21.6 percent of the variance of FCCGPA. Of the six variables in Block 1, University Setting ($\beta = .343$, $p = .005$) was the only significant control variable. The addition of the eight NCQ variables in Block 2 did not significantly increase R^2 (R^2 change = .175, $p = .068$); however, of the variables in Block 2, University Setting ($\beta = .253$, $p = .037$) and Leadership Experience ($\beta = .289$, $p = .042$) were significant positive predictors of FCCGPA. These results show that although the NCQ variable of Leadership Experience contributed unique significant experience to the prediction of FCCGPA, taken collectively, the NCQ was not a significant predictor. Regression results for FCCGPA are presented in Table 4.17. Associated regression coefficients are presented in Table 4.18.

The second analysis was identical to the first, but with sophomore cumulative college (SCCGPA) as the dependent measure. The full model was significant, accounting for 56.5 percent of the variance in SCCGPA, $F(14,43) = 3.989$, $p < .001$. Block 1 was significant ($R^2 = .338$, $p = .001$), accounting for 33.8 percent of the variance in SCCGPA. Of the six variables in Block 1, University Setting ($\beta = .409$, $p = .001$) and HSGPA ($\beta = .304$, $p = .04$) were significant positive predictors. The addition of the eight

NCQ variables in Block 2 significantly increased R^2 (R^2 change = .227, p = .013), accounting for an additional 22.7 percent of the variance in Block 2. Of the variables in Block 2, University Setting (β = .319, p = .008) and Successful Leadership Experience (β =.374, p = .009) were significant positive predictors. Knowledge Acquired in a Field (β = -.312, p .041) was a significant negative predictor. These results show that while HSGPA was a significant predictor SCCGPA in Block 1, when the NCQ was added, HSGPA was no longer a significant predictor but the NCQ was. However, of the NCQ scales, only Successful Leadership Experience (as a positive predictor) and Knowledge Acquired in a Field (as a negative predictor) uniquely contributed to the variance of SCCGPA. Regression results for SCCGPA are presented in Table 4.17. Associated regression coefficients are presented in Table 4.18.

The third analysis was also identical to the first, but with junior cumulative college GPA (JCCGPA) as the dependent measure The full model was significant, accounting for 75 percent of the variance in JCCGPA, $F(14,24) = 5.223$, $p < .001$. Block 1 was significant (R^2 = .594, p < .001), accounting for 59.4 percent of the variance in JCCGPA. Of the six variables in Block 1, University Setting (β = .416, p = .001) and HSGPA (β = .340, p = .022) were significant. The addition of the eight NCQ variables Block 2 did not significantly increase R^2 (R^2 change = .16, p = .10). However, of the variables in Block 2, University Setting (β = .479, p < .001), HSGPA (β = .391, p = .013) and Positive Self-Concept (β = .356, p = .008) were significant. These results show that SAT scores were not a significant predictor of JCCGPA but HSGPA was a significant predictor of JCCGPA. Additionally, although Positive Self-Concept as a single scale in Block 2 was a significant predictor, taken collectively, the NCQ scales did not increase

predictive power for JCCGPA. Regression results for SCCGPA are presented in Table 4.17. Associated regression coefficients are presented in Table 4.18.

Table 4.17

Regression Summary Table, Research Question 3c

	R^2	*F*	Sig. *F*	ΔR^2	*F* ΔR^2	Sig. ΔR^2
Freshman NCQ beyond HSGPA and SAT Total (*n* = 70)						
Block 1: Control Variables	.216	2.890	.015*	---	---	--
HSGPA, SAT and NCQ	.390	2.515	.008**	.175	1.968	.068
Sophomore beyond FCCGPA and SAT Total (*n* = 58)						
Block 1: Control Variables	.338	4.331	.001**	---	---	--
HSGPA, SAT and NCQ	.565	3.989	< .001**	.227	2.809	.013
Junior NCQ beyond HSGPA and SAT Total (*n* = 39)						
Block 1: Control Variables	.594	7.801	< .001**	---	---	--
HSGPA, SAT and NCQ	.753	5.223	< .001**	.159	1.929	.102

Note. Control Variables were: Age, Gender Ethnicity, University; * $p < .05$, ** $p < .01$

Table 4.18

Regression Coefficients, Research Question 3c

Variable	B	*SE* β	β	*t*	*p*
Freshman NCQ beyond FCCGPA and SAT Total (*n* = 70)					
Block 1					
Gender	.197	.111	.203	1.768	.082
Age	-.031	.044	-.082	0.689	.494
Ethnicity	-.015	.034	-.052	-.436	.664
University	.348	.120	.343	2.912	.005**
HSGPA	.073	.143	.068	.508	.613
SAT Total	.001	< .001	.160	1.160	.251
Block 2					
Gender	.192	.109	.199	1.762	.084
Age	-.023	.044	-.063	-.528	.600
Ethnicity	-.023	.035	-.081	-.674	.503
University	.257	.120	.253	2.143	.037
HSGPA	.035	.144	.033	.242	.810
SAT Total	.001	< .001	.249	1.856	.069
Positive Self-Concept	-.011	.025	-.060	-.458	.649
Realistic Self-Appraisal	-.018	.029	-.073	-.639	.525
Deals with Discrimination	.014	.022	.078	.656	.515
Preference Long-Range Goals	.005	.031	.020	.167	.868
Support Person Available	.067	.038	.201	1.778	.081
Leadership Experience	.063	.030	.289	2.083	.042

Research Coefficients, Research Question 3c, continued

Variable	B	*SE* β	β	*t*	*p*
Freshman NCQ beyond FCCGPA and SAT Total (*n* = 70)					
Community Service	.079	.049	.201	1.608	.114
Knowledge in a Field	-.111	.071	-.208	-1.554	.126
Sophomore NCQ beyond FCCGPA and SAT Total (*n* = 58)					
Block 1					
Gender	.267	.138	.243	1.930	.059
Age	-.032	.058	-.069	-.551	.584
Ethnicity	-.040	.038	-.128	-1.059	.295
University	.474	.141	.409	3.367	.001
HSGPA	.345	.164	.304	2.106	.040
SAT Total	<.001	.001	.014	.094	.926
Block 2					
Gender	.247	.129	.225	1.912	.063
Age	-.037	.054	-.080	-.682	.499
Ethnicity	-.028	.039	-.090	-.731	.469
University	.369	.134	.319	2.760	.008
HSGPA	.252	.158	.222	1.594	.118
SAT Total	< .001	< .001	.136	.941	.352
Positive Self-Concept	.019	.026	.090	.715	.478
Realistic Self-Appraisal	< .001	.030	-.002	-.014	.989
Deals with Discrimination	-.025	.026	-.118	-.975	.335
Preference Long-Range Goals	.046	.032	.169	1.433	.159
Support Person Available	.040	.041	.109	.959	.343
Leadership Experience	.089	.033	.374	2.728	.009
Community Service	.039	.055	.092	.710	.481
Knowledge in a Field	-.166	.078	-.312	-2.111	.041
Junior NCQ beyond FCCGPA and SAT Total (*n* = 39)					
Block 1					
Gender	.170	.120	.174	1.413	.167
Age	-.085	.056	-.194	-1.522	.138
Ethnicity	.015	.035	.054	.432	.669
University	.433	.118	.416	3.654	.001
HSGPA	.337	.140	.340	2.416	.022
SAT Total	.001	< .001	.214	1.443	.159
Block 2					
Gender	.156	.118	.160	1.328	.197
Age	-.027	.057	-.062	-.480	.636
Ethnicity	.037	.041	.131	.902	.376
University	.499	.118	.479	4.216	< .001
HSGPA	.388	.145	.391	2.680	.013
SAT Total	.001	< .001	.261	1.765	.090
Positive Self-Concept	.068	.023	.356	2.918	.008

Regression Coefficients, Research Question 3c, continued

Variable	B	*SE* β	β	*t*	*p*
Junior NCQ beyond FCCGPA and SAT Total (*n* = 39)					
Realistic Self-Appraisal	.027	.030	.114	.912	.371
Deals with Discrimination	-.027	.023	-.141	-1.160	.258
Preference Long-Range Goals	-.040	.031	-.163	-1.291	.209
Support Person Available	-.053	.040	-.144	-1.300	.206
Leadership Experience	.026	.030	.120	.850	.404
Community Service	-.050	.050	-.145	-.992	.331
Knowledge in a Field	.009	.080	.021	.119	.907

Note. * $p < .05$, ** $p < .01$

Supplemental Analyses

Effects of Self-Report Data. Although each participant received the same version of the NCQ, a question was added after its first administration which asked if participants were willing to provide their HSGPA and/or SAT scores if they were transfer students. As mentioned in the Procedures section, many transfer students responded to the first administration of the survey and their HSGPA and/or SAT data was not archived in their university's records because they were not required to provide this information to be admitted to the university. Two independent sample t-tests were performed in order to test if there was a significant difference between the means of: 1) Self-reported and university-archived HSGPAs; and 2) Self-reported and university-archived SAT scores. Additionally, because for some participants weighted HSGPAs were collected, whereas for the others unweighted HSGPAs were collected, an independent sample t-test was performed to test if there was a significant difference between the means of weighted and unweighted HSGPAs.

The results of the t-test to determine if there were differences between self-reported HSGPAs ($n = 7$, $M = 3.60$, $SD = .318$) and non-self-reported HSGPAs ($n = 79$, $M = 3.73$, $SD = .461$) did not find a significant difference ($t(84) = .709$, $p = .480$). This

suggests that there were no differences between HGSPAs that were self-reported and not self-reported. T-test results are presented in Appendix W.

The results of the t-test to determine if there were differences between self-reported SAT Total (n = 6, M = 1303.33, SD = 141.80) and non-self-reported HSGPAs (n = 70, M = 1267.57, SD = 151.432), did not find a significant difference (t (74) = -.56, p = .579). This suggests that there were no differences between SAT Total that were self-reported or not self-reported. T-test results are presented in Appendix W.

Finally, because for some participants weighted HSGPAs were collected, whereas for the others unweighted HSGPAs were collected, an independent sample t-test was performed to test if there was a difference between these two groups. A significant difference was found (t(84) = -8.22, p < .001) between those whose HSGPA was weighted (n = 31, M = 4.12, SD = .354) and those whose HSGPAs were unweighted (n = 55, M = 3.49, SD = .328). This suggests that there is a difference between weighted and unweighted HSGPAs. T-test results are presented in Appendix X.

In order to determine if there were any differences between college students of different class standing, two Analyses of Variances (ANOVAs) were performed to determine if there was a significant difference between 1) Freshmen's, sophomores' and juniors' mean HSGPA, and 2) Freshmen's, sophomores' and juniors' mean SAT scores.

The results of the ANOVA that was performed to determine if there was a significant difference between freshmen's, sophomores' and juniors' mean HSGPA indicate that there were no significant differences between these three means (F (2,67) = .376, p = .688). ANOVA results are presented in Appendix X.

The results of the ANOVA that was performed to determine if there was a significant difference between freshmen's, sophomores' and juniors' mean SAT scores indicate that there were no significant differences between these three means ($F(2,59) = 1.355$, $p = .271$). ANOVA results are presented in Appendix X.

Summary

This chapter described the results of the statistical analyses used to address the research questions of the study. First demographic information was provided for the sample and descriptive statistics were presented for the cognitive and noncognitive variables in the study. A correlation matrix was calculated between the all of the variables as well as the eight noncognitive variables. Further, data from the twenty-one multiple regression analyses were delineated and provided in multiple regression summary tables. Regression coefficients were also presented for each regression analyses. The fifth chapter will discuss the findings of the analyses in the context of the related literature, outcomes, limitations of the study, and suggestions for future research.

Chapter 5: Discussion

This final chapter of the dissertation provides a discussion of the results of this study involving predictors of the academic performance for college students with learning disabilities. Unfortunately, these findings cannot be used to make a determination as to whether or not the noncognitive variables of the NCQ predict college performance alone or add to the prediction of college performance beyond the HSGPA, beyond the SAT, and beyond both HSGPA and SAT. This is due to the poor internal consistency that was found for the eight NCQ subscales. Cronbach's Alpha coefficients were calculated for these eight scales and the coefficients ranged from -.37 to .48. The Cronbach's alpha coefficients that are considered acceptable as reflecting internal consistency are those ranging from .70 to .95 (Tavakol & Dennick, 2011). Although, the Cronbach's alpha analyses were scrutinized and some explanation was afforded for these low coefficients, the findings of this study cannot be applied to the general population of college students with learning disabilities.

In addition to the low internal consistency of the eight NCQ scales, a number of unanticipated problems arose during the research that included a small sample size that resulted in inadequate statistical power for some analyses and a questionable representativeness of the sample, in addition to the extremely low internal consistency estimates for all of the NCQ subscales as used in this study. Additionally, although not unanticipated, is the issue that the NCQ was modified slightly for this study *and* participants responded to the NCQ between one and four years *after* having completed college study, as contrasted with the conventional use of the NCQ used as a predictor *prior* to beginning college. As a result, it was determined that the most suitable manner

to interpret the results of this study, as presented in Chapter IV, was to consider the following possible explanations for the outcomes as found:

1. The sampling issues (inadequate size, possible limited representativeness) account for the findings.
2. The traditional *cognitive* indicators of college performance may not be good predictors for this population.
3. The findings regarding the NCQ are largely the result of the extremely low internal consistencies of the subscales.
4. In this study, participants completed the NCQ *after* having had one or more years of college.
5. The NCQ may not be a valid predictor for this population.

Discussion of Results

Sampling Issues. The present study contained several problematic sampling issues that render the results of this study nongeneralizable. For the 21 multiple regression analyses that were performed, the sample size for some of the regression analyses might have been too small to detect even large effects, let alone medium or small effects. Although the overall sample size of the study was appropriate, because each multiple regression analysis was performed on a different subsection of the sample, e.g., sophomores who had both HSGPA and SAT data or juniors who only had SAT data, each regression had a different number of CCGPAs. And because all CCGPA data was gathered per student for every year a student completed college, three CCGPAs could be collected for juniors (freshman, sophomore, and junior) whereas, only one CCGPA could be collected for freshmen. As a result, there were more CCGPAs for freshmen than

sophomores, and for sophomores than juniors. So, while the sample sizes for freshmen analyses ranged from 70 to 83 and for sophomores ranged from 58 to 66, for juniors sample sizes ranged from 39 to 41. Based on the power analysis that was performed, the multiple regression analyses for Research Question 3c (which used 14 independent variables) for juniors needed a minimum of 46 participants to detect a large effect and even more (98) to detect a medium effect. This criterion was not met. While the minimum number of participants was met for most of the other analyses to at least detect a large effect, there may have not been enough power to detect the predictive power of any of the variables of interest, leading to Type II error.

As mentioned in the Procedure section of Chapter 4, upon viewing the data from the completed surveys after the first set of invitation emails to University Setting 1, it was noticed that many transfer students were responding. At that time it was discovered that the admissions office of University Setting 1 did not require HSGPAs or standardized test scores be part of transfer students' admissions applications and at least one of these data points was essential per participant. Although a procedure was developed and approved by the IRB to contact these students by the email address they had provided to request that they self-report this data, very few participants responded and over 20 NCQ questionnaires had to be discarded. Additionally, a page was added to the forms that participants completed before the NCQ, requesting that participants provide their HSGPA and standardized test scores. While this request did not generate much self-reported HSGPA and SAT data, two t-tests were performed to determine if there were any differences between self-reported HSGPAs and SATs. The findings of this analysis confirmed that there were no differences between these scores. Regardless, that 20

questionnaires had to be discarded and some data was self-reported and some was not, these are sampling issues that contribute to the lack of this sample being representative of this population of students and, thus, nongeneralizeable.

Additionally, participants for this study were recruited from offices on the campuses that provide support for students with disabilities. Students must voluntarily register for these services. Students who had a learning disability who had not registered with these offices were not recruited. There may be differences in these two populations. Students who register for support services may be students who are more motivated or are better at advocating for their needs. Students who do not register for support services may not know about them, may not have the same level of self-advocacy or motivation as those who do, or may not believe they need these services. Variables such as self-advocacy or motivation are, in themselves, noncognitive predictors of academic performance for college students with learning disabilities but since data gathered were not for the latter population, differences in academic performance of these populations associated with these variables could be masked. This would be a similar situation for college students who have yet to be diagnosed with a learning disability but who have one. Their data is not included in this study, resulting in what might be considered a restricted range of data. As a result, the results of this study are not representative of all college students with learning disabilities.

Furthermore, approximately 900 college students were invited to participate in this study, only 13 percent of this group responded. A poor response rate can result in sampling bias; however, past researchers have typically received a poor response rate from this particular group of participants (personal communication, Jo Hutchinson,

9/14/2011; personal communication, Kathy Schwartz, 2/8/2011; DaDeppo, 2007). Regardless, the poor response rate in the present study brings into question whether the sample of students in this study is representative of the population of college students with learning disabilities.

Finally, considering the number of statistical analyses performed on the data of the current study (21 multiple regression analyses, three t-tests and three Analyses of Variances (ANOVAs)), the possibility of making a Type I error is greatly increased than if using fewer analyses. In other words, findings that were found to be significant in this study may not actually be significant based on the increased chance of error. This further contributes to the results of this study, particularly those analyses that included the NCQ scales, lacking the validity needed to be able to be generalized to college students with learning disabilities.

Traditional Cognitive Predictors. Based on the results from the regression analyses of Research Question 1, it may be that standardized test scores, a traditional cognitive predictor of college performance, are not appropriate predictors for this population of students. The first research question explored the degree to which traditional, cognitive variables predicted cumulative college grade point average (CCGPA) for college students with learning disabilities. This first research question was separated into three sub-questions, one each to address the extent to which HSGPA, SAT scores, and HSGPA and the SAT predicted freshman, sophomore, and junior CCGPAs at the end of each of these school years. The first sub-question, Research Question 1a, explored HSGPA alone as a predictor. The results across the analyses for freshmen, sophomores and juniors showed that HSGPA alone was a significant predictor of

CCGPA for each class of college students with learning disabilities. These results are consistent with Wilczenski and Gillespie (1992) who found that for both low- and high-achieving college students with learning disabilities, HSGPA was a good predictor of first-year CCGPA. Few studies have been conducted regarding the predictive value of HSGPA, especially past the first year of college for students with learning disabilities, but these results support that HSGPA alone is a good predictor for this group of students. These results are also consistent with studies of college students without learning disabilities that found that HSGPA was a good predictor of CCGPA at the end of students' freshman year (Beck & Davidson, 2001; Deberard et al., 2004; Matteson, 2007; Schmitt, et al., 2009; Tross, 2000). Additionally, there is some support for HSGPA being a good predictor of CCGPA for students without learning disabilities at the end of their senior year (Astin, 1987; Lawlor, 1997). While the above-mentioned studies did not exclusively use HSGPA as the independent variable (outside of the control variables) as the present study did, these studies found HSGPA as a clear-cut predictor. Conversely, Geiser and Santelices (2007) did perform a study to explore the extent to which HSGPA alone predicts CCGPA and found that HSGPA alone accounted for 20 percent of the variance in CCGPA. These authors, not only contend that HSGPA is the strongest predictor of not only freshmen CCGPA, but that the variance of accounted for by HSGPA in CCGPA increased in fourth-year CCGPA for college students without learning disabilities.

The second sub-question of Research Question 1, Research Question 1b, of the present study explored the degree to which SAT alone predicted cumulative college grade point average for college students with learning disabilities. The results across the

analyses for freshmen, sophomores and juniors showed that SAT scores alone predicted cumulative college GPA for juniors, but not for freshmen or sophomores. That SAT scores were not found to be predictive of CCGPA for college freshmen and sophomores with learning disabilities is not surprising. Vogel and Adelman (1992) found that ACT scores were not predictive of college cumulative GPA at any point for college students with learning disabilities. Wilczenski and Gillespie (1992) found that SAT scores were not predictive of first year cumulative college GPA for low achieving college students with learning disabilities, but they were predictive (along with high school rank) of first year cumulative college GPA for high achieving college students with learning disabilities, but only slightly more so than HSGPA. At the same time, for students without learning disabilities, Geiser and Santelices (2007) report that the while HSGPA is the best predictor of CCGPA at the end of all years, SAT alone score still accounted for some variance in freshmen to senior year CCGPA. It is curious that in the present study, SAT scores were a good predictor at the junior level and not at the freshman and sophomore level. One possible reason could be that the juniors in this sample were high-achieving as compared to the freshmen and sophomores in this sample although the mean for junior CCGPA ($x\square = 3.23$) was only slightly higher than the means for freshman CCGPA ($x\square = 3.14$) and sophomore CCGPA ($x\square = 3.19$). However, for this sample, SAT scores were more highly correlated with junior CCGPA ($r = .50$) than with freshman CCGPA ($r = .24$) and sophomore CCGPA ($r = .28$). Finally, it could also be that by the time this group of students reached the end of their junior year, they were well adjusted to the academic and social environment of college and therefore their academic performance was higher than that of the freshmen and sophomore students. There is

support in the literature that states that it often takes students of specialized populations longer to adjust to college than those nonmarginalized groups (Ryan, 1992; Sedlacek, 2004).

The third sub-question of Research Question 1, Research Question 1c, of the present study explored the degree to which HSGPA and SAT jointly predicted cumulative college grade point average for college students with learning disabilities. The results across the analyses for freshmen, sophomores and juniors showed that when both HSGPA and SAT were added to the regression model, only HSGPA, not SAT, was a significant predictor of sophomore and junior CCGPA; however, neither HSGPA nor SAT scores predicted freshman CCGPA. In other words, while HSGPA was a predictor of CCGPAs for all class standings when it was entered into the model alone in Research Question 1a, once SAT was added, HSGPA lost predictive power for freshmen but HSGPA remained as a significant predictor of sophomore and junior CCGPA. And while SAT alone in Research Question 1b was a significant predictor of junior CCGPA, when combined with HSGPA, SAT lost predictive power. This is consistent with studies that report that standardized test scores for college students with learning disabilities offer very little predictive value in CCGPA for freshmen (Wilczenski and Gillespie, 1992) or at any class standing (Vogel & Adelman, 1990; 1992). This presents a different picture than what the research reflects for college students without disabilities. While some studies show that when combined, SAT scores and HSGPA both have predictive power for first-year CCGPA (Beck & Davidson, 2001; DeBerard, et al., 2004; Geiser & Santelices; Noble & Sawyer, 2004; Tross, 2000) and for exit CCGPA (Astin, 1987, Gayles, 2006), for college students with learning disabilities, this was not the case for

college students without learning disabilities.

Internal Consistency of NCQ Scales. As discussed in Chapter 3 and as mentioned throughout this chapter, the internal consistency of the NCQ scales in the present study was very weak. The Cronbach's Alpha coefficients for this study ranged from -.37 to .48. The Cronbach's alpha coefficients that are considered acceptable as reflecting internal consistency are those ranging from .70 to .95 (Tavakol & Dennick, 2011). Although, the Cronbach's alpha analyses were scrutinized and some explanation was afforded for these low coefficients, the results of this study must be viewed with caution. The results may not be generalizable to the population of college students with learning disabilities. Much of the lack of statistical association between the NCQ variables and the outcome variables is likely the result of the very low internal consistencies of the NCQ scales used in this study.

Time of NCQ Administration. In previous studies using the NCQ, the survey was given to students at the beginning of their freshman year in college. Cumulative college grade point averages were then collected at a later date such as the end of the students' first year in college. In this study, however, participants completed the NCQ *after* at least completing a year or more of college. This could have potentially yielded invalid data on the survey as students might have answered the NCQ questions differently after having been in college. To counteract this issue, retrospective pre-testing model was used. Participants were directed to respond to the statements on the NCQ according to what their feelings or expectations of how things were going to be at the time they entered college. At the same time, there was no way to ensure that these

responses were the same as those the participants would have really provided had they taken the NCQ the beginning of their freshman year of college.

Limitations

In addition to the aforementioned sampling issues, the present study had several limitations. First, students who responded to the NCQ are students that have remained in college so the data collected was biased toward the more academically successful students with learning disabilities. Accessibility to and data for students who left the university was not available so cognitive or noncognitive variables that may be related to this outcome was not be able to be investigated. Another variation of this theme is that a student that self-selected participating in this study could have been particular type of student. If this is the case, the sample of students in the present study would not be representative of the larger college student population with learning disabilities.

Second, because weighted HSGPAs were obtained for some students and unweighted HSGPAs were obtained for others, and there was no way to make this variable uniform, an independent sample t-test was performed to test if there was a difference between these two groups. It was determined that there *was* a difference between these two groups. While this is consistent with the literature which states that unweighted HSGPA is a consistently better predictor of college performance than an honors-weighted HSGPA (Geiser and Santelices, 2006), it is a sampling issue that further reduces the validity of the results.

Third, accommodations were not offered to students who were invited to take this questionnaire because the visual-spatial aspect of the survey was designed using the principles of Universal Design and it was presumed that this group of students could

access accommodations if they needed them. It is possible that some participants might have needed a reader for the questionnaire and/or someone to enter their answers for them. However, with the state of technology today, documents can be enlarged on the computer and many students with learning disabilities use software that can read to them and respond to voice commands. Additionally, because these students were all receiving accommodations through their respective campuses' disability support office, it was thought they could also access accommodations for this study if needed through this office. However, even if students were able to access this study in those ways, taking that extra step do so might have curtailed participants' completing the study. This would result in response sample bias and is a potential limitation of this study.

Implications for Practice

In general, college admission is becoming more competitive and admissions officers are seeking additional ways to find effective predictors of college performance (Gifford, Briceno-Perriott, & Mianzo, 2006). In the past, the cognitive components of prospective students' application materials have been seen to be fair and accurate tools for use in predicting academic performance for the incoming freshmen class. Recently, however, the emphasis of traditional cognitive predictors in the college admissions review process has begun to be questioned and instruments involving the use of noncognitive predictors are beginning to found useful in this arena, especially for historically underrepresented students (Atkinson, 2001; Burdman, 2001; Chait, 2007; Crouse, 1985; Crouse & Trusheim, 1988; Gose, Selengo, & Brownstein, 2001; Schmitt, 2012; Sedlacek, 2003; Stemler, 2012; Kyllonen, 2012; Soares, 2012; Stern & Briggs, 2001; Tam & Sukhatme, 2004). Unfortunately, the NCQ may not be a viable tool for this

task when it comes to college students with learning disabilities. Due to the poor internal consistency of the eight NCQ scales, the results found in this study should not be used as the basis of practice, program planning or informing policy.

At the same time, the current study reinforces the notion that admission officers should use traditional indices with caution. In particular, standardized test scores should be either downplayed or eliminated as a prognosticator of academic performance for college applicants with learning disabilities. While the current study found HSGPA to be predictive of academic performance for college students with learning disabilities, standardized test scores were not found to be consistently predictive of academic performance for this group of students. These findings are consistent with studies that report that standardized test scores for college students with learning disabilities offer very little predictive value in CCGPA for freshmen (Vogel & Adelman, 1990; 1992; Wilczenski and Gillespie, 1992). Within the debate regarding cognitive variables in predicting future academic performance, standardized tests seem to be at the heart of the issue (Atkinson, 2001; Burdman, 2001; Chait, 2007; Crouse, 1985; Crouse & Trusheim, 1988; Crouse & Trusheim, 1991; Gose, et al., 2001; Stern & Briggs, 2001; Tam & Sukhatme, 2004). While standardized exams have been accused of not being aligned with the high school curriculum, not being able to predict academic performance beyond the freshman year of college, and being biased toward those students who can afford to take expensive preparatory courses to prepare for them, of most importance is that students from underrepresented populations tend to do more poorly than those of the dominant culture (Fleming, 2002; Hoffman & Lowitzki, 2005; Kirby et al., 2007; Lawlor, et al., 1997; Nasim, et al., 2005, Steele, 1997; Powell & Steelman, 1996; Steele,

1997; Steele & Aronson, 1995; Ting, 2003; Zwick & Sklar, 2005). If this is the case, the use of cognitive predictors presents an equity issue in the college admissions process. Admissions officers need to be mindful of this issue as standardized test scores may actually act as a socially constructed barrier that limits access to a college education for some populations of students. Using the concept of Universal Design in the admissions process can prevent discrimination from occurring in this arena. An admissions process that includes multiple predictors of academic performance, including noncognitive predictors, can make the admissions process fair for all groups of students.

Due to major differences between the secondary and postsecondary environments that students with learning disabilities face during the transition to college, services or programs designed to ease this transition are recommended at the postsecondary level. Once in college there is a dramatic disparity in how support services and accommodations are obtained for this population of students. These students must reveal to the appropriate office on campus that they have a disability and take the lead in seeking out reasonable accommodations. They must be able to advocate for their needs and understand how to navigate the disability support system on campus. This system is not even remotely similar to what they experienced at the secondary level and without guidance, many students with learning disabilities fall between the cracks when it comes to the support they may require. They also face additional personal and academic challenges, beyond those that students without disabilities face, including limitations in strategic knowledge such as study skill habits; time management skills; preparing for exams; and the organization of multiple assignments (Borkowski, 1992; Hadley, 2006; Lock & Layton, 2001; Skinner & Lindstrom, 2003). Some students may possess deficits

in writing, a slow reading speed, or problems performing basic mathematical computations (Dalke, 1999). The learning profile of every student with a learning disability is unique; so, the academic challenge each student faces is also unique to him or her. Programs designed to support the diverse needs of new college students with disabilities can increase their ability to personally and academically integrate to university life (Troiano, 2003).

Suggestions for Future Research

The present study has provides a springboard for further research regarding predictors of academic performance for college students with learning disabilities. First, this study was the first exploration of the predictive ability of the NCQ to assess the academic performance of college students with learning disabilities; however, it had many limitations. Most significantly, the internal consistency of the eight NCQ scales was poor which led to results that cannot be utilized in practice. It is recommended that future studies use the NCQ as designed; participants should take the NCQ before entering college so their true expectations are captured. The present study did not do this as students who had attended college for a year or more responded to the survey.

Furthermore, future studies should be performed using the NCQ with this population but obtaining a larger sample for each class standing and making a concerted effort to gather enough senior CCGPAs for this group to be included in the analyses. It also might behoove future researchers to seek out universities in which all the necessary variables are accessible and/or to ensure that these variables are on a similar scale, e.g., for HSGPA, this variable can either consist of all weighted or all unweighted HSGPAs. In doing so, it may be necessary to take more time to collect data but the results yielded

could be well worth this extra time. Additionally, because the response rate for this population tends to be low, using multiple means of accessing these students is warranted. For example, in addition to utilizing email to invite students to participate in a study, researchers should consider how they can use Facebook, Twitter, and other social media sites to recruit college students with learning disabilities in future studies.

Although the NCQ was designed with nontraditional students as the potential respondents, its focus was on ethnic and racial minorities. It may be necessary to pilot test the NCQ on students with learning disabilities and perform factor analyses to determine if the items of the scales coalesce in a different pattern for this group of students. Additionally, there may be additional items that can be added to this instrument based on prior research with this population. For example, the scales of Knowledge Acquired in a Field and Demonstrated Community Service are comprised of only two questions. Additional questions added to these scales may increase the scales' validity. Furthermore, the scale of Understanding/Dealing with Racism could be very valuable for use with the present population, if further research was performed to strengthen this scale. Another way to view this scale is "understanding the system" (Sedlacek, 2004) and there is an entire body of research that suggests that successfully navigating the disability support system has positive implications for college students with learning disabilities leads to better outcomes for these students (Adams & Proctor, 2010; Barga, 1996; Field, Sarver & Shaw, 2003; Hadley, 2007; Lock & Layton, 2001; Malian, 2002; Sarver, 2000). A qualitative research format might be one direction to take when considering addition items to explore on the NCQ.

Moreover, much more extensive and comprehensive studies must be conducted with college students with learning disabilities. This body of work contains outdated studies, anecdotal studies, comparison studies with limited predictive ability, studies that contain no control variables, studies that do not include standardized test scores, HSGPA, or a combination of both. These should be core, independent variables in futures studies with this population, i.e., HSGPA and standardized test scores. It is an impossible task to determine predictors of academic performance for college students with learning disabilities when the predictors identified that contribute to the most variance in CCGPA in nondisabled populations are not accounted for in studies with college students with learning disabilities or when the effects of individual variables are rolled in an "index-type" predictor that in masks the individual effects of the variables comprised in the index.

While testing companies have performed research on the predictive validity of the SAT and ACT with traditional students (Bridgeman et al., 2000; Bridgeman et al., 2008; Camara & Echternacht, 2000; Camara & Kimmel, 2005; Kobrin et al., 2004; Lawlor et al., 1997), very few studies, if any, have been conducted by these companies on college students with learning disabilities. It is recommended that studies be performed on this population of college students to determine if these instruments are appropriate for their determining future college performance.

An in-depth look should be taken at leadership experience for college students with learning disabilities as this predictor was salient in the analyses for sophomore CCGPA, even though its internal consistency was poor. Fincher (2008) has opened the door to this exploration with his master's thesis, which explored pre-college and college

variables that predicted effective leadership in college students with learning disabilities. While this study did not examine leadership as a predictor of academic performance with this population of students, it found that race (a negative predictor for Asian American students), pre-college involvement (which is what Successful Leadership Experience examined in this study), class standing (significant for seniors), mentorship, off-campus employment (a negative predictor), an on-campus leadership position, and campus climate as predictors of leadership efficacy for college students with learning disabilities.

Finally, noncognitive variables beyond those explored in this study should be explored in future research. Chapter 2 of this dissertation reviewed studies that explored noncognitive predictors of college performance for college students that included such noncognitive variables as, study habits, academic confidence, adaptability/life skills, attitude toward educators, self-worth, social acceptance, career decision-making self-Efficacy, physical and psychological health, social support, interpersonal skills, (Richard & Sullivan, 1994; Schmitt et al., 2009; Shivpuri et al., 2006; Spitzer, 2000). This research should extend to college students with learning disabilities. However, while these areas of research are important, there seems to be a consensus regarding the noncognitive predictor of self-determination contributing to the academic success for students with learning disabilities. While there is a large body of research on this predictor for students with learning disabilities, less research has been conducted with college students with learning disabilities (Brinckerhoff, 1994; 1997; Field, Sarver, & Shaw, 2003; Lehmann, Deniston, Tobin, & Howard, 1996; Lock & Layton, 2001; Malian & Nevin, 2002; Powers, 1996; Trainor, 2002; Wehmeyer & Schwartz, 1997). It is suggested that researchers pursue this important predictor for this population of students.

Conclusion

The present study began by addressing the challenges that all students, but especially college students with learning disabilities, face during the college transition. It also provided an appraisal of the college selection process, which is beginning to be recognized as one that may not be in the best interest of potential college students with learning disabilities or other students from historically underrepresented populations. This study sought to explore the value of noncognitive predictors of academic performance for college students with learning disabilities. While the results of this study related to the NCQ noncognitive predictors cannot be used in practice due to the poor internal consistency of the scales, based on the literature, it does not negate the usefulness of noncognitive factors in the college admission process. According to the literature, one of the biggest benefits in the use of noncognitive predictors of college performance during the admissions process is that they can provide flexible and equal access for **all** individuals regardless of ability. When traditional cognitive predictors are exclusively used to assess potential college academic performance, these cognitive predictors can serve as a barrier and "create" disability in the admissions environment for those students who learn differently and whose academic strengths are not reflected in standards that are represented by numbers. This is important in the context of the minority group and human variation models of disability, concepts on which this study is based, that purport that disability is not real; it is a social construction of difference between individuals that marginalizes those who have those differences. However, if those differences were not accentuated by a college admissions process that uses limited means of assessment (cognitive factors), but a college admissions process that considered a holistic valuation

of prospective students (inclusive of noncognitive factors), a learning disability may not be a barrier to those who can be successful in college. Albert Einstein (who had a learning disability) once surmised, “Everybody is a genius. But if you judge a fish by its ability to climb a tree, it’ll spend its whole life believing that it is stupid.” The time has come to not only create a level playing field for students to access learning, but a to create a level playing field in college admissions, so higher education is accessible to all.

Appendices

Appendix A: ACT and SAT Concordance Tables

Concordance Between ACT Composite Score and
Sum of SAT Critical Reading and Mathematics Scores

SAT CR + M (Score Range)	***ACT Composite Score***	***SAT CR + M (Single Score)***
1600	36	1600
1540-1590	35	1560
1490-1530	34	1510
1440-1480	33	1460
1400-1430	32	1420
1360-1390	31	1380
1330-1350	30	1340
1290-1320	29	1300
1250-1280	28	1260
1210-1240	27	1220
1170-1200	26	1190
1130-1160	25	1150
1090-1120	24	1110
1050-1080	23	1070
1020-1040	22	1030
980-1010	21	990
940-970	20	950
900-930	19	910
860-890	18	870
820-850	17	830
770-810	16	790
720-760	15	740
670-710	14	690
620-660	13	640
560-610	12	590
510-550	11	530

Appendix B: Introduction Letter (Setting 1)

Dear Student:

This e-mail is being sent to you by Disability Support Services. My name is Melissa Scarfone and I am a doctoral candidate in the College Student Personnel program at the University of Maryland. I am looking for volunteers to complete an anonymous and brief, 15-20 minute, online survey for a research study that will be a part of my doctoral dissertation. You may access this survey from any computer.

The purpose of this study is to investigate the factors that best predict the academic success of college students with learning disabilities. If you are a student with a documented learning disability, you are invited to participate in this study.

All participants who complete the survey will be eligible to enter a DRAWING for one of THREE $200 GIFT CARDS.

Your participation is very important to us and we highly value your feedback. Please click on the link below and follow the instructions:

http://www.surveymonkey.com/s/ [link to Setting 1 version of survey]

By clicking this link, you are not obligated to participate in this study and you can exit from the survey at any time. Your participation is completely confidential. I personally have no access to the Disability Support Services data base. The services you receive from DSS will not be affected in any way whether or not you participate in this study. Your anonymous responses to the survey will not be returned to the DSS office and will not be shared with any other entities on or off campus.

My study is being conducted under the supervision of Dr. William Strein at the University of Maryland, College Park. This project has been approved by the University of Maryland, College Park Institutional Review Board (IRB Approval #314866-1).

I truly appreciate your time and considering participating in this research study. Please feel free to contact me with the questions or concerns you may have about the study.

Melissa

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Appendix C: Introduction Letter (Setting 2)

Dear Student:

This e-mail is being sent to you by (Setting 2). My name is Melissa Scarfone and I am a doctoral candidate in the College Student Personnel program at the University of Maryland. I am looking for volunteers to complete an anonymous and brief, 15-20 minute, online survey for a research study that will be a part of my doctoral dissertation. You may access this survey from any computer.

The purpose of this study is to investigate the factors that best predict the academic success of college students with learning disabilities. If you are a student with a documented learning disability, you are invited to participate in this study.

All participants who complete the survey will be eligible to enter a DRAWING for one of THREE $200 GIFT CARDS.

Your participation is very important to us and we highly value your feedback. Please click on the link below and follow the instructions:

http://www.surveymonkey.com/s/ [link to Setting 2 version of survey]

By clicking this link, you are not obligated to participate in this study and you can exit from the survey at any time. Your participation is completely confidential. I personally have no access to the Academic Support Center data base. The services you receive from (Setting 2) will not be affected in any way whether or not you participate in this study. Your anonymous responses to the survey will not be returned to the (Setting 2) office and will not be shared with any other entities on or off campus.

My study is being conducted under the supervision of Dr. William Strein at the University of Maryland, College Park. This project has been approved by the University of Maryland, College Park Institutional Review Board (IRB Approval #314866-1).

I truly appreciate your time and considering participating in this research study. Please feel free to contact me with the questions or concerns you may have about the study.

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Appendix D: Follow-up Letter (Setting 1)

Dear Student,

This e-mail is being sent to you by (Setting 1). My name is Melissa Scarfone and I am a doctoral candidate in the College Student Personnel program at the University of Maryland. Recently, you were sent you a request to participate in a 15- to 20-minute survey that is investigating the factors that best predict the academic success of college students with a learning disability.

Knowing how busy you are, we thought we would send another brief request for your participation as we cannot determine who has and who has not completed this survey. You are eligible to participate if you are an undergraduate student with a documented learning disability. Your participation is completely confidential. If you have already completed this survey, thank you very much for your participation.

All participants who complete the survey will be eligible to enter a DRAWING for one of THREE $200 GIFT CARDS.

http://www.surveymonkey.com/s/link [link to Setting 1 version of survey]

By clicking this link, you are not obligated to participate in this study and you can exit from the survey at any time. Your participation is completely confidential. I personally have no access to the ASC database. The services you receive from (Setting 1) will not be affected in any way whether or not you participate in this study. Your anonymous responses to the survey will not be returned to the (Setting 1) office and will not be shared with any other entities on or off campus.

Thanks for taking the time to read this e-mail. I hope that you choose to participate in my research. If you have any questions, please feel free to contact me at mscarfon@umd.edu

Melissa

Melissa Scarfone, M.S.
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Appendix E: Follow-up Letter (Setting 2)

Dear Student,

This e-mail is being sent to you by (Setting 2). My name is Melissa Scarfone and I am a doctoral candidate in the College Student Personnel program at the University of Maryland. Recently, you were sent you a request to participate in a 15- to 20-minute survey that is investigating the factors that best predict the academic success of college students with a learning disability.

Knowing how busy you are, we thought we would send another brief request for your participation as we cannot determine who has and who has not completed this survey. You are eligible to participate if you are an undergraduate student with a documented learning disability. Your participation is completely confidential. If you have already completed this survey, thank you very much for your participation.

All participants who complete the survey will be eligible to enter a DRAWING for one of THREE $200 GIFT CARDS.

http://www.surveymonkey.com/s/link [link to Setting 2 version of survey]

By clicking this link, you are not obligated to participate in this study and you can exit from the survey at any time. Your participation is completely confidential. I personally have no access to the ASC database. The services you receive from the (Setting 2) will not be affected in any way whether or not you participate in this study. Your anonymous responses to the survey will not be returned to the (Setting 2) office and will not be shared with any other entities on or off campus.

Thanks for taking the time to read this e-mail. I hope that you choose to participate in my research. If you have any questions, please feel free to contact me at mscarfon@umd.edu

Melissa

Melissa Scarfone, M.S.
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Appendix F: Informed Consent (Setting 1)

We are inviting you to participate in this research project because you are an undergraduate student that has registered at the Disability Support Service (DSS) office on campus. This research is being conducted by Melissa Scarfone under the supervision of William Strein, Ed.D. at the University of Maryland, College Park. This study investigates if there are differences between cognitive and noncognitive factors in predicting the academic success for college students with learning disabilities.

The procedures involves completing a brief (15 minute), on-line survey that is 29 questions, most of which require you to rate your different experiences related to college on a 1 to 5 scale. You are not being asked to provide your name but you are being asked to provide your University ID and for your permission that the University anonymously release to us your cumulative college grade point average for each year of attendance, your overall high school grade point average, and your SAT or ACT scores. Because we cannot access your university records or the Disability Support Services database, we will not be able to tell who you are based on your University ID and your name will never be disclosed to us. Once the University provides this data to us, we will replace your University ID with a code to further protect your anonymity. Upon completion, you can enter a drawing to win ONE of THREE $200 GIFT CARDS.

There are no foreseeable risks involved in this study. There is no direct benefit to students from participating in this study. It is hoped that this study will help us by providing an expanded understanding of what factors are the best predictors of college success for students with learning disabilities. Through improved understanding of these factors, we hope to inform practitioners and educators about ways to enhance the college admission process.

Your identity will never be revealed to us. Any potential loss of confidentiality will be minimized by storing data in a secure location in a locked office on a password-protected computer and disclosed only with your permission or as required by law. If we write a report or article about this research project, your identity will be protected to the maximum extent possible. Your information may be shared with representatives of the University of Maryland, College Park or governmental authorities if you or someone else is in danger or if we are required to do so by law.

_____ Exit this survey

New Webpage

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you are an employee and/or student, your employment status or your academic standing at UMD will not be affected by your participation or non-participation in this study. Your responses will not be provided to the DSS office and your eligibility for

services through DSS will not be affected in any way whether or not you participate in this study.

If you have any questions, concerns or complaints, please contact me, Melissa Scarfone, at: 3214 Benjamin Building, CHSE Department, University of Maryland, College Park, MD 20742, mscarfon@umd.edu. You may also contact my faculty advisor, Dr. William Strein, at 301-405-2869 or strein@umd.edu.

If you have questions about your rights as a research participant or wish to report a research-related injury, please contact:

University of Maryland College Park
Institutional Review Board Office
1204 Marie Mount Hall
College Park, Maryland, 20742
E-mail: irb@umd.edu
Telephone: 301-405-0678

This research has been reviewed according to the University of Maryland, College Park IRB procedures for research involving human subjects (#314866-1).

Your signature indicates that you are at least 18 years of age; you have read this consent form or have had it read to you; your questions have been answered to your satisfaction and you voluntarily agree to participate in this research study. You may print a copy of this consent form. If you agree to participate, please click, “I have read and understand the above consent and I choose to participate in this study.”

___ I have read and understand the above consent and I choose to participate in this study

___ I choose to not participate in this study

Appendix G: Informed Consent (Setting 2)

We are inviting you to participate in this research project because you are a college student that has registered with the (Setting 2) office on campus. This research is being conducted by Melissa Scarfone under the supervision of William Strein, Ed.D. at the University of Maryland, College Park. The purpose of this study is to investigate the factors that best predict the academic success of college students with learning disabilities. This study investigates if there are differences between cognitive and noncognitive factors in predicting the academic success for college students with learning disabilities.

The procedures involves completing a brief (15 minute), on-line survey that is 29 questions, most of which require you to rate your different experiences related to college on a 1 to 5 scale. You are not being asked to provide your name but you are being asked to provide your University ID and for your permission that the University anonymously release to us your cumulative college grade point average for each year of attendance, your overall high school grade point average, and your SAT or ACT scores. Because we cannot access your university records or the Academic Support Center database, we will not be able to tell who you are based on your University ID and your name will never be disclosed to us. Once the University provides this data to us, we will replace your University ID with a code to further protect your anonymity. Upon completion, you can enter a drawing to win ONE of THREE $200 GIFT CARDS.

There are no foreseeable risks involved in this study. There is no direct benefit to students from participating in this study. It is hoped that this study will help us by providing an expanded understanding of what factors are the best predictors of college success for students with learning disabilities. Through improved understanding of these factors, we hope to inform practitioners and educators about ways to enhance the college admission process.

Your identity will never be revealed to us. Any potential loss of confidentiality will be minimized by storing data in a secure location in a locked office on a password-protected computer and disclosed only with your permission or as required by law. If we write a report or article about this research project, your identity will be protected to the maximum extent possible. Your information may be shared with representatives of the University of Maryland, College Park or governmental authorities if you or someone else is in danger or if we are required to do so by law.

_____ Exit this survey

New Webpage

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you are an employee and/or student, your employment status or your academic standing at American University will not be affected by your participation or non-

participation in this study. Your responses will not be provided to the ASC office and your eligibility for services through ASC will not be affected in any way whether or not you participate in this study.

If you have any questions, concerns or complaints, please contact me, Melissa Scarfone, at: 3214 Benjamin Building, CAPS Department, University of Maryland, College Park, MD 20742, mscarfon@umd.edu. You may also contact my faculty advisor, Dr. Wlliam Strein, at 301-405-2869 or strein@umd.edu.

If you have questions about your rights as a research participant or wish to report a research-related injury, please contact:

University of Maryland College Park
Institutional Review Board Office
1204 Marie Mount Hall
College Park, Maryland, 20742
E-mail: irb@umd.edu
Telephone: 301-405-0678

This research has been reviewed according to the University of Maryland, College Park IRB procedures for research involving human subjects (#314866-1) and approved by American University's IRB.

Your signature indicates that you are at least 18 years of age; you have read this consent form or have had it read to you; your questions have been answered to your satisfaction and you voluntarily agree to participate in this research study. You may print a copy of this consent form. If you agree to participate, please click, “I have read and understand the above consent and I choose to participate in this study.”

___ I have read and understand the above consent and I choose to participate in this study

___ I choose to not participate in this study

Appendix H. Permission to Access Educational Records Consent Forms for (Setting 1)

Permission to Access Educational Records Consent Form

I hereby grant permission to (Setting 1) to release to Melissa Scarfone, for purposes of her research, my cumulative college GPA, entrance exam scores (SAT or ACT), and overall high school GPA. I understand that my name will NOT be revealed and this information will be provided based on my university ID. Furthermore, this information will be held in confidence and only Ms. Scarfone will have access to it.

_____ I grant permission

_____ I do not grant permission

Appendix I. Permission to Access Educational Records Consent Forms for (Setting 2)

Permission to Access Educational Records Consent Form

I grant permission to (Setting 2), to release to Melissa Scarfone, for purposes of her research, my cumulative college GPA, entrance exam scores (SAT or ACT), and overall high school GPA. I understand that my name will NOT be revealed and this information will be provided based on my university ID. Furthermore, this information will be held in confidence and only Ms. Scarfone will have access to it.

_____ I grant permission

_____ I do not grant permission

Appendix J. Learning Disability Status (Settings 1 and 2)

Learning Disability Status

Please choose the answer that applies to you:

_____ I am an UNDERGRADUATE student and havea documented learning disability

_____ I am NOT an UNDERGRADUATE student and/or do not have a documented learning disability

Appendix K. Noncognitive Questionnaire (administered online via SurveyMonkey)

NONCOGNITIVE QUESTIONNAIRE

1. Your university identification number: _____

2. Your sex is:

   _____ Male
   _____ Female

3. Your age is: _____

New Webpage

4. If you are a student that has transferred to American University, from another college or university, please provide your UNWEIGHTED high school grade point average (HSGPA) and your SAT or ACT scores (if you are willing) as UMCP does not have this information:

HSGPA _____
Verbal SAT _____
Math SAT _____
ACT _____

New Webpage

5. Your father's highest level of education:

   _____ High school graduate or less
   _____Some college
   _____College graduate
   _____Some graduate school
   _____Graduate degree or higher

6. Your mother's highest level of education:

   _____ High school graduate or less
   _____Some college
   _____College graduate
   _____Some graduate school
   _____Graduate degree or higher

New Webpage

7. Your race is:

_____ Black (African American)
_____ White (not of Hispanic origin)
_____ Asian American (Pacific Islander)
_____ Hispanic (Latino)
_____ American Indian (Native American, Alaskan Native)
_____ Other

New Webpage

8. How much education do you expect to get during your lifetime?

_____ College, but less than a bachelor's degree
_____ B.A. or equivalent
_____ One or two years of graduate or professional study (master's degree)
_____ Doctoral Degree such as M.D., Ph.D., and so on

New Webpage

9. Please list three goals that you have for yourself right now:

1. _____
2. _____
3. _____

New Webpage

10. About 50 percent of university students typically leave before receiving a degree. If this should happen to you, what will be the most likely cause?

_____ Absolutely certain that I will obtain a degree
_____ To accept a good job
_____ To enter military service
_____ It will cost more than my family can afford
_____ Marriage
_____ Disinterest in study
_____ Lack of academic ability
_____ Insufficient reading or study skills
_____ Other

New Webpage

11. Please list three things that you are proud of having done:

1. _____
2. _____
3. _____

New Webpage

For the remainder of items on this survey, you will be asked to indicate the degree you agree or disagree with a variety of statements that relate to what your feelings were or expectations of how things were going to be WHEN YOU ENTERED COLLEGE.

When answering these questions, PLEASE THINK BACK TO WHEN YOU BEGAN COLLEGE.

Please click on Next

New Webpage

12. The university should use its influence to improve social conditions in the state.

1 = Strongly Agree
2 = Agree
3 = Neutral
4 = Disagree
5 = Strongly Disagree

13. It should **not** be very hard to get a B (3.0) average at this school.

1 = Strongly Agree
2 = Agree
3 = Neutral
4 = Disagree
5 = Strongly Disagree

14. I get easily discouraged when I try to do something and it doesn't work.

1 = Strongly Agree
2 = Agree
3 = Neutral
4 = Disagree

5 = Strongly Disagree

New Webpage

Please think back to when you began college.

Respond to the statements below with WHAT YOUR FEELINGS WERE OR EXPECTATIONS OF HOW THINGS WERE GOING TO BE WHEN YOU ENTERED COLLEGE.

Please indicate the extent to which you agree or disagree with each of the following items. Click on the appropriate number.

15. I am sometimes looked up to by others.

    1 = Strongly Agree
    2 = Agree
    3 = Neutral
    4 = Disagree
    5 = Strongly Disagree

16. If I run into problems concerning school, I have someone who will listen to me and help me.

    1 = Strongly Agree
    2 = Agree
    3 = Neutral
    4 = Disagree
    5 = Strongly Disagree

17. There is no use in doing things for people; you only find that you get taken advantage of in the long run.

    1 = Strongly Agree
    2 = Agree
    3 = Neutral
    4 = Disagree
    5 = Strongly Disagree

New Webpage

Please think back to when you began college.

Respond to the statements below with WHAT YOUR FEELINGS WERE OR EXPECTATIONS OF HOW THINGS WERE GOING TO BE WHEN YOU ENTERED COLLEGE.

Please indicate the extent to which you agree or disagree with each of the following items. Click on the appropriate number.

18. In groups where I am comfortable, I am often looked to as a leader.

1 = Strongly Agree
2 = Agree
3 = Neutral
4 = Disagree
5 = Strongly Disagree

19. I expect to have a harder time than most students at this school.

1 = Strongly Agree
2 = Agree
3 = Neutral
4 = Disagree
5 = Strongly Disagree

20. Once I start something, I finish it.

1 = Strongly Agree
2 = Agree
3 = Neutral
5 = Strongly Disagree

New Webpage

Please think back to when you began college.

Respond to the statements below with WHAT YOUR FEELINGS WERE OR EXPECTATIONS OF HOW THINGS WERE GOING TO BE WHEN YOU ENTERED COLLEGE.

Please indicate the extent to which you agree or disagree with each of the following items. Click on the appropriate number.

21. When I believe strongly in something, I act on it.

1 = Strongly Agree
2 = Agree
3 = Neutral
4 = Disagree
5 = Strongly Disagree

22. I am as skilled academically as the average applicant to this school.

1 = Strongly Agree
2 = Agree
3 = Neutral
4 = Disagree
5 = Strongly Disagree

23. I expect I will encounter discrimination at this school.

1 = Strongly Agree
2 = Agree
3 = Neutral
4 = Disagree
5 = Strongly Disagree

New Webpage

Please think back to when you began college.

Respond to the statements below with WHAT YOUR FEELINGS WERE OR EXPECTATIONS OF HOW THINGS WERE GOING TO BE WHEN YOU ENTERED COLLEGE.

Please indicate the extent to which you agree or disagree with each of the following items. Click on the appropriate number.

24. People can pretty easily change me even though I thought my mind was already made up on the subject.

1 = Strongly Agree
2 = Agree
3 = Neutral
4 = Disagree
5 = Strongly Disagree

25. My friends and relatives **don't** feel I should go to college.

1 = Strongly Agree
2 = Agree
3 = Neutral
4 = Disagree
5 = Strongly Disagree

26. My family has always wanted me to go to college.

1 = Strongly Agree
2 = Agree
3 = Neutral
4 = Disagree
5 = Strongly Disagree

New Webpage

Please think back to when you began college.

Respond to the statements below with WHAT YOUR FEELINGS WERE OR EXPECTATIONS OF HOW THINGS WERE GOING TO BE WHEN YOU ENTERED COLLEGE.

Please indicate the extent to which you agree or disagree with each of the following items. Click on the appropriate number.

27. If course tutoring is made available on campus at no cost, I would attend regularly.

1 = Strongly Agree
2 = Agree
3 = Neutral
4 = Disagree
5 = Strongly Disagree

28. I want a chance to prove myself academically.

1 = Strongly Agree
2 = Agree
3 = Neutral
4 = Disagree
5 = Strongly Disagree

29. My high school grades **don't** really reflect what I can do.

1 = Strongly Agree
2 = Agree
3 = Neutral
4 = Disagree
5 = Strongly Disagree

New Webpage

30. Please list offices held and/or groups belonged to in high school or in your community.

1. _____
2. _____
3. _____

Appendix L: Drawing Entry Information (Settings 1 and 2)

Drawing Entry Form

You are now eligible to enter a drawing for one of three $200 gift cards. If you would like to enter this drawing, please enter your e-mail address. This information will not be shared. The raffle will be held at the end of this study which is anticipated to be fall, 2012. You may email me at any time to inquire about the status of the drawing at mscarfon@umd.edu. If you do not wish to enter the drawing, do not provide your email address.

_____ Enter me in the drawing

_____ Do not enter me in the drawing

Appendix M: Drawing Entry Form (Settings 1 and 2)

If you would like to enter the drawing, please enter your e-mail address below. If not, please click on “next”

_____

Appendix N: Drawing Entry Confirmation (Settings 1 and 2)

You are now entered into the drawing for one of three $200 gift certificates.

Appendix O: Thank You Form (Settings 1 and 2)

Thank you for your time.

The purpose of this study is to investigate the factors that best predict the academic success of college students with a learning disability or a learning disability and ADD/ADHD. If you are interested in a summary of the findings of this study, please e-mail us. We will be happy to share them with you.

If you have any questions or concerns, please contact us: Melissa Scarfone at mscarfon@umd.edu or Dr. William Strein, at strein@umd.edu.

Appendix P: Letter to Student(s) Who Did Not Win Raffle – Additional Information Needed

Dear Student,

My name is Melissa Scarfone and I am a doctoral candidate in the Student Affairs program at the University of Maryland. Thank you for being a participant in my study which investigates if there are differences between cognitive and noncognitive factors in predicting the academic success for college students with learning disabilities. This email is to inform you that you did not win the drawing for the $200 gift card. Although you did not win the gift card, I want you to know that your participation in this study has been extremely valuable to me and very much appreciated.

We have two, very brief, follow-up questions we would like to ask you in regard to this research project (it would probably take no more than 1-2 minutes of your time). If you are interested, please respond to this email to let us know and we will send to you those brief questions. If you are not interested, you do not need to reply to this email.

Just as a reminder, I have no access to your private information. Your participation in this research is completely voluntary. You may choose not to take part at all. If you are an employee and/or student, your employment status or your academic standing at the University of Maryland will not be affected by your participation or non-participation in this study. Your responses to the survey will not be returned to the DSS office and will not be shared with any other entities on or off campus.

My study is being conducted under the supervision of Dr. William Strein at the University of Maryland, College Park. This project has been approved by the University of Maryland, College Park Institutional Review Board (IRB Approval #314866-1 and #314866-2) and the American University Institutional Review Board.

Thank you once again for your participation in my study. Good luck in your future endeavors.

Melissa

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Appendix Q: Letter to Student(s) Who Won Raffle – Additional Information Needed

Dear Student,

My name is Melissa Scarfone and I am a doctoral candidate in the Student Affairs program at the University of Maryland. Thank you for being a participant in my study which investigates if there are differences between cognitive and noncognitive factors in predicting the academic success for college students with learning disabilities. I am pleased to inform you that you are one of the three winners of the drawing for the $200 gift card. In order to receive the gift card, please provide me with an address so that I can mail the gift card to you. The gift card will be dispersed by December 10, 2012. Please know that your participation in this study has been extremely valuable to me and very much appreciated.

We have two, very brief, follow-up questions we would like to ask you in regard to this research project (it would probably take no more than 1-2 minutes of your time). If you are interested, please respond to this email to let us know and we will send to you those brief questions. If you are not interested, you do not need to reply to this email (except with a way to get your gift card to you).

Just as a reminder, I have no access to your private information. Your participation in this research is completely voluntary. You may choose not to take part at all. If you are an employee and/or student, your employment status or your academic standing at the University of Maryland will not be affected by your participation or non-participation in this study. Your responses to the survey will not be returned to the DSS office and will not be shared with any other entities on or off campus.

My study is being conducted under the supervision of Dr. William Strein at the University of Maryland, College Park. This project has been approved by the University of Maryland, College Park Institutional Review Board (IRB Approval #314866-1 and #314866-2) and the American University Institutional Review Board.

Thank you once again for your participation in my study. Good luck in your future endeavors.

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Appendix R: Letter to Student(s) Who Did Not Win Raffle – No Additional Information Needed

Dear Student,

My name is Melissa Scarfone and I am a doctoral candidate in the Student Affairs program at the University of Maryland. Thank you for being a participant in my study which investigates if there are differences between cognitive and noncognitive factors in predicting the academic success for college students with learning disabilities. This email is to inform you that you did not win the drawing for the $200 gift card. Although you did not win the gift card, I want you to know that your participation in this study has been extremely valuable to me and very much appreciated.

Thank you once again for your participation in my study. Good luck in your future endeavors.

Melissa

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strein@umd.edu

Appendix S: Letter to Student(s) Who Won Raffle – No Additional Information Needed

Dear Student,

My name is Melissa Scarfone and I am a doctoral candidate in the Student Affairs program at the University of Maryland. Thank you for being a participant in my study which investigates if there are differences between cognitive and noncognitive factors in predicting the academic success for college students with learning disabilities. I am pleased to inform you that you are one of the three winners of the drawing for the $200 gift card. In order to receive the gift card, please provide me with an address so that I can mail the gift card to you. The gift card will be dispersed by December 10, 2012. Please know that your participation in this study has been extremely valuable to me and very much appreciated.

Thank you once again for your participation in my study. Good luck in your future endeavors.

Melissa

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Appendix T: Self-Reported HSGPA and Standardized Test Scores

If you are a student that has transferred to your current university from another college or university, please provide your unweighted high school grade point average and your SAT or ACT scores as your current university does not have this information:

HSGPA: _____

Verbal SAT: _____

Math SAT: _____

ACT: _____

Appendix U: Request for Self-Report of HSGPA and/or Standardized Test Scores

Dear Participant,

Thank you for being willing to respond to answer two, very brief, follow-up questions related to my study which investigates if there are differences between cognitive and noncognitive factors in predicting the academic success for college students with learning disabilities.

As you may remember, in order to complete this study, I need your cumulative high school grade point average (HSGPA) and SAT or ACT scores. For some students, this data was not provided to the University of Maryland, College Park, when you applied for admission. If you are willing to do so, please reply to this email and enter the requested information below:

1. What was your cumulative HSGPA:
2. If you took the either the SAT or ACT, what were your scores on the:

   Verbal SAT:

   Math SAT:

   ACT:

You are not required to provide this information; it would just help me greatly in completing my study. I have no access to your private information. I will just match this information to the data which corresponds to your email address in the data file I have compiled for my study.

My study is being conducted under the supervision of Dr. William Strein at the University of Maryland, College Park. This project has been approved by the University of Maryland, College Park Institutional Review Board (IRB Approval #314866-1 and #314866-2) and the American University Institutional Review Board.

I appreciate your time and your consideration in providing to me your SAT or ACT scores.

Melissa

Melissa Scarfone, M.S.
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Appendix V: Scoring Key for Noncognitive Questionnaire

Positive Self-Concept or Confidence Items 7, 9, 10, 20, 23, 28

(7) How much education do you expect to get during your lifetime?

_____ College, but less than a bachelor's degree
_____ B.A. or equivalent
_____ One or two years of graduate or professional study (master's degree)
_____ Doctoral Degree such as M.D., Ph.D., and so on

(9) About 50 percent of university students typically leave before receiving a degree. If this should happen to you, what will be the most likely cause?

_____ Absolutely certain that I will obtain a degree
_____ To accept a good job
_____ To enter military service
_____ It will cost more than my family can afford
_____ Marriage
_____ Disinterest in study
_____ Lack of academic ability
_____ Insufficient reading or study skills
_____ Other

(10) Please list three things that you are proud of having done:

1. _____
2. _____
3. _____

(20) When I believe strongly in something, I act on it.
(23) People can pretty easily change me even though I thought my mind was already made up on the subject.
(28) My high school grades **don't** really reflect what I can do.

Realistic Self-Appraisal Items 9, 12, 21

(9) About 50 percent of university students typically leave before receiving a degree. If this should happen to you, what will be the most likely cause?

_____ Absolutely certain that I will obtain a degree
_____ To accept a good job
_____ To enter military service
_____ It will cost more than my family can afford
_____ Marriage
_____ Disinterest in study
_____ Lack of academic ability

_____ Insufficient reading or study skills
_____ Other

(12) It should **not** be very hard to get a B (3.0) average at this school.*
(21) I am as skilled academically as the average applicant to this school.*

Understands and Deals with Racism Items 11, 18, 22, 26, 27

(11) The university should use its influence to improve social conditions in the state.*
(18) I expect to have a harder time than most students at this school.
(22)I expect I will encounter discrimination at this school.*
(26) If course tutoring is made available on campus at no cost, I would attend regularly.*
(27) I want a chance to prove myself academically.*

Prefers Long-Range Goals to Short-Term or Immediate Needs Items 8A, 13, 19

(8A) Please list three goals that you have for yourself right now (Scored with "A")
(13) I get easily discouraged when I try to do something and it doesn't work.
(19) Once I start something, I finish it.*

Availability of Strong Support Person Items 15, 24, 25

(15) If I run into problems concerning school, I have someone who will listen to me and help me.*
(24) My friends and relatives **don't** feel I should go to college.
(25) My family has always wanted me to go to college.*

Successful Leadership Experience Items 14, 17, 29A

(29A) Please list offices held and/or groups belonged to in high school or in your community.
(14) I am sometimes looked up to by others.*
(17) In groups where I am comfortable, I am often looked to as a leader.*

Demonstrated Community Service Items 16, 29B

(16) There is no use in doing things for people; you only find that you get taken advantage of in the long run.
(29B) Please list offices held and/or groups belonged to in high school or in your community.

Knowledge Acquired in a Field Items 8B, 29C

(8B) Please list three goals that you have for yourself right now
(29C) Please list offices held and/or groups belonged to in high school or in your community.

*Indicates a "negative" response where 1 = 5, 2=4, 3=3, & 5=1. Subtract all negative responses from 6

Item 8 is used in 2 scales:

8A. Options for Long Range Goals. Each goal is coded according to this scheme:

1 = A vague and/or immediate, short-term goal (for example, "to meet people," "to get a good schedule," "to gain self-confidence)"
2 = A specific goal which a stated future orientation that could be accomplished during undergraduate study (for example, "to join a sorority so I can meet more people," "to get a good schedule so I can get good grades in the fall," "to run for a student government office")
3 = A specific goal with a stated future orientation that would occur after undergraduate study (for example, "to get a good schedule so I can get the classes I need for graduate school," "to become president of a Fortune 500 company")

8B. Options for Knowledge Acquired in a Field. Each goal is coded according to this scheme:

1 = Not at all academic or school-related; vague or unclear (for example, "to get married," "to do better," "to become a better person."
2 = School related, but not necessarily or primarily education-oriented (for example, "to join a fraternity," "to become student body president")
3 = Directly related to education (for example, "to get a 3.5 GPA," "to get to know my teachers")

Item 10. Use to score for Self-Concept. Each accomplishment is coded according to this scheme:

1 = at least 75 percent of applicants to your school could have accomplished it (for example, "graduate from high school," "held a part-time job")
2 = at least 50 percent of applicants to your school could have accomplished it (for example, "played on an intramural sports team," "was a member of a school club")
3 = at least 25 percent of applicants to your school could have accomplished it (for example, "won an academic award," "was captain of the football team")

Item 29 is used in 3 scales: Leadership, Community Service Relatedness, and Knowledge Acquired in a Field

Leadership

1 = Ambiguous group or no clear reference to activity performed (for example, "helped in school")
2 = Membership but no formal or implied leadership role; it has to be clear that it's a functioning group and, unless the criteria are met for a score of "3" as

described below, all groups should be coded as "2"even if you, as the rater, are not familiar with the group (e.g., "Fashionettes," "was part of a group that worked on community service projects through my church")
3 = Leadership was required to fulfill role in group (e.g., officer or implied initiator, organizer, or founder) or entrance into the group was dependent upon prior leadership (for example, "organized a tutoring group for underprivileged children in my community," "student council")

Community Service Relatedness

1 = No community service performed by group, or vague or unclear in relation to community service (e.g., "basketball team").
2 = Some community service involved but it is not the primary purpose of the group (e.g., "Scouts")
3 = Group's main purpose is community service (e.g., "Big Brothers/Big Sisters")

Knowledge Acquired in a Field: same coding criteria used for Item 8B

Appendix W: T-Test Results for HSGPAs and SAT Scores

Self-Reported and Non-Self-Reported HSGPAs and SAT Scores

	Self-Reported	Non-Self-Reported	*t*	*df*	*p*
HSGPA	3.60	3.73	.709	84	$p = .480$
SD	(.318)	(.461)			
SAT Score	1303.33	1267.57	.56	74	$p = .579$
SD	(141.80)	(151.432)			

Weighted and Unweighted High School Grade Point Averages

	Weighted	Unweighted	*t*	*df*	*p*
HSGPA	4.12	3.49	-8.22	84	$p = .001$
SD	(.354)	(.328)			

Appendix X: ANOVA Results for HSGPAs and SAT Scores of Freshmen, Sophomores and Juniors

High School Grade Point Average by Class Standing

	Freshmen (n (n = 15)	Sophomores (n = 21)	Juniors (n = 26)	F	Sig.
HSGPA	3.63	3.73	3.74	.376	.688
SD	(.398)	(.465)	.484		
SAT Score	1295.33	1285.71	1229.52		
SD	(119.813)	(149.116)	(151.960)		

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