Predicting First-Semester College Student Success at a Small Technology College

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Predicting First-Semester College Student Success at a Small Technology College

Abstract
This quantitative study examined the degree to which traditional (high school grade point average (GPA) and standardized tests), noncognitive, and demographic variables predict first-semester college GPA and first-to-second semester retention among a sample of 386 first-year students at a small technology college. The aim of this research was to better understand the ways noncognitive variables may predict and explain college success for a general population of first-year students as well as a population of low-achieving students. Linear and logistical regression analysis were used to determine the degree to which each of the prescribed traditional, demographic (gender, race, parent education, and family income), and noncognitive (academic engagement, educational commitment, academic self-efficacy, resiliency, social comfort, and campus engagement) predictors could predict first-semester college GPA and first-to-second semester retention. The findings of the study suggest that high school GPA is the strongest predictor of first-semester GPA and first-to-second semester retention. In addition, the study revealed that standardized tests are not predictive of first-to-second semester retention. None of the noncognitive predictors met statistical significance; however, campus engagement, a measure of the student’s willingness to become involved in campus activities, did approach significance for first-to-second semester retention. Recommendations for the use of standardized tests and campus engagement measures in admissions practices are provided.

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Dedication

This long journey to the dissertation summit would not have been possible without the support and guidance I received from so many people along the way. First, I’d like to acknowledge the everlasting support of my loving wife. Kimberly, you selflessly gave up your time, weekends, and evenings so I could pursue this dream. You’ve been my editor, cheerleader, and life coach. I am ever grateful and so ready to spend some quality time with you, Logan, and Clara.

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Mom and Dad, I owe many great things in life to you. Your everlasting love and support has shaped me into the person I am today. I love you both and look forward to spending much more time with you in the coming years.
Finally, this dissertation is dedicated to fellow cancer survivors. When all feels lost, know that you are still capable of doing great things. Be what you are now. Carpe diem.


Biographical Sketch

Robert Blanchet is currently the Dean of Admissions at Morrisville State College. Mr. Blanchet attended The College at Brockport from 1997 to 2001 and graduated with a Bachelor of Science degree in Communication Studies in 2001. He attended The College at Brockport, again, from 2006 to 2009 and graduated with a Master of Arts degree in Communication in the fall of 2009. He enrolled in St. John Fisher College in the summer of 2014 and began doctoral studies in the Ed.D. Program in Executive Leadership. Mr. Blanchet pursued his research in noncognitive characteristics and college success under the direction of Dr. Kim VanDerLinden and Dr. Tara Winter and received the Ed.D. degree in 2016.
Abstract

This quantitative study examined the degree to which traditional (high school grade point average (GPA) and standardized tests), noncognitive, and demographic variables predict first-semester college GPA and first-to-second semester retention among a sample of 386 first-year students at a small technology college. The aim of this research was to better understand the ways noncognitive variables may predict and explain college success for a general population of first-year students as well as a population of low-achieving students. Linear and logistical regression analysis were used to determine the degree to which each of the prescribed traditional, demographic (gender, race, parent education, and family income), and noncognitive (academic engagement, educational commitment, academic self-efficacy, resiliency, social comfort, and campus engagement) predictors could predict first-semester college GPA and first-to-second semester retention. The findings of the study suggest that high school GPA is the strongest predictor of first-semester GPA and first-to-second semester retention. In addition, the study revealed that standardized tests are not predictive of first-to-second semester retention. None of the noncognitive predictors met statistical significance; however, campus engagement, a measure of the student’s willingness to become involved in campus activities, did approach significance for first-to-second semester retention. Recommendations for the use of standardized tests and campus engagement measures in admissions practices are provided.
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Chapter 1: Introduction

A college degree is an important achievement in life. It opens the door to more rewarding careers and higher-paying jobs, and is considered a gateway to middle-class life in the United States. With lifetime earnings as much as $1 million more for college graduates than for those who did not advance beyond a high school diploma, a college degree continues to be a strong return on investment (Julian, 2012; U.S. Bureau of Labor Statistics [BLS], 2014). Obtaining a college education also has advantages that extend beyond fiscal return on investment. Four-year degree holders have greater job satisfaction, stronger pension plans, more social mobility, and better health benefits than those without a college education (Baum, Ma, & Payea, 2013).

The benefits of a college education are not just advantageous for the individual student. Success in college also benefits the college by validating purpose and confirming institutional mission (Braxton et al., 2014; Tinto, 2012). When achieved, student success can serve as a testament to the college’s ability to cultivate, educate, and prepare students for various careers.

College success is also connected to the social prosperity and economic well-being of society (Baum & Payea, 2005). An educated population attracts companies and industries that require high-skill labor. High-skill labor jobs pay higher wages and enhance economic sustainability and social well-being for future generations (Tinto, 2012). By increasing the population of educated citizenry, colleges also contribute to collective knowledge and advance social progress (Baum et al., 2013). With these
benefits in mind, the political rhetoric surrounding college success has become an area of intense focus by government officials.

In his 2009 State of the Union address, President Barack Obama acknowledged that the United States has been outpaced by competing countries in terms of degree attainment. While the rank of the United States was once first in 4-year degree attainment in 1990, it dwindled to the rank of 14th in 2012 (Organisation for Economic Co-operation and Development [OECD], 2012). Since then, new college affordability policies have clearly supported the President’s goal to increase U.S. college degree completion and recapture the country’s first-place ranking of college graduates within the international community (OECD, 2012). However, despite increased efforts, the percentage of students who persist and finish a 4-year college within a 6-year timeframe remains at only 59% (National Center for Educational Statistics [NCES], 2015).

The issue of college persistence is not new in educational research. Over the past three decades, scholars have produced literature that addressed the underlying reasons why a sizable portion of students who start college fail to earn a degree (Bean, 2010, 1980; Braxton et al., 2014; Robbins, Lauver, Le, Davis, & Langley, 2004; Tinto, 1975, 1993). According to Bean (2010), the freshman-to-sophomore retention rate for 4-year colleges in the United States is 75%, and only 55 out of 100 freshmen will graduate with a 4-year degree within a 6-year timeframe. Given these statistics, the issue of predicting freshman persistence and performance has been of particular interest to scholars.

The potential for freshman student success in college is commonly measured using traditional achievement measures, including high school program performance and standardized college entrance exams. The predictive power of high school grade point
average (GPA) and standardized college entrance exams tests is well documented in the literature (Bridgeman, Pollack, & Burton, 2008; Carlblom, 2014; Geiser & Santelices, 2007; Kobrin & Patterson, 2011; Kobrin, Patterson, Shaw, Mattern, & Barbuti, 2008; Noel, Levitz, & Saluri, 1985).

While traditional measures provide means to predict first-year college success, they are also a mechanism used to qualify college admission. High school GPA and standardized tests provide measurement of the students’ cognitive, or academic, abilities and are heavily used by colleges to make admission decisions (Morse & Flanigan, 2013). However, high school GPA and standardized college entrance exams alone may not be sufficient means to predict student success. These measures may fall short of measuring other important student characteristics.

The primary limitation of traditional achievement measures stems from research suggesting that high school GPA and standardized tests predict only a small percentage of the likelihood of college success (Astin, 1993; Robbins et al., 2004). In a meta-analysis study conducted by Robbins and colleagues (2004), high school GPA and standardized tests combined accounted for 25% of the predictive variance of freshman college performance. This means that a sizable 75% of college success may be attributed to factors other than traditional achievement in high school. Thus, colleges that rely heavily on traditional measures to make admission decisions are only considering a small portion of the student success equation when determining student admissibility. The inclusion of other characteristics, such as students’ motivation and academic confidence, may tell a more complete story of student success (Freeman-Butler, 2014; Krumrei-Mancuso, Newton, Kim, & Wilcox; 2013; Saltonstall, 2013).
Noncognitive characteristics, also referred to as nonacademic or psychosocial characteristics, account for behavioral qualities such as motivation, self-efficacy, commitment to college, as well as many additional behavioral factors needed to be successful in college (Kim, Newton, Downey, & Benton, 2010; Robbins et al., 2004; Sedlacek, 1993). Unlike cognitive abilities, noncognitive characteristics are engrained in a student’s personality and are not easily measured using the high school GPA and college entrance exams. In terms of college success, noncognitive characteristics facilitate student motivation, academic confidence, management of stress, desire to integrate socially, and degree of comfort in social situations (Campus Labs, 2013; Leuwerke & Dervisevic, 2008; Saltonstall, 2013). When used in concert with traditional achievement measures, noncognitive characteristics may enhance the college’s ability to predict student success for a wider range of students (Robbins, Allen, Casillas, Peterson, & Le, 2006; Robbins et al., 2004; Sedlacek, 2004).

Problem Statement

Most 4-year colleges and universities depend on traditional measures, including high school GPA and standardized test scores, to decide which students will have the opportunity to enroll. This reliance on traditional measures disadvantages students who do not perform well in high school and/or on standardized tests. Thus, a population of students may be denied the opportunity to enroll in college, to be successful in college, and to reap the benefits of obtaining a college education. This population of students who does not meet admission requirements may instead be channeled into other sectors of higher education where they are less likely to be successful (Huerta & Watt, 2015; Skomsvold, Radford, & Berkner, 2011) or into careers that do not require a college
degree. Although access-oriented community colleges offer a college pathway for many low-achieving students, the likelihood of transferring to a 4-year college is bleak. Less than 12% of students who start in community college finish a 4-year degree within six years (Skomsvold et al., 2011). Students who have limited access to higher education based on high school GPA and/or standardized test scores may be significantly disadvantaged in terms of earning potential and quality of life (BLS, 2015; Pew Research Center, 2014). This disadvantage was supported by the BLS (2015) that showed 4-year degree recipients earned 70% more income than high school graduates who did not complete college (Julian, 2012).

The reliance on traditional measures when deciding who can and cannot attend college ignores the possibility that low-achieving students might possess other attributes that could lend themselves to college success. In fact, a growing body of literature has suggested that not only are high school GPA and standardized test scores less salient predictors of student success for low-achieving students (Adebayo, 2008; Mattson, 2007), but other characteristics, known as noncognitive or psychosocial, may be better predictors of student success (Kim, 2015; Ransdell, 2001; Saltonstall, 2013). A more holistic view of student attributes that does not rely only on traditional measures may help ensure that more students have access to higher education and more students have an equal opportunity to be successful and reap the benefits of a college education.
Theoretical Rationale

**Expectancy-value theory and student success.** Scholars have heavily used the expectancy-value theory to explain educational performance (Saltonstall, 2013; Wigfield, 1994). As a framework, the theory informs the psychosocial elements rooted in student success as defined by degree of academic self-efficacy and the varying degrees of attainment, intrinsic, utility, and cost value associated with engaging in college. For the purposes of the study, the expectancy-value theory was used as a vehicle to inform the following four noncognitive student characteristics: a) social influences, b) perceptions of past performance, c) expectations for success, and d) task value (Eccles & Wigfield, 2002). Social influences include cultural and group beliefs that influence an individual’s perception of college. Perceptions of past performance refer to the positive and negative feelings associated with similar past experiences. Expectations for success, similar to Bandura’s (1997) self-efficacy expectations, refer to the academic confidence that students have in relation to a successful outcome. These four well-defined constructs inform the underlying motivations rooted in the decisions student make and help explain how noncognitive characteristics influence student success in college.

Expectancy-value theory may be traced back to Atkinson’s (1964) original expectancy-value model that connects persistence, performance, and individual choice to expectancy and task-value beliefs. The theory provides a combined perspective that weaves together elements of social-cognitive (expectancy) and motivation (value) theory. Expectancy-related theories include self-efficacy and control theories, while task value-related theories encompass intrinsic motivation, self-determination, and goal theories (Eccles & Wigfield, 2002).
Expectancy. Expectancies for success are best defined as the student’s belief about how well he or she will perform a given task in the immediate or distant future (Eccles & Wigfield, 2002). Expectancies are task-specific beliefs that include perceptions of ability, perceptions of task difficulty, as well as individual goals and self-schema. These social-cognitive variables, derived from affective memories, perceptions of past achievement, and perceptions of other people’s attitudes, influence the degree of task-related expectancy.

Similar connections may be made with Bandura’s (1997) personal efficacy expectations that link a student’s perceived history of academic performance with future expectations of success. Both the expectancy model and Bandura’s efficacy expectations share the belief that the degree of task-related confidence is linked to task motivation. One difference between the two theories lies in how expectancy is interpreted. The expectancy model focuses on personal efficacy expectations, while Bandura’s (1997) model focuses on outcome expectations. The distinction between the two theories is important because this present study was more concerned with how students interpret their ability to be successful in college. Thus, expectancies need to be evaluated in terms of a student’s personal belief that he or she can be successful in the college environment.

Value. Value, or task-value, is best described as the degree of worth one associates with task engagement (Eccles & Wigfield, 2002). The expectancy-value theory is comprised of four constructs of task value, including attainment value, intrinsic value, utility value, and cost. Since all four interdependently drive student behavior, each also interdependently influences students’ noncognitive characteristics. Attainment value is defined as the personal importance of doing well on a given task. The motivating
reasons stem from concepts of self-identity and can influence the value students place on having a college degree. Tasks with high attainment value may confirm prominent aspects of a student’s self-identity (Feather, 1988). Intrinsic value refers to the pleasure one receives from performing a task, or the personal interest one has in the subject area. This relates to how much the student enjoys learning about the subject or subjects being taught. Students who intrinsically value a college education appreciate the process of learning and exercising knowledge of the subject matter. Utility value, also referred to as extrinsic value, is the value of a task as it relates to future outcomes, including career or personal goals. The task can have value because it facilitates a positive future. While utility value is extrinsic in nature, it still relates to an individual’s internalized goals. Eccles (1987) conceptualized cost as a negative characteristic associated with doing a task, including time, anxiety, fiscal, possibility of failure, and effort required to succeed. Also considered as cost are “lost opportunities that result from making one choice rather than another” (Eccles & Wigfield, 2002, p. 120).

**Statement of Purpose**

The purpose of this study was twofold: a) to measure the degree to which predictors of student success, including academic, noncognitive, and demographic contribute to success in college; and b) to measure the degree to which these predictors may predict success in college for low-achieving students. Academic, noncognitive, and demographic variables each individually account for a degree of success in college. This study attempted to determine the overall degree to which each of these three variables accounted for first-year success in college as well as to discern proportional differences between each of the factors by high school achievement level. Proportional differences
of college success by high school achievement level will inform the unique predictive values that traditional, demographic, and noncognitive variables have on a range of student achievement levels. By measuring the interplay between each of these variables, this study attempted to measure the varying degrees to which noncognitive characteristics might predict success for general and low-achieving population of first-year college students.

Using an expectancy-value theory approach, the study utilized cognitive, noncognitive, and demographic variables to illuminate the relationships rooted in student success. The findings expand on Saltonstall’s (2013) research to further clarify the interrelationships between traditional achievement, demographic, and noncognitive variables as they relate to student achievement level.

In addition, the location in which the study was conducted added contextual depth to the current body of research. To date, very few studies examining the predictive power of noncognitive variables have been conducted at small technology colleges. These unique colleges offer a unique blend of academic majors including 4-year, 2-year, and certificate degree programs. Since each program requires different levels of academic competencies for admission, technology colleges have a wide range of admission requirements. The broad spectrum of entry requirements attracts a diverse pool of first-year students with a wide range of high school performance levels. The findings will address a need to conduct further research at a smaller college context and to broaden the understanding of how noncognitive variables may have differing effect sizes for first-year students who perform poorly in high school.

**Research Questions**
This research answered the following questions:

1. To what extent do traditional achievement measures (high school GPA and composite achievement test scores), demographic (gender, race, and socioeconomic), and noncognitive variables (academic engagement, educational commitment, academic self-efficacy, resiliency, social comfort, and campus engagement) predict first-semester college GPA?

2. To what extent do traditional achievement measures, demographic, and noncognitive variables predict first-semester GPA for low-achieving students?

3. To what extent do traditional achievement, demographic, and noncognitive variables predict first- to second-semester retention?

4. To what extent do traditional achievement, demographic, and noncognitive variables predict first- to second-semester retention for low-achieving students?

**Potential Significance of the Study**

The study comes at a time when most colleges need to adjust their admission practices to accommodate populations of students who are historically less successful in college (Western Interstate Commission of Higher Education, 2012). To ensure continued college access, success, and degree attainment, colleges may need to develop new methods to identify, enroll, and retain students who are historically less ready for college. By integrating noncognitive variables into traditional and demographic variables in its design, this study addressed a need for new, reliable predictors of student success in higher education. Research has suggested that noncognitive variables may become more salient when applied to students who are less academically prepared for college.
(Adebayo, 2008; Saltonstall, 2013; Sedlacek, 1993). As this population continues to
grow, colleges may need to place more emphasis on the behavioral qualities rooted in
student success. Noncognitive variables provide a framework to measure and use
behavioral qualities as a mechanism to predict the likelihood of success in college. By
measuring the behaviors indicative of college success, colleges may establish new
admission metrics that could widen the scope of potential admissible students, thereby
increasing the quantity of college enrollments and college access for low-achieving
students to be successful in college.

**Definitions of Terms**

*Academic Engagement:* A noncognitive variable that refers to the value students
place on academics and their level of attentiveness to school work (Campus Labs, 2013).

*Academic Self-efficacy:* A noncognitive variable that refers to the confidence
students have in their ability to do well academically and succeed in college (Campus
Labs, 2013).

*Campus Engagement:* A noncognitive variable that refers to students’ willingness
to be involved in campus activities and their perceived affection for the college or
university (Campus Labs, 2013).

*Demographic Variables:* These include the environmental and cultural conditions
of a population (Lee & Schuele, 2010). A wide range of characteristics may be
considered demographic variables. For the purposes of the study, the following
demographic factors were measured: gender, generational status, race, and income level.
Educational Commitment: A noncognitive construct that refers to students’ devotion to the ideals of college and the value placed on attaining a college degree (Campus Labs, 2013).

Generational Status: A demographic construct that identifies whether or not one or more of a student’s parents have completed a 4-year degree (Cowan et al., 2012).

Income Level: A demographic construct that identifies the amount combined yearly wages a student’s household makes (Cowan et al., 2012).

Low-achieving Student: A student who graduates from high school with a 76 cumulative GPA or lower. This definition was informed by research suggesting that students with less than a “C” average are significantly less likely to be successful in college (Rosenbaum, 2001; Rosenbaum & Gordon-McKeon, 2003).

Noncognitive Variables: These refer to the broader dimensions of personality, values, and attitudes (Sedlacek, 1993). For the purposes of this study, the six dimensions of the Student Strengths Inventory (SSI) (Campus Labs, 2013) were used: academic engagement, academic self-efficacy, educational commitment, resiliency, campus engagement, and, social comfort. As a term, noncognitive also refers to psychosocial or nonacademic in the literature. Despite differing terminologies (noncognitive, psychosocial, and nonacademic), each denotes similar constructs when used in the literature (Robbins et al., 2004). The three terms emphasize contextual and behavioral elements that exist beyond the confines of cognitive attributes. For the purposes of this study, the term noncognitive was used to communicate the meaning of noncognitive, psychosocial, and nonacademic characteristics.
**Race:** One of the following depictions of human ethnic classifications: American Indian or Alaska Native, Asian, Black or African American, Hispanic/Latino, Native Hawaiian or Other Pacific Islander, or White.

**Resiliency:** A noncognitive variable that refers to a student’s approach or handling of challenging situations and stressful events (Campus Labs, 2013).

**Retention:** The degree to which students persist or continue at the college in which they initially enrolled. First- to second-year retention is a common measure of a college’s ability to retain students (Tinto, 2012). For the purposes of this study, retention referred to the percentage of students who return after completing their first semester.

**Traditional Achievement Variables:** The combined predictive power of high school GPA and standardized tests. Traditional measures are focused on academic ability in terms of cognition and currently account for 25% of the overall predictive variance of success in college (Robbins et al., 2004).

**Social Comfort:** A noncognitive variable that refers to the student’s ability to communicate with others and feel comfortable in social situations (Campus Labs, 2013).

**Technology College:** A college that offers primarily technical programs, including 4-year, 2-year, and certificate degrees. In addition to degrees, technology colleges also specialize in offering internships and applied learning experiences designed to prepare students for careers in a specific industry (State University of New York Viewbook, 2016). Because the type of education received at technology colleges can drastically vary depending on degree type and academic program, technology colleges enroll a diverse range of student learners who enter college with a wide range of academic preparation.

**Chapter Summary**
This study will contribute to the current body of research on college student success. Rooted in the notion that traditional measures no longer provide adequate projections of college success, this study used the expectancy-value theory of motivation to analyze relationships between academic, demographic, and noncognitive factors and college success. The findings will provide higher education practitioners with new insights. Specifically, this study can inform the work of enrollment managers and student success professionals by advancing noncognitive parameters as a means of measuring the likelihood of student success. In addition, by including noncognitive variables in the college success equation, this research aimed to inform measures that could provide opportunities for students who struggle to perform well in high school and/or on standardized tests. The remaining chapters will provide a review of relevant literature, an overview of the methodology used, a summary of findings, and implications for future research.
Chapter 2: Review of the Literature

Introduction and Purpose

College student success has been a focus in educational research for decades. Dating as far back as Tinto’s (1975) student integration theory, there has been ongoing interest in understanding why some students are unable to find success in college. In recent years, however, the role of noncognitive student characteristics in college success has become an area of interest for retention and educational psychology scholars (Adebayo, 2008; Robbins et al., 2004; Sedlacek, 1993; Ting, 2003; Ting & Robinson, 1998). Supported by theory and empirical research, noncognitive characteristics are a collection of student attitudes and behaviors that are indicative of success in college. Unlike cognitive measures, such as high school GPA and standardized tests, noncognitive characteristics are related to the value, confidence, dedication, approach, and desire the student has to be successful in college. When noncognitive measures are used in concert with high school GPA and standardized testing, the predictive variance of success in college, as defined by first-year college GPA, increases by up to 14 percentage points (Robbins et al., 2004).

Despite literature supporting the predictive power of noncognitive characteristics, most colleges continue to weight traditional measures heavily, including high school GPA and standardized test scores, to determine applicant admissibility. Traditional measures of college success include high school academic performance and standardized test scores such as the Scholastic Aptitude Test (SAT) and ACT. These two measures are
commonly used in higher education to determine admissibility to college, predict first-year college student success, and, in many cases, inform freshman year course placement.

Demographic factors, including socioeconomic status, gender, and race, have cultural implications and are engrained in a student’s upbringing. Although colleges rarely use these measures to determine admissibility, demographic factors can influence the students’ access to resources, degree of parental support, and perceived value of a college education (Strayhorn, 2010). Since demographic factors influence all parts of a student’s upbringing, they can also impact a student’s academic performance in high school and his or her likelihood of success in college (Eccles & Wigfield, 2002; Robbins et al., 2004).

Most research has suggested that nontraditional students, including non-White, first-generation, and low-income students, are less likely to succeed in college (Abedayo, 2008; Attewell, Heil, & Reisel, 2011; Bromberg & Theokas, 2014; Conrad-Curry, 2011; Kim, 2015; Pascarella, Pierson, Wolniak, & Terenzini, 200; Ting, 2003, 1998). For the purposes of this study, demographic variables are important to help scholars understand the limits of generalizing results. Accounting for demographic and environmental differences is especially important in social sciences where perceptions, values, and beliefs influence behavior and choice (Bandura, 1997). The three demographic variables considered in this study included socioeconomic status, gender, and race. Each may influence the likelihood of success in college and requires additional consideration when measuring college GPA and persistence.

**Review of Literature**
The following review of literature pertains to measuring first-year college student success. For this study, student success was measured by first-semester college GPA and first- to second-semester retention. The intention was to determine the degree to which traditional, noncognitive, and demographic factors predict and explain student success. Further, the study sought to examine if high school achievement level has an effect on the saliency of noncognitive student characteristics, or variables. Traditional predictors include performance variables such as cumulative high school GPA and standardized test scores. Noncognitive characteristics encompass a series of behavioral measures, including academic engagement, academic self-efficacy, college commitment, resiliency, campus engagement, and social comfort (Campus Labs, 2013). Research that connected demographic factors to traditional and noncognitive measures of college success was also included in the review of literature.

**Traditional predictors.** Traditional measures are commonly used in higher education as a means of assessing the likelihood of success in college. Standardized tests, including the SAT and the ACT, were introduced to college admission review processes in 1926 as a means of ensuring student aptitudes were evenly measured and promoting equal opportunity for college access (Lawrence, Rigol, Essen, & Jackson, 2003). Since that time, traditional measures have become the primary means by which 4-year colleges and universities measure the probability of success in college and assign admission decisions.

Standardized tests are considered cognitive assessments that provide measures of the various aptitudes learned throughout high school (Crede & Kuncel, 2008). Cognitive abilities represent the mental processes of knowing, reasoning, and judgment, and are
required for success in many educational courses (Carroll, 1993). High school GPA, on the other hand, is the cumulative average of grades received throughout a student’s high school program. Because course examinations and tests typically make up a sizable portion of the GPA, this measure has cognitive roots. However, the GPA also encompasses some psychosocial academic behaviors, such as turning in homework on time, study habits, participation, and class attendance. These behaviors measure noncognitive factors, including the degree to which the student is engaged and committed to understanding the prescribed coursework (Robbins et al., 2004). Since the GPA is a mix of cognitive and noncognitive skills, this measure is more commonly used by a wider range of colleges to determine the likelihood of success in college. Between high school GPA and standardized tests, most of the research advances the GPA as the stronger of the two traditional predictors of student success in college (Bridgeman et al., 2008; Geiser & Santelices, 2007).

Although it ranges, most research has suggested that high school GPA and standardized tests combined account for between 21% and 25% of the predictive variance of academic success and persistence in college (Kim, 2015; Komarraju, Ramsey, & Rinella, 2013; Robbins et al., 2004). In a study designed to measure predictors of college success, Komarraju et al. (2013) found that standardized test scores and high school GPA combined accounted for 24% of the predictive variance of first-year college GPA. In a similar study, Kim (2015) found that high school GPA and ACT accounted for 23% of the predictive variance of freshman-year college GPA. Still, the predictive consistency of the GPA and standardized tests has been called into question when used to qualify academically deficient students (Adebayo, 2008); low-income students (Herman,
Huffman, Anderson, & Golden, 2013); first-generation students (Adela & Oana, 2013; Ting, 2003); and minority students (Schauer, Osho, & Lanham, 2011; Sedlacek 1993; Ting & Robinson, 1998).

Students who are academically disadvantaged are less likely to score as high as high-performing students on college preparatory standardized tests (Bromberg & Theokas, 2014). However, despite this disadvantage, Mattson (2007) found that the SAT had little to no significant value when used to predict college GPA for conditionally admitted students. The sample used in Mattson’s study measured the degree to which SAT scores could predict success for students who were considered underprepared for college. The findings revealed little to no relationship between SAT scores and first-year college GPA.

Similarly, research conducted by Kim (2015) also showed little to no relationship between high school GPA first-year college retention for conditionally admitted students. Using a sample of 7,045 students, Kim found that, while high school GPA and ACT showed some predictive power toward college persistence for regularly admitted students, these measures were far less salient for students who did not meet the general admission requirements of the college or university. Thus, traditional measures may not be strong predictors of success for students who are in some way academically disadvantaged.

Student demographic factors also influence the predictive value of traditional measures. The study by Bridgeman et al. (2008) found that college selectivity and demographic factors, including ethnicity and gender, influenced the relationship between traditional predictors and college GPA. Using a sample of 26 colleges, the study assessed
three cohorts of students over the course of 4 years to determine degrees of success. The
sample of colleges was geographically diverse, with an even mix of public and private
institutions. When measured alone, high school GPA accounted for 20.25% variance of
college academic performance for African American men. For White women, however,
high school GPA accounted for 17% more (37.2%) variance than African American men.
The findings suggested that high school GPA and standardized tests did not consistently
measure college success across gender or ethnicity.

The predictive power of standardized tests was also found to be disparate between
Black and White students in a study conducted by Fleming and Garcia (1998). Using
previous research, their study reviewed and quantified the findings of 12 prior studies that
measured the predictive power of standardized tests by ethnicity. The findings revealed
that, of the 12 studies analyzed, standardized tests were stronger predictors of success for
White students than for Black students when predicting first-year college GPA.

Gender may also play a role in how students perform in high school and
standardized tests. In Mattson’s (2007) study of precollege variables of success for at-
risk students, it was found that females, on average, outperformed males in their high
school GPA while men scored higher in standardized tests. These findings were
corroborated in study conducted by Ting and Robinson (1998) that measured the
predictive power of high school GPA and SAT, noncognitive variables, and demographic
to first-year GPA and first- to second-year retention. A total of 2,600 students at a
southeastern public research university participated in the study. When used to predict
first-semester GPA, the findings revealed that high school GPA explained 15.3% of the
predictive variance for males and 18.4% for females. Thus, in terms of gender, high
school GPA was a stronger predictor of college GPA for women than for men. When
segmented further by race, the findings showed more salient differences. For Caucasian
women, high school GPA alone explained 19.3% of the predictive variance of first-year
college GPA. For Black women, however, high school GPA, even when combined with
parental education level, was found to explain only 8% of the predictive variance of first-
year college GPA.

Gender may also influence level of performance in specific subject areas of
standardized tests. In a study assessing the ACT science and reasoning results across
gender, Conrad-Curry (2011) found that female students, across all age groups, generally
outperformed their male counterparts in areas of social studies and reading. Men, on the
other hand, were found to score collectively stronger in the math section of the SAT.
Since gender has varying effects on high school and standardized test performance, it
must also be considered when measuring the likelihood of college success.

The predictive power of traditional measures may also range depending on the
students’ socioeconomic status. Socioeconomic status, including parent or guardian
education level and family income, plays a major role in the availability of resources
while in high school and the value students assign to earning a college degree (Pascarella
et al., 2004). Students from low-income families are also less likely to perform well on
standardized tests and exams necessary for college admission (Bromberg & Theokas,
2014; Herman et al., 2013). In a demographic study measuring college entrance exam
scores by county, Herman et al. (2013) found that students from socioeconomically
distressed counties on average scored 99.22 fewer points on the SAT and 2.67 fewer on
the ACT than students from wealthier counties.
Traditional measures were also found to be less effective in determining the likelihood of success for first-generation students. First-generation describes a population of students whose parents have not completed a 4-year degree (Cowan et al., 2012). In a study of 2,190 freshmen at a large Midwest university, Riehl (1994) found that first-generation students had lower SAT scores and higher high school GPAs than the general population of incoming freshman students. Still, despite these findings, the research also showed that traditional measures may be effective predictors of college success for lower socioeconomic student populations (Ting, 2003).

The predictive power of high school GPA and standardized tests is also unclear when factoring college selectivity (Bridgeman et al., 2008; Kobrin et al., 2008). In their study, Bridgeman et al. (2008) found that high school GPA and standardized tests inconsistently predicted and explained college success by institutional selectivity. These findings were corroborated in a study conducted by Kobrin and colleagues (2008) which found that the explanatory power of high school GPA and SAT on college performance was dependent on the college’s selectivity level. Drawing from the College Board’s institutional database, 110 colleges and 196,364 student participants from across the United States were included in the study. The findings showed that the range of validity coefficients from each of the 110 participating colleges varied significantly, while the predictive power of the GPA and SAT on college academic performance varied between 13% and 64% across participating colleges. This research suggested that the predictive power of traditional measures is not uniform across institutions of higher education. The more selective the college or university, the more predictive power high school GPA and SAT have on college success.
Nonselective or open-access colleges do not use traditional measures to exclude student populations; rather, these measures determine course placement and remediation. In a study examining the relationship between high school GPA and student readiness at the California State University (CSU) nonselective colleges, Jackson and Kurlaender (2014) found that high school GPA nominally impacted college readiness correlations and was a weak predictor of freshman retention. Therefore, high school GPA is not necessarily a strong predictor of college retention for nonselective colleges.

Looking beyond first-year persistence and academic performance, Geiser and Santelices (2007) conducted a longitudinal study testing the predictive power of high school GPA and SAT through the fourth year of college. Using the University of California (UC) database of over 80,000 freshman records, the authors went a step further and developed a study that assessed the degree to which high school GPA and SAT predicted long-term college persistence outcomes. The sample was 79,785 first-time freshmen who enrolled at UC between 1996 and 1999. Controlling for family income and parent education, the authors developed multiple regression analyses using unweighted high school GPA, SAT critical reading and math, ACT composite, SAT II Writing and Mathematics, and, if available, the SAT II third subject test. 4-year graduation and cumulative college GPA were the study’s measurable outcomes. Linear regressions were used to analyze the relationship between admission variables and 4th year college GPA. The findings suggested that high school GPA was the best single predictor of 4th year college GPA.

A growing number of colleges do not require standardized testing as part of the admission criteria (National Center for Fair and Open Testing, 2015). Test-optional
colleges rely heavily on high school performance to predict student outcomes in college.

In a study conducted at the University of Winnipeg, Cyrenne and Chan (2012) sought to
determine the degree to which high school GPA predicted student success for test-
optional colleges. The authors were interested in evaluating the relationship between
high school GPA criteria and first-year college success. Unlike Geiser and Santelices’s
(2007) longitudinal study encompassing the UC system, Cyrenne and Chan were more
interested in understanding first-year persistence as it related to high school GPA and
other demographic variables. They found that students who had an average high school
GPA that was 10% higher than their peers also earned a half-letter grade higher in their
college coursework (.46 on a 4-point scale). Other findings from their research showed
that socioeconomic factors, including neighborhood income and financial need,
influenced student performance beyond the first year of college.

The current body of literature supports that, while traditional measures have some
predictive power related to college performance and persistence, the amount of
unexplained variance is sizable. When measured together, high school GPA and
standardized tests account for 21% to 25% of the predictive variance of success in college
(Kim, 2015; Komarraju et al., 2013; Robbins et al., 2004). In addition, when race,
gender, and student achievement levels were added to the predictive equations, traditional
measures were shown to have variability (Bridgeman et al., 2008; Jackson & Kurlaender,
2014; Kobrin et al., 2008; Mattson, 2007). Other factors, including noncognitive
characteristics, may help explain some of the unexplained variance.

**Noncognitive predictors.** Noncognitive predictors are student characteristics
such as academic confidence, motivation, and social aptitude. These predictors are not
easily measured by high school GPA and standardized tests (Campus Labs, 2013; Robbins et al., 2006). They are behavioral characteristics and are distinct from traditional measures that tend to quantify cognitive abilities such as memorization, reading, and reasoning (Carroll, 1993). Although cognitive abilities are important and contribute in a predictive way to explaining success in college, they are less able to encapsulate the motivational behaviors rooted in college success.

Many research articles have addressed the influence of noncognitive characteristics on college student success. However, most studies have focused on one or two underlying characteristics rather than the combined influence that multiple noncognitive characteristics could have on college success. In addition, since the idea of noncognitive characteristics spans several disciplines of academic research, it is often difficult to translate how the underlying constructs correlate with college success.

The repetition of like terms was addressed in Robbins and colleagues’ (2004) large meta-analysis study that synthesized 109 studies. The authors assessed the relationship between noncognitive characteristics and study skill factors by combining terminologies from psychology, education, and sociology. Nine broad definitions of psychosocial characteristics were aligned: achievement motivation, academic goals, institutional commitment, perceived social support, social involvement, academic self-efficacy, general self-concept, academic-related skills, and contextual influences. The findings of this study embodied a large sample of empirical research findings and supported a moderate to strong relationship between noncognitive characteristics and college GPA.
Robbins and colleagues (2006) later continued their research to focus more on student motivation, including academic performance and commitment to earning a degree. The authors were also interested in understanding how noncognitive factors incrementally predicted retention and academic success relative to traditional measures. In addition, the study aimed to understand better the relationship between noncognitive measures and college success for more diverse student populations as well as at 2-year colleges. A total of 23 two-year and 25 4-year colleges from the midwestern and southeastern United States agreed to participate. Each institution was classified in terms of admission access ranging from “open access” to “highly selective.” A total of 14,642 first-year incoming freshmen from 48 different institutions participated in the study. Each of the colleges used the Student Readiness Inventory (SRI) to assess the noncognitive characteristics of attending students. Findings revealed that noncognitive measures supported a moderate to strong relationship between first-year college GPA and first- to second-year retention for 4-year colleges \( (r = .625) \) and community colleges \( (r = .463) \).

More recently, the Student Strengths Inventory (SSI), another instrument that measures the predictive power of noncognitive student characteristics, was developed by Campus Labs (2013). Similar to the SRI, the SSI is a survey that measures varying degrees of psychosocial metrics that have been shown to be indicative of success in college. However, unlike the SRI, the SSI has a stronger validity rating (Campus Labs, 2013) and, because the survey has only 48 questions, it has a higher completion rate than most other instruments. The present study employed the SSI to measure the predictive
power of noncognitive measures to provide broader understanding of how noncognitive characteristics influence college success.

**Academic engagement.** Academic engagement is a noncognitive construct related to a student’s discipline, willingness to learn, and motivation to achieve. Simply put, it is the value a student assigns to academic coursework and attentiveness to school work (Campus Labs, 2013). If a student values coursework, he or she will display high levels of discipline, effort, and motivation to learn the material. According to Eccles and Wigfield (2002), the expectancy-value model describes the academic engagement construct as “a process involving social influences, past performance, affective reaction, goals, expectations, and values” (p. 23). Closely linked to motivation theory, academic engagement is rooted in the task value a student assigns to the coursework being studied.

The degree to which academic engagement influences success in college varies in the literature. In Robbins and colleagues’ (2004) meta-analysis study, academic engagement was found to predict college performance moderately. These findings were corroborated in a more recent study by Komarraju et al. (2013) that measured the relationship between cognitive and noncognitive predictors of college readiness and performance. The findings of this study advanced that academic discipline, a corresponding term for academic engagement, had a moderate effect on first-year college GPA and, when combined with high school GPA and standardized tests, provided an additional predictive explanation for college GPA.

Students with high academic engagement tend to be internally motivated to learn and are more likely to demonstrate an organized and disciplined approach to college coursework. In a study using the College Learning Effectiveness Inventory (CLEI)
instrument, Krumrei-Mancuso et al. (2013) found that students who indicated a propensity to be organized and attentive in class performed better in their first and second semester of college.

Academic engagement has also been shown to have a positive influence on college persistence (Ackerman, Kanfer, & Beier, 2013; Robbins et al., 2004). In a study using a trait-complex approach, Ackerman et al. (2013) categorized and combined like personality traits to assess college persistence for science, technology, engineering, and math (STEM) related majors. Using a logistical regression analysis, the authors found that desire to learn, time and study environmental management, effort regulation, and organizational skills accounted for 21% of the predictive explanation of persistence in college. The four traits defined were congruent with academic engagement, as defined by academic value and attentiveness to school work (Campus Labs, 2013).

Schweinle and Helming (2011) used a survey instrument to measure student efficacy, value, and engagement. A pool of 283 undergraduate college student participants completed an electronic survey to measure the perceived difficulty of an assigned project. The survey also measured student attitudes related to completing the course project to determine which motivational techniques would be used to overcome or withdraw from the assigned project. Goal orientation was measured using three subscales, including mastery goal orientation, performance approach orientation, and performance avoidance orientation. Five categories that defined the motivating reasons for the students’ success included: (a) grade/extrinsic, to receive a good grade; (b) mastery/intrinsic, to enjoy the activity; (c) amotivation/working, to complete the assignment; (d) social, positive interactions with people; and (e) performance, to compete
with others. The results demonstrated that higher student perceptions of engagement, intrinsic interest value, and self-efficacy were related to success when engaging in challenging college activities.

**Educational commitment.** Educational commitment embodies the students’ dedication to earning a college degree and functions independently from academic performance (Allen, Robbins, Casillas, & Oh, 2008). It describes an individual’s devotion to college and the value assigned to earning a college degree (Campus Labs, 2013). Within the expectancy-value theory, educational commitment is related to the attainment and utility value constructs (Eccles & Wigfield, 2002) of motivation. Attainment value is rooted in the identity, or self-schema, of an individual and is often related to demographic and environmental influences experienced during childhood.

In terms of college education, children whose parents earned college degrees will often grow up in an environment that supports the idea of a college education. Children whose parents have not earned a degree may assign a lower value to college degree attainment and be less supported when attending college. For an example, in a dissertation study on first-generation Hispanic women, Reyes (2012) found that, since first-generation students were less likely to be from an environment that valued a college education, motivation and commitment to college were strong indicators of college success. Utility value, also considered extrinsic motivation, refers to the value of a task as it relates to future outcomes, including career or personal goals. The task can have value because it facilitates a positive future. A common example is illustrated with course selection in higher education. A college degree paves the way to many advantageous outcomes, including desirable careers and higher wages. However, to
obtain a degree, students may need to take courses they will not enjoy (Eccles & Wigfield, 2002). In terms of college success, educational commitment embodies the value and external motivation assigned to earning a college degree.

In their study, Nieuwenhuis, Hooimeijer, and Meeus (2015) found a positive relationship between the level of educational commitment and the time to complete an educational credential. The purpose of their research was to understand better the relationship between student resiliency and educational commitment in disadvantaged urban neighborhoods. The findings revealed that students with stronger educational commitment were not only more likely to attain an educational credential, but also earned it at a faster rate.

Similarly, in a dissertation study of 2,993 incoming first-year students, Freeman-Butler (2014) found that students who indicated high levels of educational commitment on the SSI were more likely to persist to graduation. In addition, the findings also showed that the predictive power of educational commitment was more salient for underrepresented students.

*Academic self-efficacy.* Academic self-efficacy is best described as the confidence a student has in his or her ability to perform well academically and succeed in college (Campus Labs, 2013). Rooted in Bandura’s (1997) social-cognitive theory, self-efficacy is an underlying motivation for perceptions of self, attitudes, and behaviors. The current body of scholarly research has multiple studies demonstrating the predictive power academic self-efficacy has on college success (Gore, 2006; Ramos-Sanchez & Buchols, 2007; Vuong, Brown-Wetly, & Tracz, 2010).
Robbins and colleagues’ (2004) meta-analysis of 109 studies found self-efficacy to be the strongest predictor of the nine noncognitive characteristics assessed. Specifically, their findings indicated that self-efficacy accounted for up to 14% of the predictive variance in first-year college GPA. More recently, using the College Learning Effectiveness Inventory (CLEI), Krumrei-Mancuso et al. (2013) also found that self-efficacy had a significant correlation with first-semester GPA ($r = 0.36; p < .01$) and end-of-year GPA ($r = 0.34; p < .01$) for first-year college students.

In terms of persistence, Brown and colleagues (2007) found that self-efficacy had more predictive power than high school GPA and SAT when measuring for first-year retention. Using the correlations obtained from Robbins and colleagues’ (2004) meta-analysis, Brown et al. found a strong relationship between perceived past performance and academic self-efficacy. Academic performance will increase if a student has confidence in his or her academic ability, and confidence in academic ability will increase if a student perceives past academic performance favorably.

Student diligence, as defined by the degree of responsibility students feel they have over their success in college, has also been found to have strong correlations with academic self-efficacy and college performance (Arthur, Shepherd, & Sumo, 2006). The more students feel they have control over their academic performance, the more they will feel accountable for their failures and successes. In a study conducted by Arthur et al. (2006), diligence, as measured by the Student Attitudes Survey (SAS), was found to account for 18.6% of the variance in students’ academic performance in college. Levels of class participation and study habits were strong predictors of student diligence and were found to influence college GPA indirectly. The authors hypothesized that the
degree to which students exercise diligence will, in turn, influence the amount of academic self-efficacy they have.

Research has also suggested that the social environments in which students grow up may influence the development of self-efficacy (Bandura, 1997). For example, students who grew up in household environments where education was valued tended to have more confidence in their academic abilities. Conversely, students who grew up in environments that put less emphasis on the importance of education were generally less prepared for college and may have struggled to find confidence in their academic ability (Lightweis, 2014). The findings of the study conducted by Ramos-Sanchez and Nicols (2007) showed that first-generation college students generally had lower academic self-efficacy than their non-first-generation peers. The self-efficacy of 192 entering freshmen at a private liberal arts college was measured using the College Self-Efficacy Instrument (CSEI) and Student Adoption to College Questionnaire (SACQ). The CSEI consists of three subscales, including Course Efficacy, Social Efficacy, and Roommate Efficacy. The researchers found that generational status significantly predicted self-efficacy and, regardless of generational status, a student’s level of self-efficacy at the beginning of the year significantly predicted college adjustment. The findings also suggested that non-first-generation college students had significantly higher levels of self-efficacy when compared to first-generation college students.

In a similar study, Vuong et al. (2010) assessed the relationship between academic self-efficacy and academic success for first-generation sophomore students. The study sought to provide a better understanding of how academic self-efficacy affects sophomore-year college performance as well as differences between generational
statuses. Using the CSEI, 1291 second-year students from five California University campuses participated in the study, of which 441 had reported being first-generation students. The findings showed that academic self-efficacy had a positive correlation with sophomore student GPA and persistence. Similar to Ramos-Sanchez and Nicols’ (2007) findings, non-first-generation college sophomores generally outperformed their first-generation peers.

Research has also suggested that the relationship between academic self-efficacy and college performance may depend on when self-efficacy is measured. Gore (2006) conducted a study suggesting that academic self-efficacy, when measured at the end of the first semester as opposed to the beginning, was a much stronger predictor of academic performance and persistence in college. The participants included 629 first-year students entering college between fall 2000 and fall 2003. Students completed the CSEI during the first two weeks of the fall semester and again during the last two weeks of the fall semester. Hierarchical logistic regressions were used to assess the relationship between ACT scores and CSEI scores and student retention. The findings showed that academic self-efficacy, as indexed by the CSEI, accounted for 10% of the variance in first- and second-semester college GPA. In addition, the overall predictive variance of first- to second-year retention increased significantly when self-efficacy was combined with first-semester college GPA.

Academic self-efficacy may also be linked to the degree of stress and optimism students have while enrolled in college. Chemers, Hu, and Garcia (2001) found a strong relationship between academic self-efficacy and student optimism, stress management, and high school GPA. The authors used a series of surveys to assess the degree to which
students rated themselves at two points in the first academic year. The first survey took place immediately following the first quarter of the first semester, before students had received feedback from their professors. The second follow-up survey occurred at the end of the first academic year. Findings revealed that academic self-efficacy had significant correlations to academic performance in college \( (r = .51, p < .01) \), academic expectations \( (r = .28, p < .001) \), optimism \( (\text{standard coefficient} = .31, p < .001) \), and high school GPA \( (\text{standard coefficient} .23, p < .001) \). Students with higher academic self-efficacy scores also reported moderately lower stress levels \( (\text{standard coefficient} = -.16, p < .001) \) than students with lower self-efficacy scores. The results suggested that self-efficacy mediated stress levels by perceiving difficult situations as challenges rather than as threats. Stress had a statistically significant positive correlation with poor health \( (\text{standard coefficient} = .68, p < .001) \), suggesting that self-efficacy also indirectly affected health. Based on these findings, self-efficacy was reported as having more predictive power than past performance on self-reported academic tasks, including tests, papers, and group projects. In addition, the findings also showed that students with high levels of academic self-efficacy will work harder and are more likely to have lower stress levels when dealing with difficult situations.

D’Lima, Winsler, and Kitsantas (2014) also found a relationship between student stress and academic-self efficacy that affected college performance. Participants included 107 first-semester freshmen at a New York State college. The survey instrument combined questions from the Academic Milestone Scale and the CSEI to measure student stress and academic self-efficacy. To measure stress, participants were asked to provide stress rankings for a number of college-related tasks. The results
revealed that stress had a negative correlation of -0.27 with college GPA, and academic self-efficacy had a positive correlation of 0.25. The findings further illustrated the underlying connections between academic self-efficacy and stress. A student’s confidence in his or her academic ability may reduce stress caused by uncertainty. Thus, students with more academic self-efficacy may experience less stress in college and perform better in the college environment.

**Resiliency.** Resiliency is defined as a student’s ability or handling of challenging events and stressful situations (Campus Labs, 2013). Similar to the concept of emotional control or steadiness on the SRI, resiliency is a measurement of how students handle stress and anxiety (Robbins et al., 2006; Schoon, 2006; Ungar, 2008). Resiliency has been defined several ways in research. One perspective views resiliency as processes whereby the individual is able to adopt or develop competency despite stress, adversity, or trauma (Luthar & Cicchetti, 2000). Other researchers have defined resiliency by the volume of positive outcomes achieved when experiencing high degrees of stress (Masten, 2001). Both perspectives view resiliency as a personality characteristic that regulates the negative effects of stress and promotes acclimation to new environments.

The expectancy-value theory acknowledges resiliency as part of interpreting past performance and the role emotions play in achievement (Eccles & Wigfield, 2002). Resiliency is measured by a student’s ability to manage emotions and strong feelings during stressful situations. In Robbins and colleagues’ (2004) meta-analysis, academic-related skill competency also measured the students’ ability to maintain emotional control throughout stressful situations. This construct assesses behaviors and abilities, including stress coping strategies, that are necessary to “successfully complete a task, achieve
goals, and manage academic demands” (p. 267). Representative measures include problem-solving and coping strategies required to navigate challenging college environments. The meta-analysis regression analysis showed that resiliency, as defined by academic-related skill competency, has a strong correlation to first- to second-year retention ($r = .298$) and a weak correlation to first-year GPA ($r = .129$).

When transitioning to college, first-year students are forced to adjust to new environments that may be very different from the school or community in which they grew up. Many times, these students come ill prepared to handle the academic demands, cultural differences, and newfound independence that come with being in college (Braxton et al., 2014). The ability to manage stress plays a significant role throughout the transition to the college environment. Stress negatively affects the adjustment process for first-year students attending college (Friedlander, Reid, Shupak, & Cribbie, 2007). In a study at a mid-sized Canadian university, Friedlander et al. (2007) examined the longitudinal relationship between stress and self-esteem, as well as social support and academic adjustment to college. The study hypothesized that decreases in stress, enhanced social support, and increased self-esteem would predict student adjustment from the fall to spring semester. Multiple regressions were conducted to measure the degree to which self-esteem, perceived social support, and university adjustment predicted adjustment to college, as measured by the SACQ. Results showed that adjustment to college was achieved more easily for students who were better able to manage stress. More specifically, decreases in stress predicted a student’s overall adjustment.
The student’s approach to stress-inducing situations throughout the transition to college may also be mediated by problem-solving skills. The ability to problem solve provides a mechanism to relieve the stress and anxiety felt while integrating into the college environment (Coskun, Gaipagaoglu, & Tusun, 2014; Gefen & Fish, 2013; Esia-Donkoh, Yelkpieri, & Esia-Donkoh, 2011). The ability to problem solve also provides students with the means to overcome challenges while transitioning to college. Coskun et al. (2014) found a strong relationship between student resiliency, stress management, and problem-solving ability. Using the Resiliency Scale and Problem Solving Inventory, a relationship between resiliency and problem-solving skills was found among the student participants. The findings suggested that students with high degrees of resiliency were more likely to use problem-solving techniques to manage stressful situations.

Students who employ problem-solving skills to manage stressful situations are also exercising control (Pines et al., 2011). By taking action, students are empowered and will engage, rather than avoid, the situation. In their study, Pines and colleagues (2011) found that exercising control was a strong mediator of stress-related anxiety. The authors developed a study to assess correlations between resiliency (emotional control), psychological empowerment, demographic factors, and conflict management styles for nursing students. The study participants included 166 baccalaureate nursing students. Each participant was asked to complete a survey that included questions from the following instruments: Stress Resiliency Profile, Psychological Empowerment Instrument, and Conflict Mode Instrument. A multiple regression analysis revealed strong correlational values between reported empowerment scores and resiliency scores.
The findings suggested that student resiliency improved when empowerment and feelings of control existed.

An inverse relationship between stress and college performance was also demonstrated in a study by Daniels et al. (2009). Using student performance goals as a measure, the authors assessed the relationships between college GPA, high school GPA, feelings of helplessness, and stress in the form of anxiety. Performance goals measure the degree to which a student strives to achieve a predetermined academic outcome. The study was built on a framework where emotions, both positive and negative, facilitate the effects of achievement goals and indirectly mediate student academic performance. The study included 669 first-year participants enrolled in a psychology course at a Canadian university. Each student completed the prescribed questionnaire twice during their freshman year to measure feelings of hopefulness, helplessness, mastery of goals, performance goals, discrete emotions, and academic achievement. The findings confirmed that feelings of hopefulness and helplessness had residual effects on the students’ ability to meet goals and achieve in college. Regression results of interest showed significant negative correlations between college GPA and helplessness ($r = -.21, p > .001$) as well as college GPA and anxiety ($r = -.18, p > .001$). The findings suggested that student stress, specifically when it comes to feelings associated with helplessness, will negatively influence college performance.

Resiliency is also demonstrated when students have feelings of unfairness or discrimination. For example, in a study of 147 low-achieving conditionally admitted first-year students, Adebayo (2008) found that a student’s ability to cope with racism was one of the best predictors of success. Using data retrieved from the Noncognitive
Questionnaire (NCQ), the researcher measured the relationship between cumulative high school GPAs, standardized test scores, and NCQ composites. Findings revealed that the noncognitive construct, understanding and coping with racism, was a stronger predictor of college success for low-achieving students than was high school GPA. Based on the previous findings discussed in this section, and the definition of resiliency as a student’s approach to stressful situations, the ability to cope with racism in a college fit within the scope of demonstrating resiliency.

**Social comfort.** Social comfort refers to how comfortable the student is in social situations and how well the student is able to communicate with others (Campus Labs, 2013). The degree to which a student engages socially often correlates with college persistence, but less with academic performance in college (Tinto, 1975). In Robbins and colleagues’ (2004) meta-analysis, social support, a similar construct to social comfort in definition, had a weak correlation with college GPA ($r = .096$), but moderate correlation with first-year retention ($r = .199$). Using the CSEI, Gore (2006) also found stronger correlations between social comfort and college persistence. For every one-point change on the CSEI social subscale, the likelihood that the student would return to school for a second semester increased by 22%.

The ability to communicate and engage in social situations regulates the student’s integration into the college environment. In a study conducted by Braxton et al. (2014), psychosocial engagement, a noncognitive construct defined as the willingness to socialize with friends, was positively correlated with student retention. The study used the Fall Collegiate Experiences Survey (FCES) and Spring Collegiate Experience Survey (SCES) to measure the constructs proposed in the authors’ revision of the social and academic
integration theory. The sample included 408 first-year students from eight residential colleges. The findings revealed that the students’ ability to communicate and socialize with others was positively correlated with their social integration into college. In addition, the authors found that social exchanges enabled students to perceive how they fit among the greater membership of students at the college. These social exchanges increased social competencies, confidence, and comfort in a wider range of social situations. Thus, the degree to which the students were willing to be social influenced how willing they were to engage in college-related social contexts.

**Campus engagement.** Separate from social comfort, campus engagement measures the students’ willingness to engage in activities that enhance social integration and identification with the campus community. College engagements, including community service and extracurricular activities, measure the students’ eagerness to connect with the college social environment (Ting, 2003; Ting & Robinson, 1998). Campus engagement requires the student to identify with the values of the institution and integrate into the college community. The more a student perceives other students with similar interests, values, and beliefs at the college, the greater likelihood the student will become involved with the campus community (Pascarella & Terenzini, 1983; Tinto, 1975). In Robbins and colleagues’ (2004) meta-analysis study, strong correlations were found among social involvement, college GPA, and persistence.

Ting and Robinson (1998) found that student intentions to engage in extracurricular activities predicted first-year fall semester GPA. In their study, high school GPA and SAT, noncognitive variables, and demographic factors were assessed in relation to first-year GPA and retention. Unlike Braxton and colleagues (2014), these
authors were interested in learning more about how cognitive and noncognitive variables related to gender and race. A total of 2,600 students at a southeastern public research university participated in the study. Each completed the Noncognitive Questionnaire (NCQ) and a First-Year Student Survey (FYSS) during their freshman student orientations. A total of 40 variables were adopted from the NCQ and FYSS in an attempt to predict first-year GPA and retention. The findings showed that student intentions to join extracurricular activities ($r = .08, p < .001$) and demonstrated community service ($r = .10, p < .01$) both positively predicted first-year GPA. Demonstrated community service was found to be a stronger predictor of first-semester GPA for African American males ($r = .20, p < .05$), suggesting this population benefits more from campus engagement behaviors.

Parental education levels may also influence how engaged students are with the college campus (Pascarella et al., 2004; Ting, 2003). In a later study, Ting (2003) found statistically significant correlations between community service, campus engagement, and college student persistence for first-generation students. Using the NCQ, 215 first-generation students from a southeastern public university participated in the study. Multiple step-wise regression analyses were utilized to predict college GPA in the first and third semesters. Noncognitive scores were entered into the analysis to determine their relationships with high school GPA and SAT. Findings revealed that participation in community service and the ability to engage with social groups were strong predictors of academic success for first-generation students.

Pascarella and colleagues (2004) corroborated Ting’s (2003) findings in a study that measured the difference between first-generation and non-first-generation students in
terms of academic preparation, transition to higher education, and development while in college. The most significant finding of this study was that first-generation students, while somewhat less likely to be involved in campus activities, had significantly stronger benefits from becoming involved. In a similar study using the National Survey of Student Engagement (NSSE) data from 18 4-year colleges, Kuh, Cruce, Shoup, Kinzi, and Gonyea (2008) found that benefits of campus engagement also extended to other student types considered high-risk, including minority, academically underprepared, and low-income students. Hispanic students in particular were found to have a stronger correlation with campus engagement activities and college GPA.

Chapter Summary

This collection of empirical research provided evidence that traditional and noncognitive variables have predictive validity on academic success and student persistence. The findings discussed in this review of the literature revealed five important themes.

First, standardized college entrance exams ranged in predictive variance depending on the population of students. The literature review suggested that standardized test scores accounted for between 12.25% (Kobrin et al., 2008) to 0% (Mattson, 2007) of the predictive variance of first-year college GPA. This research suggested that the predictive power of standardized tests may increase as high school GPA increases. Conversely, this research also suggested that standardized college entrance exams may lose predictive power for lower-achieving and first-generation students (Adebayo, 2008; Mattson, 2007; Ting, 2003).
Second, high school GPA had a moderate to high correlation with college performance and persistence (Bridgeman et al., 2008; Geiser & Santelices, 2007; Robbins et al., 2004). Indeed, this research is not surprising, given the evidence that GPA measures both cognitive and noncognitive aptitudes.

Third, the research suggested that noncognitive variables, to varying degrees, correlated with first-year college GPA and retention (Hannon, 2014; Kim et al., 2010; Krumrie-Mancuso et al., 2013; Robbins, 2004, 2006; Sedlacek, 1993). Noncognitive variables measured students’ degrees of confidence, motivation, and social aptitude, which were not easily predicted by high school GPA and standardized tests.

Fourth, the research suggested that demographic factors, including socioeconomic status, gender, and race, may also influence success in college (Attewell et al., 2011; Bromberg & Theokas, 2014; Conrad-Curry, 2011; Keels, 2013; Kim, 2015; Wohlgemuth et al., 2007). Socioeconomic status, including family income and generational status, influenced the type of colleges students chose to attend as well as academic performance and likelihood of degree completion (Attewell et al., 2011; Pascarella et al., 2004; Ting, 2003). The social influences rooted in gender perceptions also shaped college performance attitudes in the areas of mathematics and reading (Conrad-Curry, 2011). As well, the research showed that Black and Hispanic students were less likely to perform well or be retained in college when compared with their White and Asian student counterparts (Keels, 2013; Wohlgemuth et al., 2007).

Last, the research suggested that the effect of the relationship between high school GPA, standardized tests, and noncognitive variables on first-year college success may be different for low-achieving students. High school GPA and standardized test scores have
been shown to have less predictive power for low-achieving students in conditional admission programs (Kim, 2015; Mattson, 2007). Noncognitive variables, on the other hand, have been shown to be stronger predictors of college success for this population (Adebayo, 2008; Saltonstall, 2012).

The present study measured the predictive variance of traditional, noncognitive, and demographic variables on college freshman academic success and student retention. Some research has already supported the predictive power of these variables. However, little is known about the interrelationship between the six individual noncognitive constructs, demographic factors, traditional measures, and college outcomes, especially as they relate to low-achieving student populations.

Moreover, the study will contribute to the current body of scholarly literature by measuring the predictive power of traditional, noncognitive, and demographic factors at a small, public technology college that offers associate and bachelor degree programs. As the literature review indicated, the majority of the research on this topic was conducted at large 4-year research universities that lacked diversity among incoming student achievement levels. Thus, the degree to which noncognitive characteristics predict success for low-achieving students is still unclear. Additional research is needed to understand better how noncognitive characteristics predict first-year college success for low-achieving student populations.
Chapter 3: Research Design Methodology

Introduction

This chapter provides an overview of the methodology used to predict and explain the relationships between each of the defined dependent and independent variables. The aim of this study was to measure how traditional, noncognitive, and demographic variables predicted first-semester college GPA and first- to second-semester retention. In addition, the study measured how each of the aforementioned variables predicted first-semester college GPA and first- to second-semester retention for low-achieving students.

Most 4-year colleges and universities depend on traditional measures to decide which students will have the opportunity to enroll. This reliance on traditional measures disadvantages students who struggle to perform well in high school or on standardized college entrance exams. As such, a population of students may be denied opportunities to enroll in college, to be successful in college, and to reap the benefits of obtaining a college education. This population of students who do not meet the college admission requirements may instead be channeled into other sectors of higher education where they are less likely to be successful (Huerta & Watt, 2015; Skomsvold et al., 2011) or into careers that do not require a college degree. These low-achieving students are limited access to higher education and may be significantly disadvantaged in terms of earning potential and quality of life (BLS, 2015; Pew Research Center, 2014). This disadvantage was supported by the BLS (2015) that showed 4-year degree recipients earned 70% more income than high school graduates who did not complete college (Julian, 2012).
The dependence on traditional measures in the college selection process ignores the possibility that low-achieving students might possess other qualities that could lend themselves to college success. A more holistic view of student attributes that does not rely only on traditional measures may help ensure that more students have access to higher education and more students have an equal opportunity to be successful and reap the benefits of a college education.

Although there is already some published literature on noncognitive student characteristics, the breadth of the current body of research is limited to large and medium-sized institutions of higher education (Robbins et al., 2004). Little research has been conducted at smaller technology colleges. In addition, the degree to which noncognitive factors predict college success for low-achieving high school students still remains largely unexplored. One purpose of the present study was to address this gap by measuring the degree to which noncognitive characteristics influenced freshman performance and retention for high-, middle-, and low-achieving students.

The following research questions were developed to address the outlined problem and guide the study research design:

1. To what extent do traditional achievement measures (high school GPA and composite achievement test scores), demographic (gender, race, and socioeconomic), and noncognitive variables (academic engagement, educational commitment, academic self-efficacy, resiliency, social comfort, and campus engagement) predict first-semester college GPA?

2. To what extent do traditional achievement measures, demographic, and noncognitive variables predict first-semester GPA for low-achieving students?
3. To what extent do traditional achievement, demographic, and noncognitive variables predict first- to second-semester retention?

4. To what extent do traditional achievement, demographic, and noncognitive variables predict first- to second-semester retention for low-achieving students?

This study utilized quantitative methodologies to address the research questions. Quantitative research designs are more appropriate when the variables being employed have relationships that may be quantitatively measured for correlating effect (Johnson & Christensen, 2014). The intent of this study was to advance a general understanding of the relationship between the identified independent variables (traditional achievement, demographic, and noncognitive) and dependent variables (first-semester GPA and first-to second-semester retention) within the selected context.

Research Context

The context of this study was the State University of New York at Cobleskill. Cobleskill is a small State University of New York (SUNY) technology college located in rural upstate New York. The SUNY system is comprised of 64 college campuses across New York State. Each of the colleges varies in terms of size, context, degree offerings, location, and classification. The technology college sector, including SUNY Cobleskill, has program-specific admission requirements that range significantly in selectivity. Each of the technology colleges within the SUNY system adheres to a mission of applied learning and offers a wide range of bachelor, associate, and certificate-level degree programs. Although academic program offerings vary, most degrees
provide direct links to employment by integrating experiential learning academic requirements into the program curriculum.

SUNY Cobleskill was founded in 1911 and offers a breadth of over 50 bachelor, associate, and certificate degree programs. The academic programs offered include a mix of agriculture, science, hospitality, business, and liberal arts majors. The majority of the 2,448 attending students reside on campus in the college residence halls. Eighty percent of the student population receive financial aid to attend and the overall first- to second-year retention rate is 60%. The average high school GPA for incoming fall 2015 freshmen was 87, and for 4-year degree-seeking students, the average math and critical reading SAT score was 1024.

A goal of this research was to understand better the predictive value of noncognitive variables across a range of student achievement levels. Since the SUNY technology colleges offer a range of program requirements, the context selected is ideal for understanding how noncognitive variables predicted college success for higher- and lower-achieving students. The array of admission selectivity parameters will provide a diverse range of student achievement levels within the population.

**Research Participants**

The target population for this study was full-time, matriculated, first-year college students who started their first semester in the fall of 2015. The accessible population that fit the prescribed target included 787 freshman students attending a low to moderately selective public college offering a range of associate and baccalaureate degree programs. The college selected for this study regularly admits first-year students with a wide range of academic ability. High school GPA requirements range from 70 to
92, depending on the academic program. The college campus is mostly residential (60%), with a high population of incoming students between the ages of 18 to 21. Thirty percent of the student population is non-White and the gender ratio is near even, with 47.1% male and 52.9% female (Table 3.1). Forty percent of the population is first-generation upon entering college and the average family income is $61,801. All first-year students are required to submit an admission application as well as high school transcript or high school equivalency records prior to gaining admission to the college. Standardized tests are also required, but are not mandatory for all associate degree-seeking students.

Table 3.1

2015 Student Demographics

<table>
<thead>
<tr>
<th>Race</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Indian or Alaska Native American</td>
<td>17</td>
<td>.7</td>
</tr>
<tr>
<td>Asian or Pacific Islander</td>
<td>33</td>
<td>1.3</td>
</tr>
<tr>
<td>Black</td>
<td>318</td>
<td>13</td>
</tr>
<tr>
<td>Hispanic</td>
<td>200</td>
<td>8.2</td>
</tr>
<tr>
<td>Non-Resident</td>
<td>46</td>
<td>2</td>
</tr>
<tr>
<td>White</td>
<td>1715</td>
<td>70.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>1152</td>
<td>47.1</td>
</tr>
<tr>
<td>Female</td>
<td>1296</td>
<td>52.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Socio-economic</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>First generation</td>
<td>315</td>
<td>40</td>
</tr>
<tr>
<td>Average family income</td>
<td>$61,801</td>
<td>--</td>
</tr>
</tbody>
</table>
While all 787 first-year students were targeted as participants for this study, only full-time, matriculated students who graduated from high school were included as participants. Students who attended part-time and submitted a high school equivalency to satisfy the high school graduation requirement were not considered part of the targeted population.

**Instruments Used in Data Collection**

Traditional high school achievement variables, including high school GPA and standardized tests, were electronically retrieved from the Banner college student information system converted into Excel records using the Banner report function. The Banner student information system collects and houses the student’s biographical and academic data. In addition, Banner provides a reporting function that allows for easy submission and extraction of datasets. For the purpose of this study, the high school GPA, standardized test, race, gender, parent education level, and family income of each participant was extracted at the beginning of the fall 2015 semester. The fall 2015 semester college GPA and spring semester active status to measure first- to- second semester retention, was collected at the beginning of the spring 2016 semester.

Noncognitive variables were assessed using the electronic SSI survey instrument (Appendix A). The SSI uses 48 self-reported items to gather information about student attitudes, opinions, and behaviors during the initial college experience. Reliability ratings for the SSI instrument are considered strong, with reliability coefficient alphas ranging from 0.80 to 0.89 (White, 2012) (Appendix B). A 6-point Likert-style scaled-response format was employed, with responses ranging from 1 (strongly disagree) to 6 (strongly agree). Each of the question responses serves as a measurement unit for a defined
noncognitive metric. The SSI measures six noncognitive factors that have been demonstrated to predict college student success. These metrics include: academic engagement, academic self-efficacy, educational commitment, resiliency, social comfort, and campus engagement (Campus Labs, 2013) (Table 3.2).

Table 3.2

*Student Strengths Inventory: Noncognitive Definitions, Sample Items, and Alpha Value*

<table>
<thead>
<tr>
<th>Scale</th>
<th>Definition</th>
<th>Sample Item</th>
<th>Alpha Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Engagement</td>
<td>The value an individual places on academics and attentiveness to school work</td>
<td>I turn my homework in on time.</td>
<td>0.80</td>
</tr>
<tr>
<td>Academic Self-Efficacy</td>
<td>An individual’s confidence in his or her ability to achieve academically and succeed in college</td>
<td>I will excel in my chosen major.</td>
<td>0.86</td>
</tr>
<tr>
<td>Educational Commitment</td>
<td>An individual’s dedication to college and the value placed upon a college degree</td>
<td>I see value in completing a college education.</td>
<td>0.89</td>
</tr>
<tr>
<td>Resiliency</td>
<td>An individual’s approach to challenging situations and stressful events</td>
<td>I manage stress well.</td>
<td>0.81</td>
</tr>
<tr>
<td>Campus Engagement</td>
<td>An individual’s desire to be involved in campus activities and an attachment to the college/university</td>
<td>Being active in extracurricular activities in college is important to me.</td>
<td>0.88</td>
</tr>
<tr>
<td>Social Comfort</td>
<td>An individual’s comfort in social situations and ability to communicate with others</td>
<td>I am comfortable in groups.</td>
<td>0.83</td>
</tr>
</tbody>
</table>

*Note. Data was retrieved from Using the Noncognitive Factors of Beacon in Advising by Campus Labs, Inc.*
The SSI survey was a college initiative put in place to assist with campus-wide retention efforts. All first-year college students were asked to complete the survey as part of the Freshman Foundations of College Success (FFCS) course. Freshman Foundations of College Success is a one credit course that provides incoming first-year students with academic study skill training, information about campus resources, and weekly opportunities for advisement. First-year students were encouraged by their FFCS instructors to complete the SSI survey during class and weekly survey completion reminders were sent. The survey was active for three weeks beginning on second week of the first-semester.

For the purposes of this study, each of the six constructs served as an independent variable which, when combined, constitute a collective noncognitive effect. Each individual construct was evaluated in terms of incremental effect size, or the additional effect a single metric will produce when calculated with the sum.

An application to St. John Fisher’s Institutional Review Board (IRB) requesting permission to use institutional data for this study was submitted. The IRB determined the project to be exempt as data being used was obtained from the college’s records.

**Procedures Used in Data Analysis**

Quantitative inquiry was employed to address each of the four research questions. For the purposes of this study, a multivariate correlational methodology was used to predict and explain the relationship between the outlined independent (traditional, demographic, and noncognitive) and dependent (first-semester GPA and first- to second-semester persistence) variables. The decision to use quantitative correlational methods aligned with the goal of this study, which was to predict college performance and
persistence by comparing the predictive strengths of multiple independent variables (traditional, noncognitive, and demographic). Two types of regression analysis were used to answer the research questions.

For the first and second research questions, a linear regression analysis was employed to measure the degree to which traditional achievement, noncognitive, and demographic variables predicted college GPA. Linear regressions provide correlating effect sizes between variables that may be measured while controlling for the effects of other variables (Kremelberg, 2011). When conducted consecutively, the regressions allow the researcher to understand the combined effect size of two or more variables, as well as the incremental effects of a specific variable. Thus, this method worked well for the purpose of this study, which was to reveal the significance of individual and group predictors of college GPA.

For the 3rd and 4th research questions, multiple binary logistical regressions were advanced to determine the degree to which traditional, noncognitive, and demographic variables predicted first- to second-semester retention. A logistical regression is an appropriate method for predicting a two-way binary outcome. The binary outcome represents those students who were retained, or not retained, after the first semester. A second logistical regression assessing retention for low achieving students was also attempted. As Rosenbaum (2001) prescribed, low-achieving high school GPA will encompass students with a cumulative GPA of 76 and lower. By conducting two separate logistical regressions, differences between the total sample and low achieving sample could be analyzed.

Chapter Summary
Using quantitative methodologies, this study sought to expand the current body of literature on college student success. Quantitative regression analysis is a statistical technique that reveals the effect of a dependent variable while holding constant a set number of other variables (Kremelberg, 2011). Regression analysis was used to measure the degree to which traditional achievement, noncognitive characteristics, and demographic factors predicted first-semester academic performance and first- to second-semester retention.

One aim of this study was to enlighten how each of the outlined independent variables predicted first-year college performance for low-achieving students. The college selected for this study offers a wide range of admission selectivity that produces a diverse range of student achievement levels. Thus, the context for this study provided the necessary data to measure the research questions adequately and produce meaningful findings.
Chapter 4: Results

Introduction and Research Questions

This quantitative study that measured the degree to which traditional, demographic, and noncognitive factors predict and explain first semester college success. The study further attempted to assess the degree to which the prescribed factors could predict and explain success for low-achieving students, identified as students entering college with a high school GPA of 76 or lower. Regression analysis was used to measure the combined and individual predictive power of the assigned independent variables. The focus was to measure how well the combined and individual independent variables could predict first-year first-semester college GPA and first- to second-semester retention.

The following four research questions guided the study:

1. To what extent do traditional achievement measures (high school GPA and composite achievement test scores), demographic (gender, race, and socioeconomic), and noncognitive variables (academic engagement, educational commitment, academic self-efficacy, resiliency, social comfort, and campus engagement) predict first-semester college GPA?

2. To what extent do traditional achievement measures, demographic, and noncognitive variables predict first-semester GPA for low-achieving students?

3. To what extent do traditional achievement, demographic, and noncognitive variables predict first- to second-semester retention?
4. To what extent do traditional achievement, demographic, and noncognitive variables predict first- to second-semester retention for low-achieving students?

The number of low-achieving participants who earned a 76 or lower cumulative GPA only accounted for 12% (32) of within the samples used for general regression analysis. This number fell below the acceptable sample size required to find statistically significant results and, as a result, research questions 2 and 4 could not be answered using the predetermined methodology. Thus, the interplay between predictive variables and high school achievement as it related to low-achieving students could not be answered as part of this study’s findings.

Data Analysis and Findings

The Student Strengths Inventory (SSI) had been distributed to 787 first-year students throughout the first 4 weeks of the fall 2015 semester. Of the 787 students who were sent the SSI survey, 396 attempted to complete the survey but did not submit, 386 submitted the survey, and 367 were first-year students. After deducting 19 non-first-year student respondents, the response rate for the SSI survey amounted to 46.6%. First-year students were defined as freshman students who had not taken college courses between high school graduation or equivalency and the fall 2015 term. In all likelihood, the 19 non-first-year students who completed the SSI survey were forwarded the survey by the targeted freshmen. Although all first-year students were targeted during survey distribution, the survey link was not restricted and could have been shared by any potential participants with access.
Demographic analysis of survey respondent pool. The ethnic breakdown of the SSI survey respondents included 262 White (74.9%), 40 Black Non-Hispanic (11.4%), 35 Hispanic (10%), 8 Asian (2.3%), and 5 Native American (1.4%). Although there was some variance, the proportions of each race remained similar to those of population of entering fall 2015 first-year students, including 67% White, 15.8% Black Non-Hispanic, 10.2% Hispanic, 1.2% Asian, and 1.2% Native American, respectively (Table 4.1). In terms of gender, 145 of the respondents reported as male (39.5%) and 222 (60.5%) as female. One hundred and thirty-six (38%) of the SSI respondents reported being first generation, and average household income was $72,290.95. The sample was consistent representative of the total population of fall 2015 incoming first-year students. The largest differences between the sample and population were gender and family income. The percent of male and female for the total population was 47.7% and 52.5%, respectively. The sample showed minor difference with males accounting for 39.5% and females 60.5%. Family income was also slightly disparate with the sample showing $10,490 more annual income than the total population (Table 4.1). Overall, the sample of SSI respondents was representative of the total population of incoming fall 2015 population of first-year students. Academic profile averages of the survey pool included 84.7 as cumulative high school GPA, 905 as the SAT combined math and critical reading and/or converted ACT composite score, and 2.64 as fall semester college GPA (Table 4.2).
Table 4.1

Demographic Breakdown of Respondents and Population of First-Year Students

<table>
<thead>
<tr>
<th></th>
<th>Sample Totals</th>
<th>%</th>
<th>Population Totals</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>262</td>
<td>71.4</td>
<td>510</td>
<td>67.0</td>
</tr>
<tr>
<td>Black Non-Hispanic</td>
<td>40</td>
<td>10.9</td>
<td>120</td>
<td>15.8</td>
</tr>
<tr>
<td>Hispanic</td>
<td>35</td>
<td>9.5</td>
<td>78</td>
<td>10.2</td>
</tr>
<tr>
<td>Asian</td>
<td>8</td>
<td>2.1</td>
<td>9</td>
<td>1.2</td>
</tr>
<tr>
<td>Native American</td>
<td>5</td>
<td>1.4</td>
<td>9</td>
<td>1.2</td>
</tr>
<tr>
<td>Missing</td>
<td>17</td>
<td>4.6</td>
<td>35</td>
<td>4.6</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>145</td>
<td>39.5</td>
<td>363</td>
<td>47.7</td>
</tr>
<tr>
<td>Female</td>
<td>222</td>
<td>60.5</td>
<td>398</td>
<td>52.3</td>
</tr>
<tr>
<td>First-generation</td>
<td>136</td>
<td>37.1</td>
<td>285</td>
<td>37.5</td>
</tr>
<tr>
<td><strong>Average Household Income</strong></td>
<td>$72,291</td>
<td>--</td>
<td>$68,731</td>
<td>--</td>
</tr>
</tbody>
</table>

Table 4.2

Academic Profile of SSI Survey Respondents

<table>
<thead>
<tr>
<th></th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean High School GPA</td>
<td>84.7</td>
</tr>
<tr>
<td>Mean Combined SAT or Converted ACT</td>
<td>905</td>
</tr>
<tr>
<td>Mean Fall Semester GPA</td>
<td>2.64</td>
</tr>
</tbody>
</table>

In terms of first- to second-semester retention, a total of 305 (83.1%) out of 367 total SSI respondents returned for the spring semester after completing the survey in the fall. When broken out by the demographic category, the percentages varied depending on gender, parent education level, and race. In terms of gender, females were retained at 4.6% higher than were males. Differences in retention rate were also seen depending on
parent education level. When compared to non-first-generation students, first-generation student retention was 7.7% less. Similarly, there was also variance in retention percentage depending on race. White SSI respondents had retained at 6.6% higher than Hispanic respondents and 21.6% higher than Black Non-Hispanic students. Due to inadequate sample size, Asian and Native American retention findings were not valid and were removed from the logistic regression analysis (Table 4.3).

Table 4.3

*First- to Second-semester First-year Retention*

<table>
<thead>
<tr>
<th></th>
<th>Not Retained</th>
<th>Retained</th>
<th>% Retained</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>62</td>
<td>305</td>
<td>83.1</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>28</td>
<td>117</td>
<td>80.1</td>
</tr>
<tr>
<td>Female</td>
<td>34</td>
<td>188</td>
<td>84.7</td>
</tr>
<tr>
<td><strong>Parent Education Level</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First-generation</td>
<td>29</td>
<td>107</td>
<td>78.7</td>
</tr>
<tr>
<td>Non-first-generation</td>
<td>30</td>
<td>191</td>
<td>86.4</td>
</tr>
<tr>
<td>Not reported</td>
<td>3</td>
<td>7</td>
<td>42.9</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>35</td>
<td>227</td>
<td>86.6</td>
</tr>
<tr>
<td>Black Non-Hispanic</td>
<td>14</td>
<td>26</td>
<td>65</td>
</tr>
<tr>
<td>Hispanic</td>
<td>7</td>
<td>28</td>
<td>80</td>
</tr>
<tr>
<td>Asian</td>
<td>2</td>
<td>6</td>
<td>75</td>
</tr>
<tr>
<td>Native American</td>
<td>1</td>
<td>4</td>
<td>80</td>
</tr>
<tr>
<td>Not reported</td>
<td>3</td>
<td>14</td>
<td>82.4</td>
</tr>
</tbody>
</table>

**Analysis and findings relative to first-semester GPA.** Using the Statistical Procedures for Social Science (SPSS), a linear regression analysis was employed to
predict and explain the relationship between the independent and dependent variables. Before the regression analysis was run, the distribution of the fall 2015 GPA dependent variable was measured. Kurtosis and skewness distribution fell within acceptable ranges, with standard errors of .259 and .130, respectively (Figure 4.1).

Figure 4.1. Fall 2015 GPA distribution of SSI respondents.

Table 4.4 provides an overview of total SSI survey respondents, students removed, and total participants used to complete linear regressions. Participants who were not first-year students or were missing one or more of the prescribed variables for this study were not included in the regression analysis. The total sample size for the linear regression analysis was N = 272 which, based on a 95% confidence level and 5%
margin of error, exceeds the minimum recommended sample size for the total population of first-year students.

Table 4.4

*Students Removed From Linear Regression Participant Pool by Type*

<table>
<thead>
<tr>
<th>Reason</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Respondents</td>
<td>386</td>
</tr>
<tr>
<td>Missing one or more independent variables</td>
<td>95</td>
</tr>
<tr>
<td>Not qualified as a first-year student</td>
<td>19</td>
</tr>
<tr>
<td>Total Participant Pool</td>
<td>272</td>
</tr>
</tbody>
</table>

Using Pearson correlation, each of the prescribed variables were individually measured for significance and effects relative to first-semester GPA. Of the 12 variables, HS GPA \((r = .499; p = .0001)\), combined SAT/ACT \((r = .347; p = .0001)\), first generation \((r = .181; p = .001)\), and resiliency \((r = -.103; p = .045)\) achieved significance (Table 4.5). The correlation findings revealed a strong relationship exists between high school GPA and first-semester GPA. A visual depiction of this relationship is shown in Figure 4.2.

Next, a linear regression analysis was conducted to measure the individual and combined predictive power of high school GPA, combined SAT/ACT, first generation, and resiliency. Results showed that the combined variables achieved significance at \(p = .0001\), with a correlational value of \(r = .529\). When squared, the predictive power of the combined factors showed as \(r^2 = .28\). Thus, the combined predictive power of traditional, demographic, and noncognitive factors predicted and explained 28% first-semester college GPA (4.6).
Table 4.5

Cross-correlational Pearson Coefficient of SSI and College Outcome Variables

<table>
<thead>
<tr>
<th></th>
<th>Fall GPA</th>
<th>HS GPA</th>
<th>SAT/ACT</th>
<th>Ethnicity</th>
<th>Gender</th>
<th>Family Income</th>
<th>First Generation</th>
<th>Academic Engagement</th>
<th>Academic Self-Efficacy</th>
<th>Educational Commitment</th>
<th>Resiliency</th>
<th>Campus Engagement</th>
<th>Social Comfort</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2015 GPA</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HS GPA</td>
<td></td>
<td>*.499</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Combined SAT/ACT</td>
<td>*.347</td>
<td>*.539</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethnicity</td>
<td>-.091</td>
<td>*.260</td>
<td>*.119</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.052</td>
<td>*.107</td>
<td>*.102</td>
<td>-.009</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family Income</td>
<td>-.037</td>
<td>.080</td>
<td>*.118</td>
<td>*.261</td>
<td>.034</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Generation</td>
<td>*.181</td>
<td>*.284</td>
<td>*.147</td>
<td>*.128</td>
<td>-.081</td>
<td>*.275</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic Engagement</td>
<td>.047</td>
<td>-.017</td>
<td>.080</td>
<td>.033</td>
<td>.012</td>
<td>*.097</td>
<td>*.130</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic Self-Efficacy</td>
<td>-.082</td>
<td>-.003</td>
<td>.023</td>
<td>*.131</td>
<td>.010</td>
<td>*.125</td>
<td>-.004</td>
<td>-.081</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational Commitment</td>
<td>-.054</td>
<td>-.040</td>
<td>.009</td>
<td>.031</td>
<td>-.032</td>
<td>-.024</td>
<td>-.097</td>
<td>-.012</td>
<td>*.494</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resiliency</td>
<td>*.103</td>
<td>-.063</td>
<td>*.086</td>
<td>-.092</td>
<td>-.018</td>
<td>.065</td>
<td>-.019</td>
<td>.023</td>
<td>*.144</td>
<td>.065</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Campus Engagement</td>
<td>-.061</td>
<td>.001</td>
<td>-.017</td>
<td>-.056</td>
<td>-.037</td>
<td>.068</td>
<td>-.030</td>
<td>.000</td>
<td>*.389</td>
<td>*.346</td>
<td>.043</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Social Comfort</td>
<td>-.008</td>
<td>.001</td>
<td>.037</td>
<td>-.046</td>
<td>-.023</td>
<td>.028</td>
<td>.047</td>
<td>.058</td>
<td>*.248</td>
<td>*.220</td>
<td>.011</td>
<td>*.405</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Note. *p < .05
Figure 4.2. Scatter plot demonstrating the relationship between freshman first-semester college GPA and cumulative high school GPA.

Table 4.6

Summary of Linear Regression Combined Effect

<table>
<thead>
<tr>
<th>R</th>
<th>R Squared</th>
<th>Adjusted R Square</th>
<th>Std, Error of the Estimate</th>
<th>Sig. F Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>.529</td>
<td>.280</td>
<td>.246</td>
<td>.7787</td>
<td>.0001</td>
</tr>
</tbody>
</table>

When each independent variable was measured individually, the findings showed that high school GPA (p = .0001) and combined SAT/ACT (p = .013) achieved
significance beta weights of $\beta = .382$ and $\beta = .146$, respectively. First generation and resiliency, which were both found significant in the initial Pearson correlation table, did not achieve significance in the regression findings (Table 4.7).

Table 4.7

*Linear Regression Analysis of First-Semester GPA as a Function of Traditional, Demographic, and Noncognitive Variables*

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>HS GPA</td>
<td>.057</td>
<td>.009</td>
<td>.382</td>
<td>6.344</td>
</tr>
<tr>
<td>Combined SAT and/or Converted ACT</td>
<td>.001</td>
<td>.000</td>
<td>.146</td>
<td>2.503</td>
</tr>
<tr>
<td>First Generation</td>
<td>.157</td>
<td>.097</td>
<td>.083</td>
<td>1.625</td>
</tr>
<tr>
<td>Resiliency</td>
<td>-.023</td>
<td>.085</td>
<td>-.013</td>
<td>-.274</td>
</tr>
</tbody>
</table>

Analysis and findings relative to first- to second-semester retention. Table 4.8 provides an overview of total SSI survey respondents, students removed, and total participants used to complete binary logistical regressions. Participants who were not first-year students or were missing one or more of the prescribed variables for this study were not included in the regression analysis. In addition, prior to running logistical regressions, a cross-tabulation test was conducted to determine if the sample sizes for race, gender, and parent education were strong enough to be measured. Findings revealed that the sample sizes for Asian (N = 8), Native American (N = 5), and Not Reported (N = 7) were too small to achieve meaningful findings. These variables were removed from the logistical regression analysis. After all unusable fields were removed, the total sample size for the binary logistical regression analysis was N = 273. The
sample, based on a 95% confidence level and 5% margin of error, exceeds the minimum recommended sample size for the total population of first-year students.

Table 4.8

*Students Removed From Logistical Regression Participant Pool by Type*

<table>
<thead>
<tr>
<th>Reason</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Respondents</td>
<td>386</td>
</tr>
<tr>
<td>Not qualified as a first-year student</td>
<td>19</td>
</tr>
<tr>
<td>Missing one or more independent variables</td>
<td>64</td>
</tr>
<tr>
<td>Race: Asian, Native American, Not Reported</td>
<td>20</td>
</tr>
<tr>
<td>Total Participant Pool</td>
<td>273</td>
</tr>
</tbody>
</table>

A binary logistical regression method was used to answer research question 3. Unlike linear regression, this method is categorical and measures the degree to which the assigned dependent variables predict first- to second-semester retention. The Omnibus test of the model coefficients indicated that the combined effect of all independent variables on first- to second-semester retention was significant (p = .005) with a moderate effect size (r² = .175). Based on the Nagelkerke R-Squared findings, the combination of traditional, demographic, and noncognitive predicted and explained 17.5% of the likelihood a student would be retained (Table 4.9).

Table 4.9

*Summary of Binary Logistical Regression Combined Effect*

<table>
<thead>
<tr>
<th>Chi-square</th>
<th>Sig.</th>
<th>Cox &amp; Snell R-Squared</th>
<th>Nagelkerke R-Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>28.514</td>
<td>.005</td>
<td>.099</td>
<td>.175</td>
</tr>
</tbody>
</table>
Results of the regression also showed that this model can correctly predict retention 99.6% of the time and predict non-retention 4.9% of the time (Table 4.10). While it was not expected that the Not Retained and Retained groups would have the same percentage correct, it is more common that these groups would have a similar order of magnitude. Thus, while good at predicting first- to second-semester retention, this model did not accurately predict and explain why students did not retain.

Table 4.10

Classification for Predicting Retained and Not Retained

<table>
<thead>
<tr>
<th>Observed</th>
<th>Predicted</th>
<th>Percentage Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retained</td>
<td>Not Retained</td>
<td>2</td>
</tr>
<tr>
<td>Retained</td>
<td>Retained</td>
<td>1</td>
</tr>
<tr>
<td>Overall Percentage</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* The cut value is .500

When tested for individual variable effects, it was found that, of the 12 prescribed variables, HSGPA (p = .0001) and Combined SAT and converted ACT (p = .028) were statistically significant (Table 4.11). Odds ratios were used to measure the effect sizes for HSGPA and Combined SAT and converted ACT. While HSGPA had a moderate effect (Exp = 1.177), Combined SAT and converted ACT had a slightly negative relationship with first- to second-semester retention (Exp = .997).
Summary of Results

The findings of the regression analysis indicated four underlying themes. First, since none of the noncognitive variables were found to be significant, the findings suggested that noncognitive factors do not predict first-semester GPA or first- to second-semester retention. Campus engagement, the noncognitive variable that measures the students’ desire to engage in campus activities, was approaching significance ($p = .065$) for first- to second-semester retention. Second, the degree to which traditional (high school GPA and standardized test), demographic (gender, race, family income, and
parent education level), and noncognitive (academic engagement, academic self-efficacy, educational commitment, resiliency, campus engagement, and social comfort) factors predicted college success for low-achieving students remained inconclusive. The quantity of participants who met the low-achieving requirement of a 76 or lower average was too small to achieve significant findings.

Third, the relationship between standardized tests and first- to second-semester retention was found to be slightly negative (B = -.003). This finding suggested that standardized test scores do not predict first- to second-semester retention.

Last, high school GPA was the strongest predictor of first-semester GPA and first- to second-semester retention. This finding aligns with the current body of research that supported past performance as the best indicator of success in college (Robbins et al., 2004).
Chapter 5: Discussion

Introduction

This chapter provides an overview of relative findings, limitations to the study design, implications for practice, and recommendations for future research. The study conducted was an analysis of the relationship found between traditional, demographic, and noncognitive factors of college success. The focus was to establish how well traditional, demographic, and noncognitive factors could predict first-year college student success as identified by first-semester college GPA and first- to second-semester retention. In addition, the study further attempted to assess the degree to which traditional, demographic, and noncognitive predictors could predict and explain success for low-achieving students, identified as students entering college with a high school GPA of 76 or lower.

Admission policies at most 4-year institutions heavily weight high school GPA and standardized tests when deciding who gets into college. While widely used, these measures alone explain only a fraction of the predictive variance of college success and serve as a barrier for many college-age high school students. Low-achieving high school students, who may come from an array of disadvantaged circumstances, are not afforded the same opportunity to attend a 4-year college. Instead, they are channeled into alternative, less advantageous pathways to 4-year degree completion (Huerta & Watt, 2015; Skomsvold et al., 2011).
By analyzing noncognitive characteristics, this study aimed to determine how broader dimensions of personality, values, and attitudes could be used to predict and explain success in concert with demographic factors (gender, race, parent education, and household income) and the traditional measures (high school GPA and standardized tests) commonly used in college admissions. Further, to better understand potential differences in predictive power, the study’s intent was to also measure the degree to which noncognitive, traditional, and demographic factors could predict college success for low-achieving students.

After analyzing the sample, it was found that too few low-achieving students participated in the study. As a result, not enough data was available to run the predictive regressions that could explain college success for low-achieving students. Although the study was unable to predict and explain college success for low-achieving student populations, the findings did provide an overall understanding of how traditional, demographic, and noncognitive measures predict first-semester college success at a small technology college. For the purposes of this study, student success was defined in terms of first-semester GPA and first- to second-semester retention.

A correlational research design was used to examine the relationships between the prescribed dependent and independent variables. The underlying premise of the study was to measure how well the prescribed dependent variables could collectively and independently predict first-semester college GPA and first- to- second semester retention. The predictive power of first-semester GPA was measured using linear regression, while first- to second-semester retention, a binary outcome, was measured using logistical regression.
In order for college’s to realize their mission of student success, a comprehensive understanding of the factors rooted in college performance and persistence must be understood. Student success in college is a shared responsibility between the institution and student. This shared responsibility suggests that both, the college institution and student may contribute to the college student success equation. Only when both factors are considered may comprehensive college student success strategies be developed (Braxton, 2014; Tinto, 1993). The findings presented in this study provide understanding of how pre-college student factors, including demonstrated academic ability, demographic makeup, and noncognitive characteristics, may predict student success at a small technology college. By discerning the predictive underpinnings of first-semester student success in college, the findings of this study will help inform college admission practices, retention strategies, college readiness strategies, and higher education policy.

**Implications of Findings**

The analysis of traditional, demographic, and noncognitive independent variables was conducted using SPSS software. The analysis included descriptive statistics as well as linear regression models to determine the combined and individual predictive power of the subscribed independent variables. Using linear and binary logistical regressions, the degree to which traditional (high school GPA and standardized tests), demographic (gender, race, household income, and parent education), and noncognitive (academic engagement, educational commitment, academic self-efficacy, resiliency, social comfort, and campus engagement) characteristics predicted first-semester GPA was measured. Binary logistical regression models were used to analyze the relationships for first- to
second-semester retention. The findings of the study provided a combined as well as individual measurement of the predictive power of the prescribed variables.

**Predictors of first-semester GPA.** The first research question was designed to determine the extent to which traditional, demographic, and noncognitive variables predict first-semester college GPA. The results of the linear regression findings showed that the combined effects of traditional, demographic, and noncognitive variables accounted for 28% ($r^2 = .28$) of the explained predictive variance relative to first-semester GPA. Similar to other research conducted to date, these results further demonstrated the predictive value of noncognitive factors when used in combination with high school GPA and standardized tests (Kim et al., 2010; Komarraju et al., 2013; Robbins et al., 2004).

When measured independently, the linear regression findings revealed that high school GPA had a moderate to strong predictive correlation ($\beta = .382$) and standardized tests a weak correlation ($\beta = .146$). The remaining 10 demographic and noncognitive variables did not meet the threshold for statistical significance. Thus, this finding suggested that traditional measures are the best predictors for first-semester college GPA. By affirming that high school GPA is also the best predictor of first-semester college performance, these findings add to the collective body of literature that supports past performance as the best indicator of future performance. In their meta-analysis study of 105 studies, Robbins and colleagues (2004) found that high school GPA was the strongest predictor of first-year college GPA, with true correlation values of $r = .413$. Similarly, in their research measuring a broad range of cognitive and noncognitive measures, Komarraju et al. (2013) found similar results with high school GPA as the strongest predictor of first-year college GPA ($r = .43$).
The findings of this study also suggested a relatively weak relationship ($\beta = .146$) between standardized test and first-semester GPA. Although this is not surprising given the extensive research supporting standardized tests as a weaker predictor of college success (Geiser & Santelices, 2007; Kobrin et al., 2008; Mattson, 2007), the findings did show that standardized tests are slightly predictive of first-semester performance for first-year students at a small technology college.

The study also revealed no relationship between noncognitive student characteristics and first-semester GPA. Although it was not hypothesized, past research has found distinct correlations between students’ noncognitive attributes and first-year college performance (Krumrei-Mancuso et al., 2013). The findings of this study, however, dispute the idea that noncognitive student characteristics alone can predict first-semester student performance. Since most existing research measures first-year performance as opposed to first-semester performance, the findings here suggest that noncognitive characteristics could be more salient during the second semester of the first year of college. The first semester of college is ripe with transitional challenges. Despite having strong noncognitive characteristics, students may spend the majority of their first semester adapting their attitudes and behaviors to the new expectations of college. This speculation was supported in a study conducted by Ting (2009) and Gore (2006), who found that the predictive power of noncognitive characteristics intensified during the second semester of college. In his study measuring the predictive power of noncognitive factors on student athletes, Ting (2009) found noncognitive measures increased in predictive power between the fall and spring semesters. Thus, there is a possibility that
noncognitive factors, while not strong predictors of first-semester performance, may still moderately predict first-year college success.

**Predictors of first- to second-semester retention.** The third research question was designed to assess the degree to which traditional (high school GPA and standardized tests), demographic (gender, race, and socioeconomic), and noncognitive variables (academic engagement, educational commitment, academic self-efficacy, resiliency, social comfort, and campus engagement) predict first- to second-semester retention. The binary logistical regression model results showed that traditional, demographic, and noncognitive variables accounted for 17.5% (Nagelkerke R Square = .175) of the explained predictive variance of student persistence.

When individually measured, high school GPA and standardized tests were the only significant findings. High school GPA was the strongest predictor of retention with an odds ratio of \( \text{Exp}(B) = 1.176 \). For each additional point in high school GPA, the odds of first- to- second-semester retention increased by 17.6%. Standardized tests, while significant, showed a slightly negative relationship with retention, suggesting that the odds of retention decreased by .3% for every 10 points scored on the SAT (\( B = .997 \)). Although the relationship was negative, the value was small to the point that no relationship existed.

These findings corroborate with more recent research that suggests standardized tests may not be a strong predictor of college success. In a recent study examining the performance and retention outcomes of 33 test-optional public and private colleges, no differences were found between the students who opted to take the standardized tests and those who did not (Hiss & Franks, 2014). The findings also showed that test-optional
colleges helped create access to disadvantaged first-generation and low-income students. This issue of access is an area that has been particularly scrutinized for inadequately measuring college success for disadvantaged student populations (Mattson, 2007; Sedlecek, 2004). Moreover, the irregularity of standardized tests as a predictive measure of college success has been well documented in the literature (Bridgeman et al., 2008; Bromberg & Theokas, 2014; Conrad-Curry, 2011; Fleming & Garcia, 1998; Herman et al., 2013; Kobrin et al., 2008; Mattson 2007). In Mattson’s (2007) study which measured predictors of college success for conditionally admitted students, standardized tests were found to have no predictive value when measuring first-year college GPA for lower-performing students. Similar supporting research has been noted for academically deficient students (Adebayo, 2008), low-income students (Herman et al., 2013), first-generation students (Adela & Oana, 2013; Ting, 2003), and minority students (Schauer et al., 2011; Sedlacek 1993; Ting & Robinson, 1998). Moreover, although some studies have supported the validity of standardized tests, they have shown that standardized tests only account for a small fraction of the overall college success equation (Bridgeman et al., 2008; Geiser & Santelices, 2007).

The findings of the logistical regression model also suggested that noncognitive measures do not predict first- to second-semester retention. Still, it is worth mentioning that campus engagement, the noncognitive factor measuring a student’s desire to be engaged in campus activities, was approaching significance (p = .065) with a high odds ratio effect size (Exp = 1.526). Although these findings were not significant, there is the possibility that campus engagement could fervently influence the likelihood of a student choosing to continue college after the first semester. Campus engagement measures a
student’s willingness to become involved in activities that will increase social integration and connection with the college environment (Ting, 2003; Ting & Robinson, 1998).

Within the expectancy-value theoretical framework, students with high campus engagement scores expect they will be successful when engaging in college activities and assign high value to being a part of the campus community (Eccles & Wigfield, 2002). These expectations for success are forged throughout layers of past experiences which influence perceived future outcomes. Similar to theoretical elements rooted in Bandura’s (1997) personal efficacy expectations, expectations of future successes for a given college activity are based on historical performance of similar actions. The task value assigned to campus engagement is generally described as the degree of worth a student assigns to engaging in college activities (Eccles & Wigfield, 2002). Expectancy-value theory conceptualizes four types of task value including a) intrinsic value, b) attainment value, c) utility value, and d) the cost associated with the time spent not doing something else.

Though this study was not deeply rooted in theory development, some of the outlined findings do help inform expectancy-value theory as it relates to college success. Attainment value in particular was apparent in the descriptive statistical findings related to first- to- second semester retention. When comparing retention rates by demographic variables, the findings shows that first-generation students persisted to the second semester at a rate 78.7% and non-first-generation at a rate of 86.6%; a difference of -7.7%. Though this is not an unusual finding in research (Ramos-Sanchez & Nicols, 2007; Reyes, 2012; Ting, 2003), it does further suggest that non-first-generation students come from environments that, as whole, place more value in education than first-
generation students. Within expectancy-value theory, the attainment value construct provides some explanation as to why first-generation students are less likely to be successful. Attainment task value is the worth assigned to the college activity as personal importance and is assigned by the personal feelings of inclusion and purpose that bolster the students’ self-identity. Students that assign high degrees of attainment value on college education view college completion as part of their self-schema. Since first-generation student parents did not earn a college degree, the value of a college education may be less salient throughout the student’s upbringing. With less value assigned, first-generation students are more susceptible to seeing college as an unworthy cost and, as a result, may be less likely to find success while in college.

In Braxton’s (2014) study on rethinking college students’ retention, student engagement was found to be the chief underlying reason for first-year student persistence at 4-year residential colleges. The findings, concurrent with SSI campus engagement noncognitive characteristics, showed that “greater levels of student psychosocial engagement also lead to greater degrees of social integration for them” (p. 164). These findings, however, did not presume that student engagement is entirely the students’ responsibility. Rather, campus engagement is a shared responsibility between the individual students and the institution’s commitment to creating an environment where students may easily identify with and engage in college activities. Braxton’s research suggested that the degree to which students engage in the college environment and persist to graduation may be attributed to both a student’s noncognitive make-up and the environment of the college. To maximize student engagement, students must
demonstrate a desire to be involved and college must provide an environment that is open and easily engaged.

As a noncognitive factor, campus engagement’s connection to college success is further corroborated by other, more widely used, student engagement instruments. For this study, campus engagement was one of six noncognitive predictive factors measured by the SSI instrument. Though the campus engagement questions had strong reliability ratings (Cronbach’s alpha = 0.88), only 8 of the 48 SSI questions were devoted to measuring student willingness to become involved in college activities. Further, relative to some other instruments, the SSI is new and is not yet widely used in higher education. Other instruments, including the National Survey of Student Engagement (NSSE), provide a much wider analysis of student engagement trends. In 2016, the NSSE survey was distributed by 557 institutions with a total population of over 311,000 students (NSSE, 2016). The NSSE survey measures a wide range of student engagement variables that may be used to inform retention strategies. The high volume of participating colleges and student sample suggests there is an overarching awareness among institutions of higher education that college success is, in part, tied to how well the college can develop an engaged student population. Though the NSSE survey was not used in this study, it’s focus on student engagement behaviors and wide distribution substantiates that campus engagement, as defined and measured by the SSI instrument, is predictive of student success in college.

Limitations

Five major limitations to the design of this study should be noted. First, the sample size used for the regression analysis was relatively small compared to the
population of first-year students (34.7%). The smaller sample size did not produce enough low-achieving participant students to measure the variable effects. As a result, research questions 2 and 4 remain unanswered. This issue will be discussed further in the recommendations for future research section of this study.

The second limitation was apparent when indexing academic and demographic data for the linear and binary logistical regression analysis. A sizable number of the initial sample were missing fields on the College’s Banner information system. As a result, the initial pool of SSI respondents was reduced by 12.1% because of missing data fields. Had all the data fields in the College’s Banner information system been completed, the sample population would have been larger.

Third, the study relied on the Foundations for Student Success (FFCS) course instructors to encourage survey completion. Not all course instructors used the established incentives, including bonus points for survey completion. As a result, there was some variance in student participation depending on the FFCS course instructor. Since some instructors taught specific student populations, the sample population for this study may have been disproportionate to the represented student population.

Fourth, the timing of the SSI survey may have negatively influenced the SSI survey responses. The study’s intent was, in part, to understand how precollege noncognitive characteristics predict college success. Since the survey was distributed 2 weeks after the start of the fall semester, some of the student responses may have already been shaped during the first few weeks of college.

Finally, there are limitations related to the point in time that this study was conducted. Outside influences, including the threat of diminished federal financial
support for first-year students, interim leadership roles at the college, and the addition of new academic support programs, all may have negatively influenced that findings of this study.

**Recommendations**

The findings of this study may be used to inform the practices of enrollment managers, admission professionals, and higher education policy makers. In addition, this research contributes to current body of literature and provide direction for future researchers.

**Future research.** There is still a gap in the research on how noncognitive characteristics predict student success for low-achieving students. Low-achieving students are academically disadvantaged when entering college and will need to possess a high degree of motivation, resiliency, and willingness to engage to be successful. Although some studies have measured the predictive power of noncognitive characteristics for conditionally admitted student populations, only a few studies have stratified low achievement by high school GPA. Many low achieving students are also first-generation and low-income. They come from disadvantaged environments where less value may be placed on education. As a result, these students receive fewer academic resources and less encouragement when presented with the idea of college. Although this population of student may be less college ready, they are not necessarily incapable of being successful at the 4-year college level.

In addition, future researchers should consider examining the relationship between noncognitive characteristics and second semester student success outcomes. The findings of this study suggested there is no relationship between first-semester
college success and noncognitive measures. Still, there is reason to believe that the salience of noncognitive predictors could continually increase throughout the first year of college (Gore, 2006; Ting, 2009). In his study, Ting (2009) found that first-year noncognitive student characteristics were more powerful predictors of second-semester success when compared to first-semester success. Gore (2006) also found that the salience of noncognitive predictors of first-year college student success increased throughout the first year of college. These findings suggest that the predictive power of noncognitive predictors could increase throughout the first-year college. Additional research is needed to explore the varying effects of noncognitive predictors throughout the first-year of college.

Campus engagement, the noncognitive factor that measures student willingness to engage in college activities, is another area that should be researched further as a means of predicting first semester college retention. Student campus engagement was approaching significance (p = .065) and should be examined further using a larger sample size. Although this measure has already been established as a predictor of college success in other research (Braxton, et al., 2014; Robbins, 2004), the results of this study suggests that campus engagement could be a strong predictor of first- to- second semester retention.

The findings of this study also suggest there are opportunities to explore why first-year students are not retained between their first and second semester of college. The binary logistical regression model used in this study, while good for predicting first-to- second semester retention (99.6% accuracy), was not useful for predicting why students did not retain (4.9% accuracy). Thus, the traditional, demographic, and
noncognitive factors used in this study do not consistently explain why first-year students fail-out or choose not to return after their first semester of college. A better approach to understanding first- to- second semester attrition may be to incorporate a qualitative approach. This method will provide opportunity for more open ended, exploratory questions that, by design, could capture the underlying themes rooted in first- to second semester attrition.

**Recommendation for enrollment managers.** Enrollment managers should carefully consider the use of standardized tests when developing admission criteria. The findings of this study contribute to a growing body of evidence that suggests standardized tests are not strong predictors of first-year college student retention (Hiss & Franks, 2014; Matson, 2007; Sedlecek, 2004). Further, there is research suggesting that standardized tests could limit the college’s ability to enroll larger pools of college-ready populations (Schauer et al., 2011; Sedlacek 1993; Ting & Robinson, 1998). Those most marginalized by standardized tests include ethnically diverse populations who bring with them a perspective that enriches the college experience and better prepares graduates for increasingly culturally-diverse working environments. Students who, with sufficient support services, may also be successful in college.

Enrollment managers should also consider developing strategies that provide insights as to why first-year students leave college after their first semester. Findings of this study show that high school GPA and, possibly, the campus engagement noncognitive characteristic may help us understand why students return after their first-semester. However, these measures do not provide understanding as to why students do not return. To uncover why, processes should be developed to ensure students who are
leaving the college are vetted prior to officially withdrawing. This process will provide institutionally unique data that may uncover why students are leaving prior to completing their first year of college. The themes identified in this data may provide valuable insights and be used to inform future retention strategies.

Demographic factors should also be considered in the adaptation of college retention strategies. Findings of the Pearson cross-correlational regression show significant relationships exist between the independent variables, particularly traditional (high school GPA and standardized tests) and some demographic (race, gender, and first-generation) variables. First-generation students in particular were less likely to perform well in high school, on standardized tests, and during their first semester in college. Though the alpha levels for significance were not achieved in the linear regression analysis, first-generation factor was approaching significance (p = .105). This finding suggests that first-generation students could be at greater risk of not succeeding during their first semester and merits recommendation that these students be provided additional academic support services.

**Recommendations for student affairs administrators.** Campus engagement, though an already known retention quantity (Braxton, 2014; Tinto, 1993), could be particularly significant during the first-semester of college. The findings of this study show that this noncognitive predictor, as defined as the student’s willingness to become involved in college activities, is approaching significance with a strong effect size. One possible reason for this strong effect size could be explained by the high degrees of environmental change. Incoming first-year students experience many life changes during their first semester of college. They are removed from their familiar home environments
and forced to adjust to the unfamiliar college settings. The findings of this study suggest that student affairs administrators who play a key role in program development, counseling services, and other student service functions, could strongly influence first-to-second semester first-year student persistence.

**Recommendations for K-12 administrators.** The findings of this study suggest that the predictive factors most salient in college readiness is high school GPA. The cumulative high school GPA stems from student performance in each of the high school course. Less predictive were standardized tests which measure cognitive intelligence. If a purpose of K-12 education is to prepare students for college, the findings of this research suggest greater emphasis should be placed pedagogical classroom strategies that teach the study skills, social competencies, and writing abilities. In addition to enhancing the student’s high school course grades and overall GPA, these skills are transferable to higher education and lead to greater success in college (Robbins, et al. 2004). High school state assessment tests, such as those used currently used in New York State to satisfy Common Core for English Language Arts (ELA) and mathematics, while able to measure how well the student retains course content, may not accurately measure of how well the student is able to engage in classroom learning nor the study habits students need to be successful in college. Instead, these tests tend focus on cognitive aptitudes that benefit students who are better able to memorize and retain information, which, as learned from the findings of this study, are less predictive of first semester college success.
Conclusion

The purpose of this study was to measure the degree to which predictors of student success, including academic (high school GPA and standardized tests), noncognitive (academic engagement, educational commitment, academic self-efficacy, resiliency, social comfort, and campus engagement), and demographic (gender, race, family income, and parent education level), contribute to student success. As the population of college-age students who are historically less successful increases, colleges will need to find new ways to identify students with the capacity and aptitude to be successful in college.

Chapter 1 provided the context for the study by exploring the underlying issues rooted in college retention. These issues include the disadvantages of traditional measures of college success on low-achieving high school students who, for an array of environmental reasons, may not have been provided opportunities for college readiness programming. Chapter 1 also introduced the expectancy-value model of motivation as the driving theory rooted in the context of this study.

Chapter 2 provided a review of relevant literature on the traditional and noncognitive measures of college success. Literature covering the role of demographic factors in connection with traditional and noncognitive measures was also covered. Of most importance was the literature that suggested the relatively weak predictive power standardized tests have on college retention. Also important, research demonstrating the possibility of noncognitive measures suggests that student psychosocial qualities may be measured and used to predict college success.
Chapter 3 provided an overview of the context, participants, and methodology used in this study. Using archived data, the study measured the degree to which traditional, noncognitive, and demographic factors could predict and explain first-semester GPA and first- to second-semester retention. The data were retrieved from the SUNY Cobleskill institutional records and information system. In addition to measuring the predictive power of the combined factors, this study also measured the individual relationships. Linear regression analysis was used to measure how each of the defined independent variables measured first-semester GPA, while binary logistical regressions were used to measure first- to second-semester retention.

Chapter 4 provided the results of the quantitative analysis which included three major findings. First, the results showed that noncognitive variables did not predict first-semester college GPA or first- to second-semester retention. Second, the findings confirmed that standardized tests were not predictive of first- to second-semester retention. Third, the findings confirmed that high school GPA was the strongest predictor of first-semester GPA and first- to second-semester retention. In addition, the findings suggested that campus engagement, a noncognitive predictor that measures a student’s willingness to become involved with the college community, could contribute to first- to second-semester retention.

This final chapter explored the implications of the findings in relation to the expectancy-value theory and the current body of literature. The limitations of the study design were also discussed along with meaningful recommendations for future research, policymakers, and enrollment managers.
In conclusion, as the demographic make-up of college-ready first-year students continues to diversify, 4-year colleges will need to adjust their admission policy and practices to meet enrollment targets. While some colleges and universities have begun to make these adjustments, the majority are still using admission criteria that offer little predictive value when assessing college persistence. By continuing to utilize ineffective predictive measures, colleges are missing out on opportunities to diversify their college campuses, enhance first-year student enrollments, and, perhaps most importantly, further their missions of student success.
References


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Appendix A

Student Strengths Inventory: Noncognitive Variable Definitions
and Sample Items

<table>
<thead>
<tr>
<th>Scale</th>
<th>Definition</th>
<th>Sample Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Engagement</td>
<td>The value an individual places on academics and attentiveness to school work</td>
<td>I turn my homework in on time.</td>
</tr>
<tr>
<td>Academic Self-Efficacy</td>
<td>An individual’s confidence in his or her ability to achieve academically and succeed in college</td>
<td>I will excel in my chosen major.</td>
</tr>
<tr>
<td>Educational Commitment</td>
<td>An individual’s dedication to college and the value placed upon a college degree</td>
<td>I see value in completing a college education.</td>
</tr>
<tr>
<td>Resiliency</td>
<td>An individual’s approach to challenging situations and stressful events</td>
<td>I manage stress well.</td>
</tr>
<tr>
<td>Campus Engagement</td>
<td>An individual’s desire to be involved in campus activities and an attachment to the college/university</td>
<td>Being active in extra-curricular activities in college is important to me.</td>
</tr>
<tr>
<td>Social Comfort</td>
<td>An individual’s comfort in social situations and ability to communicate with others</td>
<td>I am comfortable in groups.</td>
</tr>
</tbody>
</table>

*Note. Data was retrieved from Using the Noncognitive Factors of Beacon in Advising by Campus Labs, Inc.*
Appendix B

Student Strengths Inventory Instrument

Measured on a Likert Type Scale - 1 (Strongly Disagree) to 6 (Strongly Agree).

1. I will succeed in my chosen major.
2. I sometimes skip class.
3. I intend to seek volunteer or service learning experiences in college.
4. I am comfortable in groups.
5. I am a pretty calm person.
6. Getting a college degree is very important to me.
7. If I was offered a good job, I might not finish college.
8. I tend to work well with others.
9. I find it hard to relax.
10. It is important for me to be involved in the school I am attending.
11. I often go to class without being fully prepared.
12. I am willing to do whatever it takes to stay in college.
13. I manage stress well.
14. I am confidence that I will excel in college.
15. Little things upset me.
16. I consider myself to be shy.
17. I am a worrier.
18. I will be able to complete college English requirements with a B or better.
19. I am confident I can maintain a B average in college.
20. I plan to take part in many campus social activities.
21. I never know what to say when meeting new people.
22. Getting good grades in important to me.
23. Graduating from college is necessary for me to achieve my career goals.
24. I wait until the last moment to get my assignments done.
25. I will be able to complete college math requirements with a B or better.
26. I will participate in orientation activities to learn about the college I attend.
27. I see value in completing a college education.
28. I am easily frustrated.
29. I intent to join a campus club.
30. I get to school on time.
31. I strive for excellence in all of my school work.
32. I enjoy meeting new people.
33. I avoid social events.
34. I am quick to react emotionally.
35. I am confident that I will succeed in college.
36. I want to feel a part of the college I attend.
37. I plan to take on campus leadership roles when I am in college.
38. I rarely get anxious.
39. Being active in extra-curricular activities in college is important to me.
40. School is a priority for me.
41. I will excel in my chosen major.
42. I have many friends
43. I find it easy to talk with strangers.
44. I waste a lot time before settling down to so my homework.
45. Family members often have to remind me to do my homework.
46. I turn my homework in on time.
47. I will be able to complete college science requirements with a B or better.
48. I am sure that a college education if the right goal for me.
Appendix C

Letter of Permission

Dear Internal Review Board,

This letter confirms that Robert Blanchet has permission to use SUNY Cobleskill Student Strength Inventory data for the purposes of his dissertation research. In addition, Rob also has permission to access grade point averages, matriculation status, and demographic information available on the campus information system. Any questions or concerns regarding the use of this data for Robert’s research may be directed to me.

Yours truly,

[Signature]

Susan J. Zimmermann, Ph.D.
Provost and Vice President for Academic Affairs