A Quantitative Framework for Understanding Academically Underachieving Students

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ABSTRACT

This study explored the relationship of cognitive and noncognitive variables within academically underachieving high school students. The research on academic achievement variables is plentiful in the literature among high performing populations. Past studies reveal that a multitude of factors effect academic achievement in high school students. This population differs from the majority of the research in that this study utilizes at-risk and beyond at-risk high school students from a rural Georgia system. As a result, the purpose of this study was two fold: to determine if there were academic and background variables that significantly predict course completions and EOC scores in at-risk high school students from data collected in the 2018-2019 school year and to gain an understanding of grit and resilience among gender, minority, and nonminority high school students in the 2018-2019 school year.

A quantitative design was employed to investigate the relationship of the aforementioned variables in these at-risk high school students. Descriptive and inferential statistics were applied to discover such relationships. Results indicated several significant predictors in both cognitive and noncognitive variables. Specifically, the variables of attendance and resilience stand out as strong predictors of academic achievement. Implications reveal implementing resilience building characteristics in school may increase academic achievement results.

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DEDICATION

This dissertation is dedicated to my dad, Scott, the most resilient man I knew. May you rest in peace.

Chapter I

INTRODUCTION

Although recent reports indicate high school graduation rates across the nation are steadily increasing, it is important to note that students from low-income communities, from single-parent households, of Black or Hispanic descent, and with disabilities continue to struggle with completing high school; as a result, they are often ill-equipped to engage in postsecondary educational opportunities (Johns Hopkins University, 2016). Georgia has one of the highest dropout rates in the United States (McFarland, Stark, & Cui, 2016). In response to high dropout rates, the U.S. Department of Education is working on improving chronically underachieving students (de la Torre et al., 2013). Lacking a high school diploma can create further difficulty finding a job, increased unemployment, decreased income, additional mental health problems, and a greater susceptibility to criminal activity and jail time (U.S. Census Bureau, 2011). Moreover, the cognitive challenges students face are commensurate with the lack of noncognitive skills (Veas et al., 2015).

Legislative changes since 2008 serve as evidence that both federal and state governments have recognized serious issues with student progress and achievement. After President Barack Obama signed the Every Student Succeeds Act (ESSA) into law on December 10, 2015, a gradual commissioning of the law took place in school systems across the nation. In August 2016, the Elementary Secondary Education Act (ESEA) provided flexibility waivers for the transition to ESSA. Full implementation of ESSA

was underway beginning with the 2017-–2018 school year (Meibaum, 2016). However, it remains questionable whether past and present policies or regulations presented the most effective solutions, with some character traits remaining unaddressed among U.S. students (Mehta, 2015). Researchers have suggested that students are failing not only because of strenuous academic rigor, but also because of the lack of recognition of noncognitive factors such as well-being, resilience, and self-efficacy (Doll, Eslami, & Walters, 2013; Veas et al., 2015). This study will be a means to explore the noncognitive variables of underachieving high school students as related to their academic performance.

A Brief History of Underachieving Students

Whether students have a defined disability or are cognitively behind, many such students received unfair treatment in the public school system setting dating back to the 1800s (Yell, Rogers, & Rogers, 1998). According to Yell et al. (1998), despite increased state attendance laws, schools continued to prevent more vulnerable students from participating fully within traditional school settings. In 1893, the Massachusetts Supreme Court ruled in favor of expelling children based on the premise of being "weak in mind" and unable to take care of themselves (Yell et al., 1998). This ruling further indicated the unfair treatment underachieving students face in school. In the 1940s through the mid-1950s, high schools were overwhelmed with problems of underperforming students and dropouts (Doll et al., 2013). Critics in the 1950s began to question school performance, policies, and procedures, as was the prevalent message in the books *Educational Wastelands: The Retreat from Learning in Our Schools* (Bester & Nelson, 1953) and *Why Johnny Can't Read and What You Can Do About It* (Flesch, 1955). These authors

provided a critical analysis of the then-current school systems and expressed disapproval for the direction in which America's schools were moving (Bester & Nelson, 1953; Flesch, 1955). The lack of success among underperforming students in the 1960s and 1970s led schools to deem them poor performers and unworthy of attending public schools. This mindset of disrepute and distraction continued to spread not only in the minds of the students, but also among teachers (Yell et al., 1998).

The 1983 report *A Nation at Risk* (National Commission on Excellence in Education, 1983) indicated the United States population as overwhelmingly uneducated. This article captivated the American populace and encouraged a national response to the low educational achievement as compared to other nations, something President Ronald Reagan supported. *A Nation at Risk* emphasized the need to improve the cognitive skill levels of students across the spectrum. There remains an intentional focus within educational entities with regard to cognitive skills (Doll et al., 2013; Guthrie & Springer, 2004; Mehta, 2015).

Change is a reality within any system; however, changes considered or implemented may be insufficient to allow the underachieving populations to succeed and eventually graduate. Along with several other changes, the move from ESEA to ESSA disrupted schools nationwide (Meibaum, 2016). In 2002, President Bush signed into law the No Child Left Behind Act. This piece of legislation, which specifically targeted low-performing schools and students, established a goal of 100% proficiency by 2014, a number so unattainable it discouraged principals and teachers (Pinkus, 2006).

Conceptual Underpinnings for Self-Efficacy

The theoretical framework for this study is the self-efficacy theory originating from Bandura's (1986) social cognitive theory. Bandura identified existing thought on human behavior as unidirectional, shaped by environmental or inner dispositions. Bandura challenged this thought process with the basic principle of social cognitive theory based on the model of triadic reciprocal causation. According to this multifaceted model, human actions are affected by environmental influences, behavioral patterns, and internal personal elements (Bandura, 1986).

Bandura (1986) defined the self-efficacy theory as an awareness of certainty or competence regarding the ability to achieve a certain task or assignment. If individuals believe they will succeed, they are more likely to successfully perform a task. Expanding on self-efficacy theory, Hoy and Miskel (1991) indicated that people with the confidence to perform will work diligently. Lastly, people will work hard when they had success at a comparable job or viewed an example of how to be successful (Hoy & Miskel, 1991).

Self-efficacy is the establishment of human agency (Bandura, 1997). Hoy and Miskel (1991) suggested academic accomplishments occur based on the proficiency of students' noncognitive skills. Despite copious amounts of self-efficacy research, comparatively few scholars assessed how self-efficacy promotes resilience (Hamill, 2003). As Hamill (2003) observed, "Self-efficacy appears to play a potentially important role in resilience. Research has not examined the effects perceived self-efficacy beliefs on adolescents" (p. 117). Although Noftle and Robins (2007) attested to the relevance of personality traits and how they relate to academic achievement, other factors for academic achievement are also important. A review of the literature indicated the need

for further research regarding specific student traits (Parent & Wiethaus, 2012; Paunonen, Haddock, Forsterling, & Keinonen, 2003; Paunonen & Jackson, 2000).

At-risk and credit recovery students may have an even more difficult time fulfilling their academic needs (Powell, Roberts, & Patrick, 2015). Powell et al. further explain credit recovery as a course a student passes after he or she initially failed. Credit recovery courses are different than courses passed the first time. According to Powell et al., both at-risk and credit recovery students have higher "risk" in terms of graduation (2015). It is necessary to understand what factors helped those students who do succeed so as to further support struggling students and their peers. Noncognitive traits need more focus and research to address United States students' academic deficiency (Heckman, Stixrud, & Urzua, 2006). Grit and resilience are noncognitive variances in need of further exploration to determine if they can contribute to increased academic achievement (Hamill, 2003).

Statement of the Problem

Georgia has one of the highest school dropout rates in the United States, and simply increasing rigorous cognitive elements for children has not worked (Veas et al., 2015). In many ways, the nation's education system remains at risk, as it has been for over 30 years (Mehta, 2015). Since this label was placed on American schools, there has been an increase in the number of math, English, science, and social studies courses required of students achieve compatibility with other nations. Mehta (2015) identified too many rigorous courses required of noncognitively capable students in an effort to make America look better. In addition, a possible overreporting of graduation rates may have minimized this serious concern. Heckman, Humphries, LaFontaine, and Rodríguez

(2012) conducted a longitudinal study challenging the discrepancies within these rates. This mishandling of increased standards and the push to increase graduation rates has proven detrimental to U.S. students and their futures (Doll et al., 2013; Guthrie & Springer, 2004).

Purpose Statement

The purpose of this quantitative study is to investigate the relationship between noncognitive factors (academic integration components, environmental factors, background factors) and underperforming students' achievement levels in the high school setting. This study is an attempt to determine what type of predictive relationship, if any, resilience and grit have on academically underachieving students' success in high school. Seidman (1996) confirmed early identification and mediation in at-risk students are necessary to reduce the dropout rate among this population. A secondary purpose of this study is to investigate the connection between minority students and nonminority students, grade level, grit, and resilience.

Resilience is a relatively new area of study. In fact, very little research has taken place with regard to resilience and students who have shown academic failure in their high school careers (Hamill, 2003). Knowing whether or not resilience positively impacts underperforming high school students can determine intervention models for systems with academically underperforming and at-risk student populations. Presently, educators' evaluations, certificates, and renewals depend on the success of students' cognitive abilities (Sawchuk, 2016). The urgency is clear regarding the need for students to perform well. However, the research indicates exploring whether an emphasis on the cognitive or noncognitive variables in at-risk students will improve student outcomes. If

resilience and grit are two noncognitive skills that correlate with academic achievement in underperforming populations, educators need to address the potential growth in these traits earlier (Perkins-Gough & Duckworth, 2013). Knowing whether these noncognitive factors can forecast academic achievement in low-achieving individuals could significantly support schools with intervention processes (Henderson, 2013).

The scope of this study was on underperforming high school students Grades 9 through 12 seeking a high school diploma. The site for this study is an underperforming system in Georgia to which local public day schools send students who are about to drop out, have failed classes, or have failed and chosen to return. The system status of being at will, meaning no student is forced to attend, is in contrast to many traditional alternative behavioral settings. A traditional alternative school may court order or mandate students to attend; in contrast, this nontraditional school provides eligible high school students with an additional option. This study serves as a means to determine whether there is a relationship between grit, resilience, and specific noncognitive factors of underperforming students.

The purpose of this research was to study the relationship of noncognitive variables (race or ethnicity, disability status, English as a second language, socioeconomic status, student resilience, and grit) and academic achievement. As used in this study, academic achievement was defined as course completions and improved math and English end of course (EOC) scale scores. The population included sudents available in the Georgia system under study.

The following research questions guided this study:

1. Are the selected academic integration components (years behind cohort, behavior referrals, and attendance) and background factors (race or ethnicity, disability status, English as a second language, socioeconomic status, student resilience, and grit) significant predictors of course completions?
    a. Are academic integration components or background factors significant predictors of 12th grade course completions?
    b. Are academic integration components or background factors significant predictors of 11th grade course completions?
    c. Are academic integration components or background factors significant predictors of 10th grade course completions?
2. Are the selected academic integration components (years behind cohort, behavior referrals, course completions, and attendance) and background factors (race or ethnicity, disability status, English as a second language, socioeconomic status, student resilience, and grit) significant predictors of end of course scale scores?
    a. Are academic integration components or background factors significant predictors of Ninth Grade Literature and Composition end of course scale scores?
    b. Are academic integration components or background factors significant predictors of American Literature end of course scale scores?

c. Are academic integration components or background factors significant predictors of Algebra I end of course scale scores?

3. Is there a significant difference between minority and nonminority students by gender and grade level (9th, 10th, 11th, and 12th grades) on student resilience?

4. Is there a significant difference between minority and nonminority students by gender and grade level (9th, 10th, 11th, and 12th grades) on student grit?

Limitations and Assumptions

Some limitations exist within this study. First, sample size is a potential concern. Students attend at will and participation is limited to the students in attendance during the 2018–2019 school year. Second, all systems are in rural areas, thus invalidating certain aspects of generalizability. Lastly, this study is limited to students with self-reported data on their grit and resilience scores, which could result in inaccurate and skewed data.

The researcher assumes accurate reporting of demographic data in the student information system. Another assumption is that the internal academic measures are reported accurately. Also assumed is that students will complete surveys and scales in an accurate manner.

Definition of Key Terms

Following are definitions of specific terms to assist the reader.

Alternative education. The federal government identifies an alternative school as "a public elementary/secondary school that addresses needs of students that typically cannot be met in a regular school, provides nontraditional education, serves as an adjunct

to a regular school, or falls outside the categories of regular, special, or vocational education" (Sable, Plotts, & Mitchell, 2010, p. C-1).

At-risk. Although there is no single definition, Powell, Roberts, and Patrick suggest at-risk students are those who may be at risk of failure or in need of academic help, have a low socioeconomic status, are well below grade level, are homeless or in foster care, have been incarcerated, have disabilities, or be English learners (2015).

Average daily attendance. Computing average daily attendance entails adding the aggregate number of days in the school year attended by the student, and then dividing by the number of school days in the school year (Morgan, 1991).

Course completion. Calculation of course completion is by determining the number of courses a student completed from the beginning of the school year.

Credit recovery. The passing of a course beyond the initial attempt (Powell et al., 2015).

Grit. Grit is a desire and persistence specifically toward long-term goals (Duckworth, 2017).

Perceived self-efficacy. Individuals' certainty in their skills to accomplish a specific duty is their perceived self-efficacy (Bandura, 1977).

Resilience. A resilient individual is someone who builds strength in the face of obstacles (Duckworth, 2017).

Organization of the Study

This dissertation is comprised of five chapters. Chapter I incorporated an introduction, background, brief conceptual framework, problem statement, purpose, limitations, and definitions. Chapter II includes an evaluation of historical and current

literature, with a deeper look into Bandura's self-efficacy theory, dropouts, at-risk students, and the noncognitive skills of self-efficacy and resilience. Chapter III includes details of the quantitative research methods utilized to complete the study; next, in Chapter IV are the discoveries following data collection and analysis of the study as a whole. Finally, Chapter V presents an in-depth discussion of the findings as well as implications for future research.

Chapter II

LITERATURE REVIEW

Theoretical Framework

Bandura's (1986) self-efficacy theory served as the theoretical framework for the literature review to provide the necessary historical and academic context for this study. To that end, this chapter provides a review of applicable literature related to the research, policy, and procedures on how schools and academia addressed the issues of student retention and underperformance. This analysis entailed an exploration of the importance of grit and resilience and the impact on underperforming students' achievement.

Sense of Urgency

Policymakers have established what some consider unreasonably high academic requirements, which may have led to a myriad of challenges and obstacles facing at-risk students in Georgia and across the continental United States (Mehta, 2015). This study is a means to assess the current state of education in Georgia with regard to struggling credit recovery students and at-risk students. Georgia has some of the lowest graduation rates and highest dropout rates in the United States, according to the McFarland et al. (2016) report "Trends in High School Dropout and Completion Rates in the United States". This report revealed Georgia's high dropout rate, as well as acknowledging the limited understanding of what happens to these students or why they seem to struggle graduating (McFarland et al., 2016).

This study served as a means to challenge the overemphasis of the importance of cognitive tests to enhance academic achievement. The focus of this study was

noncognitive variables and the impact those variables had on course completions and EOC scale scores. More specifically, this study examined how the noncognitive variables of resilience and grit impacted high school students.

Bandura (1989) suggested environmental factors affect individual performance; however, the ability to overcome and master situational challenges is also possible. A range of scholars have covered the topic of early identification of at-risk students to help reduce the number of dropouts (Alexander, Entwisle, & Kabbani, 2001; Allensworth & Easton, 2005; Balfanz, Herzog, & Mac Iver, 2007; Barrington & Hendricks, 1989; Dynarski & Gleason, 2002; Finn, 1989; Fitzsimmons, Cheever, Leonard, & Macunovich, 1969; Jimerson, Egeland, Sroufe, & Carlson, 2000; Laird, DeBell, & Chapman, 2006; Lloyd, 1974; Rumberger, 1995). However, grit and resilience are relatively new areas, with very little research focused on early intervention techniques in at risk students. Educators and researchers are knowledgeable about at-risk students and their varying academic needs; what is less clear is how to use grit and resilience as a mediation tool. Knowing whether or not grit and resilience positively impact underperforming high school students can help determine intervention models for a very challenging and at-risk student population. Therefore, with a clarified intervention model, the fostering of noncognitive variables in life or school may, in turn, develop self-efficacy (Salvi, 2017).

Presently, educators' evaluations, certificates, and renewals depend on the success of their students' assessment scores (Sawchuk, 2016). The urgency is clear regarding the need for students to perform well; however, determining if an emphasis on the cognitive or noncognitive variables in at-risk students will improve student outcomes merits exploration. Since 1983, American students have faced cognitive variables; nevertheless,

dropout rates have increased. Perhaps it is the noncognitive variables in need of study and nurture.

Although Duckworth (2016) studied the perseverance of individuals, little is known about perseverance with regard to underperforming students. In developing several noncognitive character scales, Duckworth refined the Grit Scale into a shortened Grit Scale (Grit-S), maintaining the ability to predict certain academic factors and positive job factors. Grit-S scale factors included items to predict grade point average, job and military retention, and spelling bee championships. Previously, Bandura (1977) theorized the consequence of environmental effects on individuals, otherwise known as noncognitive influences. Based on this previous knowledge, the primary purpose of the proposed study is to investigate the impact of noncognitive factors on underperforming high school students' course completion and EOC scale scores.

Social Cognitive Theory

An assumption of Bandura's (1986) social cognitive model is the notion of triadic reciprocal causation. This multifaceted model indicates that environmental influences, behavioral patterns, and internal personal elements affect specific and individual actions, something to which Bandura referred as *human agency*. The social cognitive model entails individuals taking active roles in their surroundings and in the production of outcomes. The strong sense of human agency can empower individuals to exercise control over their thoughts to affect how they behave.

The triadic reciprocal causation concept developed and transformed over time due to the progress made with regard to behavior theory in the late 1960s and early 1970s (Bandura, 1986). During this time, scholars interested in the cause and effect of human

behavior shifted from a firm internal motivation to possible external motivation. Bandura's research colleague, Skinner, also found human tendencies molded by environmental factors (Bandura, 1997). Making similar claims specific to academic success, Tinto (1975) related a student's determination or resilience in academics to both academic and social interactions. Behaviorists began to view human interactions as not just a passive reaction, but an outcome of the interfaces people have with their environment. For this reason, students react differently in the environments in which they are involved (Fleming, 1984; Loo & Rolison, 1986). Tracey and Sedlacek (1986), confirmed the importance of understanding the noncognitive variables associated with academic achievement. In line with social cognitive theory (Bandura, 1986), both cognitive and environmental influences affect behavior. Specifically, students coming from low socioeconomic backgrounds may endure significant challenges, which indicate the intermingling of self-efficacy and resilience within at-risk students (Salvi, 2017). Salvi further reveals, "When conceptualized within a developmental system, resilience involves mutually beneficial, reciprocally influential relations between a person and his or her context," (2017, p. 674).

Bandura (1986) acknowledged the significance of intellectual and social constructs within behaviorist ideas. Establishing a theory bringing together behavioral, personal, and environmental factors as related elements, Bandura (1977) developed the concept of triadic reciprocal causation. With social learning theory, Bandura (1977) stressed the importance of behavioral, personal, and environmental factors operating as critical drivers, yet fluidly and not exclusively of one another, especially in relation to distinctive settings. To clarify, a specific dynamic interrelationship exists between triads.

In one situation, personal factors may prevail, whereas behavioral factors may take precedence in another situation. As shown in Figure 1, the triadic reciprocal causation relationship appears as a triangle.

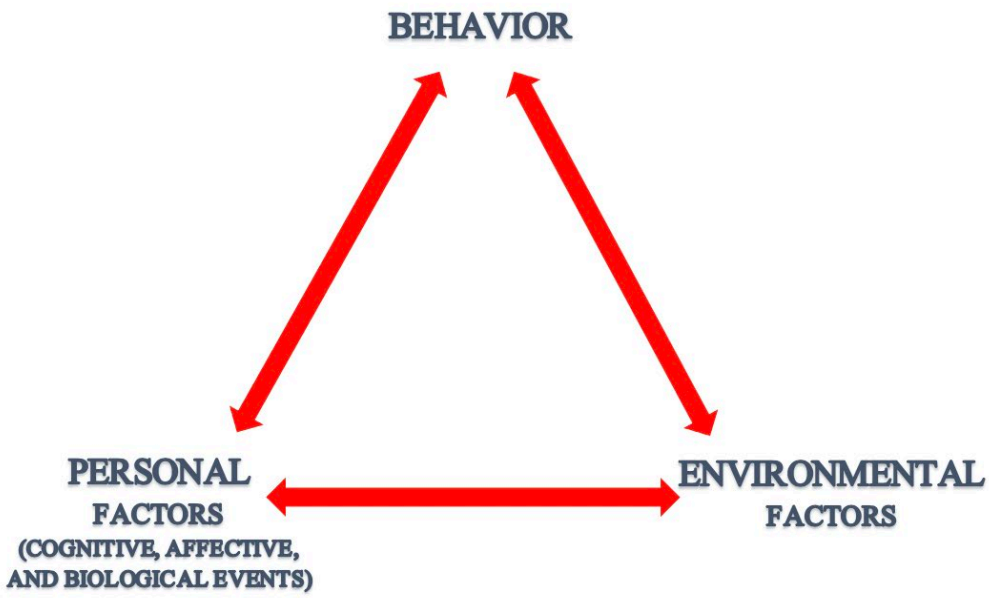

Figure 1. Triadic reciprocal causation model. Adapted from "*Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall. by A. Bandura, 1986, *Psychological Review, 84*, ps. 191-215. Copyright 2003 by the American Psychological Association.

The triadic relationship represented in Figure 1 is also presented as P (personal), B (behavior), and E (environmental) factors. Bandura (1986) identified the reciprocal P–B relationship as the segment reflecting hopes, beliefs, self-perceptions, objectives, and goals that shape behaviors. E–P, the relationship between personal characteristics and environmental stimuli, incorporates potentials, beliefs, and cognitive abilities, which trigger responses through modeling and instruction. Lastly, the B–E relationship

represents the concept that human behavior can alter environmental conditions. In other words, potential environmental surroundings depend upon how a person behaves. Thus, these segments confirm further the idea that how students think influences whether they succeed.

In another investigation of the triadic reciprocal causation model, Steele (1997) demonstrated means for individuals with self-efficacy to overcome their issues. The way individuals perceived stereotypes shaped the personal beliefs and behaviors of certain at-risk student or population groups. For example, a female student may need to overcome a teacher's low expectations to achieve greater and more opportunities. This student would need a strong belief in her own abilities to know she is able to achieve her educational goals. Steele asserted that individuals with low self-efficacy conform to the stereotypes given; however, the central quality of self-efficacy may help students overcome low expectations.

Huang, Robinson, and Cotten (2015) confirmed the use of Bandura's triadic reciprocal causation model in researching individuals' comfort with technology usage. The more anxious about technology participants were, the more uncomfortable instructors were in using technology. Accordingly, Huang et al. (2015) found peoples' perceived skills with technology influenced their ability level, suggesting interventions would have produced positive self-efficacy outcomes and improved technological skills. Huang et al. further stressed the importance of addressing emotional costs within students.

The reliance on self-regulatory capacity is contingent upon the key constructs developed in the social cognitive theory framework (Bandura, 1977). According to this

theory, people can apply control over their own actions and their surroundings. The ability to control personal, behavior, and environmental factors could, therefore, be related to strengthening student resilience (Bandura, 1977; Henderson, 2013). In the present study, students' noncognitive variables may be indicative of academic achievement. The primary purpose of identifying these variables coincides with Seidman's (1996) assertion regarding the importance of early identification of at-risk students to intervene and reduce dropout levels.

Self-Efficacy Theory

The key concepts of self-efficacy theory evolved from Bandura's (1986) social learning theory. Social learning theorists define self-efficacy as a skill or certainty specific to the performance of a task—in other words, whether or not individuals think they can achieve affects how well they actually perform. According to self-efficacy theory, a strong belief system in one's skills will impact how well a person performs (Hoy & Miskel, 1991).

Bandura (1995) wrote, the means by which beliefs in one's ability will or can impact actual success. Self-efficacy does not address the actual ability of a person, rather to what degree the individual believes they will succeed. Having this positive mindset enables individuals to thrive; therefore the development of this mindset would be groundbreaking (Seligman & Csikszentmihalyi, 2000). Bandura further stated that individuals' self-efficacy beliefs affect their school life, the choices they make, and their motivation level (1995). Students' self-efficacy could impact their academic achievement due to how they control their learning potentials (Bandura, 1995). For this reason, researchers have argued that educators can increase self-efficacy by linking

student success, reinforcing, persisting, peer modeling, and demonstrating goals (Margolis & McCabe, 2004).

Additionally, researchers proposed that individuals with high self-efficacy frequently approach duties differently than people with low self-efficacy. A person with high self-efficacy sees trials as opportunities to overcome rather than threats to evade. As a result, individuals with strong self-efficacy may have a greater essential interest, set motivating goals, establish confidence swiftly after disappointment or failure, and attribute failure to inadequate effort (Bandura, 1988). Alternately, Salvi (2017) suggested other individuals in a person's life misconstrue opportunities and call them challenges. Salvi found developing resilience based on being able to rebound from adverse situations to be a means of overcoming deficits. Resilience stems from the self-efficacy concept and works in a cohesive manner to build an individual's sense of self (Salvi, 2017). Likewise, Bandura's (1995) definition of the social cognitive theory portrays self-efficacy as multifaceted, just as resilience is multidimensional (Salvi, 2017).

Bandura (1997) illustrated the noteworthy difference between self-efficacy and self-esteem. Self-efficacy places emphasis on an individual's judgment of self-competence and ability, whereas self-esteem highlights an individual's self-worth. Bandura found no direct link between individuals' perception of their ability and perception of their self-confidence.

Bandura (1997) identified four sources of self-efficacy: mastery experiences, modeling, power of voice, and emotional arousal. The primary source of individual self-efficacy is mastery experiences, with individual self-efficacy largely dependent on past successes or failures. Previous successes intertwine with a higher self-efficacy in

comparable future circumstances (Bandura, 1997). Alternately, frequent failures will lead to decreased self-efficacy in future situations (Hoy & Miskel, 1991).

Another foundation of self-efficacy relates to various experiences or modeling. Watching someone accomplish or fail at a task has an effect on an individual's self-efficacy (Hoy & Miskel, 1991). A student is more likely to be successful if the exemplar is similar to the student. Bandura (1997) suggested that if the exemplar is more proficient, there will be a greater influence on an individual's self-efficacy.

The power of voice can also be a source of self-efficacy. Mere encouragement is the concept of verbal persuasion, thus empowering a person's voice through self-efficacy (Bandura, 1997). However, the verbal persuasion must be genuine; otherwise, it will have an adverse effect (1997). In Grantham's (2004) study, a Black student demonstrated high self-efficacy and academic competence, remembering specific instances of praise and modeling from a several moments during his time in school. Grantham concluded that verbal persuasion impacted students' academic standing throughout life.

With regard to emotional arousal, the last source of self-efficacy (Bandura, 1997), Hoy and Miskel (1991) found individuals made positive or negative decisions regarding a task based on prior emotional attachment. The researchers claimed negative emotions such as fatigue, stress, fear, and anxiety will lead an individual to exhibit a negative sense of self-efficacy, whereas positive emotions such as excitement and enthusiasm will promote a positive sense of self-efficacy. Bandura asserted that, if necessary, individuals can acquire or learn efficient coping skills to enhance their self-efficacy. In a study of high school students, Martin and Marsh (2006) described self-efficacy as a factor relating

strongly to resilience. Therefore, resilience, like self-efficacy, is not a fixed trait in students; rather, it is adaptable, open to development and nurture (Padron, Waxman, & Huang, 1999).

In addition to the four sources of self-efficacy, there are four major processes through which efficacy principles help manage human thought: cognitive, motivational, affective, and selection (Bandura, 1995). These four processes distinguish ways in which self-efficacy beliefs engage a person's psychosomatic safety and performance. As Bandura asserted, before an action takes place, a person must organize a thought. The prior thought processes help individuals to form goals by offering a method by which to gauge their own proficiency level. Deci (1995) suggested the desire to feel skilled is so strong that merits recognition as a primary human need. Hence, the more advanced individuals perceive their own skill level, the higher the goals they will set for themselves (Bandura, 1989). Specifically, when challenged, individuals with high self-efficacy will apply significant cognitive means to overcome the problem; conversely, individuals with low self-efficacy will spend extensive amounts of cognitive means agonizing about potential negative outcomes. In other words, individuals envision results through cognitive methods. People with high senses of self-efficacy are more likely to envision positive conclusions despite the challenge at hand; in contrast, individuals with low senses of self-efficacy envision the negative conclusions to their challenges.

Duckworth, Gendler, and Gross (2016) clarified the effectiveness of the mind and self-control, stating, "In self-control, the enemy is within. Nevertheless, the most effective way to do battle with our inner demons may be, in fact, by taking the battle outside of the mind" (p. 50). Similarly, Bandura (1989) asserted that visualizing success

may improve performance in future challenges. To explain why the battle of the psyche is so vital, Duckworth et al. (2016) suggested what happens in individuals' minds may be just as important as what happens in the outside world. Indeed, external rewards, punishments, and stimuli are fundamental processes. Utilizing the power of the mind and external rewards together can promote the intrapsychic outcomes individuals desire (Duckworth et al., 2016).

The motivational process is another form of regulation through self-efficacy (Bandura, 1995). The motivational process is evident through the methods by which self-efficacy beliefs impact the cognitive means individuals use to determine, assess, and accomplish specific objectives. Bandura (1986) identified attribution theory (Valins & Nisbett, 1987), expectancy-value theory (Herbert & Donald, 1972), and goal theory (Bandura, 1977) as connected with cognitive motivation. Related to attribution, individuals with high self-efficacy beliefs will characterize failures as a deficiency of singular factors outside their power. On the other hand, those with low self-efficacy beliefs internalize failures and view them as a deficiency in their personal ability. With regard to expectancy-value theory, the word *expect* is of great importance: Individuals perform based on how they expect they will and to the level they value the result. The beliefs stem somewhat from individuals' beliefs in their own abilities. Therefore, self-efficacy plays a role in certain goals individuals may set, depending on their own opinions of capabilities, which points to goal theory. With goal theory, self-efficacy views help or hinder in the limiting of motivation and achievement. For example, Bandura (1986) confirmed that motivation was dependent upon individuals' beliefs in their own abilities in relation to an inward standard for the self.

The third step of affective processes relates to the coping strategies and mechanisms individuals develop to handle stressful situations (Bandura, 1995). Efficacy beliefs often sway these coping strategies. For example, affective processes determine the way in which an individual observes or cognitively process a circumstance, thus influencing the management of disturbing thoughts. Even more so, through the process of affective processes, self-efficacy can help to minimize anxiety by postulating behavioral support to alter the circumstance (Bandura, 2000). Consequently, individuals with a high self-efficacy have the ability to successfully manage stress and anxiety.

The last process proposed by Bandura (1995) was the selection process, which indicates the selections individuals make to follow certain ambitions and participate in events, as well as their level of comfort in engagement. Individuals tend to stay with activities they feel they can master. Correspondingly, individuals will circumvent events they believe are beyond their skill level. Going further, self-efficacy beliefs help people to mold their environments based on the professional setting they choose, the better they are equipped for their chosen career, and the more tenacious they are in the presence of difficulties (Bandura, 1995).

In summary, self-efficacy is a major concept of Bandura's (1986) social cognitive theory. Self-efficacy beliefs affect how people think, feel, motivate, and act. Bandura (1997) established these beliefs from the four forms of influence, which are mastery experiences, modeling experiences, verbal experiences, and emotional states. Bandura (1995) stated that self-efficacy beliefs contribute to the control of human behavior through cognitive, motivational, affective, and selection processes.

Why Students Drop Out

Georgia has a very low high school graduation rate and a considerably higher dropout rate when compared to other U.S. states. Georgia is one of seven states having an average freshman graduation rate below 75% (McFarland et al., 2016). For purposes of this study, the average freshman graduation rate is the percent of freshmen earning their high school diploma within 4 years. Researchers have deemed America a nation at risk of poor education, which it has been for over 30 years (Mehta, 2015). As a result of poor academic achievement scores, U.S. schools have required students to take more math, English, science, and social studies courses; however, these rigorous changes have accomplished little.

Guthrie and Springer (2004) noted that an impulsive reaction took place based on the strongly worded document sent to President Ronald Reagan in 1983. The authors of *A Nation at Risk* (National Commission on Excellence in Education, 1983) addressed America's uneducated youth with statements such as "the average graduate . . . is not as well-educated"; "statistics and their interpretation by experts show only the surface dimension of the difficulties"; and "a dimming of personal expectation" (pp. 116-117). Accordingly, the importance of a proactive approach to investigating the impact of noncognitive skills with regard to student outcomes became apparent. Mehta (2015) argued that comparing American students to youth in other nations was unfair, as schools in other countries may be more selective, limiting who is able to take high-stakes tests.

Despite these arguments, the United States implemented long-term fixes on potentially nonexistent or short-term problems. Cognitive skill levels have been areas of concern in the classroom following publication of *A Nation at Risk* (Guthrie & Springer,

2004), with cognitive skills defined as the processes and constructs involved in exercising one's working memory (Jipp, 2016). Schools have placed greater attention on cognitive skills or attributes through an increased focus on science, social studies, math, and English courses (National Commission on Excellence in Education, 1983). However, Guthrie and Springer (2004) questioned whether or not abrupt focus on cognitive skills was the right decision.

Unfortunately, there was an alarming increase in high school dropout rates after the revised U.S. education standards heavily focused on cognitive factors. Doll et al. (2013) outlined historical reasons for why students have dropped out of school. It is important to note there has been a great deal of research involving sample sizes of several thousand students, which provides a thorough portrait of the dropout epidemic in America. Researchers categorized dropouts as individuals who pull out, fall out, or push out of school. More to the point, those students pulled out had internal factors that inhibited them from success at school, such as financial concerns, family needs, or childrearing. If pushed out, the student left due to factors inside the school, such as testing difficulties, attendance matters, or behavioral concerns. Consequently, falling out meant an outside source led to the student's general lack of care for school, perhaps as a result of poor parental support. The main difference with each of the three methods involves the agency with which it comes from. With pull factors, the student is the cause where they are lured out of school due to varying interferences. With push factors, the school is the cause in removing a student. Lastly, with fall factors, external causes such as disengagement occurs that neither the school nor the student control.

In a longitudinal study by Doll, Eslami, and Walters beginning in 1955, authors reported pull factors as the cause for 60% of students leaving school, according to the dropouts themselves (2013). This study continued and by 1966, the study indicated an increase to 75.5% with regard to pull factors as the leading cause for withdrawal from school. Having to work and seeking marriage were top reasons for students pulling themselves out of school during this time. By 1972, a slight shift occurred, as fall out topped the reasons for leaving school at a 48.8% overall frequency. This shift was not lasting as, in 1979, 67.4% of students cited pull out factors as the major reasons for leaving high school. By 1980, this number had dropped to 42.7%, although pull out factors remained the number one cause for leaving high school. In 1988, incoming 9th and 10th grade students reported push out reasons as their dropout factor at 42.2%. This ranking remained at the final 2002 measurement with the push out factor rate rising to 48.7%. These factors and others, to include absenteeism, a perception that rigorous standards were too difficult, students' poor academic performance, chronic academic failure, and a persistent lack of academic progress, continue to contribute to an ongoing dropout epidemic. Several authors suggested *A Nation at* Risk and President Reagan's hasty policy changes for stricter academics in the classroom caused the increased dropout population (Doll et al., 2013; Guthrie & Springer, 2004; Mehta, 2015).

Self-efficacy is predictive of behavior; thus, environmental factors have an effect on a person's achievement (Pajares & Kranzler, 1995). Additionally, noncognitive skills can predict academic achievement in students (Veas et al., 2015), with noncognitive skills defined as actions, attitudes, motivations, and strategies crucial to academic achievement (Farrington et al., 2012). According to Heckman et al. (2006), "Common

sense suggests that personality traits, persistence, motivation, and charm matter for success in life" (p. 412). Farrington et al. (2012) argued that noncognitive skills had just as much weight on academics as their cognitive counterparts. Furthermore, noncognitive measures related to predictors of student success in the classroom just as much as cognitive factors do. Noncognitive measures include motivation and self-discipline (Duckworth & Seligman, 2005), growth mindset (Dweck, 2008), and grit (Duckworth, 2016), all of which can be noncognitive academic predictors of success, along with resilience (Maston, Cutuli, Herbers, & Reed, 2009).

At Risk and Credit Recovery

In regular education school settings, one out of every four students becomes a high school dropout (Miller, Fitch, & Marshall, 2003). According to Frymier (1992):

> Children who hurt, hurt all over. Children who fail, often fail in everything they do. Risk is pervasive. If a student is at risk in one area, that student is very likely to be at risk in many other areas (p. 257).

In general, a credit recovery student is more often than not an at-risk student, but an at-risk student may never be a credit recovery student (Powell, Roberts, & Patrick, 2015). However, this may not always be the case, according to Powell et al. (2015). As the researchers explained, a student who failed one class and was taking a credit recovery course was not automatically qualified as at-risk. An at-risk student might never need to take credit recovery classes. Powell et al. argued that these two populations frequently co-mingled due to the nature of credit recovery classes; however, there remain differences between the terms.

A Nation at Risk (National Commission on Excellence in Education, 1983) resulted in more change than the American people and its students expected. This report served as an impetus to establish not only more rigorous course loads and standards, but also new terminology. Deeming a student *at risk* originated with this report (Powell et al., 2015). Although no single definition applies, the U.S. Department of Education suggested at-risk students are those who may be at risk of failure or in need of academic help, have a low socioeconomic status, are well below grade level, are homeless or in foster care, have been incarcerated, have disabilities, or be English learners (Powell et al., 2015). In turn, credit recovery students are those re-attempting to pass a class necessary for graduation (Powell et al., 2015), or to recover the failed credit. According to the U.S. Department of Education (2015), more information is needed on credit recovery programs to determine whether they are effective or ineffective. The continued research on this topic is vital for the success and development of credit recovery students.

Resilience Risk Factors

In an effort to better understand risk factors related to the construct of individual resilience, a literature review took place to determine which resiliency factors were more prominent within the underperforming, at-risk population explored in this study. Reis, Colbert, and Hèbert (2004) sought to determine why some students succeeded in the face of difficulties while others did not. In their findings, Reis et al. (2004) confirmed Bandura's (1986) triadic reciprocal causation model, finding that although an academic achiever and an underachiever may experience family instability and stress as a result of divorce, each student may react to the situation differently. An individual's self-concept often effects the response to stressful situations. In fact, it is very probable that a student

with higher sense of self-efficacy will respond in a much more positive manner than a student with a lower sense of self-efficacy (Bandura, 1986). Higher-achieving students have two important factors often lacking in lower-achieving students: having a teacher or counselor as a positive role model and having positive peer support for academic achievement. Moreover, the intensity of the emotional response and the manner in which students react often differ greatly between high-achieving and underachieving students (Reis et al., 2004).

Two National Center for Education Evaluation and Regional Assistance researchers, Hanson and Kim (2007), summarized key findings from measuring resilience in youth development. In an article providing an interesting framework from which to develop an understanding of how external resilience assets can lead to positive student outcomes, Hanson and Kim confirmed the need to look at noncognitive traits due to the intentional focus on academic standards. Likewise, there is a clear need to determine whether or not resilience is linked to academic achievement. Substantiating such a connection could prompt a proactive approach to the impending failing academic possibilities at-risk students currently face. Based on the results of Hanson and Kim (2007), it is evident that a process to identify or define resilience levels through screening processes and procedures can foster academic resilience. The researchers developed a framework to demonstrate the interconnectedness of both environmental resilience assets and internal resilience assets. In this framework, the authors included a linking component that embraced Maslow's hierarchy of needs and highlighted the individual youth's needs. Based on the work of Benard (2004), Hanson and Kim's framework

helped to develop an operational ethos in reference to the interrelationships of resilience (see Figure 2).

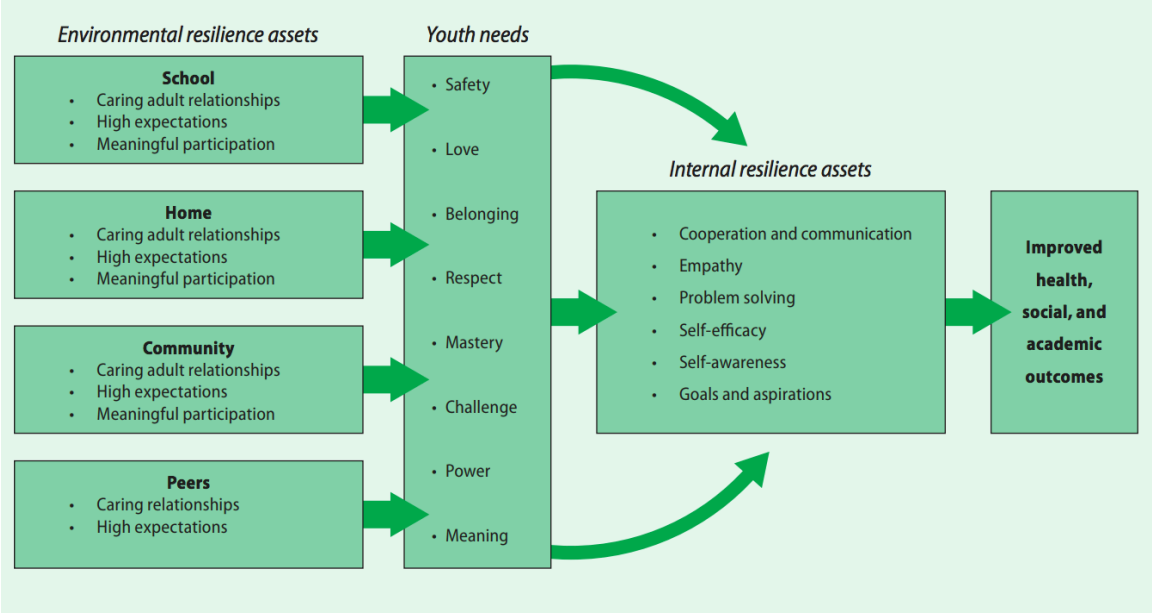

Figure 2. Resilience interrelationships. Adapted from *Measuring Resilience and Youth Development: The Psychometric Properties of the Health Kids Survey*, by T. L. Hanson and J. O. Kim, 2007. Copyright 2007 by the U.S. Department of Education.

In Figure 2, the overall resilience and youth development framework appears in four sections, each contingent upon the next with regard to the developmental phases of psychological needs, resilience, and situational outcomes (Hanson & Kim, 2007). It is important to note the appropriateness of this framework to the secondary school student. A function of this framework is to provide an enhanced view of the interconnectedness of specific components of resiliency with regard to the assets and needs of "typical" adolescents. The levels of this framework appear within the parameters of environmental resilience assets, youth needs, internal resilience assets, and outcomes (Hanson & Kim, 2007).

Hanson and Kim's (2007) framework portrays 11 environmental resilience assets identifying the situations within a student's life, subsequently categorized into four domains. The first domain within school factors determines student perceptions on caring adult relationships, adults with high expectations, and opportunities for meaningful participation in school- and nonschool-related activities (Benard, 2004). In the second domain, student perceptions and influences reside within the home, which determines student perceptions on caring adult relationships, adults with high expectations, and opportunities for meaningful participation in school- and nonschool-related activities. Benard (2004) further portrayed community relationships regarding caring adult relationships, high adult expectations, and opportunities for participation, and then illustrated the importance of caring relationships and high expectations among peers in the final domain. These relationships and having these needs met stimulate individual resilience and create a greater sense of belongingness (Benard, 2004).

The second section from Benard's (2004) framework pertained to youth needs. This section drew upon Maslow's (1943) hierarchy of needs to portray high school students' needs in a new way. Schools that allow the development of these needs will see the development of the whole child (Benard, 2004). To that extent, Benard stated, "The road to both positive learning and healthy behavior is through the process of meeting young people's developmental needs" (p. 87).

Given what the research indicates concerning basic youth needs, Benard (2004) further suggested through the framework that these needs promote resilience and strength. Coupled with environmental resilience assets and youth needs, Benard's research presented resilience and self-efficacy as critical to grow and support in

individuals. Even though some of these internal resilience assets develop through negative environmental situations, positive environmental situations may also develop and promote these assets. The internal resilience assets displayed in Figure 2 are the individual strengths of a resilient student.

Above all, the final section within the framework leads to youth outcomes. As a result of all components within the resilience and youth developmental framework, Benard (2004) presented the power of resilience, which may include many beneficial outcomes such as improved social, health, and academic behaviors. At the same time, Benard confirmed the influence on at-risk students by schools that have restored resilience within these students. The research revealed how these efforts have led to restored resilience within this population of students. As a result, these former at-risk youths turn into prospering adults who bring opportunity to their communities and families. The framework provides a distinctive context the present researcher will utilize to determine the influence, if any, of these constructs on academically underachieving students' success in a Georgia high school system.

Academic Risk Factors

Also used to guide the determination of which factors were most relevant to the present study was Hammond, Linton, Smink, and Drew's (2007) review of Education Resources Information Center (ERIC) literature from 1980 to 2005. In addition to the 25 years of literature, Hammond et al. (2007) utilized research and documentation from the PsycINFO and Medline databases, along with many other research-based articles and materials. As confirmed by Heppen and Bowles (2008), early warning signs are pivotal in identifying at-risk students. According to Alexander et al. (2001) and Jimerson et al.

(2000), a student does not make the decision to drop out based on a single variable or negative effect; rather, multiple risk factors sway the student over a period. Following is a discussion of early warning signals as noted in the literature.

The purpose of Hammond et al.'s (2007) study was to "identify the risk factors or conditions that significantly increase the likelihood of students dropping out of school" (p. 1). These research documents played a significant part in guiding and informing the process of determining which academic achievement variables most likely contributed to the lack of student engagement and academic progress. Among Hammond et al.'s (2007) insights into a continuum of factors found to contribute to the national crisis revolving around the disenfranchisement of American youth, several trends became apparent. For example, the study indicated the feasibility of condensing the majority of variables into four specific domains: individual, family, school, and community. In the proposed study, the focus is primarily on the individual domain. The family and community domains provided a wealth of information; however, these domains fell outside the parameters of the current research. The school domain presented an interesting framework to view issues, processes, and structures that impede students in their pursuit of a high school diploma; however, this domain also resided outside the parameters of the scope and purpose of the present proposal.

There are a myriad of issues and items involved with regard to the individual domain (Hammond et al., 2007); accordingly, this domain may deliver a great deal of applicable information useful for providing guidance by identifying measures consistent with the current literature and the proposed design framework (Hammond et al., 2007). Specifically, Hammond et al. (2007) found the individual domain includes several key or

significant subcategories of risk: individual background characteristics and demographics; early adult responsibilities; social attitudes, values, and behaviors; school performance; school engagement; and school behavior. In line with these categories, Balfanz, Herzog, and Mac Iver (2007) asserted that multiple domains had an effect on academic achievement. In addition, researchers such as Allensworth and Easton (2007) agreed with the importance of understanding multiple achievement variables to predict or determine the overall academic success of a student. Several of the indicators from their longitudinal study were in line with the National Dropout Prevention Center/Network study indicators predicting student success (Allensworth & Easton, 2007). To that effect, Enguita, Martinez, and Gomez (2010) stated, "There is no single factor but rather various ones," (p. 70). As a result, it is clear how individual student factors can be of use to this study with regard to the multitude of research reviewed.

The indicators within the individual domain explained by Hammond et al. (2007) have been the subjects of exploration by several other researchers. Particularly, Allensworth and Easton (2007) focused on overall course achievement, failure, attendance, and student behaviors. Hammond et al. (2007) identified school performance as one of the primary factors indicating school success. Thus, the National Dropout Prevention Center/Network and Communities in Schools study reviewing over 44 research articles determined achievement in specific grades is a positive indicator predicting academic success or failure. Further, final scores in classes presented the best measure to determine and predict low achievement. The research linked high school student's dropping out due to low school performance with their prior elementary academics. According to Hammond et al., when students receive poor grades or feel as

though they are falling behind, their overall course completion rate suffers (2007). Similarly, Heppen and Bowles (2008) identified course completion as a significant predictor of academic success. Correspondingly, Balfanz et al. (2007) labeled course completions as a specific variable essential in predicting the outcome of a graduating student. The researchers further postulated that course completions are better predictors than EOC grades alone (Balfanz et al., 2007).

Course completions are not the only way to signify achievement in school performance. Hammond et al. (2007) indicated both math skills and reading levels are essential factors, as well. According to Balfanz et al. (2007), doing well in math or English can yield a 60% positive predictive value in graduating from high school. Knowles and White (2013) tracked student assessments to determine if a student was at risk for dropout. The specific data Knowles and White used were grades and benchmark assessments similar to the Georgia Milestone End of Course tests. The Georgia Department of Education (GaDOE, 2017a) confirmed that math EOC assessments, Algebra I/Coordinate Algebra and Geometry/Analytic Geometry now require a high level of reading skills with the intensive word problems. Using the Lexile score, the math EOC tests language according to the grade level the student should be in. As determined by Heppen and Bowles (2008), overall course performance indicates potential risk in students. Therefore, in the proposed study, EOC assessments will serve as another form of school performance in the individual domain in line with Heppen and Bowles (2008), Hammond et al. (2007), and Balfanz et al (2007).

School engagement is another indicator within the individual domain of academic achievement (Hammond et al., 2007). As Hammond et al. (2007) stated, “Absenteeism

was found in various studies to impact dropout at all school levels" (p. 27). Thus, Hammond et al. go on to state poor attendance is linked to poor achievement. If students are not attending their classes, then they cannot achieve the educational foundation necessary to graduate. Students who skip class exponentially increase their chances of dropping out or failing out (Hammond et al., 2007). In like manner, Heppen and Bowles (2008), Balfanz et al. (2007), and Balfanz (2016) corroborated the major importance of attendance in school and how it is linked to academic achievement. Balfanz defined missing 10% or more days in the school year as chronic absenteeism. Knowles and White (2013) gathered attendance data to further determine early warning signs of potential dropouts. In the proposed study, specific data elements such as excused absences, unexcused absences, and tardiness will serve as determinations in the attendance domain. Due to the major risk factor of absenteeism in the individual domain, the researcher will seek to determine the effect, if any, of these constructs on academically underachieving students' success in high school. Therefore, average daily attendance will be a means to assess the relationship with academically underachieving students' success in high school.

High-risk demographic characteristics fall within the individual student domain (Hammond et al., 2007). This characteristic specifically pertains to students' character, what they value, and how they respond to situations. Additionally, Hammond et al. (2007) suggested a link between this factor and the importance of certain noncognitive skills. Resilience and grit, which stem from self-efficacy, could significantly increase academic achievement when paired correctly with other skills (Hammond et al., 2007). Other factors such as individual background characteristics may be important to note, as

well (Hammond et al., 2007). The most significant factor in this category is whether or not the student has a learning disability. Hammond et al. further stated:

> Data from two national surveys indicated that students with learning disabilities or with emotional problems were more likely than other students to drop out of school. Students with specific learning disabilities were over three times as likely to drop out as other students and students with emotional problems were over five times as likely to drop out of school. (2007, p. 29)

Balfanz et al. (2007) identified learning disabilities as status variables predictive of academic achievement. Schools commonly identify culturally and linguistically diverse student groups as at risk of school failure and underperformance (Gonzales, Brusca-Vega, & Yawkey, 1997). Baca and Cervantes (1998) identified fundamental requirements of these culturally and linguistically diverse students involving the need to learn a second language and culture. With that, developing the key language skills and knowledge of the cultural surroundings can be a slow process involving different ways of studying, thinking, networking, and collaborating (Baca & Cervantes, 1998). In addition, culturally and linguistically diverse students typically come from families of low socioeconomic status, which further hinders their academic achievement (Gonzales et al., 1997). Following this discussion of the individual domain will be further determination of the affect these constructs have, if any, on academically underachieving students' success in high school.

Academic Resilience

The topic of resilience emerged over 40 years ago (Truebridge, 2016). Henderson (2013) suggested using students' internal and environmental factors to strengthen

resilience factors. If resilience positively affects academic achievement, then efforts building up those with adverse resilient factors may merit inclusion in schools (Henderson, 2013). Although immediate fostering of resilience is not possible (Salvi, 2017), Benard (2004) emphasized the need to understand the facts surrounding resilience. It is important to realize misconceptions surrounding resilience, such as the idea that it is a characteristic one may possess and cannot nurture (Benard, 2004). In actuality, many researchers have identified resilience as improvable (Bandura, 1986; Benard, 2004; Salvi, 2017). Salvi (2017) explored the time and effort needed to develop both resilience and self-efficacy in individuals, as both are similar in the ability to focus on accomplishment, particularly in the face of difficulty.

Abramson et al. (2015) provided evidence that one's surrounding community can be a defining factor on how resilient a person is. Bandura (1977, 1986, 1995, 1997) made the same claim with self-efficacy and an individual's environment. Community, according to Abramson et al., refers to access to people, economic status, political status, social worth, and general health. The human touch is a vital element in the academic success of a student (Balfanz & Byrnes, 2018). Noncognitive interventions combining social and emotional interventions have significantly improved student academic achievement (Lemberger, Carbonneau, Selig, & Bowers, 2018). Underachieving students with high poverty rates, according to Balfanz and Byrnes (2018), particularly need the individual support of others. Further, Abramson et al. (2015) suggested the importance of social support to better equip an individual with resilience. Different disasters will occur, but it is the type of learned behaviors from a community that influence how resilient a person is.

Hill, Burrow, and Bronk (2016) studied individuals with a strong sense of direction and purpose with regard to grit and life goals. This was completed with two studies comparing purpose, and positive affect predicting grit in two different subgroups. The first studied concluded that a person would have a greater positive affect if they were striving toward long term goals. Hill et al. (2016) suggest that more investigation is needed regarding the predictive nature of cognitive variables and grit. Zolkoski, Bullock, and Gable (2016) confirmed the lack of research looking at resilience and grit in students at alternative schools, specifically credit recovery students.

Digging deeper in academic resilience is the concept of grit. Student motivation and the ability that gives certain students the drive to pursue their goal has been an ongoing topic of interest in the field of education. Maslow (1970) discussed motivation and personality in the early 1950s. Ackerman and Heggestad (1997) identified overlapping traits that positively related to noncognitive abilities and academic achievement. The specific traits identified were personality, interest, and intelligence as key constructs. Additionally, motivation emerged as a key factor for optimum performance.

Duckworth (2017) studied grit from personal experiences and doctoral research, identifying grit as a predictor of success in academics, cadets, and even careers. Duckworth differentiated grit from resilience as "not just having resilience in the face of failures, but also having deep commitments that you remain loyal to over many years," (Perkins-Gough & Duckworth, 2013, p. 16). Duckworth investigated resilience and grit within the framework of a 17-item grit scale (Perkins-Gough & Duckworth, 2013). Further clarifying, Abramson et al. (2015) identified resilience as a character trait, a

process, or an outcome, exploring the character trait and behavior of resilience in students. Cesarone (1999) defined resilience as "the human capacity and ability to face, overcome, be strengthened by, and even be transformed by experiences of adversity" (p. 7). Duckworth (2017) further defined grit as "passion and perseverance toward especially long-term goals" (p. 97). Resilience is the ability to face and be strengthened by adversity, whereas grit is the ability to pursue difficult goals despite the challenges. Both resilience and grit are important, particularly in students who have faced obstacles yet have a goal to complete high school.

Hoerr (2013) compared both resilience and tenacity to grit. Resilience and grit are different factors, yet are equally important to understand in relation to academic achievement. Hoerr referenced Winston Churchill and football coach George Allen as examples of individuals utilizing grit, crediting Churchill with attributing success as coming from failure with a great sense of zeal. This definition is the very essence of grit: Students who know what it means to be a good failure or who can bounce back are those who have grit (Hoerr, 2013).

Bashant (2014) stated that resilience is necessary to have grit, showing how these attributes intertwine and indicating the importance of examining both resilience and grit. Bashant clarified that, in the face of trials, it is vital to be resilient to accomplish a goal. Other traits necessary to have grit are conscientiousness, self-discipline, and perseverance. Bashant personified grit as a person running a marathon, with stamina, strength, and a clear course needed to finish the race. If boredom or a rocky path sets in, someone without grit will most certainly fail. A credit recovery student will have a challenging path and will thus need stamina, strength, and a clear course to finish high

school. One can see how important grit could be as a predictive indicator for academic success (Duckworth & Seligman, 2005).

According to Perkins-Gough and Duckworth (2013), a status of "gifted" means nothing beyond the schoolyard. This statement, paired with Duckworth's work, shows the importance of being more than a good student. A student with perseverance will not only be more successful in the secondary setting, but may have a higher probability of greater accomplishments later in life.

Growth Mindset

Duckworth viewed Carol Dweck as a role model in regard to growth mindset research (Perkins-Gough & Duckworth, 2013). According to Duckworth (as cited in Perkins-Gough & Duckworth, 2013), students with a growth mindset are those who typically display grit and resilience. Yeager and Dweck (2012) explored the construct of fixed mindsets compared to growth mindsets, finding neither a fixed mindset nor a growth mindset meant a person was unable to learn; nonetheless, a fixed mindset meant a person held unchangeable ideas. Essentially, the person with the fixed mindset is static and has little room for progress, whereas a growth mindset allows individuals to further mold and nurture their intellectual skills (Yeager & Dweck, 2012). When students value hard work, they are more likely to possess a growth mindset (Hochanadel & Finamore, 2015) and be malleable (Yeager & Dweck, 2012). Individuals can change their mindsets, which is a vital topic in resilience and self-efficacy research (Salvi, 2017).

Scholars and educators frequently pair Dweck's growth mindset with the concept of falling behind and the pursuit of motivation to prevail (Admitomo, 2015). The literature shows mindset, grit, resilience, and perseverance are intertwined (Duckworth,

2016; Duckworth & Seligman, 2005; Heckman et al., 2006). The common perception is of grit and resilience as the ideas behind a growth mindset (Hochanadel & Finamore, 2015). Further, Yeager and Dweck (2012) have suggested improving a mindset to be able to lead is a means of furthering resilience.

Just like a community and environment can shape a student's resilience and self-efficacy, peers can shape a student's mindset (Abramson et al., 2015; Bandura, 1977; Yeager & Dweck, 2012). Promoting this notion and shaping a student's mindset are implicit theories (Yeager & Dweck, 2012), which are essentially assumptions or predictions made based on how individuals interpret their surroundings. Yeager and Dweck (2012) described two implicit theories, entity and incremental, the former involving measuring one's ability in a threatening way and the latter entailing learning and growing to develop. Yeager and Dweck's findings of the feeling of embarrassment coincide with Bandura's primary source of emotional state affecting an individual's self-efficacy (Hoy & Miskel, 2008).

These topics on academic resilience are related to student self-efficacy, which is a significant mediator of all types of achievement performance, as well as many other categories of performance. Self-efficacy affects the options chosen, the motivation put forth, the quality of determination, individuals' resilience, and how successful the individuals think they will be.

Summary

This chapter included a synopsis of the theoretical framework, social cognitive theory, guiding this study. A definition of self-efficacy preceded a discussion of aspects concerning the differing dynamics and elements of self-efficacy. Researchers have

established the importance of resilience and academic achievement with self-efficacy, as well as the value of resilience and academic achievement. This researcher will develop upon previous scholarship specific to resilience and academic achievement by investigating prior researchers' variables as well as variables within a unique population in Georgia. Expressly, this study will be a means to investigate the relationship, or lack of relationship, between resilience variables and academic achievement indicators. Additional variables investigated will include participants' age, ethnicity, gender, years behind cohort, socioeconomic status through free and reduced lunch forms, and years in present school.

Chapter III

METHODOLOGY

This chapter includes details of the quantitative research methods utilized to complete the study. Chapter III begins with an introduction and description of the research design. Following a presentation of the population evaluated is a thorough review of the validity and reliability of each instrument. Details regarding data collection procedures follow, with subsequent examination of statistical tests and assumptions for each research question. A summary concludes this chapter.

The following research questions will guide this study:

1. Are the selected academic integration components (years behind cohort, behavior referrals, and attendance) and background factors (race or ethnicity, disability status, English as a second language, socioeconomic status, student resilience, and grit) significant predictors of course completions?
    a. Are academic integration components or background factors significant predictors of 12th grade course completions?
    b. Are academic integration components or background factors significant predictors of 11th grade course completions?
    c. Are academic integration components or background factors significant predictors of 10th grade course completions?
2. Are the selected academic integration components (years behind cohort, behavior referrals, course completions, and attendance) and background

factors (race or ethnicity, disability status, English as a second language, socioeconomic status, student resilience, and grit) significant predictors of end of course scale scores?

   a. Are academic integration components or background factors significant predictors of Ninth Grade Literature and Composition end of course scale scores?
   b. Are academic integration components or background factors significant predictors of American Literature end of course scale scores?
   c. Are academic integration components or background factors significant predictors of Algebra I end of course scale scores?

3. Is there a significant difference between minority and nonminority students by gender and grade level (9th, 10th, 11th, and 12th grades) on student resilience?
4. Is there a significant difference between minority and nonminority students by gender and grade level (9th, 10th, 11th, and 12th grades) on student grit?

Research Design

This study employed a quantitative, nonexperimental, multivariate correlational study with a group comparison design. Stepwise regressions and factorial analysis of variance (ANOVA) were appropriate to answer the research questions. Specifically, the regression models enabled the determination of which individual-level variables best

predict the dependent variables, after which factorial ANOVA enabled group comparisons.

All variables within this study came from 2018-2019 archival data. The independent variables in this study were predictor variables that consist of specific individual-level variables of students. The intent of the predictor variables was to determine if the specific individual-level variables could correctly predict the dependent variables. Collection of the predictor variables took place during the 2018–2019 school year, with data provided by the student information system. The specific academic integration components and background factors consisted of years behind cohort, behavior referrals, attendance, course completions, race or ethnicity, disability status, English as a second language, socioeconomic status, student resilience, and grit. Behavior referrals, students with a disability, race or ethnicity, English as a second language, and socioeconomic status are nominal-level variables; years behind cohort, and grade level are ordinal-level variables; grit and resilience are interval-level variables; and attendance is a ratio-level variable.

The dependent variables in this study were Course Completions, EOC scale scores, Grit, and Resilience. The number of Course Completions are ratio-level variables. Calculation of the number of course completions occurred between data collection time periods. EOC scale scores, grit, and resilience are interval-level data. EOC scores in the system vary depending on the test taken. For example, the raw scores of the Ninth Grade Literature and Composition EOC tests range from 391 to 634; the American Literature EOC scores range from 406 to 678; the Algebra I EOC tests range from 400 to 651; and the Geometry EOC scores fall between 401 and 628.

Participants

Archived student data during the 2018–2019 academic year through was pulled from the variables specific to the research questions. The total population for the prior year as reported by the Georgia full-time equivalent (FTE) in October 2017 was 2,237 students in the system. The system allows school administrators to generate the number of students for a specified period, during which time the system submits required state-reported data to the GaDOE. There are both start date and end dates to gather FTE and student data. Specific data collected on each student from this cycle appears in Appendix A. As of the October 2017 FTE collection period, there were 396, 526, 558, and 757 students in 9th, 10th, 11th, and 12th grades, respectively. There are more seniors than freshmen due to the second-chance population. As well, the system has a high number of students who have either failed a prior class, grade-level, or dropped out completely. Thus, the fact that the longer a student is in high school, the more likely the student's chance of failing classes or withdrawing draws more junior and seniors to the system being studied. The system flags these second-chance students and offers a supportive environment for students to enroll full time or complete credit recovery courses. Because this system is an individualized, self-paced, evening setting, many students who have failed or dropped out of their regular high school come to the system utilized in this study. Full-time students are those enrolled in three classes at a time. Coursework completion is on a mastery learning level; upon entering the building, students are able to work on any of the three classes in which they are enrolled.

Archival data collected was on students in the rural Georgia system in Grades 9 through 12 during the 2018–2019 school year. As preliminary information the prior year

FTE was analyzed. The system's 2017 FTE population report is comprised of students between the ages of 14 to 21 years. Of these 2,237 students, 52% are male and 48% are female. This system serves at-risk students predominantly within the Appalachia area; thus, the majority of the population is Caucasian. Based on 2018–2019 data, the system serves about 73% White students, 14% Hispanic students, 4% Black students, 3% multi-race students, and fewer than 1% Asian, Pacific Islander, or American Indian students. According to the Free and Reduced Lunch FY 17 Report pulled from the Department of Education Portal (see Appendix B), the system had a free and reduced lunch rate of 68.9%.

The attendance at this second-chance, alternative-type system may be low due to the flexibility of attendance policies distributed only to students under 16 years of age. Upon achieving the age of 16 years, students may, by law, drop out; thus, the system does not require students to attend on a daily basis. Even though it is not required, the system tracks and encourages attendance for each student, as required by the GaDOE. Students are not allowed to work on any coursework unless they are attending school. Students sign in upon arrival at the school, with attendance information logged into the system's student information system. If a student has not attended school for 6 consecutive weeks, the system will automatically withdraw the student due to lack of attendance. Each school has a typical average daily attendance of 45% of the total enrollment, a percentage calculated based on dividing the number of school days by the number of enrolled students; however, typically 100% of students have attended within the first couple months of school, a pattern that continues throughout the year. Students commonly come

to school only 2 to 3 days a week due to work, family, or other prohibiting factors. At the system, students can attend up to 176 days in a school year.

Instrumentation

Three instruments facilitated gathering data on each research question, with data available through the school information system in the 2018–2019 school year. The only data used came from this rural Georgia system. Instruments used for data-gathering include the GaDOE End of Course tests, the Strengths Difficulties Questionnaire (resulting in a Total Difficulties Score), and the Grit-S.

GaDOE (2017a) established and helped develop each of the Georgia Milestones Assessments. In Grades 9 through 12, EOC tests are part of these Georgia Milestones. Ninth Grade Literature, American Literature, Coordinate Algebra/Algebra I, and Geometry EOC tests will serve as measures in this study. These assessments measure comprehensive content knowledge and skill to evaluate the level of knowledge obtained by the student.

Validity

The GaDOE (2017b) issued *An Assessment and Accountability Brief* for EOC tests briefing extensively on the validity and reliability of the assessments. According to the GaDOE, "validity exists in context . . . validity is a matter of degree . . . validity is associated with a multi-faceted process and collection of evidence over time" (p. 1). Establishment of content validity comes through the development of the test itself, as the GaDOE meticulously ensured each phase of test development was thorough and established documentation of sound evidence for the validity of the instrument. The GaDOE committee demonstrated criteria validity of the EOC test through critical

alignment of standards, using multiple reviewers and content experts to provide evidence of the instrument's validity. Equally important, the GaDOE produces all EOC test development procedures with multiple stakeholders who include, but are not limited to, content and state standard experts, assessment specialists, and educators (GaDOE, 2017a).

Reliability

Cronbach's alpha reliability coefficient is one measure reported for the purpose of establishing interitem reliability, as "Cronbach's alpha measures the internal consistency over the responses to a set of items measuring an underlying unidimensional trait" (GaDOE, 2017b, p. 4). Furthermore, this measure, as determined by the Georgia Department of Education, is appropriate for providing an established picture of academic success due to the consistent results and the fact that "generalizations of test results are justifiable" (GaDOE, 2017b, p. 6). With the *Accountability Brief*, GaDOE described the process and testing of internal consistency as follows:

> The reliability coefficient is a unitless index, which can be compared from test to test and ranges from 0 to 1. Tables 1 through 4 show the average reliability indices as well as the minimum and maximum values across forms and administrations for the Georgia Milestones assessments organized by subject area. These range from 0.87 to 0.93. The reliabilities for the 2016-2017 Georgia Milestones assessments are consistent across forms and administrations and suggest that the assessments are sufficiently reliable for their intended purpose. That is, the reliability indicators obtained for the Georgia Milestones assessments suggest that scores reported to students for the 2016-2017 school year are well

estimated and provide a reliable picture of student performance. (GaDOE, 2017b, p. 4)

The Strengths and Difficulties Questionnaire (SDQ) has proven useful in the mental health and military fields as a predictive and screening measure among young adults (Goodman, 2001). The 25-item, 3-point scale classifies individuals on a self-reporting questionnaire, measuring mental variability in students with possible positive and negative outcomes and scores from 0 to 40 for the Total Difficulties combined score. Measure subscales incorporated into the Total Difficulties score are emotional problems, conduct problems, hyperactivity, and peer problems. The fifth subscale is Prosocial, measured separately to gather data in this area but not added to the Total Difficulties score. The Prosocial subscale is scored inversely; thus, students with lower scores indicate higher risk. Alternately, in the other four subscales, higher scores indicate a higher risk. A typical score in Total Difficulties can range between 0 and 40, with higher scores indicating more emotional instability and a potential lack of resilience within the student. A lower Total Difficulties score shows more emotional stability, indicating perceived higher resilience within the student (Abdul Kadir, Mustapha, Mutalib, & Yakub, 2015). The SDQ is a frequent screening tool for students who may be at risk, with common use to assess resilience in students (Goodman, Meltzer, & Bailey, 1998). This instrument is consistent with the risk and resilience perspective of human behavior and accordingly reflects the notions upon which this study is based, thus representing how low resilience in a student may demonstrate insufficiencies—more specifically, curricular deficiencies. Each subscale has five questions, for a total of 25 questions overall.

Validity

Establishment of validity within the SDQ stems from the strategy of determining the presence or absence of specific characteristics. In particular, verifying construct validity of the SDQ came from measuring various studies by confirmatory factor analysis (Byrne & Schneider, 1988; Marsh & MacDonald-Holmes, 1990). In a cross-cultural study on mental health, Heiervang, Goodman, and Goodman (2008) validated this specific measure in Norway and other countries. The researchers also corroborated the multitrait and multimethod analysis of convergent and discriminative validity. In the same manner, Hill and Hughes (2007) conducted a study of elementary children at risk for academic failure. As shown in previous studies, the SDQ is a valid instrument for students in at-risk situations. Next, Giannakopoulos et al. (2013) conducted the varimax orthogonal transformation to test the factor structure of the test. Hill and Hughes also utilized a multitrait and multimethod tactic in addition to a confirmatory factor analysis using the correlated uniqueness model, determining the SDQ to have established convergent validity. In addition, they recognized the subscales' use for screening purposes of certain noncognitive characteristics in at-risk children.

Reliability

As noted, selection of the widely used SDQ was because this instrument measures the explicit variables of concern, with established internal reliability and Cronbach's alpha coefficients ranging from .73 to .90 (Goodman, 2001). Established in 1997 by Goodman (2001), the SDQ has since grown into scales for more than just children. Establishing internal consistency reliability occurred by calculation of the Cronbach's alpha coefficient for each subscale. Hymel, LeMare, Ditner, and Woody (1999) found

the subscales have high reliability with a coefficient alpha of .82 to .93. Scholars distributed and tested this well-developed questionnaire at multiple times over a period of 2 months to establish good test-retest reliability with correlation coefficients of .87. The SDQ has the reliability needed for this study, particularly for the students in this study.

Equally important is the Grit-S. This eight-item survey, revised and further validated by Duckworth and Quinn (2009), is a means to determine a student's grittiness. Researchers have studied multiple versions of the Grit scale to determine its validity and reliability. The final study in this literature review pertained to worldwide finalists of the 2006 Scripps National Spelling Bee, with scores on the Grit-S positively predicting the completion and round completion of participants. According to Duckworth and Quinn (2009), participants who displayed higher amounts of grit were significantly more likely to move on to final rounds in the spelling bee. Students of high academic achievement and low academic achievement have undergone study utilizing the Grit-S, which, in turn, will determine whether or not a student possesses certain resilience and grit factors ranging from 1 (*not like me at all*) to 5 (*very much like me*). The scorer will then add all of the points, with a maximum of 5 points per question. After calculating the total score, the scorer will divide by eight to see points on the scale. The most "gritty" person is one who scores a 5, with the lowest or "not at all gritty" person scoring a 1. The purpose of this scale is to determine an individual's ability to face hardship and to potentially predict academic success.

Validity

Also further developed through time is validity on the Grit-S, a condensed version of the original 17-Item Grit Scale, in which 12 questions referred to resilience and five

questions pertained specifically to grit (Perkins-Gough & Duckworth, 2013). Duckworth and Quinn (2009) demonstrated the development and validation of shortening this scale to an 8-item scale, thus creating the Grit-S, which they subsequently validated against the Big Five Model subscale of Conscientiousness. Duckworth and Quinn produced continuous validity through each of the longitudinal studies completed to date. The researchers evaluated validity by analyzing interitem correlations, during which two subscales transpired from implementation of a 2-factor oblique rotation. Thus, they created Consistency of Interest and Perseverance of Effort, each highly correlated with the other ($r = .59$, $p < .001$). Duckworth and Quinn tested and retested the Grit-S to show strong predictive validity, with items cross-examined within five studies while the measure has been under review.

Reliability

Establishing reliability in the Grit-S is possible through a variety of ways. With multiple reliability tests, the Grit-S indicated confirmation of internal reliability with a Cronbach's alpha ranging from .73 to .84 (Duckworth & Quinn, 2009). Test-retest stability demonstrated decent reliability in the Grit-S scale, $r = .68$, $p < .001$, over the course of 1 year. Continuing to assess this survey will help develop interrater reliability. According to Duckworth and Quinn, each of the subscales work together to predict grit in individuals.

Data Collection

When the Valdosta State University Institutional Review Board (see Appendix C) granted permission, data collection commenced in accordance with protecting the rights of all participants within the study. Data collection came from three sources, all of them

maintained in the student information system: EOC tests, background information, and survey data. The GaDOE EOC test results are reported each month due to the independent pace of the students. The resilience survey consisted of 25 questions, while the Grit-S comprised of eight. Completion of both surveys occurred upon enrollment. Other demographic information came from the student profile in the student information system. Students completed the surveys in a password-protected, online portal linked to the student information system. Any information the researcher collected remained in a password-protected computer, accessible only with a secure login.

Students completed surveys alongside their mentors to ensure understanding and to answer additional questions, if necessary. This is typical protocol with many surveys within this system. Upon signing in, the participants reviewed one page of directions and completed two different sets of questions. The sets of questions consisted of the SDQ and the Grit-S (see Appendix D). Demographic data was found on the student profile page, including but not limited to gender, race or ethnicity, and age.

Data Analysis

Descriptive Statistics

Descriptive statistics generated—specifically, frequencies and percentages for categorical variables (years behind cohort, student with disability, English as a second language, socioeconomic status, race and ethnicity, behavior referrals, gender, and grade level) characterized the sample and the study variables. Behavior referrals, disability status, race or ethnicity, and socioeconomic status were calculated through free and reduced lunch forms which utilized a 2-point scale of 1 (*yes*) and 0 (*no*). Years behind cohort ranged from 0 (*zero years behind cohort*) to 3 (*more than 2 years behind cohort*).

Repeated calculations of mean, minimum, maximum, standard deviation, skew, and kurtosis occurred for continuous variables (resilience, grit, attendance, course completions, and EOC scale scores). The average score across the items of the Grit-S measured grit levels, while the Total Difficulties score of the SDQ measured resilience levels. Attendance appeared in terms of percentages from 1 to 100. Subsequently, coding of the number of course completions were displayed as the number of courses completed during the two full academic semesters. EOC scale scores reported were the actual scaled scores collected from the GaDOE monthly reports.

Inferential Statistics

Testing of the research questions within this study utilized inferential statistics, namely stepwise regression and ANOVAs. To analyze Research Question 1 and 2, stepwise regressions were performed to determine the manner and to what extent the independent variables predicted the number of course completions and EOC scale scores. The independent variables in Research Question 1 analyses were student resilience, grit, behavior referrals, race or ethnicity, attendance, years behind cohort, disability status, English as a second language, and socioeconomic status. The dependent variables were the number of course completions in 10th, 11th, and 12th grade. For Research Question 2, the independent variables were student resilience, grit, behavior referrals, race or ethnicity, attendance, years behind cohort, course completions, disability status, English as a second language, and socioeconomic status; the dependent variables were Ninth Grade Literature and Composition, American Literature, and Algebra I EOC scale scores.

A separate model was conducted for each grade level, resulting in three models for Research Question 1 and five models for Research Question 2. Standardized and unstandardized regression coefficients (*B*) were interpreted for dependent variables. The significance threshold was set at .05. The value of the regression coefficient represented the predicted number of units of change for the outcome per each unit of change in the predictor, with positive coefficients indicating a predicted increase in count and negative coefficients indicating a predicted decrease in count.

To analyze Research Questions 3 and 4, the researcher used a 2 x 2 x 4 factorial ANOVA for each question to determine the differences in resilience and grit levels by gender, grade, and minority status for each dependent variable. In this analysis, the independent variables were gender (two levels: male and female), grade level (four levels: 9th, 10th, 11th, and 12th), and minority status (two levels: minority and nonminority); the dependent variables were resilience and grit scores. Following a separate ANOVA for each dependent variable was used testing of significance of the main effects and interactions of the independent variables using *F*-tests, with *F*-value, degrees of freedom, and *p*-value reported. Each ANOVA tested three main effects (gender, grade, and minority status), three two-way interactions (gender x grade, grade x minority status, and gender x minority status), and one three-way interaction (gender x grade x minority status).

If there were main effects for gender and minority status, no post hoc tests would be necessary, given that there are only two levels of these factors. In this study, the post hoc tests were not necessary, because each factor of gender and minority had only two levels; therefore, the raw means will indicate which will be higher. If gender or minority

status were significant indicating with a *p*-value of .05 or less, the means underwent examination to determine which group has the higher dependent variable. If an ANOVA indicated which grade level had a main effect, then a post hoc would be necessary. If there was a significant main effect for grade level, then any main effects or interactions that were significant at the .05 level from the *F*-test would merit further examination using Tukey post hoc comparisons (*t*-tests). Reporting of the Tukey post hoc comparison test would be reported to describe the grade-level differences. The estimated marginal means of post hoc comparisons that were significant at the .05 level would describe the group differences.

Statistical Considerations and Assumptions

Assumptions of multiple regression were assessed before interpreting the results. The dependent variables were checked for normality via Shapiro-Wilk test. This was significant (< .05) for Research Question 1 data and thus results are interpreted using Adjusted R-squared rather than R-squared. Variance inflation factor (VIF) and tolerance were checked to see if the data met the assumption of multicollinearity. All tolerances were over .2, and all VIFs were under 10 indicating that multicollinearity was not a concern. The residuals statistics table and P-P plots were evaluated to check the variance of residuals and their distribution. Standardized residuals brandished a few points were just outside of the range of normality of -3 To 3. The P-P plots also revealed some deviation from the line, however, only extreme deviations from normality are likely to impact the results. The presence of outliers was checked via Cooks distance with all values lower than 1.0, suggesting no value would greatly influence the results.

Assumptions of multiple regression were assessed before interpreting the results. The dependent variables were checked for normality via Shapiro-Wilk test. When significant (< .05) the results of regression analyses are interpreted using Adjusted R-squared rather than R-squared. Variance inflation factor (VIF) and tolerance were checked to see if the data met the assumption of multicollinearity. All tolerances were over .2, and all VIFs were under 10 indicating that multicollinearity was not a concern. Residuals statistics tables and P-P plots were evaluated to check the variance of residuals and their distribution. The P-P plots for RQ2b were slightly abnormal, however, only extreme deviations from normality are likely to impact the results. The presence of outliers was checked via Cooks distance with a few values above 1.0, (one within the RQ2b dataset, and one within RQ2c data set) suggesting no great influence on the results.

For Research Questions 3 and 4, the assumptions of missing data, outliers, independence of observation, normality, and homogeneity of variance were tested. *Z*-scores run on the dependent variables to test for outliers and outliers were examined, subsequently considered for removal, some outliers were identified and were modified to reduce the severity of the outlier. For each ANOVA, an interval ratio level dependent variable was necessary. Grit in Research Question 1 and resilience in Research Question 2 were both interval-level dependent variables. All observations were independent of each other with no student counted more than once. All scores came from different students, thus accounting for independence of observations. A Shapiro-Wilk test was a means to test for a normal distribution on the dependent variable in each research question. A nonsignificant Shapiro-Wilk test indicates that the normality assumption is met. However, as this test is sensitive to sample size, another examination of normality

was necessary through skewness and kurtosis values (Stevens, 2009). According to Westfall and Henning (2013), skewness values greater than 2 in magnitude and kurtosis values greater than 3 in magnitude indicate marked deviations from normality. Running Levene's test was a means to test the assumption of homogeneity of variance, with results of a nonsignificant Levene's test data indicated that the assumption was met.

Summary

This chapter contained an examination of the research design and procedures completed for the quantitative, nonexperimental multivariate study. Archival data came from a rural system in Georgia based on specific individual-level variables.

Evidence concerning the validity and reliability of the academic success variable, resilience survey, and grit survey appeared in this chapter. In addition, the researcher explored extensive research to determine the specific academic integration components, environmental factors, and background factors. Data analysis varies depending on the research question. A stepwise regression was appropriate to determine how well the individual-level variables predict the data of Course Completions and End-Of-Course Scale Scores. After which, the 2 x 2 x 4 ANOVA analyzed gender, minority, and grade-level variables' effect on grit and resilience in Research Questions 3 and 4.

Chapter IV

RESULTS

There were two major purposes in this quantitative study. The primary purpose was to determine if there were academic and background variables that significantly predict course completions and EOC scores in at-risk high school students from data collected in the 2018-2019 school year. The secondary purpose was to gain an understanding of grit and resilience among gender, minority, and nonminority high school students in the 2018-2019 school year.

The following research questions guided this study:

1. Are the selected academic integration components (years behind cohort, behavior referrals, and attendance) and background factors (race or ethnicity, disability status, English as a second language, socioeconomic status, student resilience, and grit) significant predictors of course completions?
    a. Are academic integration components or background factors significant predictors of 12th grade course completions?
    b. Are academic integration components or background factors significant predictors of 11th grade course completions?
    c. Are academic integration components or background factors significant predictors of 10th grade course completions?
2. Are the selected academic integration components (years behind cohort, behavior referrals, course completions, and attendance) and background

factors (race or ethnicity, disability status, English as a second language, socioeconomic status, student resilience, and grit) significant predictors of end of course scale scores?

a. Are academic integration components or background factors significant predictors of Ninth Grade Literature and Composition end of course scale scores?

b. Are academic integration components or background factors significant predictors of American Literature end of course scale scores?

c. Are academic integration components or background factors significant predictors of Algebra I end of course scale scores?

3. Is there a significant difference between minority and nonminority students by gender and grade level (9th, 10th, 11th, and 12th grades) on student resilience?

4. Is there a significant difference between minority and nonminority students by gender and grade level (9th, 10th, 11th, and 12th grades) on student grit?

This chapter presents the quantitative findings for each research question in this study. The first section of this chapter will outline the demographic characteristics of each research question. The second section will report the inferential results of each Research Question. For Research Question 1, a stepwise regression was used to measure how well the specified variables predict student course completion numbers in 10^{th}, 11^{th}, and 12^{th} grade. Independent variables within this research question were academic

integration components (years behind cohort, behavior referrals, and attendance) and background factors (race or ethnicity, disability status, English as a second language, socioeconomic status, student resilience, and grit). For Research Question 2, a stepwise regression was used to measure how well the specified variables predict student End of Course (EOC) scale scores. Independent variables within this research question were academic integration components (years behind cohort, behavior referrals, and attendance) and background factors (race or ethnicity, disability status, English as a second language, socioeconomic status, student resilience, and grit). For Research Question 3, a 2 x 2 x 4 factorial ANOVA was conducted to determine if there were differences in resilience levels by gender, grade, and minority status for each dependent variable. For Research Question 4, a 2 x 2 x 4 factorial ANOVA was conducted to determine if there were differences in grit levels by gender, grade, and minority.

Description of the Population

The population utilized in this study was comprised of 9th through 12th grade public charter school students in Georgia during the 2018-2019 school year. The population contained a total of 2,142 participants. Of those 2,142 students, there were 1,895 Total Difficulties Scores, 1,010 Grit Scores, and 383 End of Course (EOC) tests. By content area, the public charter school had 93 Ninth Grade Literature and Composition test, 204 American Literature tests, and 86 GSE Algebra tests. Within the 1,895 Total Difficulties Scores there were 713 12^{th} graders, 452 11^{th} graders, 417 10^{th} graders, and 9^{th} graders were not included in Research Question 1.

Data Analysis

Archival data were utilized in this study to predict the significance of academic and background variables on EOCs and course completions. Generalized linear models and ANOVAs were used in the inferential statistics in this study.

SPSS software were used to conduct both one-way analysis of variance (ANOVA) and a 2 x 2 x 4 factorial ANOVA. All of the data were labeled and variables were coded in SPSS. The label used for the dependent variables in Research Question 1 was CoursesCompleted (number of course completions). The labels used for the dependent variable of EOC scale scores in Research Question 2 were NinthLitComp_SS (Ninth Grade Literature and Composition Scale Score), AmerLitComp_SS (American Literature Composition Scale Score), and GSEAlgebra_SS (Georgia Standards of Excellence Algebra Scale Score). The labels for the independent variables in both Research Question 1 and Research Question 2 were Grade (grade level), Gender (gender), YBCohort (years behind 9^{th} Grade academic cohort), Total_difficulties_score (Total Difficulties Score as measured by the Strengths and Difficulties Questionnaire), GritTotal (Grit score), Referrals (behavior referrals), Race (race), AttendancePercentage (average daily attendance percentage since start date), DisabilityStatus (Student with a disability), ESOL (English as a second language), CoursesCompleted (number of course completions) and SES (socioeconomic status). The labels used for the dependent variables of Research Question 3 and Research Question 4 were Total_difficulties_score (Total Difficulties Score as measured by the Strengths and Difficulties Questionnaire) and GritTotal (Grit score). The labels used for the independent variables of Research

Question 3 and Research Question 4 were Gender (gender), Race (race), and Grade (grade). Coding was used within SPSS for each variable as well.

Specifically, frequencies and percentages were generated for categorical variables (i.e., years behind cohort, student with disability, English as a second language, free and reduced lunch status/socioeconomic status, race and ethnicity, behavior referrals, gender, grade level and course completions). Behavior referrals, student with disability, race or ethnicity, and socioeconomic status from free and reduced lunch forms utilized a two-point scale ranging from 0 (*no*) and 1 (*yes*). Years behind cohort ranged from 0 (*zero years behind cohort*) to 3 (*two or more years behind cohort*). Grit ranged from 0 (*zero being least amount of grit*) to 8 (*being most amount of grit*). Total Difficulties Score ranged from 0 (*zero having the least number of difficult life events*) to 40 (*having the most number of difficult life events*). Course Completions ranged by number of courses completed in the 2018-2019 school year by each individual (*0-13*). Average daily attendance percentage ranged from .00 (*no longer attending*) to 1.00 (*attending every night since enrollment*). End of Course Scale Scores ranged in value from 100-678 depending on the specific test. EOC scale scores determine the student's level of achievement.

Descriptive Statistics

Descriptive statistics for Research Question 1 include academic integration components (years behind cohort, behavior referrals, and attendance) and background factors (race or ethnicity, disability status, English as a second language, socioeconomic status, student resilience, and grit). Sub questions within Research Question 1 identify

each grade level and the corresponding course completions (10th Grade, 11th Grade, and 12th Grade).

Tables 1 and 2 indicate descriptive statistics such as number of subjects, mean, minimum, maximum, standard deviation, and frequency for Research Question 1a. Tables 3 and 4 indicate descriptive statistics such as number of subjects, mean, minimum, maximum, standard deviation, and frequency for Research Question 1b. Tables 5 and 6 indicate descriptive statistics such as number of subjects, mean, minimum, maximum, standard deviation, and frequency for Research Question 1c.

Table 1

Descriptive Statistics Research Question 1a

Variable	*N*	Min	Max	Mean	Std. Deviation
Courses completed	726	0.00	12.00	2.27	2.32
Total difficulties score	713	0.00	31.00	12.31	5.80
Grit	353	1.63	5.00	3.40	0.58
Attendance percentage	726	0.00	0.95	0.22	0.26
Years behind cohort	726	0.00	3.00	0.30	0.51

Table 2

Frequencies and Percentages for Research Question 1a

Variable	Frequency	Percent
Gender		
Male	371	51.1
Female	355	48.9
Referrals		
No referrals	723	99.6
One or more referrals	3	0.4
Race		
Non-minority	568	78.2

Table 2 (continued)

Frequencies and Percentages for Research Question 1a

Minority	158	21.8
Disability status		
No	669	92.1
Yes	57	7.9
ESOL		
No	716	98.6
Yes	10	1.4
SES		
No	186	25.6
Yes	296	40.8
Missing	244	33.6

Table 3

Descriptive Statistics Research Question 1b

Variable	*N*	Min	Max	Mean	Std. Deviation
Courses completed	460	0.00	13.00	1.90	2.38
Total difficulties score	452	0.00	30.00	12.30	5.71
Grit	239	2.25	5.00	3.44	0.54
Attendance percentage	460	0.00	1.00	0.29	0.29
Years behind cohort	460	0.00	3.00	0.44	0.55

Table 4

Frequencies and Percentages for Research Question 1b

Variable	Frequency	Percent
Gender		
Male	220	47.8
Female	240	52.2
Referrals		
No referrals	455	98.9
One or more referrals	5	1.1
Race		
Non-minority	368	80
Minority	92	20
Disability status		
No	418	90.9
Yes	42	9.1
ESOL		
No	450	97.8
Yes	10	2.2
SES		
No	103	22.4
Yes	248	53.9
Missing	109	23.7

Table 5

Descriptive Statistics Research Question 1c

Variable	*N*	Min	Max	Mean	Std. Deviation
Courses completed	426	0.00	12.00	1.42	1.77
Total difficulties score	417	2.00	28.00	13.18	5.68
Grit	223	1.88	5.00	3.40	0.57
Attendance percentage	426	0.00	0.96	0.30	0.26
Years behind cohort	426	0.00	3.00	0.58	0.64

Table 6

Frequencies and Percentages for Research Question 1c

Variable	Frequency	Percent
Gender		
Male	220	51.6
Female	206	48.4
Referrals		
No referrals	418	98.1
One or more referrals	8	1.9
Race		
Non-minority	348	81.7
Minority	78	18.3
Disability status		
No	380	89.2
Yes	46	10.8
ESOL		
No	416	97.7
Yes	10	2.3
SES		
No	77	18.1
Yes	256	60.1
Missing	93	21.8

Descriptive statistics for Research Question 2 include academic integration components (years behind cohort, behavior referrals, attendance, and course completions) and background factors (race or ethnicity, disability status, English as a second language, socioeconomic status, student resilience, and grit). Sub questions within Research Question 2 identify each End of Course test (Ninth Grade Literature, American Literature and Composition, and GSE Algebra I).

Table 7 displays results of descriptive statistics such as number of subjects, mean, minimum, maximum, and standard deviation for research question 2a. Table 8 displays results of descriptive statistics such as number of subjects, mean, minimum, maximum, and standard deviation for research question 2b. Table 9 displays results of descriptive statistics such as number of subjects, mean, minimum, maximum, and standard deviation for research question 2c.

Table 7

Descriptive Statistics by grade Research Question 2a

	Grade	*N*	Min	Max	Mean	Std. Deviation
9	Ninth LitComp SS	33	429.00	600.00	527.45	41.96
	Courses completed	27	1.00	6.00	3.15	1.63
	Total difficulties score	26	4.00	33.00	13.73	6.72
	Grit	23	2.00	4.13	3.22	0.54
	Attendance percentage	27	0.00	0.96	0.48	0.32
	Years behind cohort	27	0.00	1.00	0.32	0.34
10	Ninth LitComp SS	36	404.00	594.00	520.94	43.22
	Courses completed	36	1.00	12.00	4.19	2.46
	Total difficulties score	36	2.00	23.00	12.67	6.31
	Grit	31	2.00	4.25	3.40	0.70
	Attendance percentage	36	0.00	0.91	0.54	0.24
	Years behind cohort	36	0.00	2.00	0.47	0.56
11	Ninth LitComp SS	9	447.00	569.00	513.56	38.22
	Courses completed	9	2.00	13.00	5.00	3.24
	Total difficulties score	9	2.00	24.00	8.78	6.34
	Grit	6	3.00	4.75	3.73	0.60
	Attendance percentage	9	0.28	0.86	0.62	0.17
	Years behind cohort	9	0.00	2.00	0.94	0.63
12	Ninth LitComp SS	15	425.00	605.00	494.73	53.39
	Courses completed	13	1.00	10.00	5.15	2.91
	Total difficulties score	12	4.00	23.00	12.58	6.01
	Grit	9	3.00	3.75	3.47	0.26
	Attendance percentage	13	0.00	0.95	0.66	0.28
	Years behind cohort	13	0.00	3.00	0.85	0.88

Table 8

Descriptive Statistics by grade Research Question 2b

	Grade	*N*	Min	Max	Mean	Std. Deviation
9	AmerLitComp SS	1	529.00	529.00	529.00	.
	Total difficulties score	1	18.00	18.00	18.00	.
	Courses completed	1	7.00	7.00	7.00	.
	Attendance percentage	1	0.00	0.00	0.00	.
	Years behind cohort	1	1.00	1.00	1.00	.
10	AmerLitComp SS	13	406.00	569.00	500.46	46.48
	Total difficulties score	12	3.00	23.00	13.75	5.03
	Courses completed	12	1.00	12.00	3.75	3.70
	Attendance percentage	12	0.00	0.81	0.54	0.24
	Years behind cohort	12	0.00	2.00	0.63	0.74
11	AmerLitComp SS	71	0.00	657.00	491.93	98.09
	Total difficulties score	63	0.00	30.00	12.06	6.18
	Courses completed	64	0.00	13.00	4.66	2.89
	Attendance percentage	64	0.00	0.99	0.45	0.31
	Years behind cohort	64	0.00	2.00	0.45	0.49
12	AmerLitComp SS	119	0.00	678.00	502.82	66.50
	Total difficulties score	97	1.00	30.00	11.29	6.31
	Courses completed	99	1.00	12.00	4.48	2.50
	Attendance percentage	99	0.00	0.95	0.35	0.32
	Years behind cohort	99	0.00	2.00	0.28	0.45

Table 9

Descriptive Statistics by grade Research Question 2c

Grade		*N*	Min	Max	Mean	Std. Deviation
9.0	GSE AlgebraI SS	29	420.00	567.00	497.31	36.74
	Courses completed	23	1.00	5.00	2.35	1.07
	Total difficulties score	23	1.00	25.00	14.39	6.32
	Attendance percentage	23	0.00	0.96	0.54	0.29
	Years behind cohort	23	0.00	3.00	0.44	0.70
10.0	GSE AlgebraI SS	40	400.00	616.00	495.98	45.40
	Courses completed	36	1.00	12.00	3.42	2.44
	Total difficulties score	36	4.00	25.00	12.94	5.74
	Attendance percentage	36	0.00	0.90	0.51	0.25
	Years behind cohort	36	0.00	2.00	0.49	0.60
11.0	GSE AlgebraI SS	10	424.00	561.00	491.90	46.33
	Courses completed	9	2.00	6.00	4.33	1.41
	Total difficulties score	9	3.00	22.00	10.89	5.97
	Attendance percentage	9	0.41	0.86	0.60	0.17
	Years behind cohort	9	0.00	1.50	0.56	0.63
12.0	GSE AlgebraI SS	7	432.00	537.00	479.29	32.15
	Courses completed	7	2.00	10.00	5.00	2.83
	Total difficulties score	7	5.00	16.00	10.86	3.76
	Attendance percentage	7	0.35	0.95	0.77	0.20
	Years behind cohort	7	0.00	3.00	0.86	0.99

Table 10 depicts descriptive statistics for Research Question 3 including grade level, minority status, and gender among those who completed the resilience survey of Total Difficulties.

Table 10

Descriptive Statistics for RQ3

Grade	Race	Gender		*N*	Min	Max	Mean	Std. Deviation
9	White	Male	Total difficulties score	118	1	29	12.67	5.52
		Female	Total difficulties score	116	2	33	14.95	6.24
	Minority	Male	Total difficulties score	45	1	24	10.38	5.47
		Female	Total difficulties score	34	1	22	12.21	5.55
10	White	Male	Total difficulties score	174	2	26	12.68	5.64
		Female	Total difficulties score	166	2	28	14.28	5.66
	Minority	Male	Total difficulties score	41	4	24	11.54	5.24
		Female	Total difficulties score	36	2	26	12.44	5.73
11	White	Male	Total difficulties score	176	1	29	11.44	5.39
		Female	Total difficulties score	188	0	30	13.16	5.86
	Minority	Male	Total difficulties score	41	4	25	13.20	5.79
		Female	Total difficulties score	47	0	25	11.28	5.69
12	White	Male	Total difficulties score	286	0	30	12.00	5.50
		Female	Total difficulties score	271	1	31	13.35	6.03
	Minority	Male	Total difficulties score	77	0	31	11.30	5.67
		Female	Total difficulties score	79	0	24	10.86	5.69

Table 11 depicts descriptive statistics for Research Question 4 including grade level, minority status, and gender among those who completed the Grit survey.

Table 11

Descriptive Statistics for RQ4

Grade	Gender	Race		*N*	Min	Max	Mean	Std. Deviation
9	Male	White	Grit	68	2.00	4.63	3.29	0.52
		Minority	Grit	28	2.50	4.50	3.41	0.48
	Female	White	Grit	77	1.75	4.75	3.19	0.59
		Minority	Grit	22	2.63	4.75	3.42	0.49
10	Male	White	Grit	89	2.00	4.75	3.37	0.56
		Minority	Grit	22	1.88	4.13	3.26	0.52
	Female	White	Grit	93	2.00	4.50	3.46	0.54
		Minority	Grit	19	2.50	5.00	3.46	0.73
11	Male	White	Grit	86	2.25	4.38	3.50	0.52
		Minority	Grit	15	2.63	4.00	3.24	0.39
	Female	White	Grit	105	2.25	5.00	3.41	0.55
		Minority	Grit	33	2.50	4.75	3.45	0.62
12	Male	White	Grit	137	1.63	4.88	3.39	0.63
		Minority	Grit	35	2.63	4.38	3.45	0.46
	Female	White	Grit	140	1.63	5.00	3.43	0.59
		Minority	Grit	41	2.75	4.75	3.33	0.48

Results by Question

Research Question 1

Stepwise regression was used to identify the significant predictor variables towards Course Completions in 12th, 11th, and 10th grade students. The stepwise method in SPSS includes only "significant" predictors in the regression model. The variables that do not contribute to predicting the dependent variable were not included.

Assumptions of multiple regression were assessed before interpreting the results. The dependent variables were checked for normality via Shapiro-Wilk test. This was significant (< .05) for RQ1 data and thus results are interpreted using Adjusted R-squared

rather than R-squared. Variance inflation factor (VIF) and tolerance were checked to see if the data met the assumption of multicollinearity. All tolerances were over .2, and all VIFs were under 10 indicating that multicollinearity was not a concern. The residuals statistics table and P-P plots were evaluated to check the variance of residuals and their distribution. Standardized residuals demonstrated a few points were just outside of the range of normality of -3 To 3. The P-P plots also displayed some deviation from the line, however, only extreme deviations from normality are likely to impact the results. The presence of outliers was checked via Cooks distance with all values lower than 1.0, suggesting no value would greatly influence the results.

Research Question 1a.

The best predictor of 12th grade Course Completions, identified via stepwise regression, was Total Difficulties Score (R^2 = .04, F(1, 251) = 9.36, p = .002) explaining 4% of the variability. The relationship between Total Difficulties Dcore and 12th grade Course Completions was negative (B = -0.09, p = .002). The addition of the variables Attendance Percentage, Years Behind Cohort, and Disability Status increased the predictive power in the final model (R^2 = .11, F(1, 251) = 7.23, p < .001). Thus, the coefficient of determination indicates that the proportion of variability accounted for by the final model was 11%. Attendance Percentage was positively related to 12th grade Course Completions, while all other significant variables were negatively related (see Table 12 for the regression coefficients at each step).

Table 12

Coefficients for RQ 1a Predicting 12th Grade Course Completions

Model		Unstandardized Coefficients *B*	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	*t*	Sig.
1	(Constant)	4.05	0.39		10.46	< .001
	Total difficulties score	-0.09	0.03	-0.19	-3.06	.002
2	(Constant)	3.59	0.41		8.78	< .001
	Total difficulties score	-0.09	0.03	-0.20	-3.28	.001
	Attendance percentage	1.79	0.59	0.19	3.06	.002
3	(Constant)	3.82	0.42		9.13	< .001
	Total difficulties score	-0.09	0.03	-0.20	-3.29	.001
	Attendance percentage	1.81	0.58	0.19	3.11	.002
	Years behind cohort	-0.69	0.31	-0.14	-2.25	.025
4	(Constant)	3.84	0.42		9.25	< .001
	Total difficulties score	-0.09	0.03	-0.19	-3.16	.002
	Attendance percentage	1.94	0.58	0.20	3.34	.001
	Years behind cohort	-0.71	0.31	-0.14	-2.31	.022
	Disability status	-1.06	0.52	-0.12	-2.04	.042

Research Question 1b.

The best predictor of 11th grade Course Completions, identified via stepwise regression, was Attendance Percentage ($R^2 = .07$, $F(1, 190) = 14.02$, $p < .001$) explaining 7% percent of the variability. The relationship between Attendance Percentage and 11th grade Course Completions was positive ($B = 2.42$, $p < .001$). The addition of the variables Grit and SES increased the predictive power in the final model ($R^2 = .15$, $F(3, 190) = 10.80$, $p < .001$) explaining 15% percent of the variability. Thus, the coefficient of determination indicates that the proportion of variability accounted for by the final model was 15%. Grit was positively correlated, while SES (free and reduced lunch forms) was negatively correlated. Table 13 displays the regression coefficients at each step.

Table 13

Coefficients for RQ 1b Predicting 11th Grade Course Completions

		Unstandardized Coefficients		Standardized Coefficients		
	Model	*B*	Std. Error	Beta	*t*	Sig.
1	(Constant)	1.48	0.30		5.01	< .001
	Attendance percentage	2.42	0.65	0.26	3.74	< .001
2	(Constant)	-2.06	1.14		-1.82	.071
	Attendance percentage	2.17	0.64	0.24	3.41	.001
	Grit	1.05	0.33	0.22	3.23	.001
3	(Constant)	-1.49	1.14		-1.31	.193
	Attendance percentage	2.00	0.63	0.22	3.18	.002
	Grit	1.11	0.32	0.24	3.47	.001
	SES	-1.00	0.39	-0.17	-2.56	.011

Research Question 1c.

The best predictor of 10th grade Course Completions, identified via stepwise regression, was Attendance Percentage (R^2 = .17, $F(1, 178) = 36.88$, $p < .001$) explaining 17 % percent of the variability. The relationship between Attendance Percentage and 10th grade Course Completions was positive ($B = 3.91$, $p < .001$). The addition of the variable Race increased the predictive power (R^2 = .196, $F(2, 178) = 21.395$, $p < .001$) explaining 20% percent of the variability. Race was negatively related to Course Completions. Thus, the coefficient of determination indicates that the proportion of variability accounted for by the final model was 20%. Table 14 displays the regression coefficients at each step.

Table 14

Coefficients for RQ 1c Predicting 10th Grade Course Completions

Model		*B*	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	*t*	Sig.
1	(Constant)	0.57	0.29		1.93	.055
	Attendance percentage	3.91	0.64	0.42	6.07	< .001
2	(Constant)	0.65	0.29		2.20	.029
	Attendance percentage	4.08	0.64	0.43	6.37	< .001
	Race	-0.89	0.40	-0.15	-2.25	.026

Research Question 2

Stepwise regression was used to identify the significant predictor variables towards EOC scale scores in Research Question 2a, 2b, and 2c. The stepwise method in SPSS includes only "significant" predictors in the regression model. The variables that do not contribute to predicting the dependent variable were not included. As well, variables with more than 25% of values missing were excluded from analyses. Thus, Grit was excluded from many subquestions.

Assumptions of multiple regression were assessed before interpreting the results. The dependent variables were checked for normality via Shapiro-Wilk test. When significant (< .05) the results of regression analyses are interpreted using Adjusted R-squared rather than R-squared. Variance inflation factor (VIF) and tolerance were checked to see if the data met the assumption of multicollinearity. All tolerances were over .2, and all VIFs were under 10 indicating that multicollinearity was not a concern. Residuals statistics tables and P-P plots were evaluated to check the variance of residuals and their distribution. The P-P plots for RQ2b were slightly abnormal, however, only extreme deviations from normality are likely to impact the results. The presence of

outliers was checked via Cooks distance with a few values above 1.0, (one within the RQ2b dataset, and one within RQ2c data set) suggesting no great influence on the results.

Research Question 2a.

For research question 2a stepwise multiple regression analysis was used to find predictors of Ninth Grade Literature and Composition scores among 9th, 10th, 11th, and 12th grade students. Grades 9, 11, & 12 did not have enough variables or were no significant relationships, so no analyses were completed.

The best predictor of Ninth Grade Literature and Composition score among 10th grade students, identified via stepwise regression, was disability status ($R^2 = .39$, $F(1, 27) = 16.44$, $p < .001$) explaining 39% of the variability. Though the EOC test is called Ninth Grade Literature and Composition it is possible for students in any grade to take this test. Due to the demographics of this population the majority of Ninth Grade Literature and Composition test takers are in 10th grade in this system. The correlation between disability status and Ninth Grade Literature and Composition score was negative ($B = -86.05$, $p < .001$). The addition of the variable Courses Completed increased the predictive power in the final model ($R^2 = .51$, $F(2, 27) = 12.82$, $p < .001$) explaining 51% of the variability. Thus, the coefficient of determination indicates that the proportion of variability accounted for by the final model was 51%. Course Completion was positively related to Ninth Grade Literature and Composition score ($B = 6.03$, $p = .022$). Table 15 displays the regression coefficients at each step.

Table 15

Coefficients for RQ 2a Predicting 10th Grade NinthLitComp Score

Grade		Model	Unstandardized Coefficients		Standardized Coefficients		
			B	Std. Error	Beta	*t*	Sig.
10	1	(Constant)	530.72	6.95		76.39	< .001
		Disability status	-86.05	21.23	-0.62	-4.05	< .001
	2	(Constant)	503.45	12.82		39.27	< .001
		Disability status	-84.93	19.44	-0.61	-4.37	< .001
		Courses completed	6.03	2.46	0.35	2.45	.022

Research Question 2b.

Research Question 2b utilized stepwise multiple regression analysis to find predictors of American literature and Composition score among 9th, 10th, 11th, and 12th grade students. Grades 9 and 12 did not have enough variables or there were no relationships, so no analyses were completed.

The best predictor of American Literature Composition score among 10th grade students, identified via stepwise regression, was Total Difficulties Score (R^2 = .45, F(1, 11) = 8.14, p = .017) explaining 45% of the variability. The relationship between Total Difficulties Score and American Literature Composition score was positive (B = 6.47, p = .017). The addition of the variables Race and Courses Completed increased the predictive power in the final model (R^2 = .92, F(3, 11) = 28.80, p < .001) explaining 92% of the variability. Thus, the coefficient of determination indicates that the proportion of variability accounted for by the final model was 92%. Race and course completions were positively related to American Literature Composition score.

The best predictor of among 11th grade students of American Literature Composition score, identified via stepwise regression, was Courses Completed (R^2 = .10, $F(1, 62) = 6.55$, p = .013) explaining 10% of the variability. The relationship between Courses Completed and American Literature Composition score was positive (B = 11.09, p = .013). The addition of the variable Attendance Percentage increased the predictive power (R^2 = .18, $F(2, 62) = 6.56$, p = .003) explaining 18% of the variability. Thus, the coefficient of determination indicates that the proportion of variability accounted for by the final model was 18%. The relationship between Attendance Percentage and American Literature Composition score was positive (B = 96.76, p = .017). Table 16 displays the regression coefficients at each step for each grade with a significant result.

Table 16

Coefficients for RQ 2b Predicting 10th and 11th Grade American Literature Composition Score

			Unstandardized Coefficients	Standardized Coefficients		
Grade	Model	*B*	Std. Error	Beta	*t*	Sig.
10	1 (Constant)	411.43	33.01		12.46	< .001
	Total difficulties score	6.47	2.27	0.67	2.85	.017
	2 (Constant)	405.06	25.05		16.17	< .001
	Total difficulties score	5.91	1.72	0.61	3.43	.007
	Race	55.88	19.16	0.52	2.92	.017
	3 (Constant)	413.80	14.67		28.21	< .001
	Total difficulties score	3.09	1.19	0.32	2.59	.032
	Race	69.59	11.56	0.65	6.02	< .001
	Courses completed	7.10	1.64	0.54	4.33	.003
11	1 (Constant)	438.23	23.81		18.41	< .001
	Courses completed	11.09	4.33	0.31	2.56	.013
	2 (Constant)	383.65	31.91		12.02	< .001
	Courses completed	13.47	4.28	0.38	3.15	.003
	Attendance percentage	96.76	39.41	0.30	2.46	.017

Research Question 2c.

Research Question 2c used stepwise multiple regression analysis to find predictors of GSE Algebra Scores among 9th, 10th, 11th, and 12th grade students. Grades 9 & 12 did not have enough variables or there were no relationships, so no analyses were completed.

The best predictor of among 10th grade students of GSE Algebra score, identified via stepwise regression, was Disability Status (R^2 = .24, $F(1, 31) = 9.24$, p = .005) explaining 24% of the variability. The relationship between Disability Status and GSE Algebra score was negative (B = -59.64, p = .005). The addition of the variables Courses Completed and Total Difficulties Score increased the predictive power of the final model (R^2 = .50, $F(3, 31) = 9.42$, $p < .001$) explaining 50% of the variability. Thus, the coefficient of determination indicates that the proportion of variability accounted for by the final model was 50%. Course completions and Total Difficulties Score were positively related to GSE Algebra score.

The only significant predictor of among 11th grade students of GSE Algebra score, identified via stepwise regression, was Disability Status (R^2 = .58, $F(1, 7) = 8.41$, p = .027) explaining 58% of the variability. Thus, the coefficient of determination indicates that the proportion of variability accounted for by the final model was 58%. The relationship between Disability Status and GSE Algebra score was negative (B = -67.33, p = .027) is negative. Table 17 displays the regression coefficients at each step for each grade.

Table 17

Coefficients for RQ 2c Predicting 10th and 11th Grade GSE Algebra Score

Grade		Model	Unstandardized Coefficients *B*	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	*t*	Sig.
10	1	(Constant)	510.04	7.76		65.77	< .001
		Disability status	-59.64	19.62	-0.49	-3.04	.005
	2	(Constant)	480.47	12.11		39.66	< .001
		Disability status	-52.65	17.63	-0.43	-2.99	.006
		Courses completed	8.07	2.71	0.43	2.97	.006
	3	(Constant)	451.97	17.10		26.43	< .001
		Disability status	-44.89	16.90	-0.37	-2.66	.013
		Courses completed	7.33	2.57	0.39	2.85	.008
		Total difficulties score	2.33	1.04	0.31	2.23	.034
11	1	(Constant)	495.33	11.61		42.67	< .001
		Disability status	-67.33	23.22	-0.76	-2.90	.027

Research Question 3

To address Research Question 3, a 2 x 2 x 4 factorial ANOVA was conducted to determine if there are differences in resilience levels by gender, grade, and minority status for each dependent variable. The independent variables included in the ANOVA were gender (coded as male or female), grade (coded as 9, 10, 11, or 12), and minority status (coded as white or minority). The dependent variable was resilience (i.e., total difficulties score). Only cases with resilience scores were included in the analysis; there were no missing data for the independent variables.

The assumptions of ANOVA were assessed before interpreting the results of the analysis. Outliers were checked by calculating z-scores for resilience. According to Tabachnick and Fidell (2013) z-scores greater than 3.00 in magnitude may be considered outliers. Eight outliers were identified and replaced with the next closest value (233 Grade 9, white, female: replace 32 with 29; 234 Grade 9, white, female: replace 33 with 29; 1094 Grader 11, white, female: 30 with 29; 1467: Grade 12, white, male: 30 with 29;

1468: Grade 12, white, female: 30 with 29; 1738: Grade 12, white, female: 30 with 29; 1739: Grade 12, white, female: 31 with 29; 1816: Grade 12, minor, male: 31 with 29).

The collected data met the assumptions of an interval or ratio-level dependent variable and independence of observations. Resilience is an interval level dependent variable. All observations were independent of each other and no same student was counted more than once; all scores came from different students thus counting for independence of observations. A Shapiro-Wilk test was conducted to test for a normal distribution on resilience. The Shapiro-Wilk test was significant ($p < .001$), indicating the distribution of resilience was significantly different from a normal distribution. However, as this test is sensitive to sample size, normality also was examined through skewness and kurtosis values (Stevens, 2009). According to Westfall and Henning (2013), skewness values greater than 2 in magnitude and kurtosis values greater than 3 in magnitude indicate marked deviations from normality. The skewness (0.34) and kurtosis (-0.20) values were within normal limits, so the analysis was continued. Finally, Levene's test was run to test the assumption of homogeneity of variance. The results of Levene's test were not significant ($p = .939$), indicating the assumption was met.

Table 18 displays the results of the ANOVA. The main effect of gender was significant, $F(1, 1879) = 7.42$, $p = .007$, indicating that females ($M = 13.28$, $SD = 5.97$) had higher resilience scores than males ($M = 12.00$, $SD = 5.54$). The main effect of minority status was significant, $F(1, 1879) = 17.74$, $p < .001$, indicating that White students ($M = 12.94$, $SD = 5.80$) had higher resilience scores than minority students ($M = 11.51$, $SD = 5.63$). However, these main effects are qualified by a significant interaction between gender and minority status, $F(1, 1879) = 5.96$, $p = .015$. Pairwise comparisons

revealed that White females (M = 13.93, SE = 0.22) had higher resilience scores than White males (M = 12.20, SE = 0.22, $p < .001$), but there was no difference in the resilience scores of minority females and males (p = .874). No other main effects or interactions were significant. Overall, the results indicate that there was a significant difference between minority and nonminority students by gender, but not by grade, on student resilience.

Table 18

ANOVA Comparing Gender, Minority Status, and Grade on Resilience

Source	Sum of Squares	*df*	Mean Square	*F*	Sig.	Partial Eta Squared
Gender	241.36	1	241.36	7.42	.007	0.004
Minority status	577.25	1	577.25	17.74	< .001	0.009
Grade	147.20	3	49.07	1.51	.211	0.002
Gender * Minority	193.92	1	193.92	5.96	.015	0.003
Gender * Grade	175.88	3	58.63	1.80	.145	0.003
Minority * Grade	203.99	3	68.00	2.09	.100	0.003
Gender * Minority * Grade	105.19	3	35.06	1.08	.357	0.002
Error	61150.61	1879	32.54			

Research Question 4

To address Research Question 4, a 2 x 2 x 4 factorial ANOVA was conducted to determine if there are differences in grit scores by gender, grade, and minority status for each dependent variable. The independent variables included in the ANOVA were gender (coded as male or female), grade (coded as 9, 10, 11, or 12), and minority status (coded as white or minority). The dependent variable was grit score. Only cases with grit scores were included in the analysis; there were no missing data for the independent variables.

The assumptions of ANOVA were assessed before interpreting the results of the analysis. Outliers were checked by calculating z-scores for grit scores. According to Tabachnick and Fidell (2013), z-scores greater than 3.00 in magnitude may be considered outliers. Two outliers were identified (658: Grade 10, minority, male. Replaced 1.625 with 1.750; 830: Grade 11, White, Male. Replaced 1.625 with 1.750).

The collected data met the assumptions of an interval or ratio-level dependent variable and independence of observations. Grit is an interval level dependent variable. All observations were independent of each other and no same student was counted more than once; all scores came from different students thus counting for independence of observations. A Shapiro-Wilk test was conducted to test for a normal distribution on grit. The Shapiro-Wilk test was significant ($p < .001$), indicating the distribution of grit scores was significantly different from a normal distribution. However, as this test is sensitive to sample size, normality was checked by examining skewness and kurtosis values (Stevens, 2009). According to Westfall and Henning (2013), skewness values greater than 2 in magnitude and kurtosis values greater than 3 in magnitude indicate marked deviations from normality. The skewness (-0.01) and kurtosis (0.05) values were within normal limits, so the analysis was continued. Finally, Levene's test was run to test the assumption of homogeneity of variance. The results of Levene's test were not significant ($p = .125$), indicating the assumption was met.

Table 19 displays the results of the ANOVA. No main effects or interactions were significant. Overall, the results indicate that there were no significant differences between minority and nonminority students by gender or grade on student grit scores.

Table 19

ANOVA Comparing Gender, Minority Status, and Grade on Grit

Source	Sum of Squares	*df*	Mean Square	*F*	Sig.	Partial Eta Squared
Gender	0.15	1	0.15	0.47	.492	0.000
Minority status	0.00	1	0.00	0.01	.946	0.000
Grade	0.57	3	0.19	0.60	.613	0.002
Gender * Minority	0.30	1	0.30	0.95	.329	0.001
Gender * Grade	0.94	3	0.31	0.99	.396	0.003
Minority * Grade	1.68	3	0.56	1.77	.152	0.005
Gender * Minority * Grade	1.23	3	0.41	1.29	.276	0.004
Error	314.93	994	0.32			

Summary

The primary purpose was to determine if there were academic and background variables that significantly predict course completions and EOC scores in at-risk high school students from data collected in the 2018-2019 school year. The secondary purpose was to gain an understanding of grit and resilience among gender, minority, and nonminority high school students in the 2018-2019 school year. Four research questions guided this study.

To answer Research Question 1 a stepwise regression was used to identify the significant predictor variables towards Course Completions in 12th, 11th, and 10th grade students. The stepwise method in SPSS includes only "significant" predictors in the regression model. The variables that do not contribute to predicting the dependent variable were not included.

Results for this research question indicated significant predictors of Total Difficulties Scores, Attendance Percentage, Years Behind Cohort, Disability Status, Race, Grit, and Socioeconomic Status (SES) among 10th, 11th, and 12th grade Course

Completions. Total Difficulties Score was the best predictor among 12th grade Course Completions explaining 4% of the variability. The addition of the variables Attendance Percentage, Years Behind Cohort, and Disability Status increase the predictive power to 11%. Attendance Percentage was the best predictor among 11th grade Course Completions explaining 7% of the variability. The addition of the variables Grit and SES increase the predictive power to 15%. Attendance Percentage was the best predictor among 10th grade Course Completions explaining 17% of the variability. The addition of the variable Race increase the predictive power to 20%. Overall, among Research Question 1 sub questions, 10th grade Course Completions have the highest single predictive variable of Attendance Percentage at 17%. As well, 10th grade Course Completions have the highest set of significant predictor variables with the addition of Race increasing the predictive power to 20%.

For Research Question 2 stepwise regression was used to identify the significant predictor variables towards EOC scale scores in Research Question 2a, 2b, and 2c. The stepwise method in SPSS includes only "significant" predictors in the regression model. The variables that do not contribute to predicting the dependent variable were not included.

Results for this research question indicated significant predictors of Total Difficulties Score, Disability Status, Course Completions, and Attendance Percentage among EOC Scale Scores. Grades 9 and 12 did not have any significant predictors among any EOC Scale Scores. Ninth Grade Literature and Composition scale scores have significant predictors among 10th grade students. Disability Status was the best predictor among 10th grade Ninth Grade Literature and Composition scale scores

explaining 39% of the variability. The addition of Course Completions increase the predictive variability to 51%. American Literature and Composition scale scores have significant predictors among 10th and 11th grade students. Total Difficulties Score was the best predictor among 10th grade American Literature and Composition scale scores explaining 45% of the variability. The addition of Race and Course Completions increase the predictive variability to 92%. Among 11th grade American Literature and Composition scale scores Course Completions explain 10% of the variability. The addition of Attendance Percentage increase the predictive variability to 18%. GSE Algebra scale scores have significant predictors among 10th and 11th grade students. Disability Status was the best predictor among 10th grade GSE Algebra scale scores explaining 24% of the variability. The addition of Course Completions and Total Difficulties Score increase the predictive variability to 50%. Disability Status was the only predictive variable in 11th grade GSE Algebra scale scores explaining 58% of the variability. Overall, within Research Question 2 sub questions, the best predictive variability was among 10th grade American Literature and Composition scale scores. 10th grade American Literature and Composition scale scores have the single variable significance of Total Difficulties Score at 45%. As well, the addition of Race and Course Completion increase the predictive variability to the highest overall amount of 92%.

Both Research Question 1 and 2 indicate 10th grade students having the highest predictive variables available. Several variables repeat across both Research Question 1 and Research Question 2. Variables that were tested yet produced no predictive variability were the variables English as a Second Language and Behavior Referrals. Research Question 1 and 2 had more significant variables in the background factors

component. Research Question 1 had five significant variables in background factors and 4 in academic factors. Research Question 2 had six significant variables in background factors and 5 in academic factors. However, Attendance Percentage was the most re-occurring variable in Research question 1, which comes from the academic component. As well, Course Completions was the most re-occurring variable in Research Question 2, which comes from the academic component.

To address Research Question 3, a 2 x 2 x 4 factorial ANOVA was conducted to determine if there are differences in resilience levels by gender, grade, and minority status for each dependent variable. The independent variables included in the ANOVA were gender (coded as male or female), grade (coded as 9, 10, 11, or 12), and minority status (coded as white or minority). The dependent variable was resilience (i.e., total difficulties score). Only cases with resilience scores were included in the analysis; there were no missing data for the independent variables.

Results for this research question indicated a significant main effect of gender. Thus, results indicated females had higher resilience scores than males. As well, another main effect of minority was significant. Thus, results indicated White students had higher resilience scores than minority students. A significant interaction between gender and minority revealed that White females had higher resilience scores than that of White females. However, no difference in resilience was revealed among minority females and minority males. No other main effects or interactions were significant.

For Research Question 4, a 2 x 2 x 4 factorial ANOVA was conducted to determine if there are differences in grit scores by gender, grade, and minority status for each dependent variable. The independent variables included in the ANOVA were

gender (coded as male or female), grade (coded as 9, 10, 11, or 12), and minority status (coded as white or minority). The dependent variable was grit score. Only cases with grit scores were included in the analysis; there were no missing data for the independent variables. Results for this research question indicated no significant main effects or interactions.

Chapter V

SUMMARY AND DISCUSSION

This chapter will make connections with the aforementioned research literature to the study conducted, discuss the findings and results, provide implications of the findings, review the limitations and assumptions, and explore opportunities for future research. The purpose of this quantitative study was twofold. The primary purpose was to investigate if there were academic and background variables that significantly predict course completions and EOC scores in at-risk, or academically underachieving, high school students from data collected in the 2018-2019 school year. This study was an attempt to determine what type of predictive relationship specific variables, such as grit and resilience, have on academically underachieving students' success in high school. Seidman (1996) confirmed early identification and mediation in at-risk students are necessary to reduce the dropout rate among this population. This study explored the academic success factors in the at-risk students Seidman discusses. The population within this study have typically failed at least one class, but more so, an entire grade level. In fact, the average of over 1,000 students in this study are close to half a year behind their 9th grade entry date by the time they entered this system. A secondary purpose of this study was to investigate the connection between minority students and nonminority students, grade level, grit, and resilience. Four research questions guided this study.

Due to Georgia having one of the highest dropout rates in the United States it is imperative to actively research possible early warning signs of high school students,

particularly with at-risk high school students (McFarland et al., 2016; Mehta, 2015). This study challenged the emphasis of cognitive factors as a means for academic achievement. Many scholars have studied the relationship of noncognitive factors on individuals (Duckworth, 2016; Dweck, 2008; Hanson & Kim, 2007). Rather than simply exploring cognitive variables such as GPA, test scores, or other academic variables, this study examined both cognitive and noncognitive. As well, a review of research literature indicated the majority of this research was targeted towards high achieving individuals. Thus, indicating a gap in the research with regard to underperforming high school students. Consequently, this study specifically targeted a population of statistically underachieving students to explore predictive variables of academic success. Therefore, knowing whether or not the variables within this study positively impacts underperforming high school students could help determine intervention models for systems with academically underperforming and at-risk student populations.

The first two research questions examined the predictive relationship of both academic and background variables with regard to academic progress and academic achievement. As one examines the results of the study, one begins to notice several trends indicative of complex interactions. On the surface, it does appear that merit for both the academic and the background variables utilized in the study exists. On a deeper level, the interactions explored present a myriad of implications to include both operational and policy factors. In an effort to underscore the importance of these implications, it is vital to discuss the connections made between the results of this study and the theoretical framework cited. With that being stated, Bandura's (1986) work on sources of self-efficacy; Duckworth's (2016) work with grit/resiliency; and Tracey's and

Sedlacek's (1986) work on noncognitive variables are important to the discussion of the research findings. This study used archival data to determine the relationship or lack of relationship between academic and background information. The system used in this study utilize several intake surveys, therefore, the Strengths Difficulties Questionnaires and Grit-S survey were available. Many results agreed with findings in the literature while some results did not.

This study included 2,142 students grades 9-12 in a Georgia public charter High School. Of those 2,142 students, there were 1,895 Total Difficulties Scores, 1,010 Grit Scores, and 383 End of Course (EOC) tests. By content area, the public charter school had 93 Ninth Grade Literature and Composition test, 204 American Literature tests, and 86 GSE Algebra tests. Within the 1,895 Total Difficulties Scores there were 713 12^{th} graders, 452 11^{th} graders, 417 10^{th} graders, and 9^{th} graders were not included in Research Question 1. Archival data were gathered from the 2018-2019 school year to predict the significance of academic and background variables on EOCs and course completions. SPSS software were used to conduct both one-way analysis of variance (ANOVA) and a 2 x 2 x 4 factorial ANOVA.

Quantitative Findings

The first research question tested possible predictive relationships that may or may not exist between academic variables (years behind cohort, behavior referrals, and attendance) and background variables (race or ethnicity, disability status, English as a second language, socioeconomic status, student resilience, and grit) with Course Completions in 12^{th}, 11^{th}, and 10^{th} grade students. To answer this research question a stepwise regression was used to identify the significant predictor variables towards

Course Completions in 12th, 11th, and 10th grade students. The stepwise method in SPSS includes only "significant" predictors in the regression model. The variables that do not contribute to predicting the dependent variable were not included.

Results for this research question indicated significant predictors of Total Difficulties Scores, Attendance Percentage, Years Behind Cohort, Disability Status, Race, Grit, and Socioeconomic Status (SES) among 10th, 11th, and 12th grade Course Completions. Total Difficulties Score was the best predictor among 12th grade Course Completions and the addition of the variables Attendance Percentage, Years Behind Cohort, and Disability Status significantly increase the predictive power. Attendance Percentage was the best predictor among 11th grade Course Completions and the addition of the variables Grit and SES significantly increase the predictive power. Attendance Percentage was the best predictor among 10th grade Course Completions and the addition of the variable Race significantly increase the predictive power. Attendance Percentage in 10th grade Course Completions had the highest single predictive variable.

The second research question tested possible predictive relationships that may or may not exist between academic variables (years behind cohort, behavior referrals, attendance, and course completions) and background variables (race or ethnicity, disability status, English as a second language, socioeconomic status, student resilience, and grit) with End of Course (EOC) scale scores in 9th, 10th, 11th, and 12th grade students. To answer this research question a stepwise regression was used to identify the significant predictor variables towards EOCs in 9th, 10th, 11th, and 12th grade students. The stepwise method in SPSS includes only "significant" predictors in the regression

model. The variables that do not contribute to predicting the dependent variable were not included.

Results for this research question indicated significant predictors of Total Difficulties Score, Disability Status, Course Completions, and Attendance Percentage among EOC Scale Scores by grade level. Grades 9 and 12 did not have any significant predictors among any EOC Scale Scores. Disability Status was the best predictor among 10th grade Ninth Grade Literature and Composition scale scores and the addition of Course Completions significantly increase the predictive variability. Total Difficulties Score was the best predictor among 10th grade American Literature and Composition scale scores and the addition of Race and Course Completions significantly increase the predictive variability. Course Completions were the best predictor among 11th grade American Literature and Composition scale scores and the addition of Attendance Percentage significantly increase the predictive variability. Disability Status was the best predictor among 10th grade GSE Algebra scale scores and the addition of Course Completions and Total Difficulties Score significantly increase the predictive variability. Disability Status was the only predictive variable in 11th grade GSE Algebra scale scores. Overall, within Research Question 2 sub questions, the best predictive variability was among 10th grade American Literature and Composition scale scores. Total Difficulties Score had the highest single predictive variable.

The third research question tested if there were differences in resilience levels by gender, grade, and minority status for each dependent variable. To answer this research question a 2 x 2 x 4 factorial ANOVA was conducted. Results for this research question indicated a significant main effect of gender. Thus, results indicated females had higher

resilience scores than males. As well, another main effect of minority was significant. Thus, results indicated White students had higher resilience scores than minority students. A significant interaction between gender and minority revealed that White females had higher resilience scores than that of White females. However, no difference in resilience was revealed among minority females and minority males. No other main effects or interactions were significant.

The fourth research question tested if there were differences in grit levels by gender, grade, and minority status for each dependent variable. To answer this research question a 2 x 2 x 4 factorial ANOVA was conducted.

Discussion of Results

The social cognitive theory led this research study's theoretical framework (Bandura, 1986). Bandura challenged traditional cognitive beliefs and conceived the significance of combining the person, environment, and environment as key factors in an individual's capacity to learn. This echoes the researcher Tinto's (1975) work which connects academic and environmental constructs in regards to academic performance. Bandura's research colleague, Skinner, reiterated the intertwined nature and importance of cognitive processes and environmental surroundings (Bandura, 1997). Findings within the present study agree with the theory presented by Bandura and Tinto suggesting multiple constructs can affect academic achievement. More specifically, the variables such as Attendance, Courses Completed, Total Difficulties Score, and Disability Status appear multiple times as having either significant positive or significant negative correlations. Strangely, Total Difficulties Score, calculated through the Strengths and Difficulties Questionnaire, had both a significant positive and significant negative

correlation in the present study. As an assessment tool, this questionnaire was used exclusively in research focusing on resilience. The Total Difficulties Score had a negative influence on overall Courses Completed but did not appear to influence other specific classes or test scores in the same way. It appears students with lesser difficulties through life tend to do better on overall Course Completions. Thus, indicating students with difficult life events might benefit from resilience initiatives. This is in line with Duckworth's (2017) definition of resilience as individuals who build strength in the face of obstacles.

Tracey and Sedlacek (1986) confirmed the importance of understanding the noncognitive variables associated with academic achievement. The Total Difficulties Score presented stronger predictive correlations more often than that of the Grit Score. One possible explanation is related to the comprehensive nature of the Strengths Difficulties Questionnaire (Total Difficulties Score) compared to the brief nature of the Grit-S Scale. Another explanation involves the transient nature of the student population involved in the study. It was possible to capture more student responses and receive a Total Difficulties Score while comparing the relationship with academic constructs. By assessing these two variables specifically, and predominately looking into grit and resilience, this further enhances the research by Tracey and Sedlacek. Specifically, students coming from low socioeconomic backgrounds may endure significant challenges, which indicates the intermingling of self-efficacy and resilience or grit within at-risk students (Salvi, 2017). Accordingly, a range of between 40 to 60 percent of the collective results were considered to fall into the low socioeconomic background in this study. Knowing whether or not the trait of grit and resilience positively impact

underperforming high school students can help determine intervention models for an at-risk student population. Therefore, with a clarified intervention model, the fostering of noncognitive variables in life or school may, in turn, develop self-efficacy (Salvi, 2017).

Early warning signs are crucial in identifying at-risk students (Heppen and Bowles, 2008). According to Alexander et al. (2001) and Jimerson et al. (2000), a student does not make the decision to drop out based on one single factor; rather, a student is swayed, over time, by a multitude of factors. The results of the Strengths and Difficulties Questionnaire which result in the Total Difficulties Score of each student in this study indicated several adverse childhood experiences and could be identified as an early warning sign. Likewise, Hammond et al.'s (2007) meta-analysis was pivotal in the identification of risk factors and variables tested within this research study, specifically within the domain of individual student risk factors. Conversely, multiple variables such as Disability Status, Attendance Percentage, and Socioeconomic Status were significant predictors of success in both Hammond et al.'s research and the current study. This study does not intend to limit the possibility of predictive relationships of specific variables on academic achievement. Rather, this study aims to further recognize and understand the vast number of variables, both cognitive and noncognitive, that can have a predictive relationship on academic achievement. Thus, this research study agrees with scholars Allensworth and Easton (2007) in the appreciation of and the importance of understanding multiple variables can help predict or determine the overall academic success of a student. Further, the variables such as Total Difficulties Scores, Attendance Percentage, Years Behind Cohort, Disability Status, Race, Grit, Socioeconomic Status

(SES), and Course Completions all had strong correlations with predicting academic achievement.

An operational understanding of resilience is key to understanding the basic tenets of this research. Duckworth's work provides descriptors that help to clarify this concept. Additional writers have captured the concept of resilience in a manner that illuminates personal connection and relevance. For example, Walsh (2006) describes resilience as one's ability to "bounce back." The idea of bouncing back provides a context denoting an individual has experienced something that has injected stress and/or discomfort into their life. This correlates with the findings in this study and the number of stressful or difficult experiences in the population studied. In fact, Walsh continues to develop this idea through the use of words and phrases such as rebounding and reorganizing adaptively to fit new challenges. Moreover, Robert Wicks (2010) suggests that each individual has a range of resilience. In other words, Wicks says, "the ability to meet, learn from, and not be crushed by the challenges and stresses of life," (2010, p. 3). It is worth noting that adverse childhood experiences can have a negative impact on educational attainment. Therefore, it is important to note the connection within this study's population of having a higher, or more, Total Difficulties Score had lower course completions. Students that have left the traditional high school setting and who are engaged in a non-traditional program have typically had something go awry. They are not on the traditional educational trajectory. The students participating in this study are examples of this type of situation. One could argue that these students are already leaps and bounds more gritty and more resilient than their academically similar peers due to the sole fact that they have chosen to come back to school. They have re-engaged in the

pursuit of a secondary education. With that in mind, it is imperative to recognize that many of the students involved are presently working through their range of resilience. In other words, perhaps the "snapshot" of data represents students at varying degrees, phases, and levels of resilience.

Interestingly, the National Dropout Prevention Center (Gailer, Addis, & Dunlap, 2018) recently published *Improving School Outcomes for Trauma Impacted Students.* This article breaks down the variable of resilience and the important role it plays within a population very similar to the one presented in this study. In a 5-step approach, this organization explores the fact that having an understanding of one's own difficulties and strengths leads to important outcomes with student's skill acquisitions and in effect learning and achievement. Specifically, the National Dropout Prevention Center reveal, "Knowing how trauma influences behavior and learning, meeting the resiliency needs of traumatized students, and skillfully applying skilled actions are more likely to produce the desired student outcomes than simply knowing about trauma," (Gailer, Addis, & Dunlap, 2018, p. 8). It appears the students within the current study understand their own difficulties through the results of the Strengths Difficulties Questionnaire. Nonetheless, it is now up to the system to meet the resiliency needs of these students to ascertain the positive academic achievement results that may ensue.

Implication of Findings

Just as the research questions are twofold, so are the results. The results of this study both support prior research findings and contribute new knowledge to the field. Consistent with the previous research, multiple variables effect academic achievement. No two grade levels are the same nor are any of the dependent variables conducive to

same results. Findings indicated resilience, attendance, and background variables to be significant in predicting academic achievement. Several variables repeat across both Research Question 1 and Research Question 2. Variables that were tested yet portrayed no predictive variability were the variables English as a Second Language and Behavior Referrals. Though this is inconsistent with the academic literature a justification may be present. Due to the rural setting of this study very few minority or English as a Second Language students were represented. As well, very few students had Behavior Referrals most likely due to the student's choice to come in to school and work. Research Question 1 and 2 had more significant variables in the background factors component. Thus, this is consistent with previous findings indicating noncognitive variables as predictive variables. Research Question 1 had five significant variables in background factors and 4 in academic factors. Research Question 2 had six significant variables in background factors and 5 in academic factors. However, Attendance Percentage was the most reoccurring variable in Research Question 1, which comes from the academic component. As well, Course Completions was the most reoccurring variable in Research Question 2, which comes from the academic component, as well.

The results of Research Questions 1 and 2 also contributed to research in new ways. Although the roles of noncognitive variables in predicting academic success has been investigated in the past, this study was able to show that noncognitive variables can be an important predictor among at-risk students, as well. The current study's results corroborate with other research that both noncognitive variables such as resilience by means of the Total Difficulties Score and Grit-S Score can help predict academic achievement. The first two Research Questions also found that the earlier grade level,

10th grade, of students in High School who show high levels of grit and resilience have more predictive results with their academic achievement. This potentially suggests the greater urgency in developing and teaching these traits as early as possible for academic success.

Results of Research Questions 3 and 4 also contributed to research in new ways. Although grit and resilience has been investigated in the past, this study was able to further investigate the connection between minority students and nonminority students, grade level, grit, and resilience. Interestingly, in this at-risk population, females revealed to have higher resilience than males. A main effect of minority status was also significant indicating White students had higher resilience than minority students. Then, a significant interaction between gender and minority status indicated White females had higher resilience than White males. Yet, no difference in resilience was found between minority females and males. Though an interaction is not significant by grade level as seen in Research Question 1 and 2, it is evident that a significant number of students both male and female have experienced multiple difficult experiences in this at-risk population. The fact that these at-risk students have experienced some kind of difficulty in life and have chosen to come back to school may be indicative of their persistence to overcome and graduate. Thus, resilience may be higher among this at-risk population due to the nature of this choice school setting. Even more so, the difficulties at-risk female students may face may help them recognize their own strength and resilience.

No interactions or main effects were found in Research Question 4 with grit. This may be due to the smaller span of the grit scale. For example, the Grit-S scale has a range of 1-5 whereas the Total Difficulties Scale ranges from 0-30. As well, as noticed in

Research Question 3, due to the possible increased difficulties in life and the smaller span of the grit scale, many students may recognize their possible increased level of grit. Thus, the average number of students in this study have a generally increased grit level. However, this is not to say that grit and resilience are fully achieved in this student population. Rather, it could show their consciousness to these traits and need for them even more.

Limitations and Assumptions

This research's intent was to help increase the knowledge regarding what type of predictive variables, if any, occur within student achievement. More specifically, the possible predictive variables in at-risk student populations. Systems nationwide have had to implement numerous rigorous cognitive variables while noncognitive factors seemingly get left behind.

Limitations threatened this study with the smaller sample size collected. Previous researchers in the field have had access to large universities and multiple systems across states (Duckworth & Seligman, 2005; Hammond et al., 2007). As well, there was a large difference between the historical data collected amongst students with a Total Difficulties Score and students with a Grit Score. Third, the study conducted by Dweck (2008) demonstrated a more longitudinal range and possible growth in students from one year to the next; while, this study portrayed a snapshot of the student's perception of their own grit or resilience and academic values at the given time. Not only does this researcher caution others in the generalizing of this study, but also, Duckworth (2016) cautions others in putting too much weight in her Grit-S scale and predicting academic success. The population used was limited to students enrolled in one rural district in Georgia.

Recommendations for Future Research

Based on the results of the study, several opportunities for future research exist. No research study can gather its data from a completely generalizable format meeting the needs of each unique case. Future research should involve increasing the number of systems and states. Increasing the population and area would ideally bring to light additional information on the topic. Many considerations to this research study could be considered for future research.

While the data presented in the present study provided evidence that both noncognitive and cognitive variables have predictive relationships on academic success, more information could be obtained on each specific variable that was tested. Further research into grit and resilience in other at-risk students would develop an opportunity for researchers to glean more of an understanding of these student's ability to show resilience and achieve their long-term goals. Specifically looking into other at-risk settings would be interesting. Furthermore, looking into a population of at-risk students who have not made the decision to come back to a school and complete their high school diploma. Not only that, but a comparison between at-risk and regular education high school students could help determine if one population had higher grit or resilience than the other.

Based on the results of Hanson and Kim, it is evident that a process to identify or define resilience levels through screening processes and procedures can foster academic resilience (2007). Further research might be interested in testing other domains within Hammond et al.'s study (2007). Other domains to be studied might be family domains, school domains, or community domains. Not only looking into these other domains, but also research in other student academic achievement variables may provide more insight

as to if both cognitive and noncognitive variables continue to show significant predictive relationships.

Additionally, further research could identify other scales to test resilience and grit that may have greater validity and reliability. Future research should be performed to further determine how to best measure these variables in students. Since student's self-report their grit and resilience levels it would be interesting to find a scale that were more objective in nature or reported through other means.

Lastly, since students can be identified as having grit or resilience, other studies could research how educators might increase these noncognitive skills in students. This could be done in a longitudinal study. Specifically, by implementing the Trauma Informed Schools initiative with the National Dropout Prevention Center. By doing a longitudinal study, this would allow the researcher to conduct a comparison of before and after implementation techniques were issued. A longitudinal study could reveal greater significance in the predictive variables thus further indicating a need to develop both cognitive and noncognitive variables in at-risk students.

Summary

In conclusion, the outcomes of this study support aforementioned findings and contribute new research to the literature. Students in this at-risk rural Georgia high school indicate predictive relationships in the identified variables and academic achievement variables. Noncognitive variables are identified as traits that contribute to academic success. Just as other studies mentioned, one single variable cannot predict academic success in a student; therefore, this study confirms this notion. Due to the multifaceted nature of multiple variables having an effect on academic achievement this

study does not have a guaranteed method to increase academic achievement in at-risk students. Nor does this study confirm that every student who has identified grit or resilience will succeed in school. It is evident, however, that the whole child should be considered in terms of increasing academic achievement, rather than just the academic components of a student. Soon after this study began, legislators enacted the Every Student Succeeds Act which furthered the importance of educating the Whole Child with noncognitive supports. Therefore, policymakers should consider continuing to provide these supports to increase the academic achievement of all students.

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APPENDIX A:

FTE Data Collection

FTE CYCLE	CYCLE 1	CYCLE 3
PURPOSE	STATE FUNDING and ENROLLMENT	STATE FUNDING
WHO TO REPORT	ALL STUDENTS	ACTIVE STUDENTS
WHEN	OCTOBER	MARCH
DATA ELEMENTS * Data Elements required for this cycle only Data Elements are listed in the order found on the FTE Data File Layout	SYSTEM	SYSTEM
	FISCAL YEAR	FISCAL YEAR
	REPORT PERIOD	REPORT PERIOD
	SCHOOL	SCHOOL
	GRADE LEVEL	GRADE LEVEL
	PRIOR TEN DAYS	PRIOR TEN DAYS
	RESIDENT STATUS CODE	RESIDENT STATUS CODE
	SYSTEM OF RESIDENCY	SYSTEM OF RESIDENCY
	PROGRAM CODE (SEGMENTS 1-6)	PROGRAM CODE (Segments 1-6)
	ALTERNATIVE EDUCATION PROGRAM	ALTERNATIVE EDUCATION PROGRAM
	WITHDRAWAL DATE *	
	LOCATION OF ENROLLMENT (Segments 1-6)	LOCATION OF ENROLLMENT (Segments 1-6)
	ESOL- ITINERANT	ESOL- ITINERANT
	TOTAL SERVICE MINUTES	TOTAL SERVICE MINUTES
	ESOL NON-ITINERANT	ESOL NON-ITINERANT
	GENDER	GENDER
	ETHNICITY	ETHNICITY
	RACE (Indian, Asian, Black, Pacific, White)	RACE (Indian, Asian, Black, Pacific, White)
	WITHDRAWAL REASON*	
	DIPLOMA TYPE *	
	STUDENT STATUS	STUDENT STATUS
	SCHOOL ENTRY CODE *	
	ENVIRONMENT	ENVIRONMENT
	REPORT TYPE	REPORT TYPE
	DATE OF BIRTH	DATE OF BIRTH
	TRANSPORTED (Segments 1-6)	TRANSPORTED (Segments 1-6)
	SUPPLEMENTAL SPEECH (Segments 1-6)	SUPPLEMENTAL SPEECH (Segments 1-6)
	ITINERANT TEACHER (Segments 1-6)	ITINERANT TEACHER (Segments 1-6)
	INCLUSION (Segments 1-6)	INCLUSION (Segments 1-6)
	HOURS PER WEEK (Per Disability) *	
	PRIMARY AREA	PRIMARY AREA
	RELATED HOURS (Per Service Category) *	
	ALL SPECIAL EDUCATION SERVICES	ALL SPECIAL EDUCATION SERVICES
	EL (English Learner)	EL (English Learner)
	SPECIAL EDUCATION ENVIRONMENT *	
	GTID	GTID
	GIFTED DELIVERY MODEL (Segments 1-6)	GIFTED DELIVERY MODEL (Segments 1-6)
	EVENT CODE *	
	EVENT DATE *	
	GAA FLAG *	GAA FLAG *
	SCHOOL ENTRY DATE	SCHOOL ENTRY DATE
	LAST NAME	LAST NAME
	FIRST NAME	FIRST NAME
	MIDDLE NAME	MIDDLE NAME

APPENDIX B:

Free/Reduced Lunch Report

FRL001 Status Signed Off as of 11/22/2016 06:19:44 pm **Free Reduced Menu** click here to print

Georgia Department of Education	Free and Reduced Price Meal Eligibility Report
Free & Reduced Price Lunch Eligibility([redacted] 1)	[redacted]te Charter Schools- [redacted] School

Signed Off

Free and Reduced Lunch (FRL) Data Report | FRL By School- 3 years Data | Legend

Free and Reduced Lunch (FRL) Data Report

School Name	Direct Certification	Special Provision Status	Pre-K Enrollment	Pre-K Free	Pre-K Reduced	Pre-K % FRL	KK-12 Enrollment	KK-12 Free	KK-12 Reduced	KK-12 % FRL	Total Enrollment	Total Free + Reduced	Total % FRL
0108 Mountain Education Charter High School	405	Provision II	0	0	0	0	1,926	1,155	173	68.95	1,926	1,328	68.95
System Total	**405**		**0**	**0**	**0**	**0**	**1,926**	**1,155**	**173**	**68.95**	**1,926**	**1,328**	**68.95**

I acknowledge that this information may be used for funding purposes, state reporting, and Federal reporting and therefore may be submitted to Federal, state and other governmental agencies and to the legislature and other policy makers. I understand that this information is subject to being audited at any time by the Georgia Department of Education, the Georgia Department of Audits and Accounts, the Governor's Office of Student Achievement, the Office of Inspector General, and the United States Department of Education. Falsifying, misrepresenting or knowingly omitting any of this information may result in criminal, civil, or administrative penalties, including disciplinary action under the Code of Ethics for Educators.

Signed By:	[redacted]
Date Signed:	11/22/2016 06:19:44 pm

Georgia Department of Education
Richard Woods, State Superintendent of Schools
September 26, 2017 02:32 p.m.

APPENDIX C:

Institutional Review Board Protocol Exemption Report

Institutional Review Board (IRB)
For the Protection of Human Research Participants

PROTOCOL EXEMPTION REPORT

Protocol Number: 03832-2019 **Responsible Researcher:** Victoria Stroud

Supervising Faculty: Dr. Jerry Siegrist

Project Title: *A Quantitative Framework for Understanding Academically Underachieving Students.*

INSTITUTIONAL REVIEW BOARD DETERMINATION:

This research protocol is **Exempt** from Institutional Review Board (IRB) oversight under Exemption **Category 4**. Your research study may begin immediately. If the nature of the research project changes such that exemption criteria may no longer apply, please consult with the IRB Administrator (irb@valdosta.edu) before continuing your research.

ADDITIONAL COMMENTS:

- *Upon completion of the research study all data (data list, email correspondence, address lists, etc.) must be securely maintained (locked file cabinet, password protected computer, etc.) and accessible only by the researchers for a minimum of 3 years.*

☒ ***If this box is checked, please submit any documents you revise to the IRB Administrator at irb@valdosta.edu to ensure an updated record of your exemption.***

Elizabeth Ann Olphie *05.21.2019*
Elizabeth Ann Olphie, IRB Administrator

Thank you for submitting an IRB application.
Please direct questions to irb@valdosta.edu or 229-253-2947.

Revised: 06.02.16

APPENDIX D:

Surveys

Strengths and Difficulties Questionnaire

For each item, please mark the box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best you can even if you are not absolutely certain. Please give your answers on the basis of how things have been for you over the last six months.

	Not True	Somewhat True	Certainly True
I try to be nice to other people. I care about their feelings	☐	☐	☐
I am restless, I cannot stay still for long	☐	☐	☐
I get a lot of headaches, stomach-aches or sickness	☐	☐	☐
I usually share with others, for example CD's, games, food	☐	☐	☐
I get very angry and often lose my temper	☐	☐	☐
I would rather be alone than with people of my age	☐	☐	☐
I usually do as I am told	☐	☐	☐
I worry a lot	☐	☐	☐
I am helpful if someone is hurt, upset or feeling ill	☐	☐	☐
I am constantly fidgeting or squirming	☐	☐	☐
I have one good friend or more	☐	☐	☐
I fight a lot. I can make other people do what I want	☐	☐	☐
I am often unhappy, depressed or tearful	☐	☐	☐
Other people my age generally like me	☐	☐	☐
I am easily distracted, I find it difficult to concentrate	☐	☐	☐
I am nervous in new situations. I easily lose confidence	☐	☐	☐
I am kind to younger children	☐	☐	☐
I am often accused of lying or cheating	☐	☐	☐
Other children or young people pick on me or bully me	☐	☐	☐
I often offer to help others (parents, teachers, children)	☐	☐	☐
I think before I do things	☐	☐	☐
I take things that are not mine from home, school or elsewhere	☐	☐	☐
I get along better with adults than with people my own age	☐	☐	☐
I have many fears, I am easily scared	☐	☐	☐
I finish the work I'm doing. My attention is good	☐	☐	☐

Short Grit Scale (Grit-S)

Directions for taking the Grit Scale: Please respond to the following 8 items. Be honest – there are no right or wrong answers!

1. New ideas and projects sometimes distract me from previous ones.*
☐ Very much like me ☐ Mostly like me ☐ Somewhat like me ☐ Not much like me ☐ Not like me at all

2. Setbacks don't discourage me.
☐ Very much like me ☐ Mostly like me ☐ Somewhat like me ☐ Not much like me ☐ Not like me at all

3. I have been obsessed with a certain idea or project for a short time but later lost interest.*
☐ Very much like me ☐ Mostly like me ☐ Somewhat like me ☐ Not much like me ☐ Not like me at all

4. I am a hard worker.
☐ Very much like me ☐ Mostly like me ☐ Somewhat like me ☐ Not much like me ☐ Not like me at all

5. I often set a goal but later choose to pursue a different one.*
☐ Very much like me ☐ Mostly like me ☐ Somewhat like me ☐ Not much like me ☐ Not like me at all

6. I have difficulty maintaining my focus on projects that take more than a few months to complete.*
☐ Very much like me ☐ Mostly like me ☐ Somewhat like me ☐ Not much like me ☐ Not like me at all

7. I finish whatever I begin.
☐ Very much like me ☐ Mostly like me ☐ Somewhat like me ☐ Not much like me ☐ Not like me at all

8. I am diligent.
☐ Very much like me ☐ Mostly like me ☐ Somewhat like me ☐ Not much like me ☐ Not like me at all

Duckworth, A.L, & Quinn, P.D. (2009). Development and validation of the Short Grit Scale (GritS). Journal of Personality Assessment, 91, 166-174. http://www.sas.upenn.edu/~duckwort/images/Duckworth%20and%20Quinn.pdf

Duckworth, A.L., Peterson, C., Matthews, M.D., & Kelly, D.R. (2007). Grit: Perseverance and passion for long-term goals. Journal of Personality and Social Psychology, 9, 1087-1101. http://www.sas.upenn.edu/~duckwort/images/Grit%20JPSP.pdf