GRIT AND ITS RELATIONSHIP WITH COLLEGE ACADEMIC SUCCESS

by

Lisa Vance

Liberty University

A Dissertation Presented in Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

Liberty University

May 2023

APPROVED BY:

[redacted]

Matthew Swain, PhD, Committee Chair

[redacted]

Margaret Gopaul, PhD., MSCP, Committee Member

ABSTRACT

Low college completion rates are an unfortunate reality in the United States. Some researchers have shown that a higher level of grit assisted college students in earning a higher grade point average (GPA) and completing a college credential. My study focused on grit and its relationship to college GPA, course completion rate, and the number of activities and programs participated in during one semester, along with the interaction effects of grit with a growth mindset on GPA and course completion rate through five research questions. A survey was administered to community college students participating in a TRIO Student Support Services Program (SSS), qualifying for the program as low-income, first-generation, and/or students with disabilities. Analysis of the data obtained from the survey helped to answer the research questions using linear regression, standard multiple regression, and correlation. There was little research focusing on the relationship between grit, college GPA, and course completion rates for underserved students in TRIO SSS programs, especially at community colleges, along with few research studies that look at an interaction effect between grit and growth mindset regarding college achievement. This study was unable to provide statistically significant results to show relationships between grit, college GPA, course completion rate, or the number of TRIO SSS services and activities participated in, nor an interaction effect between grit and college completion rate on GPA & completion rate. Limitations and future research recommendations are discussed.

Keywords: grit, growth mindset, TRIO Student Support Services, academic achievement, course completion rate, community college, grade point average

Copyright Page

Dedication

To my remarkable family, Chad, Dakota, Alexis, and my parents. You've supported me through this journey, even on the tough days. Thank you for your constant love and support.

Acknowledgments

There are many psychology faculty at Liberty University that were a part of my educational pursuits and I would not be to this point without everyone of them. I've also appreciated every office person who has ever answered the phone when I've called with questions. I was never met with anything but kindness and respect.

Dr. Matthew Swain, I am sincerely grateful for the time and care you put toward helping me during my dissertation journey and before as one of my classroom instructors. Your knowledge, experience, and ability to challenge me have been truly appreciated. I came to value statistical investigation with your guidance.

Dr. Margaret Gopaul, your help and direction have been a blessing. Your kindness is much appreciated. Thank you for being a part of my dissertation committee.

Dr. Rachel Piferi, besides being an instructor during my time at Liberty University, you have also been there whenever I have had questions or sought out additional information. Thank you for your knowledge and patience.

Thank you to my daughter, Alexis, for taking the time to proofread my manuscript and for supporting me throughout with our many treasured conversations.

2 Corinthians 9:15, "Thanks be unto God for his unspeakable gift."

TABLE OF CONTENTS

List of Tables

List of Figures

CHAPTER 1: INTRODUCTION TO THE STUDY

Introduction

Graduation rates at community colleges have been reported to be exceptionally low (Buzzetto-Hollywood & Mitchell, 2019; Levin & Garcia, 2018; Miller & Weiss, 2022). Levin and Garcia (2018) shared that approximately 22% of community college students completed a degree within three years, while Miller and Weiss (2022) reported a 25% three-year graduation rate for community college students. Sabay and Wiles (2020) said that about 31.5% of community college students complete an associate degree within 6 years. Fagioli et al. (2020) said their study focused on students at community colleges, sharing that community colleges widen the demographic of participants since they are open-enrollment institutions offering career and technical, community, and transfer education options. This allowed more variety when looking at the academic preparedness of students, the outside influences and demands beyond their academic lives, along with issues with the college community and sense of belonging that may be lacking based on their unique situations. For example, they stated students who attend community colleges are more likely to be students of non-traditional age, commute to campus, and attend part-time.

Vaughan et al. (2020) explained that students who begin attending college but do not persist are a major concern for postsecondary institutions. Because of low graduation rates, researchers have explored factors related to college completion rates, along with what aids a college student in being successful and completing their educational goals. There has been less research to discover grit's relationship to course completion rates and GPA for underserved students who are low-income, first-generation, and/or students with

disabilities who qualify for a TRIO Student Support Services (SSS) program. There is little to no research on an interaction effect between grit and growth mindset on GPA or course completion rate for this group of students. If there were a relationship between grit, GPA, course completion rates, and program participation, along with an interaction effect with growth mindset then future research could explore the specific college programs that may help to develop a growth mindset and influence grit.

Background

Grit

Many researchers found that grit was related to academic achievement and could serve as a predictor to college GPA and completion (Akos & Kretchmar, 2017; Braund et al., 2020; Buzzetto-Hollywood & Mitchell, 2019; Datu et al., 2018; Fernández-Martín, et al., 2020; Fong & Kim, 2019; Kannangara et al., 2018). Duckworth et al. (2007) defined grit as the level of perseverance and passion one possesses in working toward long-term goals even in the face of setbacks. Grit had been seen as a trait that remained stable over time, but some research expressed the idea that grit could be influenced. Weisskirch (2018) stated college students' insights and their experiences with success and failure led to the development of grit. Fernández-Martín et al. (2020) explained there has been a theoretical basis to expect that grit could be intentionally improved. Braund et al. (2020) discussed transformational learning theory, which stated a transformation occurs with new experiences and that college environments are a common place for these transformations where new thoughts, ideas, and ways of thinking ensue. Hochanadel and Finamore (2015) stated college faculty are in a situation where they could encourage grit and growth mindset.

Growth Mindset

Dweck (2020) found that predicting academic achievement was difficult and intelligence scores were not helpful in this endeavor. Instead, looking at the way students viewed their ability to achieve was an important indicator in whether a student would achieve academically. Wolcott et al. (2021) explained growth mindset as the belief that intelligence is malleable and individuals could regulate their capabilities, as well as grow their skills and abilities. There has been research on the relationship between growth mindset, grit, and academic achievement (Barbouta et al., 2020; Tang et al., 2019; Wolcott et al., 2021). Some researchers have shown support for the benefits of a growth mindset for those attempting to achieve academically (Barbouta et al., 2020; Braund et al., 2020; Datu et al., 2018; Kannangara et al., 2018; Pate et al., 2017; Stoffel & Cain, 2018; & Volstad et al., 2020). Since both grit and growth mindset have been linked to academic achievement, it could be assumed that grittier college students who also exhibit a growth mindset would have an interaction effect with college GPA or course completion rate.

Academic Achievement

Several studies have used GPA and/or course completion rate as measures of academic achievement (Akos et al., 2022; Akos & Kretchmar, 2017; Buzzetto-Hollywood & Mitchell, 2019; Fong & Kim, 2019; Pate et al., 2017; Saunders-Scott et al., 2017; Sweet et al., 2019; Vaughan et al., 2020; Whipple & Dimitrova-Grajzl, 2021; Wong et al., 2018). Wong et al. (2018) said that evidence from previous studies had shown grit was able to predict various achievement measures, including GPA, along with graduation rates for public high schools. Fong and Kim (2019), Akos and Kretchmar

(2017) and Buzzetto-Hollywood and Mitchell (2019) all reported a significant correlation between a college student's grit and their GPA. Duckworth et al. (2007) shared that it is possible that having a higher level of grit makes it possible to achieve a higher level of education.

Some research had been completed with both grit and growth mindset and their relationship with academic achievement, although the research focused on universities (Akos et al., 2022; Barbouta et al., 2020; Hacisalihoglu, et al., 2020; Hochandel & Finamore, 2015). Much research supports the positive relationship between grit and academic achievement, but there are researchers that obtained conflicting results. For example, Saunders-Scott et al. (2017) found that grit was a poor predictor of college students' GPA but was a statistically significant predictor of retention. Whipple & Dimitrova-Graizl (2021) found that grit was a significant predictor of GPA for male participants but not for females.

Short Grit Scale (Grit-S)

In measuring grit, numerous researchers elected to use the Grit-S, finding that it has an acceptable level of validity and reliability for college students (Akos & Kretchmar, 2017; Barbouta et al., 2020; Lopez & Horn, 2020; Lund et al., 2019; Pate et al., 2017; Saunders-Scott et al., 2017; Wesskirch, 2018). Barbouta et al. reported the Grit-S scale had high internal consistency ($\alpha = .85$). Rocha and Lenz (2022) completed a meta-analysis of the reliability of the Grit-S. In total, they looked at 1444 studies using the Grit-S, with over 14% of studies being completed in a college setting, making college students the largest study group overall, although only half of the studies reported information about reliability. The reliability internal consistency of 61 alpha coefficients

for total Grit-S scores provided a mean point estimate of .73 (95% CI = .71, .75), $r^2 < .01$, $p < .01$ and the reliability estimates within the sample of studies shown was Q(60) = 23503.41, $p < .01$, $I^2 = 99.75$. They also shared that the college setting provided higher internal consistency scores than other moderators, such as K-12 settings ($\alpha = 0.74$, k=11) and higher for those studies completed in the United States ($\alpha = 0.74$. k=47). The Perseverance of Effort factor, the Consistency of Interest factor, and the whole Grit–S showed adequate internal consistency, αs = .70, .77, and .82, correspondingly. (Duckworth & Quinn, 2009).

TRIO SSS Program

The U.S. Department of Education (2009) explained that eligibility for acceptance into a TRIO Student Support Services (SSS) Program in postsecondary education requires a college student to be low-income, first-generation, and/or a student with a disability. TRIO SSS was developed to serve this population of students, stating that those who qualify are more likely to drop out of college than the average student. Ishitani (2016) reported that low-income and first-generation students were at a higher risk for college attrition than students overall. Pratt et al. (2019) said that students who qualified as first-generation tended to be more doubtful of their ability to accomplish college and career goals and assumed more obstacles would come up during their time in college. TRIO SSS Programs are required to offer services and activities that assist with financial literacy, tutoring, cultural events, and much more.

In considering the information provided by previous researchers regarding grit, growth mindset, college programming, and academic achievement, the current study came to light. There were five research questions included in the investigation to discover

how the aforementioned variables related to one another. Little research had been done to discover how grit affected underserved community college students that qualified to participate in a TRIO SSS Program. Most research focused on university students (Akos & Kretchmar, 2017; Braund et al., 2020; Buzzetto-Hollywood & Mitchell, 2019; Datu et al., 2018; Fernández-Martín et al., 2020; Fong & Kim, 2019; Kannangara et al., 2018). A relationship was found between grit, college GPA, course completion rate, and number of TRIO SSS programs participated in, as well as an interaction effect with growth mindset. This information may assist community colleges support their students in fostering grit and growth mindset, steering students toward improved retention and graduation rates for underserved students.

Problem Statement

Concern had been raised about the low college graduation rate, especially for those who are low-income, first-generation, and students with disabilities (Akos et al., 2020; Bassett, 2020; Fagioli et al., 2020; Hacisalihoglu et al. 2020; Kundu, 2019; Miller & Weiss, 2022; Sarid et al., 2020; Tansey et al., 2018). Previous research focused on marginalized populations but there was little research available regarding grit, college GPA, course completion rate, or an interaction effect with growth mindset pertaining specifically to students attending community colleges that are part of the federally funded TRIO SSS program. Vaughan et al. (2020) shared that TRIO Student Support Services programs are specifically designed to provide support to students who are first-generation, low-income, or have a disability since they are at increased risk for attrition due to their backgrounds.

Many researchers have studied non-cognitive factors such as self-regulation, motivation, God's love, spirituality, social acceptance, and their relationship to academic success (Castro Baker et al., 2021; Winkler, 2021; Wong et al., 2018). One factor that had been studied extensively was grit. Grit was explained as a non-cognitive factor where a higher level of grit correlated with a higher GPA and greater academic success, but the research had primarily focused on four-year college students in previous studies (Akos & Kretchmar, 2017; Braund et al., 2020; Burt et al., 2019; Buzzetto-Hollywood & Mitchell, 2019; Datu et al., 2016; Fong & Kim, 2019; Hill et al., 2016; Kannangara et al., 2018; Lopez & Horn, 2020; Lund et al., 2019; Pate et al., 2017; Saunders-Scott et al., 2018; Vaughan et al., 2020; Volstad et al., 2020; Wesskirch, 2018; Whipple & Dimitrova-Graizl, 2021). More research is needed to determine what factors assist community college students from marginalized backgrounds achieve academic success. Many researchers have supported the idea of both grit and growth mindset as important components in academic success (Barbouta et al., 2020; Kannangara et al., 2018; Pate et al., 2017; Stoffel & Cain, 2018; & Volstad et al., 2020).

Given the lack of research on reported grit and its relationship with GPA, college course completion rates, and interaction effects with growth mindset for community college students in TRIO SSS Programs, study of these variables has been valuable. Community colleges and TRIO SSS students will benefit from the research by further understanding what helps this group of students achieve academically knowing that students who fall into the low-income, first-generation, and disability categories have a lower college success rate (Bassett, 2020; Burt et al., 2019; Vaughan et al., 2020).

A college education provides many benefits that should be available to all learners. The students who begin college but do not finish are unable to experience the advantages of higher education including psychological, physical, and financial benefits, such as higher rate of employment, better access to health care insurance, money to provide for a family, (Coelho & Liu, 2017), as well as higher sense of control (McFarland et al., 2016), and less stress (Manigault et al. (2018). The problem is the low completion and graduation rates for low-income, first-generation, and students with disabilities attending community colleges supported by the percentages stated in current research. For example, Ishitani (2016) said 34% of first-generation students leave college without a degree, compared with 23% of college students whose parents had earned a 4-year degree. Even low-income students who had planned to attend college may experience a "summer melt" where they changed their minds, with 22% of those students electing to hold off on enrollment the fall after graduating high school. Sarid et al. (2020) said that only 21.2% of students with learning disabilities enrolled in 4-year college, in comparison to 40% of students without a learning disability. The problem has been that students who are low-income, first-generation, and students with disabilities complete college at a much lower rate (Bassett, 2020; Kundu, 2019; Miller & Weiss, 2022; Sarid et al., 2020; Tansey et al., 2018).

Purpose of the Study

The purpose of this quantitative, correlational research study was to examine how grit related to college GPA, course completion, and TRIO SSS program participation. In addition, an interaction effect between grit and growth mindset on college GPA and

course completion rate was studied to determine if the two variables provided a stronger correlation to academic achievement than grit alone.

Research Questions and Hypotheses

Research Questions

RQ1: Does grit level influence cumulative GPA for community college students in TRIO SSS Programs?

RQ2: Does grit level influence course completion rates for community college students in TRIO SSS Programs?

RQ3: Do students with a higher level of grit participate in a greater number of TRIO SSS services and activities?

RQ4: Does an interaction effect exist between reported grit and growth mindset on GPA for community college students in TRIO SSS Programs?

RQ5: Does an interaction effect exist between reported grit and growth mindset on course completion rate for community college students in TRIO SSS Programs?

Hypotheses

Hypothesis 1: A higher level of grit influences cumulative GPA for community college students in TRIO SSS Programs.

Hypothesis 2: A higher level of grit influences course completion rate for community college students in TRIO SSS Programs.

Hypothesis 3: There is a positive relationship between grit level and the number of TRIO SSS services and activities students elect to participate in.

Hypothesis 4: Grit and growth mindset have an interaction effect on GPA and/or course completion rate for community college students in TRIO SSS Programs.

Hypothesis 5: Grit and intrinsic spirituality have an interaction effect on GPA and/or course completion rate for community college students in TRIO SSS Programs.

Assumptions and Limitations of the Study

Limitations of this study included a small sample size. The study was sent to various TRIO SSS programs at community colleges in the United States, but survey responses obtained at the time data collection did not meet the number of participants required according to G*Power.

Colleges with different demographics have different results. Fong and Kim (2019) reported a limitation in their study saying they used online self-report data that reflected bias in the results. The current study used online self-report data that likely reflected bias in the results, as well. The questions in the Grit Scale are obvious in intent, making social desirability bias more likely since some likely responded to the questions in a way they believed made them appear more favorable (Duckworth et al., 2007; Stoffel & Cain, 2018; Whipple & Dimitrova-Grajzl, 2021; Pate et al., 2017). In addition, response bias probably occurred with the use of Likert scales since it has been shown that respondents tend to select responses toward the middle of these scales (Fong & Kim, 2019).

When a cross-sectional research method is implemented, it does not allow information about longitudinal changes or causality (Fong & Kim, 2019; McElroy-Heltzel et al., 2018). Similar limitations were experienced with the current study. Buzzetto-Hollywood and Mitchell (2019) used a study of participants from only one

university. The current research collected survey responses from various geographical regions and demographics. Another limitation may be that racial backgrounds may not be widespread if students from a limited number of racial backgrounds chose to complete the survey, but this demographic information was not reported on the survey (Lopez & Horn, 2020).

Researcher bias can occur in social scientific studies when researchers have expectations that affect the results of a study or use confirmation bias by ignoring evidence that does not coincide with expectations (Spielman et al., 2020). The current study avoided this issue by ensuring responses to the survey were ambiguous and confidential.

Theoretical Foundations of the Study

An important theoretical concept in the study was the theory of grit. Duckworth et al. (2007) stated grit as the level of perseverance and passion one possesses in working toward long-term goals. Fong and Kim (2019) discussed the theory behind their study saying that both dimensions of grit, perseverance of effort and consistency of interest, were important components in determining grit. Datu et al. (2018) explained that grit theory stated consistency of interest as the dimension dealing with sustaining the same interests over time, while perseverance of effort meant that one continued the work toward goals even when barriers arose. The authors also supported the fact that grit could be fostered, suggesting the scaffolding of activities that could cultivate grit, although specific activities were not alluded to. Some researchers explained grit as a trait that remains stable over time, but more recent literature pointed to the idea that grit could be improved.

Additionally, Weisskirch (2018) indicated that college student's insights and their experiences with success and failure led to development of grit. Fernández-Martín et al. (2020) said there is a theoretical basis to expect that grit could be intentionally improved. They also shared that it would be necessary to study effective tactics and interventions on grit with a vast range of subgroups and in various settings, including educational settings. Braund et al. (2020) discussed transformational learning theory that supported the idea that a developmental process occurred with new experiences providing transformations and explained this is a common phenomenon in college environments where new thoughts, ideas, and way of thinking occur. Barbouta et al. (2020) found that grit appears to improve with age.

Wolcott et al. (2020) discussed related theory regarding growth mindset, which is the idea that individuals believe they have the fortitude to regulate their capabilities and intellect. They suggested that educators provide environments conducive to learning and put focus on helping learners to accept feedback and provide the opportunity for supportive and collaborative relationships. Kannangara et al. (2018) discussed a theory that had been proposed by Dweck (2012) regarding growth mindset, as well. This theory proposed the idea that students must focus on the growth and development of their abilities by being open to feedback, leading to an understanding of what errors they made and how to improve during the next attempt, thus expanding their skills. Their study found that students with grit coincided with possessing a growth mindset. The current research sought to understand whether the relationship between grit with GPA and course completion rate may strengthen when students possess a growth mindset.

These research studies alluded to the fact that grit level could be enhanced, or at least made more salient, rather than remain stable. 1 Corinthians 15:10 stated, “But by the grace of God I am: and his grace which was bestowed upon me was not in vain; but I labored more abundantly than they all: yet not I, but the grace of God which was with me (King James Bible, 1971/2022). His scripture discussed how Paul worked more diligently than the other apostles and used God’s grace to improve himself. Grit could be improved upon through God, making grit necessary to thrive as a Christian.

Definition of Terms

The following is a list of definitions of terms that are used in this study.

Course Completion Rate – Term one is defined as the percentage of cumulative credit completed versus the total number of credits attempted, calculated by dividing the cumulative credit that earned a passing grade by total cumulative credit attempted including those credits earning a withdraw or a failing grade (Code of Federal Regulations, 2022).

Cross-Sectional Study – Term two is defined as a research method where several segments of a population can be studied at the same time (Spielman et al., 2020).

Grade Point Average (GPA) – Term three refers to the average of scores for all classes attempted with this study using GPA on a 4.0 scale (CollegeBoard, n.d.).

Grit **–** Term four is defined as the ability to achieve long-term goals through persistence and perseverance despite setbacks (Duckworth & Gross, 2014)

Growth Mindset – Term five refers to an individual’s belief that one can control one’s level of intelligence and abilities (Wolcott et al., 2021).

TRIO SSS Programming – Term six is defined as services and activities offered to students within the program, including advising, study sessions, relational support, transitional classes, tutoring and other programming to support the academic goals of students who qualified as low-income, first-generation, or students with disabilities (Goldman, 2019).

Significance of the Study

Graduation rates at community colleges are a difficult reality. Many who begin college do not complete a degree (Buzzetto-Hollywood & Mitchell, 2019; O'Neal et al., 2016). It had been reported that those who qualify as low-income, first-generation, and students with disabilities were at a higher risk of non-completion. Therefore, these students were unable to experience the benefits of higher education, including psychological, physical, and financial benefits. For example, Coelho and Liu (2017) found that those who were more highly educated had a higher rate of employment, better access to health care insurance, the ability to purchase a home, a positive work environment doing something they are passionate about, and the ability to feed their families. Dahlgren and Whitehead (1991) completed research showing that higher education was correlated with improved health.

The low completion rates of community college students were a concern for those who worked in postsecondary education considering the loss of revenue and the impact on both the college community and society. Levin and Garcia (2017) reported that a college education provided benefits such as higher tax revenues and spending less on public services, including public assistance.

There was little research available regarding grit, growth mindset, college GPA, and course completion rate pertaining specifically to students attending community colleges that were part of the federally funded TRIO SSS program. Vaughan et al. (2020) shared that TRIO Student Support Services programs are specifically designed to provide support to students who are first-generation, low-income, or have a disability since they are at increased risk for attrition due to their backgrounds. The current study added to the research literature by specifically focusing on students who met the qualifying criteria for acceptance in TRIO SSS Programs.

Researchers suggested that level of grit could be fostered by environments and activities that cultivated new thoughts, ideas, and ways of thinking (Braund et al., 2020; Datu, et al., 2018; Fernández-Martín et al., 2020; Weisskirch, 2018). It was found that a higher level of grit had a positive relationship with higher GPA and course completion rate, along with added strength to these relationships with a growth-mindset. This information may benefit colleges by determining what activities and services could be offered to assist students in cultivating grit and growth-mindset in their students. A long-term goal would be to assist community colleges in developing programs, services, and activities that foster grit for underserved students. This study is significant to the welfare of college graduates and the communities where they will live.

Summary

Research studies involving students who are historically underserved, including those who are low-income, first-generation, and/or students with disabilities is limited. The current research study focused on those college students who fell in these categories by recruiting community college students who participate in a TRIO SSS Program in the

United States. Both marginalized students in TRIO SSS Programs, community colleges, and society as a whole could benefit from the research by learning how to foster grit level. This would lead to improved college completion rates that would precede earning a college degree, higher rate of employment and income level, and improved health.

CHAPTER 2: LITERATURE REVIEW

Overview

Researchers have touted several factors that correlate with academic achievement. Some of the factors studied were intelligence, aptitude, motivation, self-regulation, spirituality, and social connection (Castro-Baker et al., 2021; Lerner, 2018; Lung et al., 2018; Winkler (2021). A factor that had been publicized more recently was grit (Buzzetto-Hollywood & Mitchell, 2019; Datu et al., 2018; Fosnacht et al., 2019; Lund et al., 2019). Growth mindset had also been linked to academic achievement and sometimes studied alongside grit (Barbouta et al., 2020; Hacisalihoglu et al.; 2020; Kannangara et al., 2018; Wolcott et al., 2020). The Bible discussed the idea of grit in various scripture passages. There were also factors that could be seen as those that negatively affected college achievement. Some of those listed were being a first-generation student, having a disability, and being a low-income student, all of which encompass the criteria used to qualify for the TRIO SSS Program (Basset, 2020; Monahan et al., 2020; Palmer, 2014; Volstad et al., 2020). This is a federally funded program provided to underserved college students to provide college programming to support and guide students in pursuit of a college credential.

Description of Search Strategy

The literature search strategy used for this study included a search of the Jerry Falwell Library online, provided by Liberty University. An advanced search was conducted to find titles that matched search terms including grit, growth mindset, grade point average (GPA), TRIO Student Support Services (SSS), and academic achievement as the primary keywords searched. Most searches were conducted by limiting the publication date to the

last 5 years and looking for journal articles that offered full online text. The online database and the King James Bible online were used for biblical research and scripture passages using search terms such as grit, spirituality, and Christianity. The specific databases that contained articles presented in this research include APA PsycNet, EBSCOhost, Gale In Context, JSTOR, MEDLINE, National Library of Medicine, Project Muse, ProQuest, SAGE Journals, Taylor & Francis Online, and Wiley Online Library.

Review of Literature

Introduction

Sixty-five percent of jobs since 2020 have required some type of postsecondary education, making this a time when the attainment of a college degree is more important than ever before (Fotuhi et al., 2022). They found that even those who spent time in college without earning a degree experienced a higher earning potential than those without college involvement. Although there are many benefits to a college degree, such as higher earnings, life-satisfaction, well-being, satisfaction with employment, and both psychological and physical health, there are students who experience barriers to earning a postsecondary degree. The aforementioned benefits are not equally accessible to all students.

There are many factors that affect college achievement and completion that go beyond the historical measure of intelligence and aptitude and instead include non-cognitive factors. Fagioli et al. (2020) said that tracking student self-reported non-academic variables has gained acceptance in the last 30 years. They mentioned self-efficacy, grit, and conscientiousness as examples of these non-academic components. There are many non-cognitive factors that have been researched, but the current study focused on grit and its relationship with academic achievement, as well as whether a growth mindset may strengthen the relationship between grit and a higher GPA or course completion rate. Review of the literature also included use of the Grit-S in measuring grit level, the TRIO SSS program, college services and activities that are typically offered to college students in TRIO SSS, and the relationship between grit and the Bible.

Factors Affecting College Achievement and Completion

There are well-known factors that assist in positive academic outcomes, such as intelligence and aptitude, but there are also additional factors that have been studied. Fosnacht et al. (2019) said college admissions personnel started looking at traits and abilities outside of standardized tests and grade performance in determining acceptance into their colleges and universities, believing the use of a broader range of traits in determining acceptance would lead to a more diverse student body. Fagioli et al. (2020) said that college academic success required a wider range of skills, and those skills were not entirely academic based.

The current study focused on grit and a possible relationship with academic achievement through correlations with GPA and course completion rate. Wong et al. (2018) said that self-regulation and motivation undergird grit to help individuals persist in working toward goals. They explained that individuals who were clear in their self-concept and had an awareness of their self-attributes provided resilience when challenges arose. Wong et al. determined that when one is working toward a long-term goal, clarity of self-concept increases and provides the ability to self-verify the attributes that help them persevere toward the goal. Winkler (2021) added that God's love and acceptance, as well as competencies, are shown to improve goal attainment. Castro Baker et al. (2021) said spirituality and feeling socially connected are additional helping influences, and Lerner (2018) added that character allows an individual to develop thoughts and skills that allow one to act lucidly. There are many additional factors that affect college achievement and course completion both positively and negatively.

Factors that have the potential to negatively affect college grade point average (GPA) and course completion rates have been researched, including age, gender, race,

income level, being the first to earn a college degree in the family, and geographic area. Palmer et al. (2014) said those first-generation students whose parents have not earned a 4-year degree are much less likely to succeed in college than students whose parents earned a bachelor's degree. They explained that first-generation students lacked the social and cultural capital necessary to succeed in college. They shared that over 67% of Black, male college students are first-generation and that several factors have led to college attrition of Black men in college. In comparison to Black males attending 4-year colleges, those attending community colleges are more likely to be older, first-generation, married, and have dependents. Only 24% of those attending a public two-year college earned a degree while close to 50% of public and private four-year college attendees earned a degree. Ottley and Ellis (2019) added that Black, male college students had their own unique challenges when attending a college whose enrollment consisted of predominantly White students, so initiatives in retaining this group of students were also unique.

Bassett (2020) said low-income and first-generation students had much lower rates of college completion than the average student, with only 21% of students completing a 4-year degree within 6 years, while the general population completed at a rate of 57%. She explained that the income and education level of parents was correlated with graduation rates of their offspring, leading to the realization that not all who begin college are equally likely to complete a degree. She suggested some barriers low-income and first-generation students experience, that may be different than the typical college student, include a lack of financial aid that will cover all costs, lack of knowledge in academic culture and expectations, and social isolation. She said colleges typically expect the student to change rather than the college making changes to better suit this population

of students. After studying low-income and first-generation students she reported that these students claimed both individual and institutional issues. Three individual problems that were discovered included a lack of a plan to succeed, lack of preparation for academic rigor, and low confidence in themselves academically. Institutional obstacles included the rising cost of a college education, college bureaucracy that students had difficulty understanding, and a lack of understanding by the college in the experiences of those who were low-income and first-generation.

Romanelli (2020) reported that approximately 24% of college students in undergraduate programs were first-generation students. He stated that 50% of first-generation students were also from low-income families. Romanelli was a first-generation, low-income college student himself, growing up in an immigrant family where they were reliant on blue-collar jobs that led to a worry about whether one would incur an injury that would prevent work, the economy would take a downturn, or one of his parents would be laid off. He discussed the difficulty he had figuring out the admissions process, determining colleges that provided the best rate, and figuring out financial aid. With limited English, Romanelli usually had to explain paperwork to his parents rather than a parent assisting him with the process.

Monahan et al. (2020) shared that more people with disabilities than ever before attend college, but they are less likely to complete postsecondary education. They are also less prepared than the general population since they are not as likely to have taken preparatory classes or placement tests. Legislation requiring high schools to provide college readiness to students with disabilities has prompted College & Career Readiness (CCR) programs that teach academic and nonacademic skills to help students get ready

for postsecondary education. The review provided various information about both academic and nonacademic skills that could be taught to students in preparation for postsecondary education, with grit being one of the nonacademic skills discussed.

Volstad et al. (2020) explained that mental health is a factor that affected college students' success. The typical age range for those attending college coincided with the age range where individuals were more susceptible to mental health impairments. Little was known about how college students coped with the transition and maintained good mental health. Mental health impairments are a category of disability that would provide eligibility to students in applying for a TRIO SSS Program.

Volstad et al. (2020) described themes that arose from the research including various aspects about flourishing that encompassed individual, contextual, temporality, and dialectic aspects of flourishing. They described flourishing as being a high level of functioning in various domains of development. For individual aspects of flourishing, students stated personal characteristics such as wanting to do things actively to transition well. Contextual aspects involved how individuals interacted with their environment to aid in transition. The context primarily concerned family, living, university, and community environments. The temporality aspect referred to how one thought about a situation and whether it was a process or endpoint. Dialectic aspects dealt with challenges participants experienced. The study's results found personal strengths and challenges as being something that all participants related to and discussed, along with perseverance, being passionate about goals and determined to accomplish them. Their study provided some awareness of how those in education may tailor programs and policies that would assist students in transition. Since the interviews were conducted after the first year of

school, this allowed them to reflect on their experiences and provide information in recent memory.

Bowen (2020) researched homelessness, child welfare systems, and educational challenges that posed unique experiences for those transitioning to adulthood. The research explored how resilience worked to provide a successful transition. Concepts, such as striving and dreaming were investigated. Bowen said there were college students who had difficulty forming meaningful relationships or using program assistance, making it more difficult for them to make progress in their education.

Perez-Brena et al. (2019) investigated why some students achieved goals in college when confronted with stress while others did not. The primary focus was on the 2007 recession in the United States and how this may have affected college achievement and commitment. Various patterns of resilience were explored. Four themes were identified regarding the perceptions of youth and the impact of the recession. The themes included not having the ability to pay for college, making changes to academic objectives, figuring out what resources were most important, and feeling hopeless and/or helpless. The largest concern dealt with the ability to pay for college, which was a barrier stated by 86.1% of participants.

Goldman (2019) explained that access to higher education could be more difficult for those from rural areas. She stated rural students were more likely to attend a college close to home, or at least one that would be considered rural. They were also less likely to apply to or attend selective colleges, to have parents who had gone to college, and they were more likely to come from a lower socioeconomic background. Golman found that it depended on their life stories which barriers and supports were disclosed, which provided

a variety of responses. Some themes that emerged included finances, whether a student was prepared for academic rigor, types of family support or impediments that existed, what their journey to college entailed, and whether they were intrinsically motivated.

Another factor that affected college completion was being a non-traditional student since they had additional life roles to maintain (Bennett et al., 2021). It was estimated that more than 60% of jobs, specifically in the state of Georgia, would require a college education, making a drive for non-traditional students to enter college to remain competitive in the workforce. Non-traditional college students faced cultural barriers, navigation of college without family support, and being academically underprepared.

With the many factors that negatively impacted college GPA and completion rates, it is necessary to find out why some students from the various groups experienced success while others did not. Non-cognitive skills have become a focus and therefore have been studied as predictors of goal attainment, with grit being an example. Wang et al. (2018) and Hacisalihoglu et al. (2020) defined grit as the willingness to pursue long term goals even when obstacles came about and explained grit as a key component toward student achievement.

Grit as an Important Factor in Academic Achievement

To ascertain if grit may relate to a higher GPA and course completion rates, along with an interaction effect with growth mindset, a literature review was conducted about grit for various populations of students. Researchers provided some general information about grit that supported a beneficial relationship between grit and academic achievement. Fosnacht et al. (2019) stated that grit helped students succeed despite lacking the skills or abilities for traditional academic achievement measures.

Kannangara et al. (2018) and Lam and Zhou (2019) explained intelligence was only one factor that led to college achievement, while some college students with a lower intelligence measure surpassed others academically. Kannangara et al. (2018) focused on the concept of grit and its importance to university students' successful graduation. Qualitative research was done to assess non-academic factors that support a student in earning a college degree. Interviews were completed and a few themes arose. They included passion and perseverance, self-control, and a positive mindset. The first theme included setting goals, being dedicated to their education, being resilient, and the ability to endure. This theme showed that those with a personal interest and passion for the goal will succeed despite challenges. The second theme involved time management, being self-aware by knowing strengths and need areas, and the ability to prioritize responsibilities. Positive mindset referred to having a positive attitude about learning whether it was compliments on a job well-done or constructive feedback.

Datu et al. (2018) and Lund et al. (2019) said grit assisted participants to be successful and showed a positive correlation with academic achievement. Datu et al. completed a qualitative research study to determine whether grit was a principal factor in accomplishing goals, particularly in collectivist societies. They found a few key themes from the interviews that included perseverance of effort, consistency of interests, and adaptability to situations that they discovered led to accomplishment of long-term goals. Perseverance of effort indicated a willingness to exert effort even in the face of challenges. Consistency of interests was referred to as the ability to prioritize activities to accomplish goals. Adaptability to situations meant individuals could adapt to changing life circumstances as they worked toward long-term goals. All three themes were shown

to be important in academic achievement and work toward long-term goals for those from a collectivist society. Both perseverance of effort and consistency of interests are embedded within the concept of grit. Lund et al. (2019) and Hill et al. (2016) researched whether students who felt a purpose in life also demonstrated a higher level of grit. Lund et al. (2019) found that grit and purpose were significantly correlated, meaning college students who had a greater level of purpose also had a higher level of grit. Information like this could help college programs develop services that improve students' feelings of purpose.

Hill et al. (2016) explored two sources of grit in college students, so in addition to researching commitment to a purpose, they also studied positive affect. Those with higher grit also reported higher levels of purpose commitment and positive affect and this occurred across the results of two studies they conducted. Adding purpose and direction to one's existence is important in having more grit and achieving long-term goals.

Lopez and Horn (2020) and Whipple and Dimitrova-Grajzl (2021) both completed research that involved gender as a variable. Whipple and Dimitrova-Grajzl (2021) researched variables that predicted academic achievement in first-year college students. They hypothesized that grit would be positively correlated with first-year GPA and that gender would moderate the impact of grit on academic success. From the researchers' knowledge, this was the first study to find that gender moderated the effect of grit on college GPA. They found grit was a significant predictor of college GPA for first-year male college students, but the same impact was not found for female college students.

Lopez and Horn (2020) sought to determine if grit, high school GPA, and gender could predict persistence in college for Hispanic students. For male Hispanic students, it was found that high school GPA and three items on the grit scale were significant predictors of retention. High school GPA and ACT reading scores, along with one grit item were found to be significant predictors of retention for female Hispanic students. Predictors of retention for the entire population of participants were high school GPA and ACT reading scores.

Wesskirch (2018) completed a study that sought to find a connection between final grades in a class and whether they could be predicted by grit, self-esteem, learning strategies, and attitudes toward life-long learning. He researched whether grit, self-esteem, learning strategies, and attitudes toward life-long learning predicted actual performance in college classes, and whether self-esteem, learning strategies, and attitudes toward lifelong learning predicted grit. He found that expectations of their own performance influenced how they approached the learning process and in turn influenced how they performed academically. Wesskirch said self-awareness in knowing about one's own performance comes from their self-esteem, grit, learning strategies, and attitudes about learning. In addition, a student's learning experiences could shape grit. He found that grit-perseverance and self-esteem were able to predict expected grades.

Fasnacht et al. (2019) said students with grit were more likely to begin schoolwork and complete it without delay. Buzzetto-Hollywood and Mitchell (2019) researched whether constructs, such as grit, academic buoyancy and future time perspective were predictors of academic achievement, such as GPA. They found a relationship between grit and persistence to graduation. Some researchers related grit

with growth mindset, saying those with the ability to control their intellect and abilities would have a higher grit level (Barbouta et al., 2020; Kannangara et al., 2018; Pate et al., 2017; Stoffel & Cain, 2018; & Volstad et al., 2020).

Pate et al. (2017) sought to figure out the grit level of students from pharmacy schools and whether grit assisted them in being academically successful in their program. The grit total score was a significant predictor for the participants who reported their GPA of 3.5 or higher but total grit scores were not significant for those students that reported a GPA of 3.49 or less. An implication of their results may be that a high level of grit was associated with those high-achieving students, while those that were lower-achieving were not correlated with grit level. Pate et al. suggested grit be a focus of secondary schools to help students achieve a higher GPA once they are in college.

Barbouta et al. (2020) researched how academic achievement may be affected by mindset and grit. They hypothesized that growth mindset and high grit would increase academic achievement, whereas a fixed mindset and low grit would lead to poor academic performance. Results of their research showed a positive correlation between total growth mindset and academic performance and a positive correlation between grit and growth mindset. Grit also had a positive correlation with mindset subscales and a positive correlation between grit and age, meaning that grit typically increased with age. Older participants had more grit than those who were younger. Since grit seemed to grow with age, it would make sense to create educational programs that endorsed grit within high school.

There was a focus on personal characteristics of students that enabled higher success. Grit was one of those concepts explored as a catalyst to academic achievement

by Braund et al. (2020). Their research study was to determine what characteristics of grit helped mothers with academic achievement in postsecondary education. Mothers tended to be a non-traditional student group that needed support due to lack of confidence and other issues. Mothers wanted to earn a college degree to set themselves up for a lucrative career and a better life for their families. Many Australian universities offered programs they termed “enabling,” which meant to help marginalized groups of students. Braund et al. found that 70% of participants believed they showed characteristics of grit throughout the program they were enrolled in, leading them to believe they were capable of achievement.

Burt et al. (2019) completed a study specifically for low-income college graduates in a nutrition program that were low-income and persons of color to figure out what barriers and support they found helpful when testing for their credential. A theme found for low-income nutrition graduates of color was a lack of self-confidence, being unaccustomed to what was expected of them, and questioning how becoming a registered dietician nutritionist (RDN) could benefit them and their careers. The researchers reported that grit was necessary in pursuit of the RDN, but grit was not at the same level in lower-income students. Along with grit, knowledge of how to navigate the educational setting was another important piece of the puzzle.

Stoffel and Cain (2018) completed a literature review to gain information about grit and resilience for those involved with health professions education, specifically pharmacy education. Medical profession education recognized the importance of non-cognitive factors and their relationship with the success of students. The concepts of grit and resilience have increasingly been used in academic settings. There were several

theories that attempted to explain why some students had difficulty. Some of these ideas were a fear of failure, while others believed students had less grit than those of previous generations and did not possess the resilience needed to persist and graduate from college. The researchers aimed to figure out how grit and resilience were related to pharmacy education since not much information could be found about this specific population in the literature. The researchers found that grit and resilience were listed as positive factors leading to success for those in the health professions and their ability to thrive in both school and life. Another theme that emerged was the support colleges should provide to students as they pursued medical profession degrees. Some of the supports were counseling and accommodations, but they cautioned against too much support that could hinder their success after graduation.

Direito et al. (2021) completed a review of the literature to discover the relationship between grit and college engineering education. They found that research on grit for engineering students was inconsistent in how the research was approached, their findings, and how findings were reported, but a theme found within the literature was that those in engineering education saw grit as a form of perseverance, while disregarding consistency of interest.

There have been studies to suggest grit has been positively related to college grade point average (GPA), specifically. Several researchers used GPA as an indicator of academic achievement (Akos & Kretchmar, 2017; Buzzetto-Hollywood & Mitchell, 2019; Direito et al., 2021; Duckworth et al., 2007; Duckworth & Quinn, 2009; Fagioli et al., 2020; Fernández-Martín et al., 2020; Stoffel & Cain, 2018; Weisskirch, 2018). For example, Stoffel & Cain (2018) reported on a study that showed total grit score was a

significant predictor of GPA for those students who earned a 3.5 GPA or greater. O'Neal et al. (2016) explored stress and depression levels, grit, and college GPA, finding that those with grit were more likely to achieve academic success. Wong et al. (2018) said evidence from previous studies showed grit predicted various achievement measures, including GPA, along with graduation rates for public high schools. Duckworth et al. (2007) concluded that grit scores and higher GPAs were related ($r = .25, p < .0001$).

Akos & Kretchmar (2017) studied non-cognitive predictors of college success since history had shown that colleges used primarily cognitive ability to predict success. They hypothesized that grit scores would predict first-year grade point average. The researchers used hierarchical multiple regression to discover grit significantly predicted first-year GPA ($\beta = .13$, $p < .05$), resulting in a significant increase in R^2, $F(7, 201) = 4.49$, $p<.05$. The Grit-S was able to explain 30.8% of the variation in first-year GPA. and suggested schools focus on grit as a non-cognitive factor important in academic success and to support programs that may foster grit.

Sriram et al. (2018) completed a cross-sectional, correlational research design with participants found using a Gallup tracking sample where they were asked questions using a survey format over the phone. The study determined variables that influenced self-control and grit among college students, in the form of predictor variables. There were a few variables found to be a considerable influence of self-control and grit, which included others-focused purpose, time spent in academic activities, success-focused purpose, and importance of religion. Others-focused purpose was the strongest predictor. Another variable that had a large effect size was time spent socializing but provided a negative influence on self-control and grit.

Growth Mindset

Kannangara et al. (2018) explained that a growth mindset was the belief that one could develop abilities through hard work and that intelligence and aptitudes were malleable. Wolcott et al. (2021) looked at research completed on growth mindset through a systematic review of the literature. They looked for strategies that could help one improve one's growth mindset since it had been shown this enabled one to overcome challenges and reach goals. Specifically, the researchers wanted to find literature that would help them understand what concepts might have helped students in health education professions be successful. Health profession education required the ability of students to traverse educational environments, which could be challenging for some. Goal orientation was explained as the idea that either learning or performance would be an emphasis. Being learning focused meant that developing new knowledge was important, while being performance focused had more to do with developing the skills needed to carry out activities. Individuals were motivated through both goal orientation and mindset. Fixed mindsets were an issue in goal attainment, but studies had been completed to discover how one could change his or her mindset. Wolcott et al. found that growth mindset helped students cope with challenges that were experienced during the educational journey. Unfailingly, the articles confirmed that growth mindset provided both emotional and psychological support for learners.

Hochanadel and Finamore (2015) said students with a fixed mindset tended to put less energy forth to work toward goals than those who had a growth mindset. What students believed about the malleability of their brains affected their ability to learn, be motivated, and to achieve academically. Claro et al. (2016) stated that economically

disadvantaged students tended to have a fixed mindset more often than their growth mindset counterparts. They explained those with a fixed mindset were more likely to avoid environments or situations that they believed would cause them to struggle. They discovered those from the lowest socioeconomic situations were twice as likely to have a fixed mindset than those who came from higher-income families. Claro et al. found that mindset and academic achievement were correlated regardless of socioeconomic status. Those with a growth mindset were able to out-perform fixed mindset peers regardless of income level.

Many researchers stated that a growth mindset helped one achieve academically because it allowed individuals to perceive challenges as opportunities and see abilities as being flexible (Barbouta et al., 2020; Braund et al., 2020; Datu et al., 2018; Kannangara et al., 2018; Pate et al., 2017; Stoffel & Cain, 2018; & Volstad et al., 2020). Barbouta et al. (2020) tested undergraduate and postgraduate students, their perceived mindset, and grit as another study to test academic achievement. There was a positive correlation between total growth mindset and academic performance, $r(238) = 0.464, p < .001$. There was also a positive correlation between grit and mindset, $r(238) = 0.527, p < .001$. Grit also had a positive correlation with mindset subscales.

Braund et al. (2020) said growth mindset assisted college students in achieving academic goals by providing a self-belief that they could accomplish educational tasks and would, therefore, put in the extra time and effort needed. Mental toughness was a benefit to those working on a college degree. Datu et al. (2018) concurred saying that growth mindset was a non-cognitive quality that led to academic success, as well as psychological and physical well-being.

Sabay and Wiles (2020) stated that grade point average and having strong academic skills were not enough to help students achieve academic success. In addition, having a growth mindset and tenacity toward academics were important to completing a college degree. TRIO SSS had been touted as a program that helped to build tenacity and the ability to navigate college, promoting goal-setting and self-advocacy in helping students continue their progression toward a degree regardless of the obstacles students may confront. Sabay and Wiles recommended TRIO SSS provide programs that encourage growth mindset and systems that aid students in navigating the college system.

Relationship Between Grit and Growth Mindset

Although Barbouta et al. (2020) studied both growth mindset and grit, they were studied separately to determine if they were each correlated with academic achievement. They were able to confirm a positive relationship between growth mindset and academic achievement. They also found that grit could predict educational attainment and that it improved with age. Wolcott et al. (2020) said many studies they reviewed measured the mindset of its participants and how various variables correlated with mindset, including grit. Tang (2019) completed a study of grit, growth mindset, and other variables to find out if there was a relation with academic achievement. They found the connection between grit and growth mindset was small, stating that goal commitment was a better indicator of higher grit level than growth mindset.

Hacisalihoglu et al. (2020) believed a connection between growth mindset and grit existed and created a course for first-year STEM students meant to help students improve growth mindset, grit, and skills of critical thinking. Again, the researchers studied both grit and growth mindset but did not research whether the combination of the

two would fortify academic achievement through GPA or course completion rate. They found a statistical significance between growth mindset and academic achievement, while grit scores showed a moderate positive correlation with GPA. Since growth mindset may be an alternative correlation with academic achievement, it will be interesting to study whether grit and growth mindset studied together would correlate more strongly with academic achievement than grit alone.

Kannangara et al. (2018) reported that higher grit scores were associated with having a growth mindset. They stated that having a growth mindset related to grit and the probability college students would persevere when confronted with barriers. One of the studies showed that when students were gritty they also showed a growth mindset. Students in their study who were shown to have a growth mindset were known to advocate for their needs and realized they could develop their abilities.

Research provided from previous studies revealed that both grit and growth mindset had a positive correlation with academic achievement. I became curious about whether grit would show a stronger relationship with academic achievement when combined with growth mindset. My study sought to determine whether TRIO SSS students who showed both an elevated level of grit and growth mindset would interact to provide a stronger correlation with GPA and course completion rate than grit alone.

Research Using the Short Grit Scale (Grit-S)

Grit had been touted as a concept that could be measured and studied with many researchers quantifying levels of grit through a grit scale. The Grit-S was said to be a more effective measurement of grit, with better psychometric properties than the original 12-item scale. (Fernández-Martín, 2020). Researchers including Barbouta et al. (2020),

Fong and Kim (2019), Park and Cho (2019), Rimfeld et al. (2016) and Wong et al. (2018) used the Short Grit Scale (Grit-S) to measure the grit level of their participants. Akos and Kretchmar (2017) described the Grit-S as a scale that included 8-items using 5-point Likert-type statements where respondents rated items from Not At All Like Me (1) to Very Much Like Me (5). Barbouta et al. (2020) said the Grit-S scale had high internal consistency reliability ($\alpha = .85$). Duckworth and Quinn (2009) tested validity and reliability of the Grit-S and found an acceptable internal consistency reliability with alphas of .73 to .83 overall with four different samples. One of those samples involved Ivy League undergraduate students. They also found that both factors used in the Grit-S, Consistency of Interest and Perseverance of Effort, both shown to have internal consistency and a strong intercorrelation, $r = .59, p < .001$.

Although the Grit-S contains two subscales, Consistency of Interest and Perseverance of Effort, many researchers have used only the total grit score in their analysis (Akos & Kretchmar, 2017; Buzzetto-Hollywood & Mitchell, 2019; Chen et al., 2021; Duckworth et al., 2007; Fagioli et al., 2020; Hacisalihoglu et al., 2020; Kannangara et al., 2018; Lopez & Horn, 2020; Saunders-Scott et al., 2018; Tuckwiller & Dardick, 2018; Whipple & Dimitrova-Grajzl, 2020. Gonzalez et al. (2020) stated a single factor provides explanation of most of the variance of the Grit-S items, leaving little use for separation into subscales to provide additional information. They explained that the total score obtained from the Grit-S should be used for analysis. There were other researchers who incorporated both total grit score and the subscores into their research (Barbouta et al., 2020; Fong & Kim, 2019; Pate et al., 2017), and others used only the grit subscores

during in their research (Hodge et al., 2018; Lombardi et al., 2019; Rimfeld et al., 2016; & Tang et al., 2019). For my study, the total grit score was used.

Fong and Kim (2019) researched whether constructs, such as grit, academic buoyancy and future time perspective were predictors of academic achievement through GPA. They hypothesized there would be a positive correlation between grit, academic buoyancy, and future time perspective with academic achievement. An online survey was sent to each participant's email address. They completed a consent form and then completed each section of the combined survey and some demographic information, along with self-reported GPA. This was like the current study where an online survey was supplied to participants asking comparable information. Their study showed grit was a vital component in students' success through academic performance.

At the same time, Fosnacht et al. (2019) explained there have been studies that did not show a strong correlation between grit and various positive academic outcomes. They said findings between research studies had been mixed. They also said the construct validity of Grit-S and whether grit was truly a unique variable had been a concern. Multiple demographic groups were analyzed. It was determined that the Grit-S was invariant after using the criteria of a change greater than or equal to -0.010 for the comparative fit index (CFI) and less than or equal to .015 for Root Mean Error of Approximation (RMSEA) compared to the model. Rimfeld et al. (2016) concluded the Big Five personality traits accounted for more of the academic achievement experienced, while grit added only a small prediction when other personality factors were controlled.

Saunders-Scott et al. (2017) sought to compare traditional predictors of academic success, such as ACT scores and high school GPA, with other factors including grit and

perception of stress to figure out which of them truly predicted academic success. Their hypotheses stated there would be a positive correlation between grit and GPA, a positive correlation between grit and ACT scores, and that grit would be a better predictor of college GPA than ACT scores or high school GPA. Grit and ACT scores did not show a significant relationship *(r = .069).* There were no significant relationships between grit and college GPA or ACT scores but there was a statistically significant relationship between ACT scores and college GPA, which then did not support the last alternative hypothesis since grit was not shown to be the best predictor of college GPA, $r = -.37$, $p = <.001$.

Even though reviews on grit have been mixed, Fosnacht et al. (2019) stated grit had become a focus for colleges, administrators, and policymakers and gave rise to the importance of additional investigation between grit and positive college outcomes with a suggestion that focus be placed on marginalized students. Since it would not be possible to change many of the factors that negatively affected college GPA and course completion rates, colleges should look at programming that could assist students in achievement, including how one might increase reported grit and growth mindset. Bassett (2020) said higher education institutions typically focused on how students could change to bring about more success, and suggested colleges instead focus on what can change within the college environment. To focus on historically underserved students, TRIO SSS Program members were participants of the study.

TRIO Student Support Services (SSS)

The U.S. Department of Education (2009) explained the purpose of TRIO SSS as a program meant to increase completion of a college program for students who comprise

the categories of low-income, first-generation, and students with disabilities who show academic need. Post-secondary institutions are awarded a TRIO Student Support Services (SSS) grant through an SSS Program competition that is held every four years using a five-year grant cycle. TRIO SSS was developed to serve this population of students, stating that those who qualify are more likely to drop out of college than the average student. Once a college is awarded a grant they must provide academic tutoring, help with college course selection, information about financial aid and literacy resources, and help with the transfer process to four-year colleges. In addition, SSS programs may also choose to offer personal and career counseling, cultural events, mentoring, and temporary housing during semester breaks. Sabay and Wiles (2020) shared that colleges provide over 3,100 TRIO programs in the United States and the programs serve about 800,000 students every year. TRIO SSS typically uses an intake process that allows tailored programming to its participants with academic planning, networking opportunities, and a plan for growth and connection at the college to assist in persistence, graduation, and transfer to four-year colleges. The Department of Education (2021) reported that those students in TRIO SSS at community colleges from Fall 2007 through Fall 2017 completed an associate degree within three years at a rate of 22%, while those students who could qualify for TRIO SSS but did not participate in the program were found to have an 11% graduation rate. Those who elected to refrain from participation in TRIO SSS were similar in their eligibility as both low-income and first-generation students. Although graduation rates for students in TRIO SSS were twice as high, the Department of Education reported that the graduation rate of 22% is still lower than the average graduation rate for all 2-year institutions.

This information raised further questions. Did those students who elected to participate in TRIO SSS already have both cognitive and non-cognitive factors that made them more likely to participate compared with their non-participating peers? Might it be possible that those students who elected to participate had a higher level of grit than those who did not? The current study began to answer these questions by determining whether grittier students elected to participate in more TRIO SSS services and activities and whether grittier students were those who had higher GPAs and course completion rates, leading to a higher graduation rate within the three-year timeframe.

First-Generation College Students

Ishitani (2016) described first-generation students as those whose parents did not complete a four-year degree. He said these students were more likely than those whose parents had a bachelor's degree to drop out of college, reporting that 34% of first-generation students drop out compared to 23% of non-first-generation students, indicating that first-generation college students (FGCS) were at a higher risk for college attrition than students overall since FGCS are 80% more likely than those whose parents earned a 4-year degree to drop out of college. When comparing differences between first-generation and non-first-generation students and characteristics before beginning college, one of the biggest differences was that more first-generation students were likely to come from families that were low-income. First-generation students were also more likely to be older, have more dependents, have lower GPAs and placement test scores, and were more likely to attend two-year institutions. They also spent more time working than their non-first-generation peers and had less understanding of the benefits of higher education. Wilson-Strydom (2017) added that first-generation students tended to view their

communities in negative terms, which would serve to provide less sense of community and support. Kundu (2019) added that first-generation college students comprised 50% of all college students in the United States.

Pratt et al. (2019) reported similar findings to Ishitani (2016), but three years later. Their study also showed that first-generation college students (FGCS) were less likely to complete a college degree. Their study quantified an attrition rate of 20% for FGCS while those who are not FGCS had a 12% attrition rate. Specifically, in their first year of college first-generation students were 71% more likely to discontinue their college education than their non-first-generation peers. They stated that first-generation students were less likely to be involved in campus activities and experienced fear that they would fail at a greater rate. First-generation students also took more remedial classes than their non-first-generation counterparts, which extended their time to graduation. Various risk factors for first-generation student attrition were financial insecurity, lack of confidence in their academic ability, and feeling they did not belong in the college community.

Although the researchers' percentages varied, they both concurred that FGCS had more difficulty with course completion than those who did not fall within the first-generation category. This information led to questioning why some students who qualify for TRIO SSS choose to leave college without earning a degree while others continue and graduate from college. The current research will focus on determining whether grit, with a possible interaction with growth mindset, may help first-generation students succeed. Another eligibility category for the TRIO SSS Program is to be a low-income student.

Low-Income College Students

Claro et al. (2016) explained that socioeconomic background had been a well-established predictor of academic achievement. Low-income students had a disadvantage since they were more likely to experience less access to educational resources, more stress, inadequate nutrition, and fewer opportunities to receive sufficient healthcare. They shared that students from low-income backgrounds were more likely to fail if they believed their intelligence level was stagnant, referred to as a fixed mindset. Ober et al. (2020) reported that 22% of low-income students who had planned to attend college, changed their minds prior to enrolling in their first fall semester. They explained that the financial expenses associated with college attendance kept low-income students from attending college during the fall term after graduating from high school.

Miller and Weiss (2022) described issues that low-income students faced in entering and completing college. Although postsecondary education is touted as a strategy leading to higher rates of pay, those from low-income families were less likely to attend college. According to Miller and Weiss, community colleges serve approximately 40% of all college students because they are open admission and typically less expensive than other college options. At the same time, although the cost to attend a community college is about one-third the cost of public four-year colleges and universities, it is still an expense that many cannot afford from lower socioeconomic backgrounds. Financial aid awards cannot always cover costs of attendance entirely, making it difficult for low-income students to pay full tuition, buy textbooks, and pay for other expenses related to attendance. Kundu (2019) reported that racial minorities from low-income families had a challenging time remaining in college when they were unable to find and use services for student support on campus. He also said low-income racial minority students experienced

implicit biases and microaggressions from educators and staff at the college, making it problematic to excel regardless of academic ability.

Spica and Biddix (2021) explained that the ability to afford college is an indicator of whether students enrolled and completed college. The affordability of a college education went beyond the cost of tuition. Their study sought to determine the extent that community college students attended without textbooks and other materials required for class because they could not afford them, and in turn, how lack of course materials affected their academic achievement. The researchers reported the cost of textbooks and other materials had tripled over the last 30 years. They found that two-thirds of students held off on purchasing a textbook due to lack of funding, while just over 41% of students chose not to buy required materials at all. Some students believed the lack of required materials caused academic issues, with over 15% reporting a low grade and over 3% saying they failed a course because they were not able to pay for the materials. They also shared that cost for materials that could not be paid for through job earnings or savings end up incurring debt from student loans when they elect to purchase the materials using some form of financial aid. They pointed out that the lack of money to purchase required materials had various negative results, such as withdrawing from courses or avoiding certain courses altogether.

Spica and Biddix (2021) said the cost of materials impacted progress in course completion and graduation since they would take fewer classes per college term. At least 27% of students said they took fewer classes per semester or chose not to take particular courses due to the cost, delaying progress toward graduation. The researchers completed a logistic regression on academic achievement and found that low-income hindered

academic achievement no matter the students' race, ethnicity, or age. This information strongly supports the idea that the cost of materials has become an equity concern for students in lower income brackets.

Fotuhi et al. (2022) stated that students with a lower socioeconomic status enroll in college at a much lower rate than those in higher income brackets, which then led to low-income job prospects with the cycle continuing through generations. This created a negative feedback loop that continued to perpetuate economic inequality and reduced completion of a higher education degree for students in a lower-income bracket. Low-income students who already had difficulty with the increasing cost of higher education experienced an exacerbation of this issue when financial aid opportunities were limited. Unfortunately, the college and financial aid applications were arduous and confusing and resulted in low-income students who would qualify for aid refraining from applying. There were also students who applied to college but missed the financial aid application deadline, resulting in the inability to attend. Fotuhi et al. pointed out that stressors experienced each day by low-income students made the psychological toll in completing the financial aid application appear daunting and something that avoided when present concerns revolved around survival and the ability to pay typical household bills.

Students with Disabilities

Sarid et al. (2020) explained that more students with learning disabilities (LD) were attending college than ever before. They believed this was due, in part, to legislation that protected people with disabilities from discrimination and required support from federally funded organizations. Although policies had been positive for students with disabilities, students with LD had enrollment and completion rates that were much lower

than those without learning disabilities (NLD). During their study they found that placement test scores were lower for those with LD than for NLD, but then found that the GPA earned by students with LD up to graduation was higher than that of NLD graduates, even after low-achieving graduates were excluded from the analysis. They reported that entrance exams for admission to postsecondary schools were not helpful predictors of college achievement, explaining that graduates with LD who were admitted to college without meeting the standard admission criteria had a GPA that did not differ from graduates with LD who were admitted using the standard admission process. These results indicated that using standard cognitive criteria for college admission were not effective for students with LD. It may benefit colleges to use non-cognitive traits as an indicator of college achievement for students with disabilities, including grit level.

Gothberg et al. (2015) stated that nonacademic skills, such as grit, character, and resilience were more highly correlated with both academic and work outcomes than cognitive skills. Since academic skills were emphasized in educational settings, it may have benefitted students to embed the teaching of nonacademic skills during class time. They recommended high school teachers use service-learning projects, courses that focused on exploring employment options, and volunteer opportunities that would teach nonacademic skills to help prepare students with disabilities for college.

Tuckwiller and Dardick (2018) researched the connection between mindset, grit, optimism and pessimism and their relationship to life satisfaction for university students who reported anxiety and/or depression. They explained that university students were increasingly reporting poor mental health, including stress, anxiety, and depression. Their study examined differences in the variables for those with anxiety and/or depression and

those who did not have a mental health impairment. They found that college students with these diagnoses were more likely to have a fixed mindset, higher levels of pessimism, and lower levels of grit, optimism, and life satisfaction. Kundu (2019) said that college campuses are not always welcoming, resulting in mental health issues for students, which could further lead to diagnosable disabilities. There were strong correlations between higher stress levels and immune responses that were detrimental to a student's health and possible development of anxiety and depression.

Tansey et al. (2018) explained that college students with disabilities had unique challenges including attitudinal and structural barriers because of their disability and the need to request accommodations for classes, testing, and housing, and possible medical care coordination. They said students with disabilities had higher rates of depression and distress and less social support. These issues made it important for programs, such as TRIO SSS, to provide them with support and connection.

Glover et al. (2021) stated that, although having a disability can make college pursuits more complex, it does not mean that having a disability equates to less success. Instead, the lower success rate for college students with disabilities may stem from not knowing about the services that could be used to support their efforts, the fear in using services due to being stigmatized, lack of self-advocacy skills, and poor experiences with faculty regarding their disabilities. Their research focused on finding whether there was a relationship between disability status and grit. They obtained a significant main effect of disability status on grit, with students with disabilities reporting lower grit scores. There was also a significant interaction between disability status and being non-White with those falling into both categories scoring lower on grit scores compared to White students

with disabilities. The same results occurred during the analysis of the consistency of interest subscore. Grit scores did not vary based on disability status for White students, while grit scores were much lower for non-White participants who had disabilities compared to those without disabilities.

College Programming

Researchers have made suggestions on how colleges could support students in their grit level, including those services and activities provided by TRIO SSS programs. Fagioli et a. (2020) said using non-cognitive variables to predict academic outcomes may help colleges provide the support services necessary based on the data collected. For example, a study of rural students attending college showed that students appreciated the feeling of family that was provided by campus community support. Participating students said TRIO was a critical component in their ability and willingness to remain in college. The TRIO SSS Program provided students with financial support, guidance, and classes that taught learning strategies and other skills. Those students who qualified for the TRIO SSS program under the first-generation prong were grateful for guidance and the sharing of information typically needed to navigate college. Organized study sessions were listed as an important programming option (Golman, 2019). Vaughan et al. (2020) explained that integrated programs, such as TRIO SSS with a first-year seminar, helped with retention by providing constant reinforcement of mentorship and knowledge application.

Bennett et al. (2021) researched participants of TRIO SSS who reported that academic advising, mentorship, academic resources, and providing a campus family were all helpful services that aided them in completing a college degree. Some of the academic resources college students in TRIO SSS described as helpful were tutoring, assistance in

transferring to a four-year college, and having a computer lab that allowed free printing. Compared to the general student population, those in the TRIO SSS program were a small number, helping them feel like a family on campus.

Bassett (2020) talked about programs that were commonly offered at higher education institutions including orientations, mentorship by both faculty and peers, tutoring, remedial coursework, providing space for study, identity development activities, and scholarships to help fund education. Bassett's study specifically looked at those college employees who were typically part of TRIO SSS students' lives and how the employees perceived injustices at the college for marginalized students. There were some themes found in the perception of low-income, first-generation (LIFG) college students from those at the college who worked directly with LIFG college students. These included lacking a plan for academic achievement, not being prepared for college academic life, and having a low level of self-confidence. The plan for academic achievement might have been missing because passion for a particular major did not equate to having the aptitude, skills, or preparation necessary for that major. Low academic self-confidence typically stemmed from high school experiences that were discouraging or lacked the demand necessary to prepare for college.

Volstad et al. (2020) added information about other programs that colleges offered including student support groups, recreational programs, and student clubs and committees. They discussed both formal and informal programs. One specific formal program was a peer learning program where a student could receive support and get involved on campus in a safe environment. Off-campus involvement was also said to be helpful, making friendships that were not related to their academics. Some involvement

off campus included attending church, employment off campus, volunteer work, and spending time with friends outside of campus. Direito et al. (2021) added information about a specific program for engineering education that included a grade recovery option and services to introduce topics of engineering and physics, and to help students transition to college. Peer coaching involved peers working with one another, cultivating improved academic performance. An online boot camp was implemented as a summer bridge program that focused on perseverance, spatial visualization, and a readiness for the rigor of math required of engineering students.

Ottley and Ellis (2019) explained that much research had been conducted on initiatives meant to retain college students, but most of this research has primarily focused on White students while little research had focused on nontraditional students and students of color. Even though colleges attempted to employ retention initiatives directed at Black male college students, the attrition rates were high. Research by Ottley and Ellis focused on a particular retention initiative that involved mentorship and gathering each month as a large group to discuss assorted topics of interest, have meals, and participate in tutoring activities. They found that most students, administrators, and mentors believed it was helpful to have one place on campus that would allow them to feel accepted and found this place to be effective in allowing Black male students to share their frustrations. Having a space specifically for those in a TRIO SSS Program may also be beneficial for similar reasons.

Hochanadel and Finamore (2015) discussed college faculty and the unique position they would be in to provide an environment that promoted a growth mindset and could foster grit by helping them internalize their motivations to remain in college. They

reported that when faculty taught their students how to persevere, this helped students develop a growth mindset that led to a higher level of grit and the ability to work through barriers toward academic achievement. The researchers said growth mindset could be taught to those who teach at the college, as well as students and others. Rather than a narrow focus on only the achievement of good grades, faculty could work to challenge students and help them produce creative solutions to problems.

Spica and Biddix (2021) suggested faculty select required class materials by keeping cost in mind. Low-income students with insufficient financial aid might not be able to afford materials and would, therefore, affect their academic achievement in a particular class. They suggested faculty and colleges as a whole look at open educational resources (OER), subscription materials, or library collections rather than expensive materials students would be required to purchase. They added the possibility that colleges could provide incentives to faculty for selecting lower-cost materials.

Wilson-Strydom (2017) explained that inequalities in higher education, including access, admission, and educational attainment had been well-documented and they believed that focusing on “at risk” students created an understanding of students as deficient and at fault when they failed. Instead, she suggested focusing on students who had experienced educational achievement despite coming from a marginalized group. She discussed students living in poverty who attended inferior quality and poorly funded primary and secondary schools but were still accepted into universities. The question fell on what interventions they may have experienced that helped them attain educational goals. A suggestion by Wilson-Strydom was for universities to recognize students had lives beyond the university and the outside influences could either serve as enablers or

constraints in academic achievement. Universities could focus on helping students to build their sense of agency and self-efficacy, as well as help them recognize their strengths.

Hacisalihoglu et al. (2022) discussed the worry about graduation rates in higher education and explained this concern prompted many universities to provide courses that taught skills meant to help them accomplish educational goals. Their study showed a moderate positive relationship between the skills taught and first-semester grade point average. They also found that growth mindset was associated with academic achievement.

With the knowledge accumulated through the literature review regarding the benefit of grit and growth mindset correlating with academic success and the knowledge that God supports the idea of grit and perseverance (Hebrew 12:1, King James Bible, 1971/2022), it was determined that the current research would focus on grit as a non-cognitive factor that may be associated with higher cumulative GPA and college course completion rate. It will also be determined whether possessing a growth mindset may have an interaction effect with grit specifically for students attending community colleges who participate in a TRIO SSS program since students who fall under the categories of low-income, first-generation, or students with disabilities are less likely to experience academic success. Research looking at grit level and growth mindset are lacking for those in TRIO SSS programs. The level of involvement with TRIO SSS programming will also be explored.

Biblical Foundations of the Study

The Bible discussed grit and perseverance in pursuit of a goal. Hebrews 12:1 referred to staying the course in accomplishing goals saying, “Wherefore seeing we also are compassed about with so great a cloud of witnesses, let us lay aside every weight, and the sin which doth so easily beset us, and let us run with patience the race that is set before us” (King James Bible, 1971/2022). When one sets aside the weight or obstacles that are in the way of goals one can work steadily, using grit to overcome obstacles to achievement. Yost et al. (2019) stated Christians believed that all individuals were treasured through God’s view and that all could accomplish more than what was assumed by looking only at aptitude and intelligence. McElroy-Hetzel et al. (2018) explained that spiritual enterprise was the ability to work through barriers rather than giving up or attempting to avoid situations. They said spirituality allowed an individual to form an understanding of their experiences and make adaptations that could be necessary in the face of adversity. Clement et al. (2020) said they found grit to be associated with an elevated level of spirituality. Bowen et al. (2020) held that one’s spirituality could serve as a coping mechanism in challenging times, which related to grit and the idea of persevering over the long haul even when challenges arose. Fernández-Martín et al. (2020) explained that grit was related to the experiences that occurred each day through spirituality, while Stoffel & Cain (2018) stated spirituality was a protective factor that could help to build resilience. Sriram et al. (2018) shared that religion was a predictor variable related to grit. Spirituality had a positive influence on grit, and spiritual development had a positive effect on student academic results (Barton & Miller, 2015). There were many additional bible verses that refer to words that would be associated with

grit. The term itself would not come up since it is a newer term within literature but words that relate to grit were common in the Bible. Matthew 7:14 stated, “Because strait is the gate, and narrow is the way, which leadeth unto life, and few there be that find it” (King James Bible Online). It can be difficult to follow the right path and doing so would take grit and determination when often an easier road could be tempting. 1 Corinthians 15:58 said, “Therefore, my beloved brethren, be ye steadfast, unmoveable, always abounding in the work of the Lord, forasmuch as ye know that your labour is not in vain in the Lord” (King James Bible Online). Paul was asking others to keep going in their faith and to be immovable so they would not compromise their behavior or beliefs regardless of what surrounded them in the environment. An additional verse from 1 Corinthians 15:10 stated, “But by the grace of God I am what I am: and his grace which was bestowed upon me was not in vain; but I labored more abundantly than they all: yet not I, but the grace of God which as with me” (King James Bible online). Paul was converted to faith by the Grace of God and worked harder than the other apostles. There were many scripture verses written that related to grit, with the examples provided being only a few.

Summary

Researchers have studied several factors relating to college achievement and completion of a college credential. There are underserved students who may have experienced more barriers to college achievement than others. Students who qualified as first-generation, low-income, or students with disabilities experienced college achievement at a lower rate than the average student. Grit was a non-cognitive factor that had been linked to the achievement of long-term goals, such as college degree

achievement, despite barriers that might have developed. Grit had been studied in college students of various demographic categories. Growth mindset had also been studied, finding that it was related to academic achievement. Many scripture verses discussed ideas related to grit and perseverance and how these concepts related to achievement. The current study focused on discovering if a relationship existed between grit, GPA, course completion rate, and TRIO SSS program participation, as well as determining if the existence of growth mindset had an interaction effect with grit to influence higher GPA and course completion rates.

CHAPTER 3: RESEARCH METHOD

Overview

The study consisted of providing an online survey that included questions about gender and age, a grit scale, a growth mindset scale, self-reported GPA, and course completion rate. The survey hyperlink was sent to directors of TRIO SSS who worked at community colleges across the United States. The first part of the survey contained informed consent to participate and four screening questions before moving on. The Grit-S was used to determine the grit level of each survey participant, listing eight questions on a 5-point Likert type scale where question responses ranged from “very much like me” to “not like me at all.” Whether participants had a growth mindset was determined using Dweck’s Growth Mindset Scale that consisted of eight questions on a 6-point Likert type scale with responses ranging from “strongly agree” to “strongly disagree” (2006). Open-ended questions were used to obtain participants’ cumulative GPA on a 4-point scale, rate of college credit attempted versus earned, the TRIO SSS programming each participant participated in, the average number of services and activities participated in during one semester, gender, and age. Although minor risk could be involved that would hinder the wellness of participants, information was provided in case the survey questions triggered a negative reaction and participants wanted to seek help. Data was compiled from all survey responses, downloaded as a .csv file, and then converted to an excel file. The data was cleaned and put into an SPSS program for analyses to answer five research questions and determine each null or alternative hypothesis.

Research Questions and Hypotheses

Research Questions

RQ1: Does grit level influence cumulative GPA for community college students in TRIO SSS Programs?

RQ2: Does grit level influence course completion rates for community college students in TRIO SSS Programs?

RQ3: Do students with a higher level of grit participate in a greater number of TRIO SSS services and activities?

RQ4: Does an interaction effect exist between reported grit and growth mindset on GPA for community college students in TRIO SSS Programs?

RQ5: Does an interaction effect exist between reported grit and growth mindset on course completion rate for community college students in TRIO SSS Programs?

Hypotheses

Hypothesis 1: A higher level of grit influences cumulative GPA for community college students in TRIO SSS Programs.

Hypothesis 2: A higher level of grit influences course completion rate for community college students in TRIO SSS Programs.

Hypothesis 3: There is a positive relationship between grit level and the number of TRIO SSS services and activities students elect to participate in.

Hypothesis 4: Grit and growth mindset have an interaction effect on GPA and/or course completion rate for community college students in TRIO SSS Programs.

Hypothesis 5: Grit and intrinsic spirituality have an interaction effect on GPA and/or course completion rate for community college students in TRIO SSS Programs.

Research Design

The research study used a cross-sectional, self-administered electronic survey method for collecting and analyzing data. Using a cross-sectional method allowed the study to take place at a single point in time and study various characteristics at once. Analysis of the relationship between variables for the same group of subjects was conducted.

Participants

The subjects were participants over the age of 18 attending community colleges in the United States who were participants of a TRIO Student Support Services (SSS) Program. Eligibility for this federally funded program required students to be low income, first-generation, and/or students with a disability. Participants were recruited by contacting TRIO SSS Directors at community colleges in the United States with a request to disseminate a supplied email containing the survey hyperlink to students in their programs who had finished at least one semester of college. Participation was entirely voluntary, and a disclosure was provided within the survey to allow students to provide their permission to use their confidential responses for statistical analysis. Students were screened from the survey before completion if they did not meet the qualifying parameters set, which were completion of at least one semester at a community college who participated in a TRIO SSS Program for at least one semester.

Study Procedures

Participants were recruited by contacting TRIO SSS Directors at community colleges in the United States with a request to disseminate an email containing the survey hyperlink to students in their programs who had finished at least one semester of college.

The survey consisted of the Grit-S scale, Growth Mindset Scale, questions about college cumulative GPA and completion rate, the average number of TRIO SSS services and activities participated in during one semester, and brief demographic questions. There was no direct point of contact with individual students. Contact information for me, as the researcher, was provided at the end of the online survey.

Instrumentation and Measurement

College Cumulative Grade Point Average (GPA)

Current cumulative GPA at the time of survey completion was a question posed on the online survey. College cumulative GPA, on a 4-point scale, was used as a measure of academic achievement. Buzzetto-Hollywood & Mitchell (2019) found GPA to be a strong predictor of academic success.

Course Completion Rate

The number of courses attempted and the number of courses completed were requested as part of the online survey. Completed courses were defined as those that earn a grade of A, B, C, or D, excluding those courses noted as a withdrawal (W) or failing (F) grade. College course completion rate was determined by dividing the number of courses completed by the number of courses attempted. College course completion rate was used as a measure of academic achievement.

Demographic Information

Demographic information contained in the online survey included gender and age. Although these variables will not be used to answer the five research questions, they are included since previous researchers found these variables affected grit level.

Grit

The Grit-S was incorporated into the electronic survey questionnaire to measure grit. The Short Grit Scale (Grit-S) consists of eight items on a 5-point Likert scale where participants rated their agreement with the statements given. Several studies used the Grit-S Scale to quantify grit (Akos et al., 2022; Barbouta et al., 2020; Fong & Kim, 2019; Park & Cho, 2019; Rimfeld et al., 2016; and Wong et al., 2018). Pate et al. (2017) reported Cronbach's alpha of .73 in determining the Grit-S as a reliable instrument in measuring grit in a group of college pharmacy students. They also reported construct validity and model fit indices as acceptable for their sample with 76% power to detect a difference at a confidence level of 95%. Duckworth and Quinn (2009) stated the Grit-S showed good internal consistency where alphas ranged from .73 to .83. They also used confirmatory factor analysis to show that Consistency of Interest and Perseverance of Effort were second-order latent factors and both factors showed internal consistency and a strong intercorrelation, $r = .59$, $p < .001$.

Growth Mindset

Dweck (2000) explained that both entity and incremental theories of intelligence were identified and later known as fixed and growth mindsets. She explained that those who were growth-seeking were motivated to expand their capabilities and work toward their potential. Whether a student participant has a growth mindset, as opposed to a fixed mindset, will be measured with questions posed in the online survey using the "Growth Mindset Scale" (Dweck, 2006). This portion of the survey consisted of eight questions on a 6-point Likert scale. Barbouta et al. (2020) found there was a moderate positive correlation between academic achievement and growth mindset *($r(238)=0.464$, $p<0.001$).* Chen et al. (2021) said that the growth mindset scale showed goodness of fit,

the items were consistent with the expected model, and shown good convergent, discriminant, and construct validity, although they used Chinese samples from primary and secondary schools, *Chi-square = 356.645, Degrees of freedom= 124, x2/df = 2.876, RMSEA = 0.054, CFI = 0.958, SRMR= 0.036*.

Program Participation

A list of college programs was provided in the online survey and included an "other" option for students to write in additional programs they participated in that were not pre-listed. A question asking about the average number of TRIO SSS services and activities that were participated in during a one semester period was requested.

Operationalization of Variables

Grit – this variable is an ordinal variable and will be measured by total score on the "Grit-S" portion of the survey (Barbouta et al., 2020; Duckworth et al., 2007; Fong & Kim, 2019; Park & Cho, 2019; Rimfeld et al., 2016; and Wong et al., 2018).

Grade Point Average (GPA) – this variable is a ratio variable and will be determined by self-report using an online survey using a 4.0 scale.

Growth Mindset – this variable is an ordinal variable that will be determined by total score using the "Growth Mindset Scale" contained in the online survey (Dweck, 2006)

Course Completion Rate – this variable is a ratio variable and will be measured by total courses (in credit hours) completed divided by courses attempted (in credit hours).

College Program Participation – this variable is a ratio variable measured by participant self–report listing the estimated number of times a student participated in all TRIO SSS services and activities, on average, during one semester.

Data Analysis

The purpose of this quantitative correlational study was to examine the extent to which grit was related to cumulative GPA, college course completion rate, and the average number of services and activities TRIO SSS community college students participated in during one semester. There was also analysis of an interaction effect between grit and growth mindset on both college cumulative GPA and course completion rate. Response options for each scale were coded using the numeric values based on instructions specified by the authors of those scales. Survey responses were downloaded as a comma-separated values (CSV) file and then converted to a Microsoft Excel file format. Data cleaning ensued then data was copied into an SPSS file.

The questionnaire components were examined with linear regression, standard multiple regression, and correlational analysis using SPSS. Many researchers have used correlational studies when studying grit and college success (Akos and Kretchmar, 2017; Barbouta et al., 2020; Braund et al., 2020; Buzzetto-Hollywood & Mitchell (2019); Dimitrova-Graizl, 2021; Direito, et al., 2021; Kannangara et al., 2018; Pate et al., 2017; Rimfeld et al., 2016; Saunders-Scott et al., 2018; Sriram et al., 2018; Whipple & Wesskirch, 2018). Linear regression allowed me to determine whether level of grit statistically predicted both college cumulative GPA and course completion rate. Multiple regression permitted me to determine the degree to which the independent variables, grit and growth mindset, had an interaction effect with cumulative GPA and course completion rate. By adding both independent variables into the equation it was possible to determine shared variation attribution with one another (Laerd Statistics, 2015).

To summarize the data obtained from survey responses, descriptive statistics were provided for various variables, such as gender and age through frequencies and percentages, along with the min, max, mean, and standard deviations of Grit-S total score, growth mindset total score, cumulative GPA, course completion rate, and the number of TRIO SSS services and activities participated in during one semester. Descriptive statistics for the variables were obtained through SPSS using the Descriptives option to select the statistics of interest.

To answer research question 1, I used a linear regression to determine how a change in grit level affected college cumulative GPA using SPSS. Grit level and GPA data were added to the data view in SPSS and then marked as continuous, or scale, variables through the variable view. The Chart Builder was used to create a scatterplot to figure out if a linear relationship existed and then a linear regression was run. The scatterplot was generated through SPSS using grit level on the x-axis and GPA on the y-axis to visually confirm the existence of a linear relationship between the two variables. In running the linear regression procedure in SPSS, I marked both Estimates and Confidence intervals at the 95% level. Casewise diagnostics was used to determine whether there were outliers outside of 3 standard deviations.

I used the Plots tab to move ZRESID to the Y box and ZPRED to the X box and selected both Histogram and Normal probability plot (Laerd Statistics, 2015). Homoscedasticity was tested by looking at the scatterplot of GPA using the predicted values versus the standardized residuals. The scatterplot showed a constant spread, so homoscedasticity was assumed. A histogram was employed to visually determine normal distribution of the standardized residuals. In addition, the Normal P-P plot was used to

confirm the residuals were normally distributed by approximately following a diagonal line.

The Model Summary table from the SPSS output was utilized to view R^2 to find the percentage of variation that could be explained by the model in the population and an estimate of the effect size. The ANOVA table allowed me to determine the statistical significance of the results and linear relationship of the regression model by looking at the *p*-value. I used the Coefficients table to find the regression equation that helped me figure out whether the proportion of variance of GPA was explained by grit level (Laerd Statistics, 2015). The same statistical model, linear regression, was employed to determine the strength and direction of a relationship between grit level and college course completion rate to answer research question 2.

Research question 3 was initially thought to be answered using Pearson product-moment correlation to determine the strength and direction of a possible relationship between grit level and number of TRIO SSS activities and services participated in during one semester. During the analysis, it was discovered that not all variables were normally distributed, as assessed by Shapiro-Wilk's test ($p < .05$). For this reason, a Spearman Rank-Order analysis was run instead. A scatterplot was created to determine if there was a monotonic relationship between grit level and number of TRIO SSS activities and services participated in during one semester. The Spearman Rank-Order procedure involved running a bivariate correlation in SPSS. A look at the coefficient value allowed for information regarding the strength and direction of an association between grit level and participation and then to determine whether the value was statistically significant using $p < .05$ as the indicator.

To answer research question 4, I ran a standard multiple regression to figure out how much of the variation of the dependent variable, cumulative GPA, could be explained by the independent variables, grit and growth mindset as an interaction. In using multiple regression, a test for linearity was conducted to ensure a linear relationship was present between grit, growth mindset, and the interaction of the two with college cumulative GPA by creating scatterplots of grit level and GPA, growth mindset and GPA, and the interaction of grit and growth mindset with GPA. The individual scatterplot was used to test for homoscedasticity. Multicollinearity was examined using the Correlations table in SPSS output to make sure the independent variables did not have correlations greater than 0.7. The Tolerance findings from the Coefficients table were viewed to determine whether there was a collinearity issue. Collinearity issues were found so grit level, growth mindset level, and the interaction of grit and growth mindset were all mean-centered.

Casewise diagnostics were run to determine if there were any outliers using a value of $>\pm 3$, and a check for normality was completed. It was assessed whether grit had a main effect and whether grit and growth mindset had an interaction effect on college cumulative GPA (Laerd Statistics, 2015). The slope between grit and cumulative GPA was expected to increase when growth mindset was added to the equation.

Using the output in SPSS from running the multiple regression, R^2 was utilized to determine how grit and growth mindset concurrently explained the variability of college cumulative GPA in answering research question 4. To determine the multiple correlation coefficient and total variance explained, I looked at the SPSS output to find the Model Summary. This provided the R, which is the Pearson correlation coefficient showing

what was predicted by the regression model and the real numbers of the dependent variable. This number showed the strength of the linear relationship.

R^2 was viewed to find the proportion of variance explained by both grit and growth mindset. The ANOVA table in the SPSS output was used to find the significance. Since $p > .05$, it was determined that the results could not confirm grit and growth mindset statistically significantly predicted college cumulative GPA. The Coefficients table was checked to find the slope coefficient, which was used to determine the change in college cumulative GPA for a one-unit change in the independent variables. The confidence level was used to determine that the confidence between lower and upper bounds were statistically significant (Laerd Statistics, 2015). The multiple regression analysis was repeated using college course completion rate as the dependent variable to answer research question 5.

Data analysis of the variables in this study occurred by using linear regression, Spearman Rank-Order Correlation, and standard multiple regression to answer the five research questions. Research questions 1 and 2 were answered by running a linear regression to determine the regression equation that described the relationship between grit level and college GPA, and again to discover the relationship between grit level and college course completion rate. A Spearman Rank-Order correlation was analyzed to find out if there was a relationship between grit level and the number of TRIO program activities and services a student participated in during one semester. Multiple regression was studied to discover the nature of the relationship between grit and growth mindset as the independent variables in how they may concurrently influence college GPA as the

dependent variable and then run again using college course completion rate as the dependent variable.

Delimitations, Assumptions, and Limitations

A delimitation of the study was to focus on TRIO SSS participants since qualifications for this program required a student to fall under the categories of low-income, first-generation, or being a student with a disability. This study was focused on underserved students with these criteria since little research had been completed regarding the research questions for this group of students. It was assumed that students across the United States participating in TRIO SSS at various community colleges would elect to participate in the study to provide information coming from various geographical areas and from all three qualifications of low-income, first-generation, and students with disabilities. It was also assumed that participants would complete the survey voluntarily and respond to questions accurately. Although it was assumed that students at many different community colleges would choose to participate, only a small number of students elected to complete the survey. A small sample size is susceptible to Type II error, causing an inability to reject the null hypothesis when it may be false because of low statistical power (Shreffler & Huecker, 2022).

Another limiting factor was that, due to the nature of the confidential survey and it being provided nationally, there was no way to know what geographical area of the United States students were from. The study was based on online self-reported data which may have reflected bias in responses due to social desirability issues (Fong & Kim, 2019). Other limitations for the proposed study included the use of a cross-sectional design, which did not allow for determination of causation, and the assumption that

cumulative GPA and course completion rates were the best markers to indicate academic achievement (O'Neal et al., 2016).

Summary

There were five research questions to figure out if grit was related to college cumulative GPA and course completion rate, whether grit had an interaction effect with growth mindset, and how grit related to the average number of services and activities provided by TRIO SSS that community college students participated in. It was hypothesized that all variables were related with grit and an interaction effect between grit and growth mindset on college GPA and course completion rate existed. A cross-sectional design was implemented using an online survey that provided demographic information, questions about GPA, course completion, and average number of TRIO SSS services and activities participated in during a semester, as well as the Grit-S and Growth Mindset Scales. Statistical analyses of the relationship between grit, college cumulative GPA, course completion rate, and average number of TRIO SSS services and programs participated in during one semester were conducted. Type II error was likely due to small sample size (Shreffler & Huecker, 2022).

CHAPTER 4: RESULTS

Overview

The purpose of this quantitative, correlational research study was to examine how grit related to college GPA, course completion rate, and TRIO SSS program participation. In addition, an interaction effect between grit and growth mindset on college GPA and course completion rate was studied to determine if the two variables provided a stronger relationship to academic achievement than grit alone. Participant responses to the online survey were aggregated to form a dataset using SPSS data analysis software. Descriptive statistics provided an overview of some demographic characteristics of the participants. The results of linear regression, multiple regression, and Spearman Rank-Order analyses are reviewed. Evaluation of the study's inability to reject the null hypotheses are discussed.

Descriptive Results

Data in this study were collected between December 12, 2022 and March 7, 2023. The sample population included only those that could positively answer the four screening questions provided and agreed to informed consent. Initially, 95 participants attempted the survey, but only 82 passed the screening questions that were included in the study, resulting in the exclusion of 13 potential participants.

Demographic information contained in the online survey included gender and age. Although these variables were not used to answer the five research questions, they were included because previous researchers found these variables affected grit level (Lopez & Horn, 2020; Whipple & Dimitrova-Grajzl, 2021). The survey was sent to the national TRIO listserv, the Association on Higher Education and Disability (AHEAD) national

listserv, four regional AHEAD groups, all 15 TRIO directors in my home state, and 128 additional TRIO SSS Directors in various states that were found using a Google search. These directors were sent individual correspondence containing both the email for directors and a copy of the email for their students, which included a hyperlink to the online survey.

Gender options included male, female, non-binary, or other. Of the 82 survey respondents, female participants totaled 76.8%, while males came to 15.9%, non-binary were 3.7%, and those who listed something other than male, female, or non-binary totaled 3.7%. Participants aged 18-24 represented 62.2% of respondents, ages 25-34 were 22.0%, and participants aged 35 or older denoted 15.9% of respondents (see Table 1).

Table 1

Frequency Table for Participants' Demographic Characteristics

		n	*%*
Gender			
	Male	13	15.9
	Female	63	76.8
	Non-binary	3	3.7
	Other	3	3.7
Age			
	18-24	51	62.2
	25-34	18	22
	35+	13	15.9

Note. % = percentage of total *n*.

The minimum GPA reported was 0.00 and the maximum was 4.00, with a mean GPA of 3.26 and standard deviation of .713. The minimum course completion rate was 0.8% while the maximum was 100%, with 100% meaning that all courses had been completed that were attempted. The mean course completion rate was 89.87% and the standard deviation was 20.1%. Some respondents stated they did not participate in any

TRIO SSS programs while the maximum number of activities and services participated in during one semester was 56. The mean number of activities and services participated in was 8, with a standard deviation of 10.2.

Grit-S scores ranged from 2.25 to 4.50 with a mean score of 3.38 and a standard deviation of 0.60. Growth mindset score ranged from 8 to 40 with a mean score of 26.65 and a standard deviation of 5.59. Table 2 displays the min, max, median, and standard deviation for all variables used in the study, which include grit, growth mindset, course completion rate, GPA, and participation in TRIO SSS services and activities.

Table 2

Descriptive Statistics for Variables

Variable	*n*	Min	Max	M	SD
Grit	82	2.25	4.50	3.38	0.602
Growth Mindset	82	8.00	40.00	26.65	5.592
GPA	79	0.00	4.00	3.26	0.713
Course Completion Rate	82	8.00%	100.00%	89.87%	0.201
Participation in Service/Activities	82	0.00	56.00	8.05	10.203

Internal Consistency

The Grit-S was used to measure grit level and consisted of eight questions. The scale had a moderately high level of internal consistency, as determined by Cronbach's coefficient alpha of .733. Another scale used in the study was the 8-item Growth Mindset Scale. The scale also had a moderately high level of internal consistency, as determined by Cronbach's coefficient alpha of .705.

Study Findings

Research Questions

RQ1: Does grit level influence cumulative GPA for community college students in TRIO SSS Programs?

To assess linearity, a scatterplot of grit level against GPA was plotted. Visual inspection of the plot indicated no linear relationship between the variables (see Figure 1). There was homoscedasticity and normality of the residuals (see Figure 2). There was one outlier, Case #48, which was removed from this analysis.

Grit level did not statistically significantly predict GPA, $F(1, 76) = .229$, $p = .634$, accounting for only 0.3% of the variation in GPA with an $R^2 = .003$ a very small effect size according to Cohen (1988; see Table 3). The null hypothesis could not be rejected.

Figure 1

Scatterplot of Grit-Centered and GPA

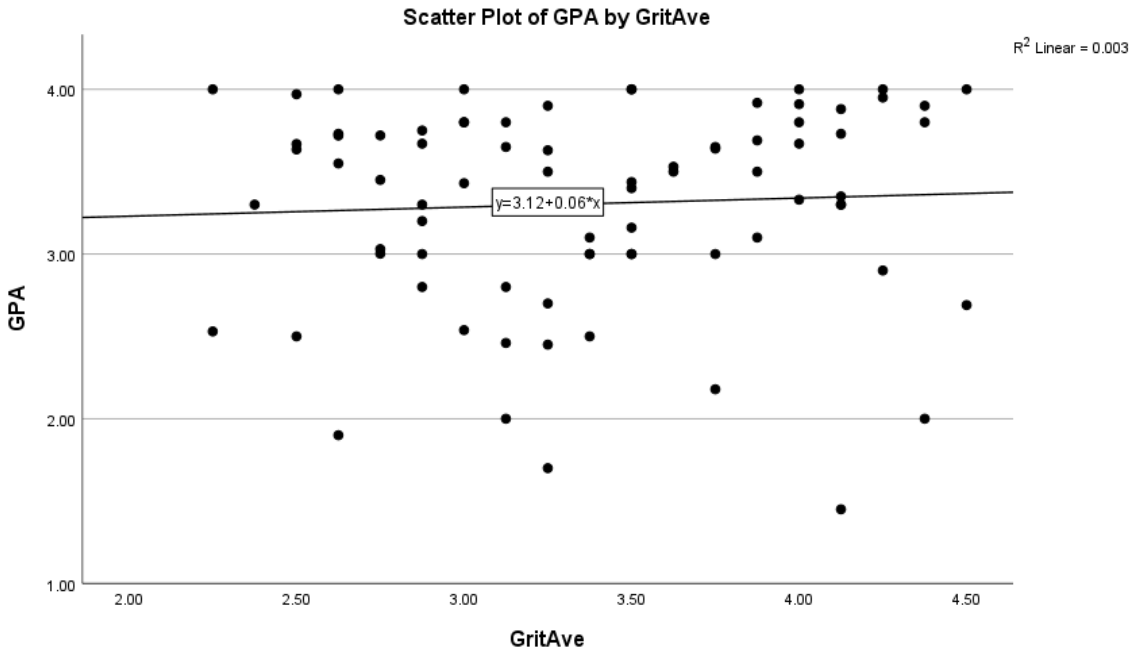


Figure 2

Normal Probability Plot of Observed vs Expected Percentiles (GPA)

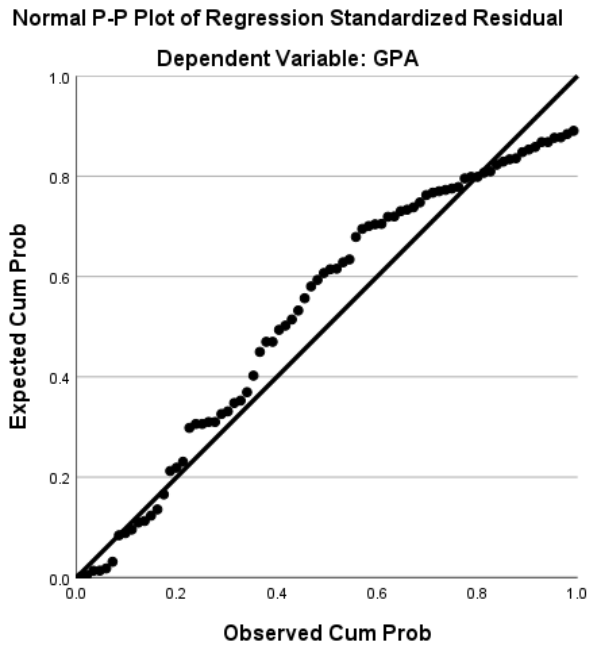


Table 3

Regression Analysis Summary for Grit Predicting GPA

Variable	*b*	*b* 95% CI (LL, UL)	*SE*	*β*	*t*	*p*
(Constant)	3.119	[2.331, 3.908]	.396		7.879	<.001
Grit	0.055	[-.174, .285]	.115	.055	.478	.634

Note. R^2 = .003; *b* represents unstandardized regression weights; *SE* indicates standard error; *β* indicates the standardized regression weight; LL and UL indicate the lower and upper limits of the confidence interval around *b*.

RQ2: Does grit level influence course completion rates for community college students in TRIO SSS Programs?

I ran a linear regression to understand the effect of grit level on course completion rate. To assess linearity, a scatterplot of course completion rate against grit level was

plotted. Visual inspection of this plot indicated a linear relationship between the variables (see Figure 3). There was homoscedasticity of the residuals. There was a deviation in the normality assumption but regression is usually robust to the assumption (See Figure 4). Three participants were outliers with course completion rates of .08, .31, and .15, but they were not removed, as this caused additional outliers.

Grit level did not statistically significantly predict course completion rate, $F(1, 80) = 1.129$, $p = .291$, accounting for 1.4% of the variation in course completion rate, $R^2 = .014$, a very small effect size according to Cohen (1988; see Table 4). The null hypothesis could not be rejected.

Figure 3

Scatterplot of Grit and Course Completion Rate

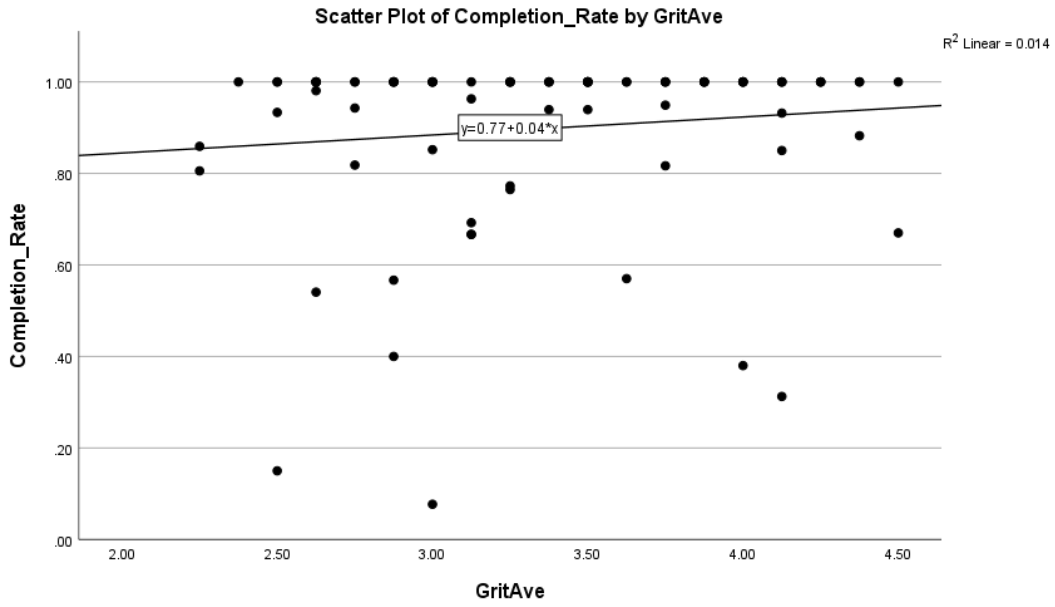


Figure 4

Normal Probability Plot of Observed vs Expected Percentiles (Course Completion Rate)

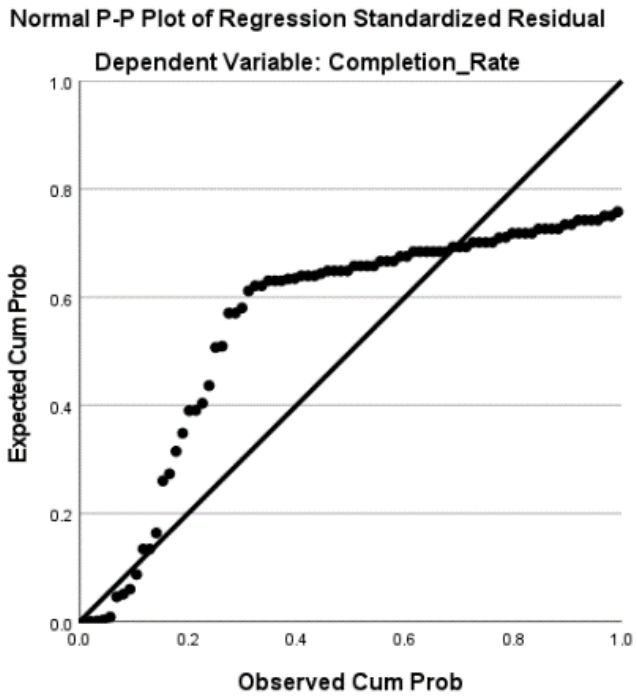


Table 4

Regression Analysis Summary for Grit Predicting Course Completion Rate

Variable	*b*	*b* 95% CI (LL, UL)	*SE*	*β*	*t*	*p*
(Constant)	0.766	[.513, 1.018]	.127		6.035	<.001
Grit	0.039	[-.034, .113]	.037	.118	1.063	.291

Note. R^2 = .014; *b* represents unstandardized regression weights; *SE* indicates standard error; *β* indicates the standardized regression weight; LL and UL indicate the lower and upper limits of the confidence interval around *b*.

RQ3: Do students with a higher level of grit participate in a greater number of TRIO SSS services and activities?

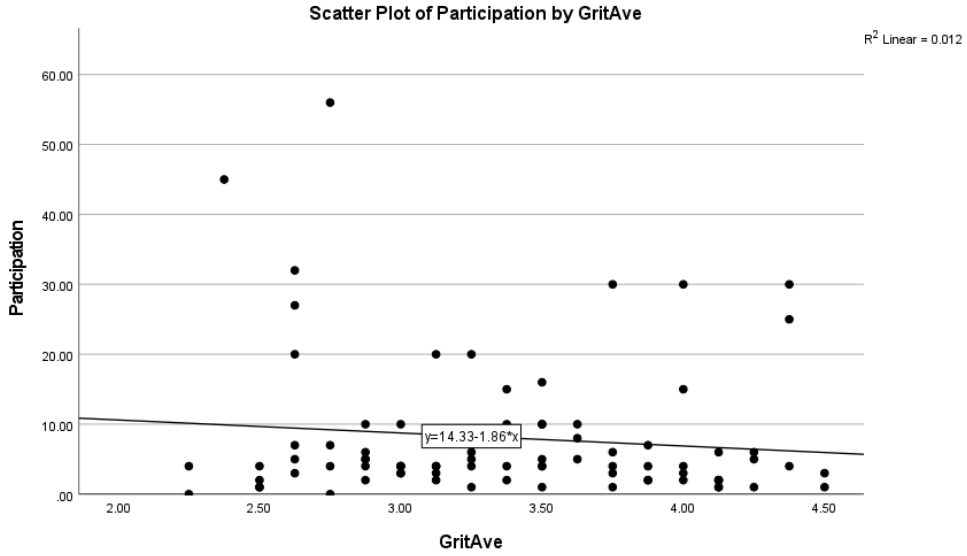
Initially, I ran a Pearson's product-moment correlation to assess the relationship between grit level and the number of TRIO SSS services and activities students participated in, with the premise that students with a higher level of grit would participate in a greater number of services and activities. Assumptions of a Pearson's correlation

include that continuous variables are being used for measurement, the continuous variables are paired, the relationship between the variables are linear, there are no significant outliers, and there is an assumption of normality. Preliminary analyses showed the relationship was linear based on a scatterplot but a Shapiro-Wilk test showed a significant departure from normality, W(82) = .966, p = .028.

Because the variables were not normally distributed, I ran a Spearman Rank Order analysis instead of Pearson Product-Moment Correlation to assess the relationship between grit level and participation in TRIO SSS programs and activities. Eighty-two participants were included in this analysis. Preliminary analysis showed the relationship to be monotonic, as assessed by visual inspection of a scatterplot (see Figure 5). There was no statistically significant correlation between grit level and participation, r_s(82) = -.079, p = .480.

Figure 5

Scatterplot of Grit and Program Participation



RQ4: Does an interaction effect exist between reported grit and growth mindset on GPA for community college students in TRIO SSS Programs?

I ran a multiple regression analysis to discover whether an interaction effect existed between grit and growth mindset levels on GPA. Scatterplots revealed a linear relationship between grit and GPA, growth mindset and GPA, and the interaction of grit and growth mindset with GPA (see Figures 6, 7, & 8). Case #48 was an outlier and, therefore, removed for this analysis. There was homoscedasticity, as assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values (Figure 9). There was evidence of multicollinearity, as assessed by tolerance values less than 0.1, so grit and growth mindset were mean-centered. There were two leverage values slightly above 0.2 but the values for Cook's Distance were below 1 so the cases remained for this analysis. The assumption of normality was met, as assessed by a P-P plot (Figure 10).

The multiple regression model did not statistically significantly predict GPA, $F(3, 74) = .968$, $p = .412$, $R = .194$ $R^2 = .038$. The interaction of grit and growth mindset explained 3.8% of the variability in GPA but the interaction was not statistically significant, $p > .05$. Regression coefficients and standard errors can be found in Table 5.

Figure 6

Scatterplot of Grit (mean-centered) with GPA

Figure 7

Scatterplot of Growth Mindset (mean-centered) with GPA

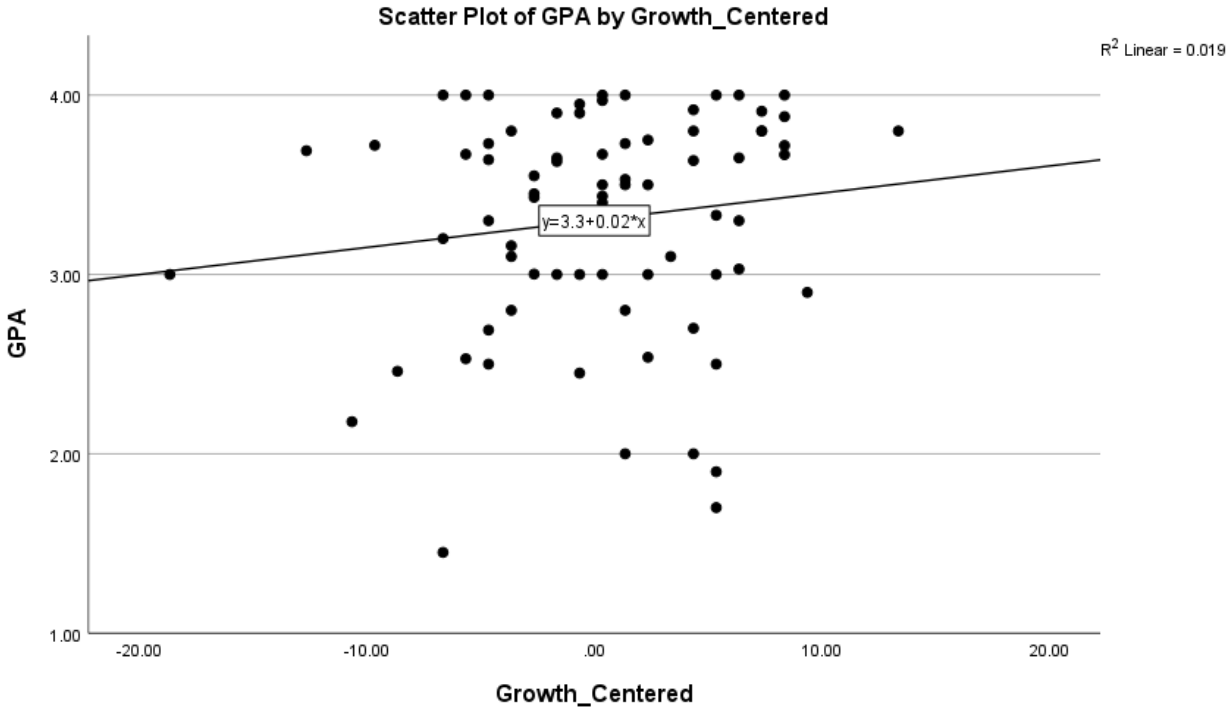


Figure 8

Scatterplot of the Interaction of Grit & Growth Mindset (mean-centered) with GPA

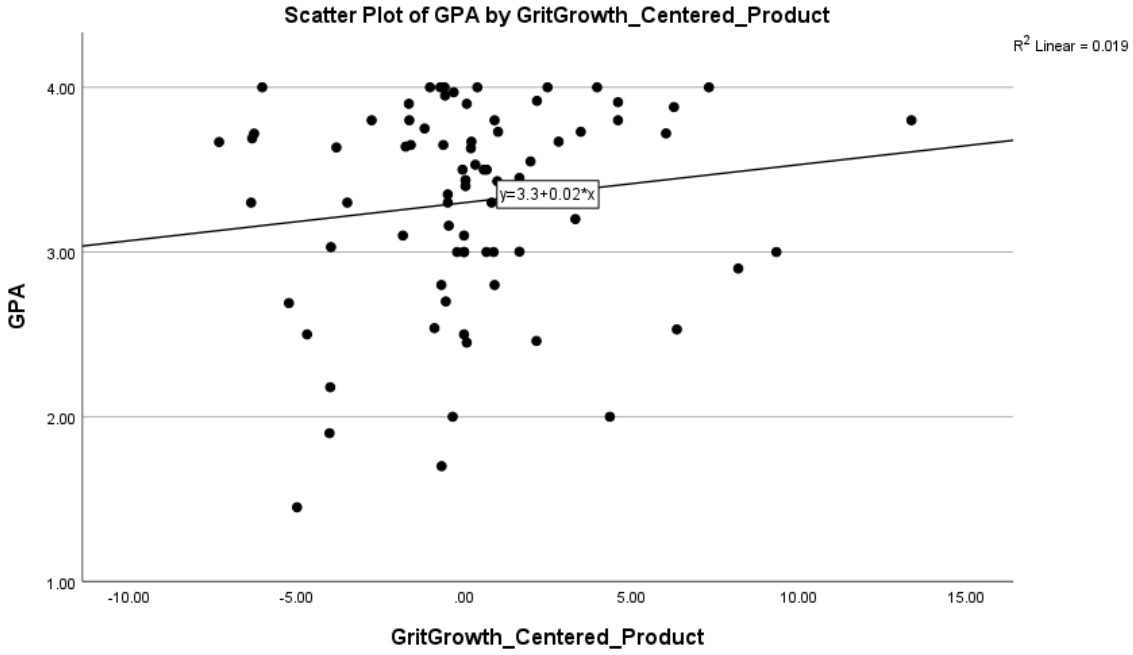


Figure 9

Scatterplot of Studentized Residuals by Unstandardized Predicted Values

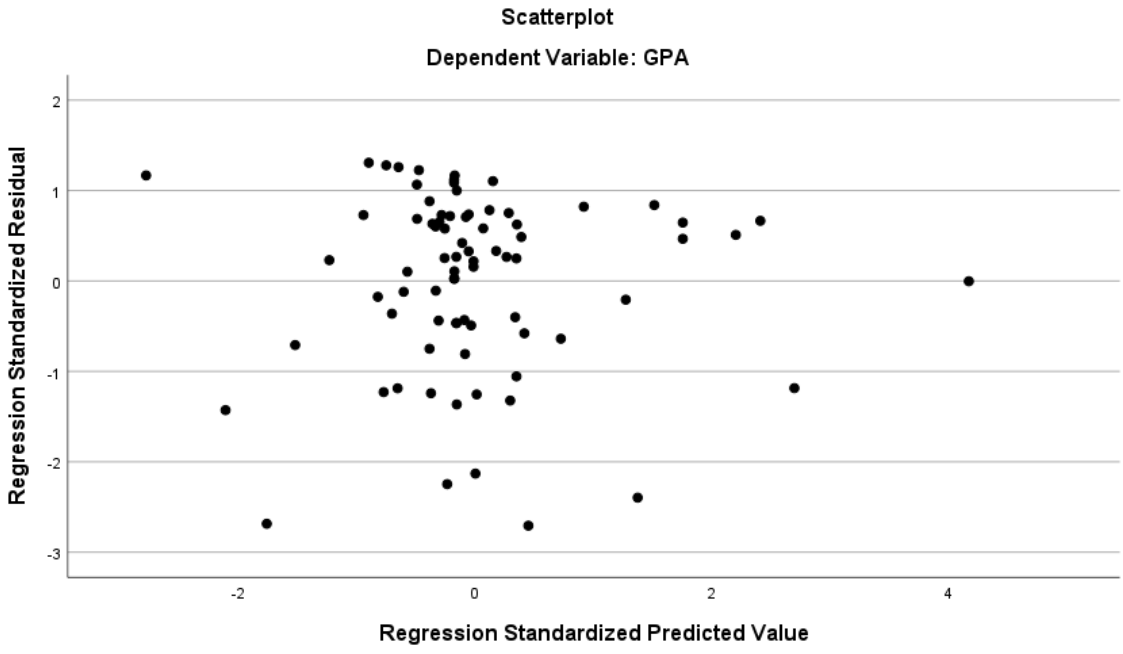


Figure 10

Normal P-P Plot of Regression Standardize Residuals

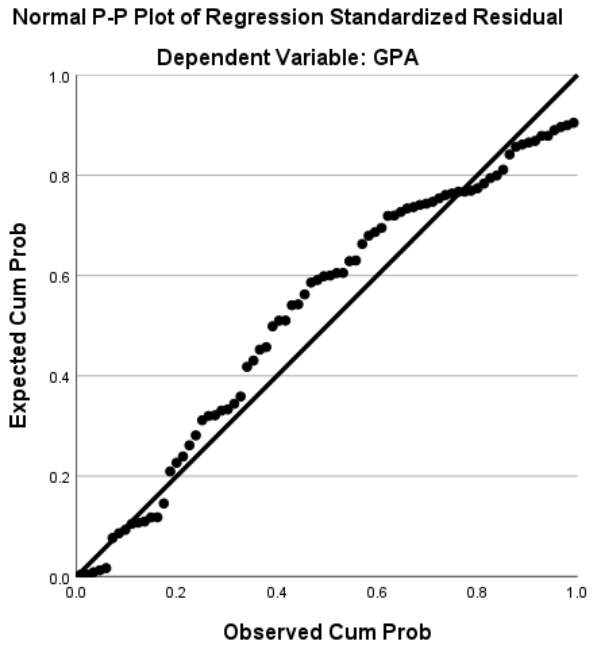


Table 5

Regression Predicting GPA with Grit, Growth Mindset, and an Interaction between Grit and Growth Mindset

Variable	*b*	*b* 95% CI (LL, UL)	*SE*	*β*	*t*	*p*
(Constant)	3.296	(3.157, 3.435)	0.07		47.326	<.001
Grit (MC)	0.012	(-.225, .248)	0.119	0.012	0.098	0.922
Growth Mindset (MC)	0.015	(-.010, .040)	0.012	0.158	1.183	0.241
Grit*Growth Mindset (MC)	0.022	(-.017, .061)	0.020	0.133	1.130	0.262

Note. R^2 = .038*; b* represents unstandardized regression weights; *SE* indicates standard error; *β* indicates the standardized regression weight; LL and UL indicate the lower and upper limits of the confidence interval around *b*.

RQ5: Does an interaction effect exist between reported grit and growth mindset on course completion rate for community college students in TRIO SSS Programs?

I ran a multiple regression to discover whether growth mindset interacted with grit to change its relationship with course completion rate. Grit, growth mindset, and the interaction of grit and growth mindset all showed a linear relationship with course completion rate (see Figures 11, 12, & 13). Cases 17 and 55 were outliers but when removed for this analysis it created additional outliers so all cases were kept for this analysis. There was homoscedasticity, as assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values (Figure 14). There was evidence of multicollinearity, as assessed by tolerance values less than 0.1, so variables were mean-centered, resulting in no evidence of multicollinearity with all tolerance values greater than 0.1. There were two leverage values slightly above 0.2 but the values for Cook's Distance were below 1 so the cases were not removed for this analysis. There was a deviation in the normality assumption but regression is usually robust to the assumption (see Figure 15).

The multiple regression did not statistically significantly predict course completion rate, $F(3, 78) = 1.183$, $p = .322$, $R = .209$, $R^2 = .044$. The interaction of grit and growth mindset did not statistically significantly predict course completion rate, $p > .05$. Regression coefficients and standard errors can be found in Table 6. The null hypothesis could not be rejected.

Figure 11

Scatterplot of Grit (mean-centered) with Course Completion Rate

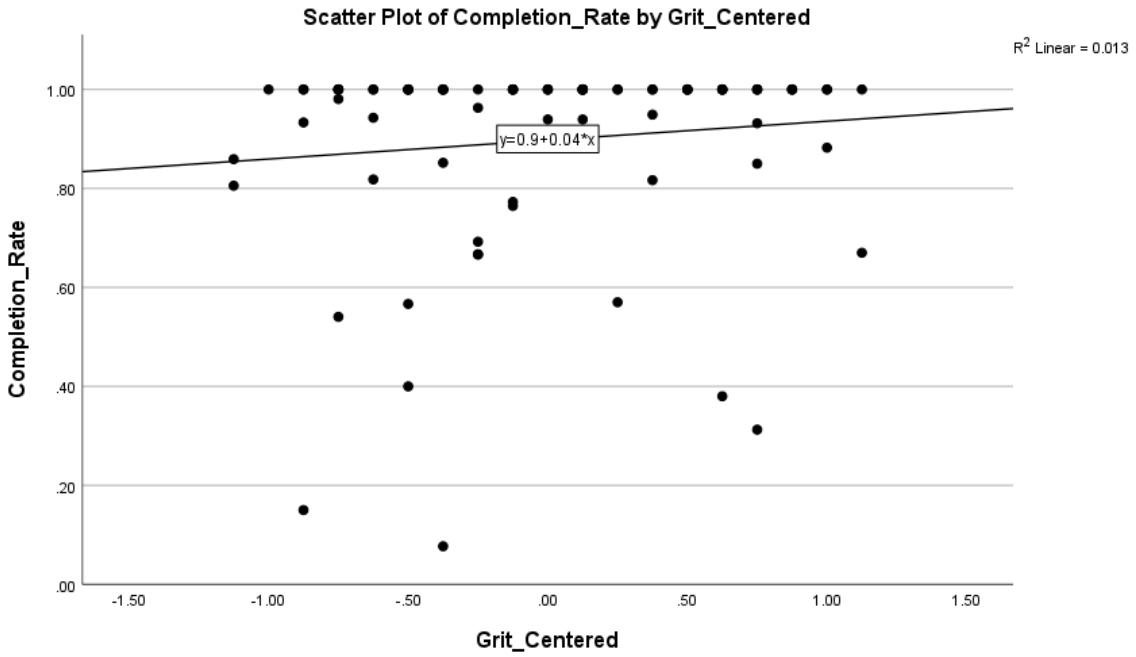


Figure 12

Scatterplot of Growth Mindset (mean-centered) with Course Completion Rate

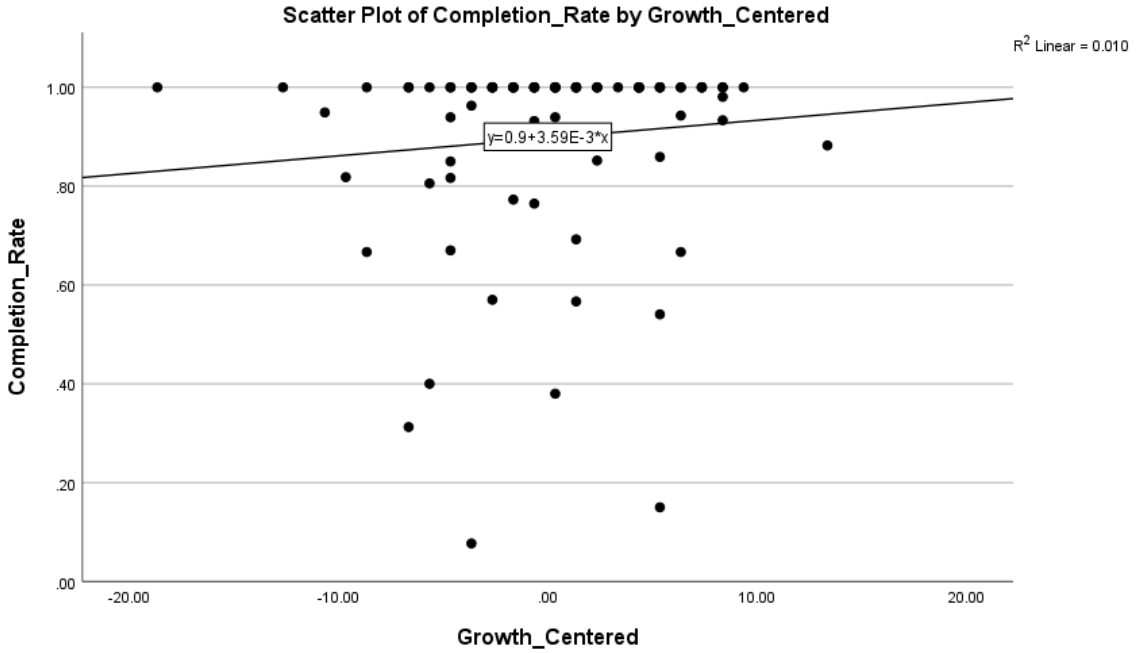


Figure 13

Scatterplot of Interaction between Grit & Growth Mindset (mean-centered) with Course Completion Rate

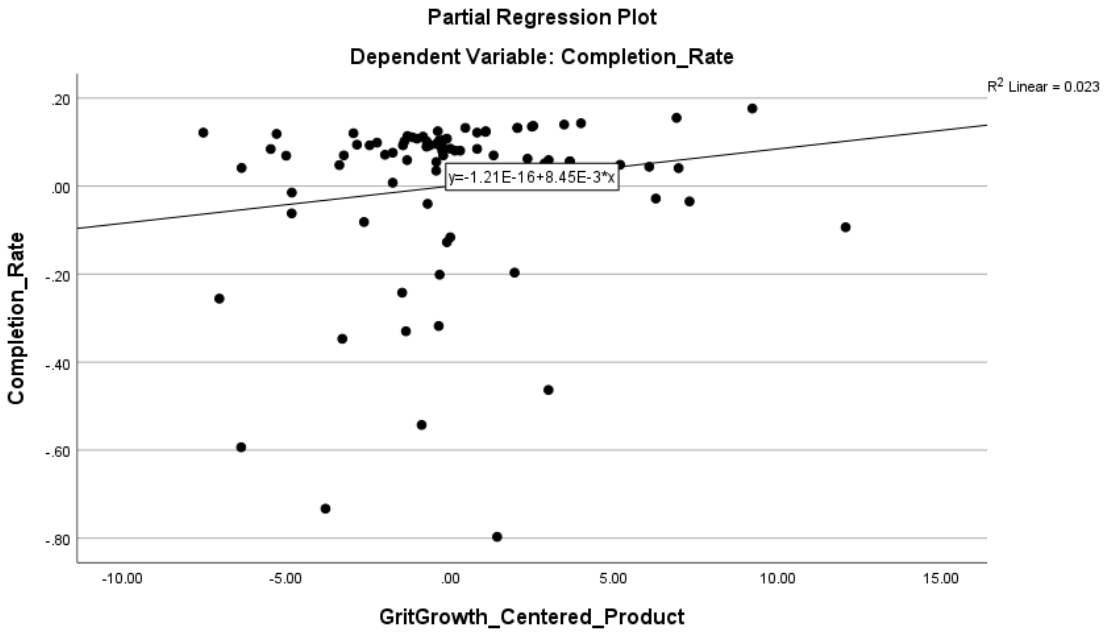


Figure 14

Scatterplot of Studentized Residuals by Unstandardized Predicted Values

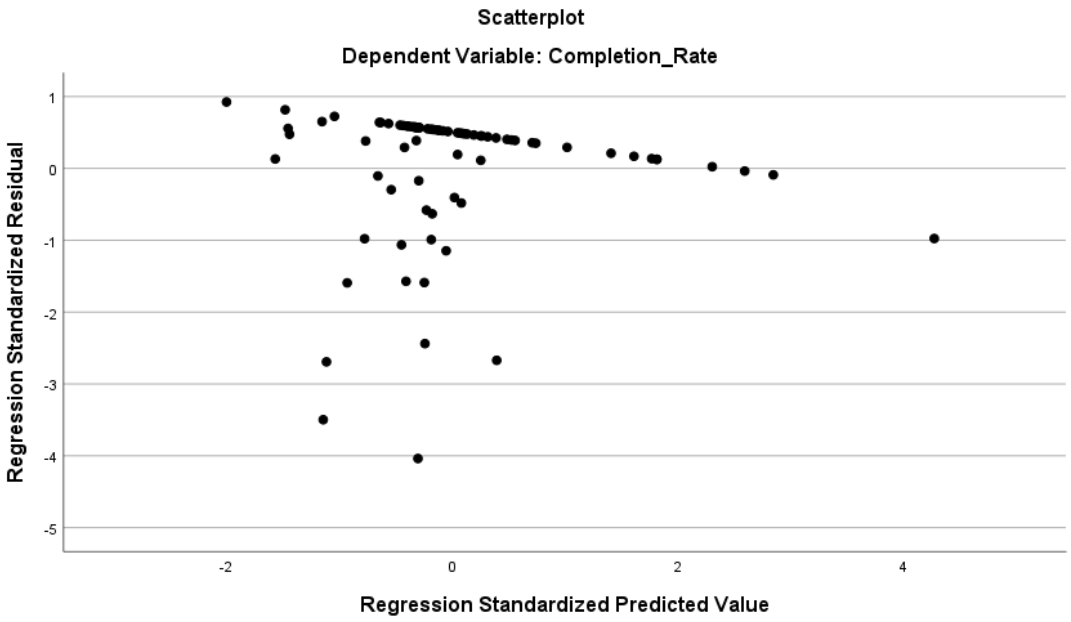


Figure 15

Normal P-P Plot of Regression Standardize Residuals

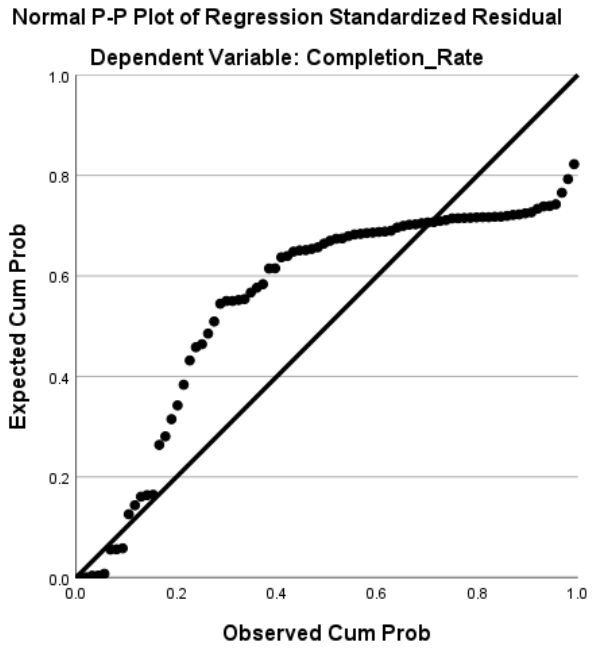


Table 6

Regression Predicting Course Completion Rate with Grit, Growth Mindset, and an Interaction between Grit and Growth Mindset

Variable	*b*	*b* 95% CI (LL, UL)	*SE*	*β*	*t*	*p*
(Constant)	0.896	(.852, .940)	0.022		40.324	<.001
Grit (MC)	0.026	(-.049, .102)	0.038	0.078	0.688	0.118
Growth Mindset (MC)	0.003	(-.005, .011)	0.004	0.090	0.804	0.095
Grit*Growth Mindset (MC)	0.008	(-.004, .021)	0.006	0.153	1.355	0.168

Note. R^2 = *.044; b* represents unstandardized regression weights; *SE* indicates standard error; *β* indicates the standardized regression weight; LL and UL indicate the lower and upper limits of the confidence interval around *b*.

Summary

In this research study, I sought to discover relationships between grit with college GPA, course completion rate, and participation in TRIO SSS services and activities. I also completed research to figure out if the relationships between grit with both GPA and course completion rate may change with an interaction of growth mindset. The sample size was small, with only 82 participants who passed the survey's screening questions. Descriptive statistics were provided for the variables in the study. I found that no statistically significant results could be obtained to ascertain whether grit had a relationship with GPA, course completion rate, or participation in TRIO SSS services and programs. There was not a statistically significant interaction between grit and growth mindset on GPA or course completion rate, even after mean-centering the variables. None of the null hypotheses could be rejected.

CHAPTER 5: DISCUSSION

Overview

The purpose of this quantitative, correlational research study was to determine whether grit level related to college GPA, course completion rate, and the number of TRIO SSS services and activities a student participated in. Another intention of the study was to determine whether an interaction effect between grit and growth mindset may exist using GPA, then course completion rate, as the criterion variables. This chapter discusses the findings related to the five research questions and whether the results contribute to the knowledge of grit and its relationship with college academic achievement.

Summary of Participants

Participants were found through requests in various state and national listservs and contacts made directly to Directors of TRIO SSS Programs. Potential participants were required to confirm through screening questions to be at least 18 years of age, have completed at least one semester at a community college in the United States, and have participated in a TRIO SSS Program for at least one semester. Participants who were able to answer yes to all screening questions were then able to advance to the survey where they completed the Grit-S and a Growth Mindset questionnaire, along with responding to questions about GPA, course completion rate, and the average number of TRIO SSS services and activities each had participated in during one semester. There were 15.9% males, 76.8% of females, and 7.4% classified themselves as either non-binary or other. The largest percentage of participants were aged 18-24 at 62.2%, 22% were aged 25-34, and 15.9% were aged 35 or more. The median grit level reported by participants was

3.38, a growth mindset median was 26.65, and the median GPA, course completion rate, and participation in services and activities were reported as 3.26, 89.87%, and 8.05, respectively.

Summary of Findings in Hypotheses

Hypothesis 1: A higher level of grit influences cumulative GPA for community college students in TRIO SSS Programs.

The findings of a linear regression revealed that a higher level of grit did not influence cumulative GPA. There was only a small effect size of 0.3% of the variation in GPA being accounted for by grit level and the result was not statistically significant. These results indicated that the null hypothesis could not be rejected. Hypothesis 1 was not supported. This result is inconsistent with many earlier research studies that demostrated grit level does, in fact, influence college GPA (Akos & Kretchmar, 2017; Buzzetto-Hollywood & Mitchell, 2019; Direito et al., 2021; Duckworth et al., 2007; Duckworth & Quinn, 2009; Fagioli et al., 2020; Fernández-Martín et al., 2020; Weisskirch, 2018). Stoffel and Cain (2018) completed a study that showed that grit level was a significant predictor of GPA but only for those students earning a 3.5 or greater GPA. For this reason, an additional linear regression was run using only the cases with a 3.5 GPA or higher, but again, the result of this analysis $F(1, 37) = .847$, $p = .363$ was not statistically significant.

Hypothesis 2: A higher level of grit influences course completion rate for community college students in TRIO SSS Programs.

Again, a linear regression was run to determine whether there was a relationship between grit level and course completion rate for community college students

participating in TRIO SSS Programs. The results of $F(1, 80) = 1.129$, $p = .291$, were not statistically significant. The null hypothesis could not be rejected. A higher level of grit did not influence the course completion rate for community college students in TRIO SSS Programs.

Hypothesis 3: There is a positive relationship between grit level and the number of TRIO SSS services and activities students elect to participate in.

The Spearman Rank Order Correlation was run since the variables used during a Pearson Product-Moment Correlation were not normally distributed and contained outliers. The results of this analysis provided a small, negative correlation between grit level and the number of TRIO SSS services and activities students participated in but were not statistically significant. The results did not support the hypothesis and if anything were the opposite of what was expected. Vaughan et al. (2020) shared that TRIO Student Support Services programs are specifically designed to provide support to students who are first-generation, low-income, or have a disability since they are at an increased risk for attrition due to their backgrounds. The negative correlation, although not statistically significant, could indicate that those with a higher grit level had less need for the services and activities that TRIO SSS Programs provide.

Hypothesis 4: Grit and growth mindset have an interaction effect on GPA for community college students in TRIO SSS Programs.

Some researchers hypothesized a relationship between grit with growth mindset, saying those with the ability to control their intellect and abilities would have a higher grit level (Barbouta et al., 2020; Kannangara et al., 2018; Pate et al., 2017; Stoffel & Cain, 2018; & Volstad et al., 2020). Multiple regression was used to figure out if an

interaction effect between grit level and growth mindset changed how GPA was affected. Due to issues with collinearity when the interaction effect was included in the analysis, the variables were mean-centered, and the multiple regression was run again. The multiple regression model did not statistically significantly predict GPA, $F(3, 74) = .968$, $p = .412$, $R^2 = .038$. The unstandardized regression weights showed a larger change in GPA for a one unit change in the interaction of grit and growth mindset over the main effects of grit or growth mindset, but again, was not statistically significant. Thus, the null hypothesis could not be rejected.

Hypothesis 5: Grit and growth mindset have an interaction effect on course completion rate for community college students in TRIO SSS Programs.

A similar result to the analysis for Hypothesis 4 was found for Hypothesis 5. Collinearity issues arose when the interaction effect was included in the multiple regression analysis, so the variables were mean-centered. The multiple regression model was run again with no collinearity issues but did not statistically significantly predict course completion rate, $F(3, 78) = 1.183$, $p = .322$, $R^2 = .044$. None of the variables added statistically significantly to the prediction, $p > .05$. The unstandardized regression weights showed a larger change in course completion rate for a one unit change in the interaction of grit and growth mindset over the main effects of grit or growth mindset, but again, was not statistically significant. The null hypothesis could not be rejected.

Discussion of Findings

Grit and its relationship with academic achievement have been studied by several researchers who found a positive relationship between grit and academic success (Buzzetto-Hollywood & Mitchell, 2019; Datu et al., 2018; Fosnacht et al., 2019; Lund et

al., 2019). The same was true for growth mindset with research results indicating there was a positive link between growth mindset and academic achievement. Some studies looked at both grit and growth mindset and how they were involved in research regarding college academic achievement (Barbouta et al., 2020; Hacisalihoglu et al.; 2020; Kannangara et al., 2018; Wolcott et al., 2020).

These researchers discovered positive relationships between the variables, while the results of the current study showed no statistically significant relationship between grit and academic achievement using GPA and course completion rate as indicators (Barbouta et al., 2020; Buzzetto-Hollywood & Mitchell, 2019; Datu et al., 2018; Fosnacht et al., 2019; Lund et al., 2019;; Hacisalihoglu et al.; 2020; Kannangara et al., 2018; Wolcott et al., 2020). In addition, there was no statistically significant relationship between grit level and the number of TRIO SSS services and activities a student participated in. In fact, if anything there was a slight negative correlation between the two variables if statistical significance was not considered. This may have some merit in that those with a higher grit level may not believe they need as much help through participation in the services and activities afforded to them. An interaction effect with grit and growth mindset when using either GPA or course completion rate as criterion variables caused collinearity issues, requiring the variables to be mean-centered and analyzed again. At the conclusion of all analyses, it was determined that none of the null

hypotheses could be rejected, although this could be due to Type II error based on low power from a small sample size.

Theory of Constructs

Theory of Grit

Duckworth et al. (2007) defined grit as the level of perseverance and passion one possesses in working toward long-term goals even in the face of setbacks. Braund et al. (2020) discussed transformational learning theory, which stated a transformation occurs with new experiences and that college environments are a common place for these transformations where new thoughts, ideas, and ways of thinking ensue. Considering the definition of grit and theories, such as transformational learning theory, it would make sense that grit would relate to academic achievement. In addition, Fernández-Martín et al. (2020) said there is a theoretical basis to expect that grit could be intentionally improved. They also shared that it would be necessary to study effective tactics and interventions on grit with a vast range of subgroups and in various settings, including educational settings. Research and information like this led to the hypothesis that more services and activities one experiences would have the possibility of improving one's level of grit.

Theory of Growth Mindset

Dweck (2000) provided a theoretical underpinning to growth mindset explaining that this concept is the idea that individuals believe they can improve their capabilities and intellect. Wolcott et al. (2020) recommended that educational environments should be conducive to supportive and collaborative relationship building where growth mindset can be elevated. Kannangara et al. (2018) proposed a similar theory related to growth

mindset when they suggested that students should be encouraged to be open to feedback and make improvements with future attempts.

Biblical Worldview

There have been studies completed on spirituality and its relation to both grit and achievement in various areas. Clement et al. (2020) said they found grit to be associated with an elevated level of spirituality and Sriram et al. (2018) stated that religion was a predictor variable for a higher level of grit. Bowen et al. (2020) found that spirituality aided those who met with challenges to help in persevering to overcome them. The term "grit" was not specifically used in the Bible since grit was a concept developed later but words related to grit, such as being steadfast, laboring more abundantly, and laying aside every weight to run the race with patience are found in various Bible verses including Hebrew 12:1, Corinthians 15:58, Corinthians 15:10, respectively (King James Bible, 1971/2022). Although the current study did not find relationships between grit and academic achievement the Bible verses support the idea that words related to grit helped apostles and others to achieve the goals they had set and to overcome obstacles.

Implications

This quantitative, correlational research study has implications to add to the current literature in that no statistically significant results support a relationship between grit and academic achievement, nor that growth mindset could interact with grit for a greater effect in academic accomplishments. Although previous research has been able to show that grit influences academic achievement there is still much research to do. Very little research has focused on community college students, especially those specifically involved in a TRIO SSS Program. The findings of the current research study contradict

much research that has been completed on grit and academic success. The current results challenge existing theories that have shown that both grit and growth mindset influence academic achievement using GPA and college completion as indicators (Barbouta et al., 2020; Kannangara et al., 2018; Pate et al., 2017; Stoffel & Cain, 2018; Volstad et al., 2020). If the current research is used to change the perspective on the relationship between grit and academic achievement then the results suggest that additional theoretical constructs should be researched to discover what variables may influence college academic achievement, if not grit or growth mindset. It is prudent to note that the current research findings may be inconclusive based on Type II error from a small sample size (N=82).

Governments, policy makers, and educators could look at the results of the current research study to recognize that there may be additional factors involved in college academic achievement beyond grit or growth mindset and assume that grit alone may not be enough to influence college success. Other non-cognitive factors that could be explored as having a relationship with college achievement are self-regulation, motivation, spirituality, and social acceptance (Castro Baker et al., 2021; Winkler, 2021; Wong et al., 2018). With the small number of research studies on TRIO SSS students, it would be worth additional studies to discover how low-income, first-generation, and students with disabilities can be assisted in college achievement.

Limitations

Limitations of this study included a small sample size, unknown demographics, use of self-report data, a cross-sectional research method, bias in responses to self-report Likert scales and social desirability bias, a deviation in the normality assumption during

analysis of course completion rate, and a possible Type II error. The study was sent to various TRIO SSS programs at community colleges in the United States, but survey responses obtained during the data collection period resulted in a small number of respondents.

It may be that the results of analyses were inconclusive owing to the likelihood of Type II error based on low statistical power from a small sample size (N=82). Lieberman and Cunningham (2009) explained that a Type II error happens when there is a failure to recognize a true effect, which may cause important research to be ignored even though it may provide real effects.

Colleges with different geographical areas and demographics may have different results. For example, Goldman (2019) explained that access to higher education could be more difficult for those from rural areas and that they were more likely to be first-generation college students and come from lower socioeconomic backgrounds. This is much like a limitation of Buzzetto-Hollywood and Mitchell (2019) when they used a study of participants from only one university. Although geographic factors like this may exist, there was no way to ascertain the physical area participants were reporting from due to the confidential survey and it being provided nationally.

The current study used online self-report data that likely reflected bias in the results, as well. Although Fagioli et al. (2020) stated tracking student self-report of non-academic variables has gained acceptance in the last 30 years, the questions in the Grit-S are obvious in intent, making social desirability bias more likely since some participants likely responded to the questions in a way they believed made themselves appear more favorably (Duckworth et al., 2007; Pate et al., 2017; Stoffel & Cain, 2018; Whipple &

Dimitrova-Grajzl, 2021;). In addition, response bias could have occurred with the use of Likert scales since it has been shown that respondents tend to select responses toward the middle of these scales (Fong & Kim, 2019). There was no incentive provided to participants to provide dishonest responses to the survey questions, but the biases mentioned remain possible. Researcher bias was reduced by ensuring responses to the survey were anonymous and confidential.

Another limitation is the use of a cross-sectional research method, which Spielman et al. (2020) explain as a method where several segments of a population are studied during the same time period. When a cross-sectional research method is implemented, it does not allow information about longitudinal changes or causality (Fong & Kim, 2019; McElroy-Heltzel et al., 2018). Inherent in its design, similar limitations were experienced with the current study.

There was a deviation in the normality assumption for RQ2 and RQ5. Although, Schützenmeister et al. (2012) stated that a violation of normality may not be damaging because of the robustness of the *F*-test in a regression model, it could affect the dependability of the results and the generalizability of the results in a wider context. Jupiter (2017) said that regardless of normality, regression can accurately estimate coefficients but when it comes to estimation of confidence intervals and a *p*-value, these practices become difficult without the assumption of normality. On the other hand, Hubbard (1978) claimed that breaking the normality assumption should only cause minimal issue when determining β and that an *F*-test could still bring about accurate estimates if the departure from normality is not extreme.

Recommendations for Future Research

Further research is recommended to add to the literature on grit and its relationship with college academic achievement specifically for low-income, first-generation, and students with disabilities. These populations can benefit from further research since those who qualify for TRIO SSS Programs have historically found more impediments to college success. For example, first-generation students leave college without a degree at a higher rate than those whose parents have earned a 4-year degree (Ishitani, 2016) and students with disabilities tended to enroll in college at a much lower rate (Sarid et al., 2020). The TRIO SSS-qualifying college students were more likely to drop out of college than the average student (Bassett, 2020; U.S. Department of Education, 2009). At the same time, according to Coelho and Liu (2017), college-educated adults experience advantages of higher education including higher rates of employment, better access to health care insurance, and more money to provide for a family (Coelho & Liu, 2017), making research in college success imperative.

Limitations of the study were noted. It is believed through previous research studies that the variables in this study are worth further investigation with a larger sample size. Additional methods of recruitment may provide improved findings by increasing participants and, therefore, power. Lieberman and Cunningham (2009) suggested that if 20 or more similar studies were combined by meta-analysis and the *p*-value was reported for each the effect may result as significant. The results of the current study should be considered only if the results can be replicated through additional studies using meta-analysis.

Use of additional research methods including a mixed method or qualitative method could expand the current research. Some researchers have used a mixed methods research design to study grit and college GPA. For example, O'Neal et al. (2016) used a mixed-methods approach beginning with an online survey and then a portion of those that completed the survey participated in interviews using a semi-structured interview protocol. Interviews were transcribed and coded then they were ordered by theme. Their research was conducted specifically to determine how the relationship between stress, depression, grit and grade point average differ for Latina/o who are citizens or non-citizens. There have also been researchers who studied grit or college academic success with a qualitative research method using interviews then coded by thematic analysis (Datu et al., 2018; Kannangara et al., 2018). For example, Kannangara et al. (2018) focused on the concept of grit and its importance to university students' successful graduation. The researchers used different studies with one of them using qualitative research by means of semi-structured interviews that were then coded with thematic analysis.

Future research could consider whether demographic data be analyzed with grit and academic achievement to find out whether there are additional factors that influence GPA and course completion rate. Investigating whether gender, race or ethnicity, and age may warrant further investigation. Bennett et al. (2021) explained that being a non-traditional student affected college completion since they would typically have additional life roles to fulfill. Whipple and Dimitrova-Grajzl (2021) found that gender moderated the effect of grit on college GPA. They also found that grit was a significant predictor of

college GPA for male college students but not for female students. Further investigation of these demographic differences could prove fruitful.

Additionally, other non-cognitive factors, including self-regulation, motivation, and spirituality could be the focus on research on college academic achievement (Castro Baker et al., 2021; Winkler, 2021; Wong et al., 2018). In addition to grit and the others mentioned, Fagioli et al. (2020) stated self-efficacy and conscientiousness could be components of student success that may warrant examination. They suggested non-cognitive factors may be useful in predicting academic outcomes and to then figure out what support services may be most effective for student college success.

Summary

This quantitative, correlational research study did not find statistically significant results to support a relationship between grit with GPA, college completion rate, nor the number of TRIO SSS services and activities a student participated in. There were also no interaction effects between grit and growth mindset to affect GPA or college completion rate that could be ascertained. It remains important to continue work in researching what factors may help students from low-income and first-generation families or students with disabilities reach college academic success based on the lower success rates of these college students. If only the current research analyses are considered, then college educators and other stakeholders would want to search for other possible non-cognitive factors that may play a vital role in college success and completion.

There were some limitations to the current research in that there was a small sample size that may make committing a Type II error possible, resulting in the inability to detect a true effect. It was not possible to ascertain the geographical area where

participants resided because the study was provided nationally and anonymously. Self-report data was used in the study, along with Likert-type questions that could affect results through social desirability bias and response bias. A cross-sectional research method was used that prevented acquiring information on causality or longitudinal changes. It is recommended that research continue for factors that would improve the college success rate of low-income, first-generation, and students with disabilities and look at other non-cognitive factors beyond grit or growth mindset.

REFERENCES

Akos, P., Greene, J. A., Fotheringham, E., Raynor, S., Gonzales, J., & Godwin, J. (2022). The promise of noncognitive factors for underrepresented college students. *Journal of College Student Retention: Research, Theory & Practice, 24*(2), 575-602. 10.1177/1521025120935111

Akos, P. & Kretchmar, J. (2017). Investigating grit at a non-cognitive predictor of college success. *The Review of Higher Education, 40*(2), 163-186. 10.1353/rhe.2017.0000

Barbouta, A., Barbouta, C., & Kotrotsiou, S. (2020). Growth mindset and grit: How do university students' mindsets and grit affect their academic achievement? *International Journal of Caring Sciences, 13*(1), 654-664. 10.17605/OSF.

Barton, Y. A., & Miller, L. (2015). Spirituality and positive psychology go hand in hand: An investigation of multiple empirically derived profiles and related protective benefits. *Journal of Religion and Health, 54*, 829-843. 10.1007/s10943-015-0045-2

Bassett, B. S. (2020). Better positioned to teach the rules than to change them: University actors in two low-income, first-generation student support programs. *The Journal of Higher Education, 91*(3), 353-377. 10.1080/00221546.2019.1647581

Bennett, C. A., Hsiao, E., Dees, D. C., Kim, D., & Bochenko, M. J. (2021). The impact of TRIO student support services on academic performance of non-traditional students at a public state college in Georgia. *Journal of Adult and Continuing Education, 27*(2), 157-174. 10.1177/1477971420915938

Bowen, E., Ball, A., Semanchin Jones, A., & Irish, A. (2020). Striving and dreaming: A

grounded theory of the transition to adulthood for cross-systems youth. *Youth & Society, 52*(6), 1006-1032. 10.1177/0044118X18791869

Braund, A., James, T., Johnston, K., & Mullaney, L. (2020). Grit-ability: Which grit characteristics enable success for mothers entering university? *Student Success, 11*(1), 22-34. 10.5204/ssj.v11i1.1457

Burt, K. G., Delgado, K., O'Hara, J., Gissen, J., Stopler, M. (2019). Persistence in nutrition education and credentialing among low-income minority students: A qualitative exploratory study. Journal of Best Practices in Health Professions Diversity, 11(2), 107-122. www.jstor.org/stable/26894212

Buzzetto-Hollywood, N., Mitchell, B. C. (2019). Grit and persistence: Findings from a longitudinal study of student performance. *Issues in Informing Science + Information Technology, 16*, 377-391. 10.28945/4375

Castro Baker, A., Grinnell-Davis, C. L., Ma, C., & Bragg, J. E. (2021). Revisiting hope's third pillar: Mattering, spirituality, and social connectedness among financially marginalized households. *Journal of Human Behavior in the Social Environment, 31*(5), 551-563. 10.1080/10911359.2020.1799898

Chen, S., Ding, Y., & Liu, X. (2021). Development of the growth mindset scale: Evidence of structural validity, measurement model, direct and indirect effects in Chinese samples. *Current Psychology* (New Brunswick, N.J.), 10.1007/s12144-021-01532-x

Claro, S., Paunesku, D., & Dweck, C. S. (2016). Growth mindset tempers the effects of poverty on academic achievement. *Psychological and Cognitive Sciences, 113*(31), 8664-8668. 10.1073/pnas.1608207113

Clement, D. N., Wingate, L. R., Cole, A. B., O'Keefe, V. M., Hollingsworth, D. W., Davidson, C. L., & Hirsch, J. K. (2020). The common factors of grit, hope, and optimism differentially influence suicide resilience. I*nternational Journal of Environmental Research and Public Health, 17*(24), 9588. 10.3390/ijerph17249588

Code of Federal Regulations. (2022, May 18). National Archives and Records Administration. Retrieved May 20, 2022, from https://www.ecfr.gov/

Coelho, P. R. P. & Liu, T. (2017). The returns to college education – An analysis with college-level data. *Eastern Economic Journal, 43*, 604-620. 10.1057/eej.2015.44

CollegeBoard. (n.d). *How to Convert Your GPA to a 4.0 Scale*. BigFuture. https://bigfuture.collegeboard.org/plan-for-college/college-basics/how-to-convert-gpa-4.0scale#:~:text=Colleges%20report%20GPA%20%28grade%20point%20average%29%20on%20a,by%20averaging%20the%20scores%20of%20all%20your%20classes.

Dahlgren, G. & Whitehead, M. (1991). *Policies and strategies to promote social equity in health*. Stockholm: Institute for Futures Studies.

Datu, J. A. D., Yuen, M., & Chen, G. (2018). Exploring determination for long-term goals in a collectivist context: A qualitative study. *Current Psychology, 37*(1), 263-271. 10.1007/s12144-016-9509-0

Delahunty, J., & O'Shea, S. (2019). I'm happy, and I am passing. that's all that matters!': Exploring discourses of university academic success through linguistic analysis. *Language and Education, 33*(4), 302-321. 10.1080/09500782.2018.1562468

Direito, I., Chance, S., & Malik, M. (2021). The study of grit in engineering education research: A systematic literature review. *European Journal of Engineering Education*, *46*(2), 161-185. 10.1080/03043797.2019.1688256

Duckworth, A. L., & Gross, J. (2014). Self-control and grit: Related but separable determinants of success. *Current Directions in Psychological Science*, *23*(5), 319-325. 10.1177/0963721414541462

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*, *92*(6), 1087–1101. 10.1037/0022-3514.92.6.1087

Duckworth, A. L. & Quinn, P. D. (2009). Development and validation of the short grit scale (Grit-S). *Journal of Personality Assessment*, *91*(2), 166-174. 10.1080/00223890802634290

Dweck, C. S. (2000). Self-theories: Their role in motivation, personality, and development. Psychology Press.

Dweck, C. S. (2006). Mindset: The new psychology of success (1st ed.). Random House.

Fagioli, L. P., Baker, R., & Orona, G. A. (2020). The role of non-cognitive variables in identifying community college students in need of targeted supports. *Research in Higher Education*, *61*(6), 725-763. 10.1007/s11162-020-09588-7

Fernández-Martín, F. D., Arco-Tirado, J. L., & Hervás-Torres, M. (2020). Grit as a predictor and outcome of educational, professional, and personal success: A systematic review. *Psicología Educativa*, *26*(2), 163-173. 10.5093/psed2020a11

Fong, C. J. & Kim, Y. W. (2019). A clash of constructs? Re-examining grit in light of

academic buoyancy and future time perspective. *Current Psychology, 1*, 1-15. 10.1007/s12144-018-0120-4

Fosnacht, K., Copridge, K., & Sarraf, S. A. (2019). How valid is grit in the postsecondary context? A construct and concurrent validity analysis. *Research in Higher Education, 60*(6), 803-822. 10.1007/s11162-018-9524-0

Fotuhi, O., Ehret, P. J., Kocsik, S., & Cohen, G. L. (2022). Boosting college prospects among low-income students: Using self-affirmation to trigger motivation and a behavioral ladder to channel it. *Journal of Personality and Social Psychology, 122*(2), 187-201. 10.1037/pspa0000283

Glover, H., Robertson, S., & Geye, T. (2021). Investigating the relationship between disability status and grit. *Psi Chi Journal of Psychological Research, 26*(2), 130-138. 10.24839/2325-7342.JN26.2.130

Goldman, A. (2019). Interpreting rural students' stories of access to a flagship university. *The Rural Educator, 40*(1), 16-28. 10.35608/ruraled.v40i1.530

Gonzalez, O., Canning, J. R., Smyth, H., & MacKinnon, D. P. (2020). A psychometric evaluation of the short grit scale: A closer look at its factor structure and scale functioning. *European Journal of Psychological Assessment, 36*(4), 646-657. 10.1027/1015-5759/a000535

Gothberg, J. E., Peterson, L. Y., Peak, M., & Sedaghat, J. M. (2015). Successful transition of students with disabilities to 21st-century college and careers: Using triangulation and gap analysis to address nonacademic skills. *Teaching Exceptional Children, 47*(6), 344-351. 10.1177/0040059915587890

Hacisalihoglu, G., Stephens, D., Stephens, S., Johnson, L., & Edington, M. (2020).

Enhancing undergraduate student success in STEM fields through growth-mindset and grit. *Education Sciences, 10*(10), 279. 10.3390/educsci10100279

Hill, P. L., Burrow, A. L., & Bronk, K. C. (2016). Persevering with positivity and purpose: An examination of purpose commitment and positive affect as predictors of grit. *Journal of Happiness Studies, 17,* 257-269. 10.1007/s10902-014-9593-5

Hochanadel, A. & Finamore D. (2015). Fix and growth mindset education and how grit helps students persist in the face of adversity. *Journal of International Education Research, 11*(1), 47-50. 10.19030/jier.v11i1.9099

Hodge, D. R. (2003). The intrinsic spirituality scale: A new six-item instrument for assessing the salience of spirituality as a motivational construct. *Journal of Social Service Research, 30*(1), 41-61. 10.1300/J079v30n01_03

Holcombe, E. M., & Kezar, A. (2021). Exploring the organizational value of integrated transition programs for underrepresented college students. *Journal of Student Affairs Research and Practice, 58*(1), 15-28. 10.1080/19496591.2020.1726358

Hubbard, R. (1978). The probable consequences of violating the normality assumption in parametric statistical analysis. *Area, 10*(5), 393-398.

Ishitani, T. T. (2016). Time-varying effects of academic and social integration on student persistence for first and second years in college: National data approach. *Journal of College Student Retention: Research, Theory & Practice, 18*(3), 263-286. 10.1177/1521025115622781

Jupiter, D. C., PhD. (2017). Assumptions of statistical tests: What lies beneath. *The Journal of Foot and Ankle Surgery, 56*(4), 910-913. 10.1053/j.jfas.2017.05.022

Kannangara, C. S., Allen, R. E., Waugh, G., Nahar, N., Khan, S. Z. N., Rogerson, S., &

Carson, J. (2018). All that glitters is not grit: Three studies of grit in university students. *Frontiers in Psychology, 9,* 1539-1539. 10.3389/fpsyg.2018.01539

Kezar, A., & Kitchen, J. A. (2020). Supporting first-generation, low-income, and underrepresented students' transitions to college through comprehensive and integrated programs. *The American Behavioral Scientist, 64*(3), 223-229. 10.1177/0002764219869397

King James Bible. (2017). King James Bible Online. https://www.kingjamesbibleonline.org/Hebrews-12-1/ (Original work published 1769)

Kundu, A. (2019). Understanding College "Burnout" from a Social Perspective: Reigniting the Agency of Low-Income Racial Minority Strivers Towards Achievement. *The Urban Review, 51*(5), 677-698. 10.1007/s11256-019-00501-w

Laerd Statistics (2018). Pearson's product-moment correlation using SPSS Statistics. *Statistical tutorials and software guides.* Retrieved from https://statistics.laerd.com/

Laerd Statistics (2015). Multiple regression using SPSS Statistics. *Statistical tutorials and software guides*. Retrieved from https://statistics.laerd.com/

Lam, K. K. L., & Zhou, M. (2019). Examining the relationship between grit and academic achievement within K-12 and higher education: A systematic review. *Psychology in the Schools, 56*(10), 1654-1686. 10.1002/pits.22302

Lerner, R. M. (2018). Character development among youth: Linking lives in time and place. *International Journal of Behavioral Development, 42*(2), 267-277. 10.1177/0165025417711057

Levin, H. M. & Garcia, E. (2017). Accelerating community college graduation rates: A benefit-cost analysis. *The Journal of Higher Education, 89*(1), 1-27. 10.1080/00221546.2017.1313087

Lieberman, M. D., & Cunningham, W. A. (2009). Type I and type II error concerns in fMRI research: Re-balancing the scale. *Social Cognitive and Affective Neuroscience, 4*(4), 423-428. 10.1093/scan/nsp052

Lopez, J. D. & Horn, J. M. (2020). Grit and retention among first year Hispanic college students at a Hispanic serving institution. *Hispanic Journal of Behavioral Science, 42*(2), 264-270. 10.1177/0739986320910153

Lund, T. J., Liang, B., DeSliva Mousseau, A., Matyjaszczyk, V., & Fleurizard, T. (2019). The will and the way? Associations between purpose and grit among students in three US universities. *Journal of College Student Development, 60*(3), 361-365. 10.1353/csd.2019.0031

Manigault, A. W., Woody, A., Zoccola, P. M., Dickerson, S. S. (2018). Education is associated with the magnitude of cortisol responses to psychosocial stress in college students. *International Journal of Behavioral Medicine, 25*, 532-539. 10.1007/s12529-018-9727-y

McElroy-Heltzel, S. E., Ordaz, A., Van Tongeren, D. R., Davis, D. E., Gazaway, S., Hook, J. N., Davis, E. B., Shannonhouse, L. R., Aten, J. D., & Stargell, N. A. (2018). The role of spiritual fortitude and positive religious coping in meaning in life and spiritual well-being following hurricane Matthew. *The Journal of Psychology and Christianity, 37*(1), 17-27.

McFarland, M. J., Wagner, B., & Marklin, S. (2016). College education and sense of

control: A twin-discordant design. *Socius: Sociological Research for a Dynamic World, 2,* 1-12. 10.1177/2378023116656011

Miller, C., & Weiss, M. J. (2022). Increasing community college graduation rates: A synthesis of findings on the ASAP model from six colleges across two states. Educational Evaluation and Policy Analysis, 44(2), 210-233. 10.3102/01623737211036726

Monahan, J. L., Lombardi, A., Madaus, J., Carlson, S. R., Freeman, J., & Gelbar, N. (2020). A systematic literature review of college and career readiness frameworks for students with disabilities. *Journal of Disability Policy Studies, 31*(3), 131-140. 10.1177/1044207320906816

Musumari, P. M., Tangmunkongvorakul, A., Srithanaviboonchai, K., Techasrivichien, T., Suguimoto, S. P., Ono-Kihara, M. & Kihara, M. (2018). Grit is associated with lower level of depression and anxiety among university students in Chiang Mai, Thailand: A cross-sectional study. *PLoS ONE, 13*(12), 1-16. 10.1371/journal.pone.0209121

National Student Clearinghouse. (2022, April 3). https://www.studentclearinghouse.org/

Ober, T. M., Ahn, J., Ali, A., Homer, B. D., Moner, A., Azam, A., & Ramos, N. (2020). A mixed-methods analysis of mechanisms to support college enrollment among low-income high school students. *Translational Issues in Psychological Science, 6*(2), 118-131. 10.1037/tps0000226

O'Neal, C. R., Espino, M. M., Goldthrite, A., Morin, M. F., Weston, L., Hernandez, P.,

& Fuhrmann, A. (2016). Grit under duress: Stress, strengths, and academic success among non-citizen and citizen Latina/o first-generation college students. *Hispanic Journal of Behavioral Sciences, 38*(4), 446-466. 10.1177/0739986316660775

Ottley, J. A. & Ellis, A. L. (2019). A qualitative analysis: Black male perceptions of retention initiatives at a rural predominately white institution. *The Journal of Educational Foundations, 32*(1-4), 72-103

Palmer, R. T., Wood, J. L., Dancy, T. E., & Strayhorn, T. L. (2014). Black male collegians: Increasing access, retention, and persistence in higher education. *ASHE Higher Education Report, 40*(3), 1-147. 10.1002/aehe.20015

Park, S-A & Cho, Y-S. (2019). The impact of grit on university student's core competency in dental hygiene students. *Journal of Dental Hygiene Science, 19,* 170-180. 10.17135/jdhs.2019.19.3.170

Pate, A. N., Payakachat, N., Harrell, K., Pate, K. A., Caldwell, D. J., Franks, A. M. (2017). Measurement of grit and correlation to student pharmacist academic performance. *American Journal of Pharmaceutical Education, 81*(6), 1-8. 10.5688/ajpe816105

Perez-Brena, N. J., Sang, S., Kuo, S. I., Rodríguez De Jesús, Sue A, Updegraff, K. A., Umaña-Taylor, A. J., & McHale, S. M. (2019). Patterns of academic risk and resilience: Post–High school educational pathways in the context of the 2007 economic recession. *Journal of Adolescent Research, 34*(4), 351-380. 10.1177/0743558418810842

Pratt, S. I., Harwood, H. B., Cavazos, J. T., & Ditzfeld, C.P. (2019). Should I stay should

or should I go? Retention in first-generation college students. *Journal of College Student Retention, 20*(1), 105-118. 10.1177/1521025117690868

Rimfeld, K., Kovas, Y., Dale, P. S., & Plomin, R. (2016). True grit and genetics: Predicting academic achievement from personality. *Journal of Personality and Social Psychology, 111*(5), 780-789. 10.1037/pspp0000089

Rocha, L., & Lenz, A. S. (2022). Psychometric meta-analysis of the short grit scale reliability across demographic groups and academic settings. Counseling *Outcome Research and Evaluation, ahead-of-print*(ahead-of-print), 1-14. 10.1080/21501378.2022.2065975

Romanelli, F. (2020). Reflections of a first-generation college student, American, and academician. *American Journal of Pharmaceutical Education, 84*(8), 1049-1051. 10.5688/ajpe8007

Sabay, S., & Wiles, K. (2020). How TRIO enhances equity for community college transfer students. *New Directions for Community Colleges, 2020*(192), 109-119. https://doi.org/10.1002/cc.20428

Sarid, M., Meltzer, Y., & Raveh, M. (2020). Academic achievements of college graduates with learning disabilities vis-a-vis admission criteria and academic support. *Journal of Learning Disabilities, 53*(1), 60-74. 10.1177/0022219419884064

Saunders-Scott, D., Braley, M.B., Stennes-Spidahl, N. (2017). Traditional and psychological factors associated with academic success: Investigating best predictors of college retention. *Motivation and Emotion, 42*, 459-465. 10.1007/s11031-017-9660-4

Schmidt, F. T. C., Fleckenstein, J., Retelsdorf, J., Eskreis-Winkler, L., & Moller, J. (2019). Measuring grit: A German validation and a domain-specific approach to grit. *European Journal of Psychological Assessment, 35*(3), 436-447. 10.1027/1015-5759/a000407

Schützenmeister, A., Jensen, U., & Piepho, H. -. (2012). Checking normality and homoscedasticity in the general linear model using diagnostic plots. *Communications in Statistics - Simulation and Computation, 41*(2), 141-154. 10.1080/03610918.2011.582560

Shreffler, J. & Huecker, M.R. (2022, March 18). *Type I and Type II Errors and Statistical Power.* National Library of Medicine. https://www.ncbi.nlm.nih.gov/books/NBK557530/

Sigmundsson, H., Haga, M., & Hermundsdottir, F. (2020). Passion, grit, and mindset in young adults: Exploring relationships and gender differences. *New Ideas in Psychology, 59*, 1-7. 10.1016/j.newideapsych.2020.100795

Spica, E., & Biddix, J. P. (2021). Prices they pay: Academic achievement and progress to graduation barriers experienced by community college students due to the cost of course materials. *Innovative Higher Education, 46*(6), 643-662. 10.1007/s10755-021-09557-7

Spielman, R. M., Jenkins, W. J., & Lovett, M. D. (2020) *Psychology 2e*. Openstax.

Sriram, R., Glanzer, P. L., Allen, C. C. (2018). What contributes to self-control and grit? The key factors in college students. *Journal of College Student Development, 59*(3), 259-273. 10.1353/csd.2018.0026

Stoffel, J. M., & Cain, J. (2018). Review of grit and resilience literature within health

professions education. *American Journal of Pharmaceutical Education, 82*(2), 124-134. 10.5688/ajpe6150

Tang, X., Wang, M-T., Guo, J., Salmela-Aro, K. (2019). Building grit: The longitudinal pathways between mindset, commitment, grit, and academic outcomes. *Journal of Youth and Adolescence, 18*, 850-863. 10.1007/s10964-019-00998-0

Tansey, T. N., Smedema, S., Umucu, E., Iwanaga, K., Wu, J., Cardoso, E. d. S., & Strauser, D. (2018). Assessing college life adjustment of students with disabilities: Application of the PERMA framework. Rehabilitation Counseling Bulletin, 61(3), 131-142. 10.1177/0034355217702136

Tuckwiller, B., & Dardick, W. R. (2018). Mindset, grit, optimism, pessimism, and life satisfaction in university students with and without anxiety and/or depression: Implications for practice and research. Journal of Interdisciplinary Studies in Education, 6(2), 32.

U.S. Department of Education (2009, November 3). *Eligibility.* Student Support Services. https://www2.ed.gov/programs/triostudsupp/eligibility.html

U.S. Department of Education, Office of Postsecondary Education, Student Service (2021, August). TRIO fast facts report: Postsecondary degree completion rates among students on the Upward Bound/Upward Bound math-science to Student Support Services pathway. https://www2.ed.gov/programs/trioupbound/resources.html

Vaughan, A. L., Dorn, B., Rose, J. S., Ward, C., & Hauck, A. A. (2020). Intersection

between TRIO/SSS programs and FYS: Effects on first-generation students. *Journal of Higher Education Theory and Practice, 20*(15), 126-138. 10.33423/jhetp.v20i15.3942

Volstad, C., Hughes, J., Jakubec, S. L., Flessati, S., Jackson, L., & Martin-Misener, R. (2020). "You have to be okay with okay": Experiences of flourishing among university students transitioning directly from high school. *International Journal of Qualitative Studies on Health and Well-being, 15*(1), 1834259-1834259. 10.1080/17482631.2020.1834259

Wang, S., Dai, J., Li, J., Wang, X., Chen, T., Yang, X., He, M., & Gong, Q. (2018). Neuroanatomical correlates of grit: Growth mindset mediates the association between gray matter structure and trait grit in late adolescence. *Human Brain Mapping, 39*(4), 1688-1699. 10.1002/hbm.23944

Wesskirch, R. S. (2018). Grit, self-esteem, learning strategies and attitudes and estimated and achieved course grades among college students. *Current Psychology, 37*, 21-27. 10.1007/s12144-016-9485-4

Whipple, S. S., & Dimitrova-Grajzl, V. (2021). Grit, fit, gender, and academic achievement among first-year college students. *Psychology in the Schools, 58*, 332-350. 10.1002/pits.22449

Wilson-Strydom, M. (2017) Disrupting Structural Inequalities of Higher Education Opportunity: “Grit,” Resilience and Capabilities at a South African University. *Journal of Human Development and Capabilities, 18*(3), 384-398, 10.1080/19452829.2016.1270919

Winkler, D. A. (2021). Reframing how grading affects and shapes students’ self-worth

in Christian higher education. *Christian Higher Education*, 1-17. 10.1080/15363759.2021.1978904

Wolcott, M. D., McLaughlin, J. E., Hann, A., Miklavec, A., Beck, Dallaghan, G. L., Rhoney, D. H., & Zomorodi, M. (2021). A review to characterize and map the growth mindset theory in health professions education. *Medical Education, 55*(4), 430-440. 10.1111/medu.14381

Yost, P. R., Terrill, J. R., & Chung, H. H. (2019). An economy of abundance: From scarcity to human potential in organizational and university life. *The Journal of Applied Business and Economics*, *21*(7), 182-200. 10.33423/jabe.v21i7.2554

Young, E., Thompson, R., Sharp, J., & Bosmans, D. (2020). Emotional transitions? exploring the student experience of entering higher education in a widening-participation HE-in-FE setting. *Journal of further and Higher Education, 44*(10), 1349-1363. 10.1080/0309877X.2019.1688264

APPENDIX A: DISSERTATION SURVEY

Liberty University

Liberty University: Survey for Dissertation
Screening Questions

Directions: Please answer "Yes" or "No" to the following questions.

	Yes	No
I have completed at least 1 (one) college term, earning final grades at least once.	☐	☐
I attend a community college in the United States.	☐	☐
I have participated in a TRIO SSS program at a community college for at least one (1) term.	☐	☐

If you were able to answer "Yes" to all three questions?

- Yes
- No

Informed Consent (Adults 18 and older)

Title of the Project: Grit and Its Relationship with College Academic Success
Principal Investigator: Lisa Vance, PhD Candidate, Liberty University

Invitation to be Part of a Research Study
You are invited to participate in a research study. To participate, you must be 18 years or older, be a community college student participating in a TRIO Student Support Services (SSS) Program, who has completed at least one semester of college to complete this survey.
What is the study about and why is it being done?
The purpose of this study is to investigate what may assist TRIO SSS community college students in moving toward academic achievement. The study will determine whether grit is related to college cumulative GPA, course completion rate, and the average number of TRIO SSS Program services and activities participated in, as well as whether having a growth mindset may interact with grit to assist with college achievement.
What will happen if you take part in this study?
If you agree to be in this study, I will ask you to do the following:
Complete the online survey. This should take approximately 10 minutes or less.
How could you or others benefit from this study?
Participants should not expect to receive a direct, monetary benefit from taking part in this study, but this project will expand knowledge about factors that may assist TRIO SSS participants

attending community colleges to earn a higher GPA and complete courses at a higher rate.

What risks might you experience from being in this study?

The risks involved in this study are minimal, which means they are equal to the risks you would encounter in everyday life.

How will personal information be protected?

Your survey responses will be confidential. No personal, identifying information about you will be linked to this survey.

Is study participation voluntary?

Participation in this study is voluntary. Your decision whether to participate will not affect your current or future relations with Liberty University. If you decide to participate, you are free to withdraw at any time prior to submitting the survey without affecting those relationships.

What should you do if you decide to withdraw from the study?

If you choose to withdraw from the study, please exit the survey and close your internet browser. Your responses will not be recorded or included in the study.

Whom do you contact if you have questions or concerns about the study?

The researcher conducting this study is Lisa Vance. If you have questions, you are encouraged to contact her at [redacted]. You may also contact the researcher's dissertation chair, Dr. [redacted] at [redacted].

Whom do you contact if you have questions about your rights as a research participant?

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, you are encouraged to contact the Institutional Review Board, 1971 University Blvd., Green Hall Ste. 2845, Lynchburg, VA 24515 or email at irb@liberty.edu.

Disclaimer: *The Institutional Review Board (IRB) is tasked with ensuring that human subjects research will be conducted in an ethical manner as defined and required by federal regulations. The topics covered and viewpoints expressed or alluded to by student and faculty researchers are those of the researchers and do not necessarily reflect the official policies or positions of Liberty University.*

Your Consent: Before agreeing to be part of the research, please be sure that you understand what the study is about. You can print a copy of the document for your records. If you have any questions about the study later, you can contact the researcher using the information provided above.

Do you consent to participate in this study? *

◯ Yes

Short Grit Scale (Duckworth, 2007 & 2009)

Directions for taking the Grit Scale: Here are a number of statements that may or may not apply to you. For the most accurate score, when responding, think of how you compare to most people, not just the people you know well, but most people in the world. There are no right or wrong answers, so just answer honestly.

Grit-S Statements: *

	Not like me at all	Not much like me	Somewhat like me	Mostly like me	Very much like me
New ideas and projects sometimes distract me from previous ones.	☐	☐	☐	☐	☐
Setbacks don't discourage me.	☐	☐	☐	☐	☐
I have been obsessed with a certain idea or project for a short time but later lost interest.	☐	☐	☐	☐	☐
I am a hard worker.	☐	☐	☐	☐	☐
I often set a goal but later choose to pursue a different one.	☐	☐	☐	☐	☐
I have difficulty maintaining my focus on projects that take more than a few months to complete.	☐	☐	☐	☐	☐
I finish whatever I begin.	☐	☐	☐	☐	☐
I am diligent.	☐	☐	☐	☐	☐

Growth Mindset Scale (Dweck, 2006)
Directions for taking the Growth Mindset Scale: Using the 6-point scale below from Strongly Disagree to Strongly Agree, indicate how much you agree with the following statements.

	Strongly disagree	Disagree	Mostly disagree	Mostly agree	Agree	Strongly agree
You can learn new things, but you can't really change how intelligent you are.	☐	☐	☐	☐	☐	☐
You can always change basic things about the kind of person that you are.	☐	☐	☐	☐	☐	☐
No matter how much intelligence you have, you can always change it quite a bit.	☐	☐	☐	☐	☐	☐
You can do things differently, but the important parts of who you are can't really be changed.	☐	☐	☐	☐	☐	☐
You are a certain kind of person, and there is not much that can really be done to change that.	☐	☐	☐	☐	☐	☐

No matter what kind of person you are, you can always change substantially.	☐	☐	☐	☐	☐	☐
Your intelligence is something very basic about you that can't change very much.	☐	☐	☐	☐	☐	☐
You can always substantially change how intelligent you are.	☐	☐	☐	☐	☐	☐

Current Cumulative GPA (on a 4-point scale):

Number of credits you have attempted at any college (number of credits you have enrolled in throughout your semesters of college attendance) including dual credit (college credit taken while a high school student): _____

Number of credits you have completed at any college (number of credits you have earned a passing grade in (a grade other than W-withdraw or F-fail), meaning grades between A+ to D- including dual credit (college credit taken while a high school student): _____

Program participation. What TRIO SSS services and activities did you participate in prior to completion of this survey?

- Tutoring
- Advising
- Counseling (Career, personal, &/or other)
- Mentoring
- Financial Guidance
- Personal Development Workshop(s)
- Educational Enrichment Activities
- Courses offered by the Program.
- Cultural Events

- Other: _____

Referring to the question above about TRIO SSS programming, what is the estimated average number of times you participated in their services & activities within your last full semester at the college? _____

What is your gender?

- Male
- Female
- Non-binary/third gender
- Other

What is your age?

- 18 – 24
- 25 – 34
- 35 or over

Thank you for helping me with my research study. Please click the submit button at the bottom when you are finished.

Note: Although this survey was entirely voluntary, asking about personal information, such as college GPA, may trigger negative feelings. If you find that you need help in dealing with triggers you have experienced after completing the survey, below are some resources you can use. You may also seek help from your college's counseling office, as well as speak to your TRIO SSS counselor or advisor for assistance.

Crisis Text Line

- Crisis Text Line provides free, 24/7 support via text message
- Text "HOME" to 741741 to connect with a Crisis Counselor

National Suicide Prevention Lifeline

- 24/7 free, confidential support for people in distress; prevention and crisis resources
- Call 1-800-273-8255

References

Dweck, C. S. (2000). Self-theories: Their role in motivation, personality, and development. Psychology Press.

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, 92(6), 1087–1101. 10.1037/0022-3514.92.6.1087

Duckworth, A. L. & Quinn, P. D. (2009). Development and validation of the short grit scale (Grit-S). Journal of Personality Assessment, 91(2), 166-174. 10.1080/00223890802634290

APPENDIX B: EMAIL TO TRIO SSS DIRECTORS

Dear TRIO SSS Director,

As a graduate student in the School of Psychology at Liberty University, I am doing research to better understand what may relate to academic achievement for students participating in TRIO SSS at community colleges. The current study will determine whether grit is related to college cumulative GPA, course completion rate, and the average number of TRIO SSS Program services and activities were participated in, as well as whether having a growth mindset may interact with grit to assist with college achievement.

I am writing to request that you forward a pre-created email to the participants of your Program that have participated for at least one (1) college term asking them to complete an online survey. It should take approximately 20 minutes to complete the survey. Participation will be completely anonymous, and no personal, identifying information will be collected.

To participate, please forward the pre-created email to your students that will provide them with the [redacted] I appreciate your willingness to encourage your students to participate and would be glad to email the final results of the research study to you upon your request. You may make this request by emailing me and I will provide you with the dissertation at the end of the process. It may even help in writing your grant application for the next cycle.

Sincerely,

Lisa Vance
Dissertation Student
[redacted]

APPENDIX C: EMAIL TO TRIO SSS STUDENT PARTICIPANTS

Dear TRIO SSS Member:

I am sharing information about a research study I am conducting with TRIO SSS members attending community colleges in the United States. The research should help to better understand what may assist with academic achievement for college students like yourself. The current study will determine whether grit is related to college cumulative GPA, course completion rate, and the average number of TRIO SSS Program services and activities were participated in, as well as whether having a growth mindset may interact with grit to assist with college achievement.

You must be 18+ years of age attending a community college in the U.S. and a member of the TRIO SSS Program for at least a full term so that final grades have been earned at least once. You are being asked to participate in an online survey, which will include a consent form. It should take approximately 20 minutes to complete the survey. Participation will be completely anonymous, and no personal, identifying information will be collected. Thank you ahead of time for helping to discover relationships that may lead to new information in what coincides with college academic achievement for students in TRIO SSS Programs attending community colleges in the United States.

To participate you are able to use the [redacted] available. [redacted]

Sincerely,

Lisa Vance
Dissertation Student
[redacted]