A QUANTITATIVE STUDY INVESTIGATING THE CRITICAL NINTH-GRADE YEAR

AND HOW GRIT INFLUENCES STUDENT ACADEMIC SUCCESS

A Dissertation

Presented in Partial Fulfillment of the Requirements for the

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by

Guy A. Kovacs

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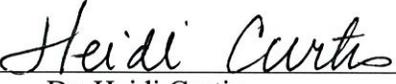Major Professor: Lori W. Sanchez, PhD

AUTHORIZATION TO SUBMIT DISSERTATION

This dissertation of Guy Kovacs, submitted for the degree of Doctor of Philosophy in Education with a major in Educational Leadership and titled "A Quantitative Study Investigating the Critical Ninth-Grade Year and How Grit Influences Student Academic Success" has been reviewed in final form. Permission, as indicated by the signatures and dates given below, is now granted to submit final copies.
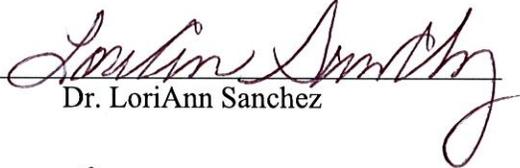
Committee Chair _____ Date 4/26/18
Dr. LoriAnn Sanchez

Committee
Members _____ Date 4/6/18
Dr. Pat Kissell

_____ Date 4/6/18
Dr. Brian M. Lowney

Doctoral
Program Director _____ Date 4/6/18
Dr. Heidi Curtis

College of Adult
and Graduate
Studies, Dean _____ Date 4/19/18
Dr. Michael Pitts

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DEDICATION

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ABSTRACT

Our school systems are in place to create positive citizens who can contribute to the greater good and to also create a foundation for a life of learning. Schools were originally formed to help our country become stronger in its infancy by generating a population that had common knowledge, baseline skills, especially in literacy, and the ability to be citizens who could move the country forward and keep leaders honest. The same holds true today. However, research is showing that one out of five high-school students is dropping out of school and not graduating within the traditional four-years of high-school. Why students drop out of high-school, and how that may be prevented, is a topic much discussed and researched. The future of non-graduates is grim and the negative impact to society is costly.

What are common characteristics of students who drop out from high-school? How might educators better the odds for at-risk students? What can we point to that leads other students to find success? The ninth-grade year is a vital one for the success of students in high-school. The skills students build in the ninth-grade will, in large part, determine how they succeed in the latter parts of high-school and beyond. Research shows that the brain continues to grow well beyond the high-school years and there is no limit to the learning of new skills and knowledge. Non-cognitive characteristics also play a key role in the level of success one achieves. While intelligence can serve as a predictor of success at some level, it is not as strong of a determiner as some non-cognitive characteristics that have been identified.

In this study, the characteristic of grit was looked at to determine if there was a correlation between grit and academic success in ninth-grade students. A quantitative approach was applied to gathering data from ninth-grade students from a rural school district in Washington State. The theoretical frameworks used as a lens throughout this process were

Bandura's Social Cognitive Theory and Dweck's Mindset Theory. The foundational belief of

Social Cognitive Theory is that people learn from other people. According to this theory, our

beliefs and actions are determined by what we experience with, and witness in, other people.

Our choices are shaped by our understanding of how our behaviors lead to a better life through

what we have seen in those around us. Dweck's Mindset Theory works to explain what propels

people to be successful. The Mindset Theory also focuses on determination, goal setting, and a

desire to better oneself while challenging the high-praise society that students live in today.

Dweck differentiates between a fixed mindset and a growth mindset in a person. This theory

states that in the fixed mindset, things are set and very little can change in a person. In this way

of thinking, things are what they are with little hope of change. The opposite way of thinking is

having a growth mindset. A growth mindset is the belief that we are constantly growing and

bettering ourselves throughout our lives. It is the belief that we can and should learn more and

continue to build our skills. Dweck states that our brain is a muscle that can be developed and

improved upon over time. These frameworks were chosen because grit is a characteristic that is

deeply influenced by our experiences with other people and also influenced by the mindset in

which people choose to live. With a growth mindset, we can improve the characteristic of grit

over time. While grit may be partially inherent, it is a characteristic that can be taught, learned,

and improved upon. Duckworth believes that grit is important in understanding and supporting

student success. This study specifically looks at grit and whether the presence of grit may lead

to greater academic success in ninth-grade students.

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Chapter I

Introduction

"Houston, we have a problem." This quote is connected to the Apollo 13 moon mission of 1970, but it could also be used to describe today's public high-school dropout crisis in the United States. Though improvements have been seen in various states in recent years, and the U.S. dropout rate has declined by more than half since 1967, our national graduation rate is currently still at only 80.9% (National Center for Education Statistics, 2016). That means that nearly one in five U.S. high-school students does not graduate with grade-level peers. "United States, we have a problem" might be a more accurate and appropriate statement about this high-school dropout dilemma in public education today. In 2010, over 7,000 students dropped out of high-schools across the nation every single school day (Swanson, 2010). In 2016, that number had decreased to around 5,600 students who had dropped out every school day across the country (National Center for Education Statistics, 2016). While that improvement should be celebrated, when looked at on an annual basis, today there are still nearly one-million students dropping out of high school every year (National Center for Education Statistics, 2016; Swanton; 2010).

Today, a key to each school's mission is helping students become productive citizens in what is becoming a shrinking world as competition for jobs is getting more intense. Positive options for students who drop out of high-school are becoming less available (Doll et al., 2013; Rumberger, 2013; Sandoval, 2018). More so than in the past, students who drop out of school face a bleak economic and social future. When compared to students who graduate from high-school, those who dropout are less likely to find jobs that provide a living wage. Moreover, students who drop out are much more likely to suffer from adverse health conditions due to their poverty (Rumberger, 2013; Sandoval, 2018; Swanton; 2010). Research is not only showing the

negative effects of dropping out of school, but research is also pinpointing when students choose to drop out and why they choose to drop out (Sandoval, 2018). Reasons for dropping out vary from student to student but can be put into three distinct categories. Those categories include push, pull, and falling out factors that can be used as a framework for better discussing and understanding why students choose to leave school before graduating (America's Promise Alliance, 2016; Doll et al., 2013). Push factors are influences that come directly from the school that push on the student. These can include consequences related to attendance, poor behavior, or not following school policies. Pull factors are influences that come from outside of school from other areas of students' lives. Pull factors can include needing to raise a sibling, raise a child, or get a job. Falling out factors are influences not caused by the school or outside factors but can be categorized as being more internal. Falling out factors lead to disengagement, being disenfranchised, and/or not seeing the benefit of a formal education (Doll et al., 2013; Stark et al., 2015). Of these three distinct categories, students have reported the biggest influence on whether to drop are the push factors, which is the category most controlled by the school system. Nearly half of students studied shared that influences from school are the biggest reasons for choosing not to remain in school. One major contributor to this is the increase in national standardized testing. Students report feeling the pressure from higher academic testing standards, which began with the publication of A Nation at Risk. This led to the No Child Left Behind Act of 2001 and created the current high-stakes testing in public schools (Doll et al, 2013; Klein, 2017; Stark et al., 2015).

In school, there is much that can be examined to determine if students are at-risk of dropping out (Sandoval, 2018; Stark et al. 2015). It is vital that at-risk students be identified and supported as 80% of eighth-grade and ninth-grade students who are determined to be at-risk

eventually drop-out of high-school (Burrus & Roberts, 2012). There is evidence that students who earn the lowest grades have the greatest predictability of dropping out of school. The level at which lower grades makes the biggest difference is in eighth-grade as students are gearing up to transition into high-school. According to one study, 30% of all students in eighth-grade with low grades ended up dropping out of school (Bowers et al., 2010) during that year. Another larger than usual year for students choosing to dropout is eleventh-grade, when most students are legally allowed to drop out. Only twenty-one states in the U.S. require students to attend high-school until they graduate or turn 18 (Burrus & Roberts, 2012). It was also discovered that teacher-assigned grades, as averaged and represented by grade point averages (GPA), were a good predictor of students dropping out, with a clear indication that the lower the grades the greater the risk of leaving school (Bowers et al., 2010; Sandoval, 2018). Direct correlations between high absences from school and lower or failing grades have been made. Students who have attendance problems are at a higher risk of dropping out from school when compared to students who have healthier attendance patterns (Kassarnig, Bjerre-Nielsen, Mones, & Lehmann, 2017; Burrus & Roberts, 2012; Cooper, 2011). The negative effects for not graduating from high-school are becoming more severe (Alliance for Excellent Education, 2015; Burrus & Roberts, 2012; Sandoval, 2018; Stark et al., 2015). Students who drop out of high-school make-up a disproportionately higher percentage of the United States' institutionalized population (Stark et al., 2015). Students who drop out are more likely to rely on public assistance when compared to their peers who graduated from high-school. They are also more likely to be involved in crime and generate other burdens on taxpayers (Burrus & Roberts, 2012; Rumberger, 2013). Not graduating impacts the ability to get a job. When looking at people age 25 and older,

fewer people who dropped out of school are in the labor force (Stark et al., 2015) when compared to those who graduated from high-school.

Students living in poverty are five times more likely to drop out of high-school when compared to high-income students. This statistic looked at the bottom 20% of the population in terms of family income and the top 20% of the population in family income (Chapman, Laird, & Ifill, 2011). Not only family poverty, but community poverty also impacts whether students stay in school or not. Poorer neighborhoods tend to have higher levels of joblessness, family instability, substance abuse, and crime (Burrus & Roberts, 2012; Nairz-Wirth & Feldman, 2017; Stark et al., 2015). There is a lack of resources for these disadvantaged communities. Negative peer influences are more prevalent, as students living in these poorer communities are more likely to have friends or family members who have dropped out when compared to students living in more affluent communities (Burrus & Roberts, 2012; Kassarnig et al., 2017; Kearney, 2015). Getting a diploma benefits the individual and society. People who graduate have shown to have lower rates of unemployment and lower rates of poverty. Income inequality leads to lower rates of educational investment among lower income families, leading to a cycle of poverty that is challenging to escape (Burrus & Roberts, 2012; Stark et al., 2015).

Poverty also increases social mobility (Kearney, 2015). Families that are regularly on the move find more challenges with landing jobs. Children in these families find less success in school due to the challenge of having other competing needs. Because of this transiency, these families are considered at-risk and therefore students are more likely to drop out than students who are not transient (Kearney, 2015; Stark et al., 2015). Students who graduate, when compared to their peers who drop out, tend to smoke less and are in better physical shape

(Chang, 2014). This study went on to state that graduates have higher voting rates and higher rates of civic involvement in their communities (Chang, 2014). Furthermore, graduates shared a higher rate of satisfaction in life and they were shown to live healthier life styles (America's Promise Alliance, 2016; Chang, 2014; Kearney, 2015). Obvious connections can be made between those students who drop out from high-school not typically being part of the college graduate population and therefore missing out on all the benefits that a college graduate brings to society and to oneself (Chang, 2014; Chapman, Laird, & Ifill, 2011). Across the United States, educators are working to minimize at-risk factors and better support students on their path to high-school graduation. While all grade-levels are essential, much importance is being put upon student performance at the ninth-grade level (Bowers, 2010; Cooper, 2011; Dudley, 2012; McWilliams, 2014; Rumberger, 2013).

The early elementary years of formal education serve as a foundation for learning to read, write, and do mathematics (Gray, 2008). The final two years of high-school, grades eleven and twelve, tend to serve as preparatory years for post high-school plans, whether that be to continue to higher education, an apprenticeship, the military, or go into the work force (Cooper, 2011; Gray, 2008). Although the early foundational years of elementary school and the more preparatory years at the end of high-school play a significant role in one's level of success in life, it is the ninth-grade year that is getting much attention as the critical year in high-school (Bowers, 2010; Cooper, 2011; Dudley, 2012; Rumberger, 2013). If students falter in this grade, chances of not graduating increases dramatically (Cooper, 2011; Rumberger, 2013). Adolescent students in their freshman year are at the greatest danger of dropping out of high-school (Burrus & Roberts, 2012; Cooper, 2011; McWilliams, 2014; Neild et al., 2009).

Ninth-grade students who find academic success have a greater likelihood of walking across the stage at graduation four years later, while those who become credit deficient in ninth-grade are more likely to drop out (Doll et al., 2013; Neild et al., 2009). This ninth-grade year is when credits for graduation begin and students typically start their high-school grade-point average (Neild, Stoner-Eby, & Furstenberg, 2008). This additional pressure on students within the school system can be too much for some and this ninth-grade transitional year becomes key to whether they drop out or not (Doll et al., 2013; Klein, 2017; Neild et al., 2009). Those students who are on-track to graduate, meaning they have not failed a class or fallen behind in their credits, are three and one-half times more likely to graduate from high-school in four years than their counterparts who have fallen behind in credits (Roderick et al., 2014). Failure to graduate from high-school is strongly associated with failures at the ninth-grade level (Bowers et al., 2013; Burrus & Roberts, 2012; Cooper, 2011; Roderick et al., 2014; McWilliams, 2014; Rumberger, 2013). Research has shown that between 70-80% of students who become credit deficient in their freshman year will not graduate from high-school (Wyner et al., 2007). Another study showed that if students had two or more of the following risk factors, they were significantly more likely to not graduate from high-school: poor attendance, low grade point average, credit deficiency, and low individual grades (Burrus & Roberts, 2012; Neild et al., 2008).

The negative impact of dropping out of high-school is well documented not only for the individual, but also for society (Bridgeland et al., 2009; Chang, 2014; Kearney, 2015; Wood, Kiperman, Esch, & Leroux, 2017). Students who dropout have an immediate cost to society due to related crime, needed government assistance, and other direct and immediate costs. They also have a social cost that stems from lost wages, lower economic growth, lower tax revenues, and

future health costs (Wood et al., 2017). On average, students who drop out from high-school are an immediate taxpayer cost of $13,900 per year and an immediate social burden to the cost of $37,450 per year (Belfield et al., 2012). When these financial impacts are carried over the course of a person's lifetime, the estimated direct cost to taxpayers is $170,740, with a larger social burden of $529,030, in 2011 dollars, per student who failed to graduate (Belfield et al., 2012). For some communities, dropout rates are higher than others (Englund et al., 2008; Stark et al., 2015). In the United States, nearly twenty-percent of all high-school students do not graduate with their grade-level cohort (Bernstein-Yamashiro & Noam, 2013; National Center for Education Statistics, 2016), but those numbers are not equally distributed between communities or races. Asian-American and Caucasian students are still far more likely to graduate than Latino and African-American students (Bernstein-Yamashiro & Noam, 2013; National Center for Education Statistics, 2016). Even more alarming is the fact that almost 2,000 high-schools across the U.S. graduate less than 60% of their students (Kearney, 2015; National Center for Education Statistics, 2016). At-risk students are the ones most likely to drop out from high-school. There is abundant research on what serves as roadblocks to at-risk students and the clear disadvantages they are facing, but it has also been discovered that some students overcome obstacles and find success in school despite being at-risk (Bassi & Della Fave, 2012; Duckworth & Robertson-Kraft, 2014; Dweck, 2008; Garofalo, 2016; Sandoval, 2018). Knowing why and how some at-risk students overcome challenges can help educators better serve and support these students (Bowers et al., 2013; Burrus & Roberts, 2012; Cooper, 2011; McWilliams, 2014; Roderick et al., 2014). It is during the ninth-grade year many students must earn passing grades in their courses for the first time. Prior to high-school, social promotion and a lack of clear accountability with grades may have played a role in promotion in school (Fulk, 2003). Satisfactory completion of

core courses is typically required before graduating from high-school, and these core courses are characteristically some of the toughest and most rigorous academic classes a student must take in high-school (Smith, Akos, Lim, & Wiley, 2008). Furthermore, students may find that the increase of standardized tests to measure school performance adds to the difficulty and importance of doing well in high-school (Doll et al, 2013; Klein, 2017; Schemo, 2004).

In the state of Washington, where this study was completed, high-school students have the new requirement of earning twenty-four credits to be eligible for high-school graduation (Washington State Board of Education, 2016). In recent prior years, that number was only twenty-two credits which gave students flexibility and time to make-up credits if the students had failed a class and fell behind in credit requirements. However, now failing just one class as a freshman can have profound consequences and it makes graduating on-time much more challenging for high-school students. If a student now falls behind in Washington State, graduation has immediately been put at-risk (Washington State Board of Education, 2016). This places even more emphasis on students finding success in the ninth-grade. In 2017, there were 295 school districts in the State of Washington and six charter schools. Of those 295 districts, 290 had building configurations that served a 9th-12th grade high-school population. That means that the very large majority of the current 1.1 million students in the state start high-school in a high-school building, while the rest are in a junior-high or similar setting (Office of Superintendent of Public Instruction, 2017). The ninth-grade participants in this study were in a junior-high setting.

With the ninth-grade year being pivotal in overall high-school success, the stakes are higher than ever for students in this grade to find success (Bowers et al., 2013; Burrus & Roberts, 2012; Cooper, 2011; McWilliams, 2014; Neild et al, 2008; Roderick et al., 2014). To increase the high-

school graduation rate, educators need to look closely at the ninth-grade year and decrease the reasons for students dropping out (McWilliams, 2014; Roderick et al., 2014). Some states are finding more success than others. The 2014 graduation rate in Nebraska was 89.7% and in Iowa it was 90.5%, the two highest amongst the fifty-states. The lowest states that year were Nevada, at 70%, and New Mexico, at 68.5% (America's Promise Alliance, 2016). States can learn from one another and educators need to continue to share their successful strategies with one another. Every angle to support efforts to increase graduation rates should be looked at. New ways of engaging and teaching students must be applied, and research findings must be put into practice (McWilliams, 2014; Roderick et al., 2014). One such area of research is non-cognitive characteristics, like grit, and determining how the presence of grit may aid in the charge to increase graduation rates (Datu et al., 2017; Daw, 2015; Duckworth et al., 2007; Hansen, 2016; Tough, 2012).

Statement of the Problem

Too many freshmen are not finding success in the school system (Bowers et al., 2013; Burrus & Roberts, 2012; Cooper, 2011; McWilliams, 2014; Roderick et al., 2014). There are numerous reasons for this lack of success: poverty level, curriculum, student engagement, trauma in the life of the student, lack of foundational skills, parent involvement, and parent education level can all be influences on the amount of success a child may find in school (McWilliams, 2014; Roderick et al., 2014). Much is being looked at in the field of education regarding grit and how grit may be a predictor to success in life (Duckworth et al., 2011). However, research is limited when it comes to what extent grit in ninth-grade students may be a predictor to academic success. It has been shown that grit can be a stronger predictor than intelligence in finding success in school (Duckworth et al., 2011), but research within the ninth-grade population is

limited. While graduation rates have steadily improved over the decades, still today one in every five high-school students is not graduating and improvements in graduation rates have appeared to become stagnant in the past two years (National Center for Education Statistics, 2016). Researchers and educators are looking for answers.

Some students arrive to the school system better prepared than others. Many of these student abilities, such as IQ, have been studied and well documented, but less is known about the non-cognitive characteristics in human beings (Duckworth, 2006). Grit in ninth-grade students will be looked at in this study. Specifically, correlations will be examined between grit and five specific academic data sets. Angela Lee Duckworth is one of the foundational researchers on grit. In an opening statement in her research that connected grit to the achievement of long-term goals, Duckworth shared that there are two broad problems in psychology. The first is to identify human abilities; the second to identify how humans tap into those abilities (Duckworth et al., 2007). When identifying these two problems, Duckworth was referring to the early work of William James, an American psychologist and philosopher of the late-nineteenth and early-twentieth century. James' claim was written in 1907, but many of those same beliefs and claims continue today (Duckworth et al., 2007). James associated with grit in his early writings regarding habit formation and will. He claimed it is important for successful people to be able to show a strong effort of attention and to attend to a challenging task, keeping the mind strong as to persevere (James, 1950). This early work by James is being carried on today by those who are researching grit (Duckworth et al., 2007).

The goal of this study was to collect data that will positively impact school educators, especially those working with ninth-grade students, with the hope that dropout rates will

continue to be curbed. Another ambitious goal was that the findings in this study would lead to greater achievement by more students. While the education of students at all levels is the charge of all educators, there is much to consider at each grade-level to best understand what students are going through (McWilliams, 2014). This is especially true for the adolescent students in ninth-grade. To best serve them, we must first understand them (Bowers et al., 2013; Cooper, 2011; Hansen: 2016; McWilliams, 2014; Waxman, Gray, & Padron, 2003).

For many ninth-grade students, they are at an educational crossroads, one that will either guide them toward high-school success or one that will lead them down the path of being another dropout statistic (McWilliams, 2014). Intelligence is a major factor in school success, but it is not necessarily a key predictor for students and their academic success while in school (Duckworth, 2006). More research needs to be done on non-cognitive characteristics and how students with grit are overcoming barriers in their lives (Duckworth et al., 2007; McWilliams, 2014; Rumberger, 2013; Tough, 2012). Investigating grit and other non-cognitive characteristics in students at the beginning of high-school may serve as clearer predictors for future student success (Hansen, 2016; McWilliams, 2014). The effort in this study was to dig deeper into grit, within ninth-grade students, and whether that characteristic correlates with student academic achievement.

Background

Currently, in the United States, there are more than 50,000,000 public school students from kindergarten through twelfth-grade, with approximately half of those students being in elementary schools and half in secondary schools. There are nearly another 3 million students in charter schools and almost 6 million additional students in private schools, when counting all

students from kindergarten to twelfth-grade (National Center for Education Statistics, 2017). To house the older half of these students, there are about 26,000 public secondary schools and nearly 11,000 private secondary schools across the United States (U.S. Department of Education, 2016). While this study looked at the importance of the ninth-grade school year, the importance of secondary education has not always been the case in our country. In fact, the roots of formal education in early American history did not even include a ninth-grade year. When Indianola Junior High opened its doors in Columbus, Ohio in 1909, it became the first school in the United States to ever be called a "junior high" school. From 1892 until Indianola Junior High opened its doors, schools typically just had the first eight elementary years. The "senior high school" years first officially began as part of the discussion in 1892 when a recommendation from the National Education Association was made to include all students of all abilities in more years of formal schooling (Lounsbury, 1960).

As our country was in its infancy, most learning took place in the homes of the early colonists. Parents took on the role of lead educator and taught their children the basics (Kahlenberg & Janey, 2015; Smith et al., 2013). To the lucky few, if families could afford it, hired tutors taught within the homes (Smith et al., 2013). The essentials of reading, writing, mathematics, and usually religious studies were the core curricula of this early teaching (Gray, 2008; Smith et al., 2013). One of early America's foundations was that of religious freedom. The early colonies had various faiths of emphasis, but the religious studies became critical as part of this early focus on learning. It was the Puritans who were the first public group to stress the need for common learning and an emphasis on elevating the baseline standard of education for all (Bell, 2015; Gray, 2008). As the early colonies began to unite, and leaders of these colonies began seeing themselves as a unified country, there came the need for more formal teaching and

learning (Bell, 2015). Colonies wanted common thought, a population that was understanding of the united cause of the colonies, and a population that had the skills to create prosperity. It was understood that good citizenship related to having a well-rounded education and this was also a way to promote the beliefs of democracy, free religious exercise, human rights, and other aspects of the freedom these colonists sought in their new land (Kahlenberg & Janey, 2015; Smith et al., 2013). It was also believed that an educated population would keep leaders honest and that leaders would then be more likely to serve with the future country's best interest at heart (Kahlenberg & Janey, 2015).

The first Boston Latin School was established in 1635 (Smith et al., 2013). This was the beginning of colonists establishing early public schools in the new land. Soon thereafter, mandatory learning and mandatory school systems became the norm (Bell, 2015). The Massachusetts Bay Colony required that children could read. In 1647, Massachusetts passed the first law that required communities to create public elementary schools for any community that had fifty or more families (Katz, 1976), but these schools were mainly for the boys of the community and "public" did not necessarily mean free, so many students were still being left out of a formal education. The next century brought a boom in schools across early America. Elementary schools were soon to be found in most thriving towns (Bell, 2015; Smith et al., 2013). Then Ben Franklin, an American founding father, author, and theorist, furthered the foundations of public schools by creating the "academy" concept which was a precursor to secondary education as we know it today. Franklin's first academy was introduced in 1751 and it introduced a balanced teaching of the classical and modern that stressed practical skills for students regardless of what line of work they would be in (Bell, 2015; Smith et al., 2013).

After Americans fought for independence in the Revolutionary War, Thomas Jefferson argued that this new country, with foundations in liberty and the pursuit of happiness as found in the Declaration of Independence (US 1776), needed an even more comprehensive educational system (Bell, 2015). It was Jefferson's work that led to federal tax dollars being used to not only support such a school system, but to lay legitimacy to it (Katz, 1976). However, Jefferson's efforts were not completely supported by all lawmakers, and it took nearly a century for his vision to be fulfilled. It was Horace Mann who reintroduced this more expansive approach to our public-school system in 1837 when he spread his vision of a standardized curricula, one in which common subject matter and skills were taught, across the entire country (Gray, 2008; Kahlenberg & Janey, 2015; Smith et al., 2013). Along with Henry Barnard, Horace Mann pushed for the idea of compulsory school for every child in the United States and his bold movement also included the idea of a free education for every child (Bell, 2015; Katz, 1976). These ideas began to take root in Massachusetts when the first compulsory school laws were passed in 1852 (Smith et al., 2013). In the later 1800's, Harvard College decided to become a national university. Prior to this, Harvard was a regional institution for higher education. Knowing that with this change Harvard would be a university that would now be accepting students from across the entire country; the university had newly found interest in how well students were being educated in all corners of the nation. Harvard had a direct interest in being sure the university would be receiving students who could find success in their institution (Bell, 2015). This emphasis from such a well-respected school gave additional support to the idea of all students in the entire country being educated in the same way (Bell, 2015, Kahlenberg & Janey, 2015; Smith et al., 2013).

Out of these nation-wide public-school changes, influenced by Harvard, came a restructuring of the norm for grade-level alignments at the early grades. Since the explosion of

elementary schools in the 1600's, there had not been much debate over what the grade-level configuration should be (Bell, 2015; Kahlenberg & Janey, 2015). As upper grades were added, the typical arrangement for schools was the eight-year elementary configuration and the four-year high-school institution. It was not until the mid-1800's that this configuration was replaced with our now familiar elementary set-up through grade six and our 7-12 secondary arrangement (Bell, 2015; Gray, 2008). In this new grade-level structure, the seventh and eighth-grade years were considered "junior" or "introductory" high-school grades and this was the foundation of our junior-high schools or middle-schools that we are familiar with today (Bell, 2015; Smith et al., 2013).

It is challenging, due mainly to the ever-changing educational landscape and grade-level configurations of school buildings around the country, to determine the percentage of freshman who are learning in an actual high-school building versus those who are learning in another physical layout such as a junior-high where ninth-graders are not in an actual high-school building (National Center for Education Statistics, 2017). The importance of success in ninth-grade remains the same regardless of the type of educational configuration in which a freshman student may be housed (McCallumore & Sparapani, 2010; McWilliams, 2014). Grade point averages begin following students in this ninth-grade year and the level of early high-school success is proving to be a predictor of what is to come for students in terms of academic achievement and whether students will remain in school (Burrus & Roberts, 2012; Cooper, 2011; McWilliams, 2014; Rumberger, 2013).

The transition from middle-school to high-school is a crucial step in a student's formal educational journey (McCallumore & Sparapani, 2010; Meyer, 2013). Not only is there an

increase in the academic demands for students, but students also find new independence and a greater level of responsibility (Allensworth & Easton, 2005; Meyer, 2013). The ninth-grade year can bring social challenges, the trials of how to balance this new-found freedom while staying focused on coursework, and the tug-of-war of pushing away from parents while still needing and wanting strong adult role models (Allen, 2014; Allensworth & Easton, 2005; Fegley, 2010). For some students, these changes in life can be too much and they falter, leading to poor grades, a loathing of school, or even dropping out of school altogether (Bava & Tapert, 2010; McWilliams, 2014). Not only are adolescent students moving into a high-school setting that can be unknown and intimidating, they are also experiencing the usual adolescent challenges of needing to feel accepted, making new friends, building confidence, as well as the developmental physical changes that are occurring (Bava & Tapert, 2010; Finn & Zimmer, 2012; McCallumore & Sparapani, 2010).

While there has been promise in the past few years with an increase in graduation rates, the concerns around students dropping out of high-school have become a priority at the national level (National Center for Education Statistics, 2017). The issue is so serious that in 1994 the federal government took a stronger role in public education, which had traditionally been influenced more at the state level, by establishing the national goal of a 90% high-school graduation rate within six years (America's Promise Alliance, 2016; Jorgenson & Hoffman, 2003). In 1994, the United States entered what has become known as the "No Child Left Behind" era (Bridgeland et al., 2009). While not called "No Child Left Behind", the 1994 reauthorization of the Elementary and Secondary Education Act (ESEA), originally put in place in 1965, changed the focus of ESEA to support the needs of all students, not just the disadvantaged or those at-risk of dropping out. This 1994 reauthorization of ESEA was the foundation for what

was to become "No Child Left Behind" in 2001 (America's Promise Alliance, 2016; Jorgenson & Hoffman, 2003). The emphasis in 1994, however, did not show immediate results. In 1994, the United States high-school graduation rate was at 68%. Six years later, the rate had only risen to 68.2%. However, the national graduation in 2014-2015 was up to just over 80%, so improvement is being made (National Center for Education Statistics, 2017). Typically, graduation rates are defined as the percentage of students who complete the four years of high-school in the "standard number of years", which includes grades nine through twelve (U.S. Department of Education, 2016). Sometimes numbers are shown to include just students in that four-year window, while at other times graduation rates give students an additional year beyond high-school to graduate and count those students within a five-year window (Jorgenson & Hoffman, 2003). When only looking at a national four-year graduation rate, and not considering the larger five-year rate, graduation rates in the decade of the 1990's went from 78% in 1991 to 75% in 2001 (National Center for Education Statistics, 2017). While there are relative differences in looking at the statistics in four-year versus five-year rates, the data still showed a disturbing trend of too many students not graduating in our country (Bell, 2015; Bridgeland et al., 2009; Jorgenson & Hoffman, 2003; National Center for Education Statistics, 2017). It is understood that historically states have calculated graduation rates using various methods instead of a standardized method. This inconsistent approach created confusing data that was hard to compare between states or even within the same state if that state chose to change the reporting method. Change was needed and in 2012 the first uniform reporting system was used across the country. This uniform high-school graduation rate now demands that every state reports the percentage of students who graduate in a four-year time span (Bell, 2015).

When students transition from the elementary years to the middle-school years and again into the high-school years, students are transitioning from a more nurturing experience to one that can be more chaotic, clinical, and demanding. It makes sense then that as students move into high-school environments their schooling experiences can become more challenging and exhausting (McCallumore & Sparapani, 2010; McWilliams, 2014; Meyer, 2013). All too often these challenges can lead to a lack of motivation to remain in school, even leading to dropping out of school all together by some (Bassi & Delle Fave, 2011; Meyer, 2013). Add in the pitfalls of ever-changing social media, peer groups and dating, as well as the hormonal changes of early teens, and young learners are faced with an extremely challenging time (Bridgeland et al., 2009). For many students, the academic task at hand is the furthest thing from their mind (Bassi & Delle Fave, 2011; McWilliams, 2014). In addition to these challenges, students are spending a lot of their energy trying to find an appropriate balance of independence while still cultivating meaningful relationships with adults in their lives, often without a roadmap (Meyer, 2013). Adolescent students are discovering who they are, who they want to be, and where they fit in the world (McWilliams, 2014; Meyer, 2013).

A student's skill level and approach to schooling is initially influenced by that student's primary care-givers (Allen, 2014; Jensen, 2009). Therefore, educators need to take a close look at what student skills and characteristics can be influenced, working to increase student achievement and decrease the student dropout rate (Ruzek, 2012). Teachers are probably not going to impact such things as family poverty levels or parent education levels, but student skills and characteristics, and to some extent, student beliefs, can be influenced (Allen, 2014; Hansen, 2016; Paunonen & Ashton, 2001).

Research Questions

The intent of this study was to construct and explore several earnest research questions (Creswell, 2014; Marshall & Rossman, 2016). The gap in the professional literature related to these specific questions was mentioned above and is explained in detail in this research paper. Grit has been identified as being a strong indicator of student academic success (Duckworth et al., 2007; Neild et al., 2008; Tough, 2012). Test scores and overall grades (Bowers et al. 2010; Burrus & Roberts, 2012; McWilliams, 2014; Neild et al., 2008 Roderick et al., 2014), as well as student attendance, (Burrus & Roberts, 2012; Cooper, 2011; Kassarnig et al., 2017) are key indicators of the level of success a student finds in school. While researching the influence grit has on academic achievement in ninth-grade students, the following research questions guided the research work in this study and provided focus for this dissertation journey:

- What is the correlation between ninth-grade students' grit level and ninth-grade students' first-semester GPA?
- What is the correlation between ninth-grade students' grit level and ninth-grade students' first-semester total absences?
- What is the correlation between ninth-grade students' grit level and ninth-grade students' state test scores (ELA, Math, and Science)?
- What is the correlation among ninth-grade students' first-semester GPA, ninth-grade students' first-semester total absences, and ninth-grade students' state test scores (ELA, Math, and Science)?

Description of Terms

There is a risk of key terms and phrases being defined in diverse ways from various authors. It is important to know what is meant by specific words or phrases when shared in a study. Those in the field of education are known for a host of specific terms, phrases, and definitions, as well as the use of education specific acronyms. The section below defines some of the important words and phrases that are used throughout this study.

Achievement Goal Orientation Theory. A theory that examines the reasons why students engage in their academic work. It looks closely at motivation (Kim, 2015)

Adverse condition. Conditions or effects that are negative to a person (Dweck, 2008).

At-risk student. A student who is believed to have a higher probability of failing in school, maybe even dropping out, due to his/her history, life outside of school, and/or support systems (Burrus & Roberts, 2012).

Autonomy. Self-governing or independent (Allen, 2014).

Conscientiousness. The trait of being diligent, careful, or vigilant. It implies a desire to do a task well and for the right reasons (Fegley, 2010).

Cultural capital. The social assets a person has that supports his/her social movement beyond economic means. Typically, financial assets are not part of social assets (Belfield et al., 2012).

Dropout. A person who stops going to a school before finishing the requirements to receive a high-school diploma (Bell, 2015).

Efficacy. The ability to produce an intended result, typically used when talking about people (self-efficacy), which would be the ability to produce one's desired outcome (Fegley, 2010).

Extrinsic motivation. Behavior that is driven by the possibility of earning external rewards such as money, higher grades, and/or praise (Bassi & Delle Fave, 2011).

Fixed mindset. A state of mind in which a person believes his/her intelligence and talents are fully developed, usually thinking they were born that way, and not believing that hard-work and effort can improve intelligence or talents (Dweck, 2008).

Functioning. The ability to do work and show on-task behavior, especially in the school setting (Driscoll & Nagel, 2010).

Grade Point Average (GPA). A system to convert high-school letter grades into a numerical value on a scale. Traditionally, a GPA scale ranges from 0.0 to 4.0, with a 4 representing an A. High-school grades are added up, then divided by the total number of grades to calculate a Grade Point Average (Bowers, 2010).

Graduation rate. The percentage of a school's cohort population that meets the requirements for a diploma on-time. For high-schools, this can be a four or five-year window (Bell, 2015).

Grit. A characteristic that shows the ability to reach long-term goals regardless of barriers and challenges along the way, often compared to courage and resolve (Duckworth et al., 2007).

Grit Scale. A survey tool to measure grit, typically using 8, 10, or 12 multiple choice questions, created by Duckworth at the University of Pennsylvania. Questions are answered on a Likert scale (Duckworth et al., 2007).

Growth mindset. A state of mind in which all things are possible, one can learn and grow, improving both intelligence and talents through hard-work and commitment, and mistakes are just another form of learning (Dweck, 2008).

Independence. Freedom from the control and influence of others (McWilliams, 2014).

Intrinsic motivation. Behavioral choices that are driven by internal rewards. Such efforts lead to pleasure, the development of skill, or is done because it is morally right (Bassi & Delle Fave, 2011).

Measurements of Student Progress (MSP). Part of a system to implement and assess Common Core State Standards. It has been a Science test taken by students throughout Washington State (Office of Superintendent of Public Instruction, 2017).

Motivation. The reasons an individual has for behaving in a particular way or for making particular choices (Bassi & Delle Fave, 2011).

Poverty. The state of a person being financially poor, typically defined in school by the combined home-income of a set number of family members and often leading to free/reduced lunch in the school system (Burrus & Roberts, 2012).

Protective factors. Conditions or attributes in people that help them deal more successfully with stressful events in their lives and help eliminate potential risks (Meyer, 2013).

Resiliency. The ability in a person to get through or bounce back from a difficult event or time in one's life (Allen, 2014).

Self-control. The ability to control one's emotions and desires as well as related behavior (Lerner & Galambos, 1998).

Self-Determination Theory. A theory that works to explain motivation. It states that motivation is human's natural or intrinsic tendencies to behave in effective and healthy ways (Deci et al., 2001).

Smarter Balanced Assessments (SBA). Part of a system to implement and assess Common Core State Standards. The educational consortium includes fifteen states working to create common assessments (Smarter Balanced Assessment Consortium, 2017).

Socioeconomic status (SES). The social standing of a person or group that is often measured as a combination of one's education level and his/her job and related income, typically shortened to SES (Chapman, Laird, & Ifill, 2011).

Teacher-Student relationship. The relational connection between a teacher and a student, usually in a school setting, including communication, depth of the relationship, trust, the value each puts into that relationship, and the level that person influences and supports the other (Allen, 2014).

Trauma. – Distressing or disturbing experience that one goes through, often leading to some level of mental or physical impact (Fegley, 2010).

Significance of the Study

In an analysis of the research, a gap was discovered in the academic literature on what correlation there may be between grit and academic success within ninth-grade students. Similar grit research has been done with elementary students, seniors in high-school, and college level students, but research is limited when it comes specifically to ninth-grade students (Duckworth & Seligman, 2006). Duckworth and her teams, as well as others, have done numerous studies over the years to show the impact grit has on achievement (Duckworth et al., 2007; Eskreis-Winkler, Shulman, Beal, & Duckworth, 2014). Spelling Bee champions, first-year cadets at a military institution, a study on twins in the United Kingdom, workplace sales, lifetime educational attainment, and academic performance at the university level are just a few of the major studies done that have shed light on the predictive powers of grit and grit's correlation to success areas in life (Eskreis-Winkler et al., 2014). With the freshman year being so pivotal, more research needs to take place with this group of students (Bowers et al., 2013; Burrus & Roberts, 2012; McWilliams, 2014; Ruzik, 2012). Non-cognitive characteristics like grit need further investigation to see if it has a positive impact on academic achievement in students (Duckworth et al., 2007; Meyer, 2013; Tough, 2012).

This study expands on prior research and speaks specifically to educators working with high-school freshman, but it has potential to help educators of all levels and grades. A goal is to influence improvement efforts in teacher preparation and professional development in the school system. The study should also influence how non-academic skills are perceived in the overall success of students as well as further the conversation around taking what educators already know and layering in this grit information to improve schools and better serve students (Chamorro-Premuzic & Arteche, 2008).

Overview of Research Methods

This study was based on a quantitative approach. It examined the demographic and academic factors for a targeted group of participating ninth-grade students in a school district in the State of Washington. The quantitative approach allowed the author to examine data that came from students who completed the 12-point Grit Scale (Duckworth et al., 2007) and the researcher compared that grit data to specific student academic data. That data included test scores, GPA, and total absences. This allowed a connection to be made between the level of grit and the level of academic achievement students were finding (Creswell & Garrett, 2008), determining the correlation between the two variables. The specific academic achievement indicators used were students' Smarter Balanced Assessment (SBA) English/ELA scores, Smarter Balanced Assessment (SBA) Math scores, Measurements of Student Progress (MSP) Science scores, Grade Point Averages (GPA) from first semester, and total absences from first semester. This study included 283 students from six junior-high schools in the State of Washington, within a suburban school district. In this specific community, the high-schools have a 10th-12th grade configuration, with junior-high schools serving the 7th-9th population. Student participants took

the 12-point Grit Scale with permission from the district's superintendent designee (Appendix A) and faculty at NNU (Appendix B). Consent from the students' parents or guardians was gathered prior to students being included in the study (Appendix C). This plan was also communicated through a letter from the researcher to the teachers helping with the survey (Appendix D). Each student took the 12-item Grit Scale (Appendix E) in a controlled environment after listening to directions from the researcher. The environment in some junior-high schools was a classroom with one class while in other junior-high schools it was a cafeteria with multiple classes, as agreed upon by the principals of each building and the researcher. Permission was granted by Duckworth (Appendix F) to use the 12-point Grit Scale. Student assent (Appendix G) was gathered during the beginning of each session with each set of students, prior to the directions being shared. Students were given the opportunity not to participate or to not answer specific questions. It was made clear that any decision whether to participate in this study would not negatively impact the student's status at school in any way.

Chapter II

The Literature Review

Introduction

The purpose of this study was to examine the ninth-grade year, the first of four high-school years for students in the United States. Specifically, the work looked at how the non-cognitive characteristic of grit may be correlated with student success in school. Grit has been shown to be a better predictor of success than intelligence (Duckworth, et al., 2007). Prior studies have been done to look at grit as a predictor for academic success, but little has been done specific to the freshman year in high-school. This first year of high-school, the year that sets the foundation for habits of learning and creates the base for every student's GPA, is vital in setting up each child for long-term success (Bava & Tapert, 2010). More students drop out of school in the ninth-grade than in any other year (Cooper, 2011; Dudley, 2012; McWilliams, 2014).

Throughout this literature review, several components were examined to help provide a clearer understanding of ninth-grade students, grit, and life influences that are connected to grit and serve as supports for success. The main components covered in this literature review included: Adolescent Development, Motivation in Adolescent Students, Teacher-Student Relationships and Academic Achievement, Mindset, and Grit and Academic Success. An introduction is provided to explain specifically what the main topic is in this study. Efforts were made to use current research and to secure an original source when other researchers were referring to prior studies. Research examples have been provided to share findings pertaining to studies on grit and other topics relating to grit. Grit is connected to several other characteristics and ninth-grade students have many influences in their lives, so this literature review extends

beyond just what has been studied on grit as a predictive characteristic. Causes of student behavior and decision-making were explored, as well as the idea of mindsets, to frame the research on grit and attempt to better understand challenges ninth-grade students face. The literature review compared and built on information from prior studies as it related to these topics.

The scope of the review supported a deeper understanding of current information on these themes and their relationships as well as attempted to identify areas needing additional studying, which created the impetus for this specific research. Grit has been defined by many people in numerous ways. Grit is defined by Duckworth et al. (2007) as "working strenuously toward challenges, maintaining effort and interest over years despite failure, adversity, and plateaus in progress. The gritty individual approaches achievement as a marathon; his or her advantage is stamina" (pp. 1087-1088). Many related traits and characteristics, and even skills, have been compared to grit, but grit is unique. Grit is not perseverance alone. Grit is not just about motivation. However, part of the intent of this chapter was to make connections to other related topics to show how they are intertwined.

On average, in schools across the United States, about one in every five high-school students does not graduate with the cohort that student started with in the ninth-grade. Whether looking at four-year or five-year graduation data, the numbers remain similar both comparatively and throughout recent years (National Center for Education Statistics, 2017). The U.S. Department of Education (2016) does show a recent increase in overall graduation rates from 2010 to 2013, moving the percentage from 79% to nearly 81% of high-school students in the United States graduating on time, but the trend over a longer period shows that graduation rates have been a troubling topic in the U.S. for several decades now (National Center for Education

Statistics, 2017). Even with the slight increase from 2010-2013, concerns remain about the cause

of poor graduation rates and what can be done to continue any positive increase shown from

2010-2013. Specific groups, within our larger high-school population, perform even worse.

African-American students graduate at only 72.5%, English Language Learners at 62.6%,

American Indians/Alaska Natives at 69.6%, and Low-Income students at 74.6% (Department of

Education, 2016). High-school graduation is more important than ever in terms of producing

contributing citizens who can earn a healthy wage through a steady job (Chang, 2014). The jobs

available to students who drop out from high-school are not as available as they have been in

past decades and even entry-level jobs are becoming more competitive. Therefore, a high-school

diploma carries much more weight today for students and their lives beyond high-school than did

their counterparts from fifty, forty, or even ten years ago (Rumberger, 2013).

Adolescent Development

The ninth-grade year rings in the official beginning of high-school and typically has

students in the second half of their adolescent years. This is the time they are working to move

from childhood to adulthood (McWilliams, 2014). Adolescence usually describes the years

between 13 and 19 years old. However, there is a problem. School systems can create an

incompatible environment for adolescent students and their developmental needs. Schools and

their common practices and systems do not meet the needs that students have at this time in their

lives (Cooper, 2011; McWilliams, 2014). Students at the ninth-grade level are seeking peer

approval and meaningful adult relationships, they need more sleep in, they are seeking greater

independence, yet many do not yet have the skills to fully find success in that independence

(Bava & Tapert, 2010). Often the school system that ninth-grade students are in is one that feels

more clinical, fast paced, and less supportive than what students have experienced in the past,

and usually high-school also begins very early in the morning (Lerner & Galambos, 1998). This

early start is not conducive to learning (Bava & Tapert, 2010; Lerner & Galambos, 1998). It is

important that professional educators know as much as possible about students at this age so that

they can best serve students at this critical juncture in their lives (Bava & Tapert, 2010). While

no child is exactly alike, there are typical developmental stages that can be expected at this age

(Cooper, 2011; Driscoll & Nagel, 2010). Most ninth-grade students are 14 or 15 years old, and

they are experiencing physical, emotional, relational, and spiritual changes (Bava & Tapert,

2010; Lerner & Galambos, 1998). Teens of this age begin putting more quality time to

contemplating their future and conversing on topics that they feel strongly about (Bava & Tapert,

2010). Vocabulary and opinions are expanded on, and this is new and exciting to them.

However, as they grow, they are often placed into a new school environment that is more

competitive and less personal than the prior school and grade configuration they were in. This

new environment also has a stronger emphasis on grades and following adult-like expectations

(Bava & Tapert, 2010; Cooper, 2011; Lerner & Galambos, 1998). It is at this age that students

are excited about new-found abilities to think more abstractly and understand more multifaceted

issues than they did in their earlier teen years (Bava & Tapert, 2010; Driscoll & Nagel, 2010). It

is also during this time that adolescents begin looking for their first job or getting more involved

in school through sports and other extra-curricular activities (Bava & Tapert, 2010; McWilliams,

2014). Their desire for independence has them spending more time with friends than with family

(Bava & Tapert, 2010; Cooper, 2011). Per Jean Piaget's work, students of this age are more able

to solve intellectual problems in a logical way, they become more interested in social issues and

their own identity as they take on more adult thinking, and they are more scientific in the way they think (Driscoll & Nagel, 2010).

On the outside, change is shown through growth spurts, facial hair, muscle development, and other more noticeable physical changes (McWilliams, 2014; Stevenson & Zimmerman, 2005). However, the most important changes are taking place in the brain (Bava & Tapert, 2010; Driscoll & Nagel, 2010). The detectable change in adolescents from their prior guided functioning, usually offered by parents, to the more mature independent functioning is pushed by the less visible development within the brain at this point in teenagers' lives (Driscoll & Nagel, 2010; Stevenson & Zimmerman, 2005). There are significant changes in the prefrontal cortex, the limbic system, and nerve fibers (Driscoll & Nagel, 2010). To be independent in this area means that you do not need adult support to get the needed task at hand completed. While brain growth and continued development are meaningful and positive changes, students of this age show greater tendencies toward risk-taking and greater vulnerability when it comes to mental or behavioral well-being (Bava & Tapert, 2010: Driscoll & Nagel, 2010). The challenge for those going through this period of adolescent growth is a combination of the physical changes taking place within a person and how that young adult is adapting to new surroundings (Driscoll & Nagel, 2010; Stevenson & Zimmerman, 2005). Schools often offer the chance to test this ability to adjust to a new environment. As adolescent students grow and mature, their relationships change with their parents and peers (Bava & Tapert, 2010). These young adults are now having conversations that are different and more thought provoking, and their depth of understanding of the world around them changes. Finding comfort and success as they go through this has much to do with the ability to adjust to change (Driscoll & Nagel, 2010; Lerner & Galambos, 1998; Stevenson & Zimmerman, 2005).

Unfortunately, as young people maneuver through this period of adolescence, the unpleasant aspects of society tend to become more prevalent as well (Stevenson & Zimmerman, 2005; Wood et al., 2017). Young people going through adolescence are often presented with the challenges of drugs, alcohol, peer pressure on social media, ideas of being intimate with someone, financial pressures, and getting a job. All this, while also needing to balance a busier life with taking care of oneself physically through proper sleep, diet, and exercise (Bava & Tapert, 2010). With the mental roller-coaster that can come at these ages, it is no wonder that failing in school and having feelings of hopelessness are the norm for many teens (Cooper, 2011; Stevenson & Zimmerman, 2005). As students move toward more independence, as well as unrealistic high expectations put on by oneself and coupled with low self-esteem, some students become more isolated and withdrawn (Stevenson & Zimmerman, 2005). As these students move away from their parents and closer to their peer group, it is not by chance that this group of ninth-grade students has a higher percentage of students drop out from high-school than any other high-school grade (Cooper, 2011). When at-risk students are specifically studied, as they draw closer to their like-minded peers, they are minimizing good role-models in their lives to support their own success (Bellin & Kovacs, 2006; Kassarnig et al., 2017). However, it is also easy to be optimistic for this group of students as they typically show increased interest in moral reasoning, show more compassion and empathy, and have early feelings of love and passion (Bava & Tapert, 2010; Cooper, 2011). This is, after all, their departure from childhood and their arrival into adulthood. Adolescent students also want to find their place in the world, a world that they are eager to get to know better (Cooper, 2011).

With many possible negative impacts to their lives, ninth-grade students also have possible counters to those negatives in their lives (Bellin & Kovacs, 2006). Parents, teachers, and

other positive adults in their lives can be such counters. Family has been a major contributing factor to success in adolescent children (Cooper, 2011; Sandoval, 2018). The level of marital satisfaction, the lack of depression in parents because of their own coping skills, the strength of sibling bonds, and the cohesiveness of the family unit can all positively impact students in their adolescent years (Bellin & Kovacs, 2006; Sandoval, 2018). While the family is the primary source of psychosocial development and support, students can also be positively impacted by adults at school, in the church, or in the neighborhood (Bellin & Kovacs, 2006; Cooper, 2011; Fegley, 2010).

Motivation in Adolescent Students

Motivation is another key factor in the level of student success during the ninth-grade year (Ruzik, 2012). In adolescents, motivation often declines radically, and learning is negatively impacted (Finn & Zimmer, 2012). Declining motivation around the middle-school level is influenced by a combination of the elementary transition and the need for students to be more independent and to have a say in the rules that govern their day (Bava & Tapert, 2010; Ruzik, 2012). Elementary students typically have one teacher. In the elementary, there is a focus on the whole-child and supports for social and emotional growth are in place (Ruzik, 2012). As students move into the middle-school or junior-high system, they typically are presented with more independence and accountability. There does tend to be a different philosophical approach between middle-schools and junior-high schools. Middle-schools retain more of that whole-child, nurturing approach, while junior-high schools tend to have more of a high-school feel where nurturing will feel minimized by students. Either way, during the middle-school and junior-high school years, the focus is more on healthy work habits and study skills, and grades

are still less of an emphasis than in high-school (McWilliams, 2014; Ruzik, 2012). However, as students move into that first year of high-school, ninth-grade, many are in for a big surprise. Grades immediately become more emphasized, students are expected to know how to study, and there is less emphasis on social and emotional support as students are treated more like young adults (Finn & Zimmer, 2012; McWilliams, 2014). Ninth-grade students are entering buildings that are more controlling and authoritative than the elementary or middle-school buildings they were used to, and this dichotomy is a large part of what adolescent students find challenging in the school system during this time (Finn & Zimmer, 2012; Ruzik, 2012; Stevenson & Zimmerman, 2005). A lack of motivation puts students more at-risk. There are many reasons for adolescent students to lack motivation. Lack of motivation can stem from not having a healthy relationship with the teacher, not having a clear understanding of how the expected task impacts the future, not having a supportive household, or having too many other barriers in life to actually care about the task (Bava & Tapert, 2010; McWilliams, 2014; Ruzik, 2012). Moreover, this time of adolescence is also a time when students need stronger relationships with teachers and other adults outside of the home, even though, beginning in middle-school and continuing through high-school, relationships with teachers tend to be weaker than when in elementary school (Fegley, 2010; McWilliams, 2014). Students discover that personal attention is comparatively lacking than when in earlier grades. This can be viewed as teachers not caring as much about each student and could negatively impact motivation and self-esteem, which are going to also negatively impact student behavior and student achievement (Bassi & Delle Fave, 2011; McWilliams, 2014).

In schools, it is important for students to have a desire to do the work asked of them and to complete both short-term and long-term tasks. This typically takes motivation and a level of

interest. Motivation is what makes people choose to do what they do (Bassi & Delle Fave, 2011; Kim, 2015). However, that simple definition is not enough to understand the idea of motivation. Two critical theories have evolved on this topic (Kim, 2015). The Achievement Goal Orientation Theory was proposed by Dweck back in the 1980's and the Self-Determination Theory, or SDT, was developed by Deci and Ryan in the 1970's and furthered developed in the 1980's (Bassi & Delle Fave, 2011; Kim, 2015). While similar, the two theories have different assumptions. The Achievement Goal Orientation Theory centers around the idea that goals are the current intellectual depiction of one's resolve to succeed, and these goals are motivating forces that guide students' growth and actions (Bassi & Delle Fave, 2011). An example of this would be the ambition behind a student's determination to achieve on an assignment or a given school task. The Self-Determination Theory is based on the idea that all individuals have a natural predisposition to progress into being a better person over time. Therefore, in the SDT, individuals would have an inherent desire to learn and grow. In the SDT, it is believed that people have a psychological need to be capable and to improve themselves, having a desire to be the best that they can be (Bassi & Delle Fave, 2011; Kim, 2015).

How and why people are motivated is important to know in the world of public education (Allen, 2014; Kim, 2015). Intrinsic motivation can also support student success (Wiest et al., 2001). As students move from being dependent upon adults in their lives to becoming more independent young adults themselves, students rely on those prior adult relationships as safety nets for ventures into freedom (Wiest et al., 2001). These healthy transitions can more easily encourage students to take a risk and pursue a challenging task, or new learning, merely for the innate pleasure of it, not because it was required or expected (Allen, 2014; Wiest et al., 2001). With so much research focused on the positives and importance of intrinsic motivation, some

students have acknowledged that extrinsic motivators were initial catalysts to begin a task that

they may have not otherwise started, and found over time that they enjoyed it, shifting reasoning

to more intrinsic motivation (Bassi & Delle Fave, 2011). This willingness of students to take on

new initiatives shows that there is value, at least in some part, to extrinsic motivators. When

students were given choice or autonomy in an activity, they tended to score higher in their

enjoyment in what they were doing (Bassi & Delle Fave, 2011; Kassarnig et al., 2017). A task or

activity that was chosen for intrinsic reasons was marked as a higher quality experience by

students. This wanting to do something because it is right or because it makes a person better

also supports teenagers' yearning for independence (Allen, 2014; Cooper, 2011; Wiest et al.,

2001). This intrinsic motivation was the difference in students saying, "I wanted to do it" versus

"I had to do it" (Wiest et al., 2001). The rationale for intrinsic motivation is that intrinsic

motivation leads to a high level of competence in oneself, which then encourages an even greater

degree of autonomy, meeting these dual needs of the adolescent student (Allen, 2014; Rajan,

Harifa, & Pienyu, 2017).

The idea of competence has been linked through research with academic performance

(Bassi & Delle Fave, 2011; Ruzik, 2012; Wiest et al., 2001). Students who self-report higher

competence are shown to produce higher grades. Those studies went on to demonstrate that this

idea of competence in students is more theoretical in nature because competence is really about

what the students believe of themselves as compared to what others believe or what data is

showing. This belief in oneself primarily comes from others in students' lives, such as their

parents, teachers, and peers (Bassi & Delle Fave, 2011; Kassarnig et al., 2017; Ruzik, 2012;

Wiest et al., 2001). Therefore, competence is challenging to pinpoint because there is a cyclical

affect between one's own beliefs of personal ability and the belief and influence of those around that person (Allen, 2014).

Students who are intrinsically motivated also have confidence in themselves and tend to have a growth mindset, leading to greater success in school when compared to non-motivated students (Allen, 2014). This positive mindset leads to more hope about the future than their non-motivated peers, who can be said to have a fixed mindset (Dweck, 2008). Students with growth mindsets showed to have a more positive outcome, feel more supported at school, and have a greater level of intrinsic motivation (Allen, 2014; Dweck, 2008).

Extrinsic motivation is incentive driven and characterized by activities performed to reach an end-product that is detached from the activity itself. Students who are motivated extrinsically are completing something to please someone else or to get something offered (Allen, 2014; Bassi & Delle Fave, 2011). They are not doing it for internal satisfaction. There has been much controversy as to whether efforts of extrinsic motivation, through rewards for students, have undermined intrinsic motivation in schools. Using extrinsic motivators is not an abnormal strategy for teachers (Allen, 2014; Bassi & Delle Fave, 2011; Deci et al., 2001).

Adolescent students have lives full of physical changes, social changes, and changes in school related expectations (Cooper, 2011; McWilliams, 2014). Accordingly, their behavior can be unpredictable and varied from day to day. Behavioral choices stem from the need to feel competent (Allen, 2014). Adolescent students are discovering who they are, how they fit in, and who they will become (Cooper, 2011; Wiest et al., 2001). It is important that students feel competent as they move through that discovery process. The drive for independence is high within students around the ninth-grade ages, and it is important to those students to find autonomy on this journey (Allen, 2014; Cooper, 2011; Kassarnig et al., 2017). Motivation, in

large part, is driven by the competence and autonomy students find at this time of adolescence (Wiest et al., 2001) and educators can be of significant influence (Hansen, 2016; Kassarnig et al., 2017; McWilliams, 2014).

Low motivation will not only negatively impact the ability for students to understand needed content within each academic area, but the essential skills of being organized, staying on-task, doing homework, and working in a group will also be negatively impacted (Murdock et al., 2000). A lack of motivation can be cyclical, as students who do not find success may not seek the help needed or they may act out in some way (Stevenson & Zimmerman, 2005). This leads to them being isolated by teachers, which can turn students' attitudes toward teachers in a negative direction and this cycle could lead to a feeling of hopelessness (Fegley, 2010; McWilliams, 2014; Stevenson & Zimmerman, 2005). This time in the lives of many students is one of concern, especially when it comes to academic risks (McWilliams, 2014; Murdock et al., 2000). When tied to the developmental stages of adolescents and the physical changes being experienced, motivation becomes a major player in how these students head into, and emerge out of, their high-school years (Allen, 2014; Fegley, 2010).

The idea of being resilient is also connected to motivation (Azzam, 2013). When children are surrounded by a loving and supportive family, it is easier to grow resilient because children of these families cultivate self-esteem. It is this belief in oneself that allows people to get through challenging times (Allen, 2014; Azzam, 2013; McCain, 2017). If a student is lacking in finances, food, clothing, schooling, etc., there will be limits on where that child will learn resiliency and therefore there is a cycle in that lack of resiliency, a key element in human success, from generation to generation (Azzam, 2013; McCain, 2017). When children are focused on surviving day to day due to a lack of appropriate resources, motivation to do well in school or to grow

personally becomes less of a priority (Allen, 2014; Azzam, 2013; Rajan et al., 2017). While

circumstances can be challenging in a child's home, there is hope for positive influences from

other adults, through the church, the school, and other entities. These positive relationships can

help build resiliency in children (Anthony & Jensen, 2009; Azzam, 2013). Studies show that

helping build resiliency in at-risk students can also build motivation and successfully engage

young people who are living in high-risk environments (Anthony & Jensen, 2009; Benard,

1997). Resilience-related skills include the ability to: form positive relationships, problem solve,

develop a sense of identity, and have hope for a positive purpose and future (Benard, 1997;

Rajan et al., 2017). Teachers can help build resiliency in students by providing three protective

factors to these students, including a caring relationship, positive and high expectations, and

opportunities to participate and contribute (Anthony & Jensen, 2009; Benard, 1997; McWilliams,

2014; Rajan et al., 2017).

Teacher-Student Relationships and Academic Achievement

Students desire robust and healthy relationships with their teachers at the secondary level

(D'Souza, 2017; Fegley, 2010; Nairz-Wirth & Feldman, 2017). Motivation increases in

adolescent students when teachers reach out to build personal relationships and show that they

care (McWilliams, 2014; Ruzek, 2012;). These relationships strongly influence student intent

and persistence in their school-related behavioral and academic choices (Allen, 2014; Collins,

2001; Nairz-Wirth & Feldman, 2017). The importance of relationships holds true both inside and

outside of the classroom (Allen, 2014). Research suggests that students who integrated

successfully into a new school environment identify a healthy adult relationship as one of the key

reasons for that success (Fegley, 2010). Moreover, regular interactions with teachers, as well as

the level of concern teachers show for students, has been identified by students as the strongest contributors to a caring relationship (Collins, 2001; Fegley, 2010). The idea of teaching through relationships suggests that teachers who have knowledge of their students will be better able to teach them (Allen, 2014; Fegley, 2010). This happens because teachers will better understand students' needs, the students' learning styles, and what best motivates those students. Teaching through relationships describes the multifaceted setting in which students and teachers interact in the classroom (Allen, 2014; Collins, 2001; D'Souza, 2017; McWilliams, 2014; Nairz-Wirth & Feldman, 2017).

This relationship, both in and out of school, is also based on shared experiences and regular communication (Fegley, 2010). While upholding the more formal relationship between teachers and students, teaching through relationships recognizes that each child has a story to tell, just like every teacher has a story to tell. It is in these stories that commonalities are found, and bonds are built. In these stories, support and empathy evolve. As relationships are built, so is the commitment to one another (Fegley, 2010; McWilliams, 2014). Ken Blanchard (1982), of One Minute Manager book fame, wrote, "People who produce results feel good about themselves" (Blanchard, 1982, p. 21). While Frosty Westering, Hall of Fame college football coach, said, "People who feel good about themselves produce good results" (Westering, 2008, p. 98). The first statement is about producing, then feeling good about the end-product (Blanchard, 1982). The second statement is about feeling good about oneself first and then creating good outcomes because of that good internal sensation (Westering, 2008). This second statement speaks to the importance of relationships and how students who feel good at school will find more success than those who do not feel good about being at school (Allen, 2014; Fegley, 2010; McWilliams, 2014; Westering, 2008). A major contributor to feeling good about being at school

is having students positively connected with teachers and other school adults. In revisiting those two quotes, the first speaks to the internal satisfaction of a job well done (Blanchard, 1982), the second speaks to how our emotions and self-esteem impact our achievement (Westering, 2008). This second quote is linked to the importance of teacher-student relationships and trust building. A student will put more value into a performance if that student believes the teacher cares for the student as an individual (McWilliams, 2014). A student will work harder to succeed if that student believes that the teacher cares about each individual and the level of academic achievement involved (Fegley, 2010). A student's emotional health and academic achievement go hand-in-hand and should not be looked at separately (Allen, 2014; Fegley, 2010; McWilliams, 2014; Westering, 2008). The more at-risk the student, the greater the need for such positive teacher-student relationships (Kim, 2015; Ruzik, 2012). Teacher relationships make a difference and students who feel connected and supported at school feel safer, creating more student effort and better student attendance. This all leads to greater academic success (Allen, 2014; D'Souza, 2017; Kassarnig et al., 2017; McWilliams, 2014; Ruzik, 2012).

The positive impact teachers can have on achievement through healthy relationship with a student has been studied at various grade-levels and in different school settings. A positive teacher-student relationship can be a contributing factor for resiliency for students without supportive parents (Collins, 2001; Reed & Spicer, 2003). This same study shared that the power of the teacher-student relationship could be equally positive or negative, depending on the quality of the relationship. If the relationship is positive and nurturing, the student is more likely to flourish. If the relationship is negative and non-supportive, the student is more likely to struggle academically (Collins, 2001; Reed & Spicer, 2003). A positive relationship is identified as being healthy, supportive, respectful, focused on the student's well-being, and professional

(Fegley, 2010). A negative relationship is identified through punishment, inappropriate behavior, sarcasm, confrontation, and other unhealthy aspects of relationships (Fegley, 2010). Teacher-student relationships were viewed and described differently by students and teachers when asked about them, but both groups identified the importance of positive relationships. Students who regularly outperformed their school-age peers academically identified as having more positive relationships with teachers (Allen, 2014; Fegley, 2010; Reed & Spicer, 2003). One of the key factors in student success, as identified by the students, was that the teachers had a sense of caring and teachers were willing to help when needed. This connection and feeling of support could not be said for the lower performing students. Students in advanced placement and accelerated courses also reported that they were known better by teachers in the school than students in general education courses (Collins, 2001; Fegley, 2010). The highest achieving students reported having the most positive teacher relationships in the school setting (Collins, 2001; Fegley, 2010). Students who felt supported by teachers also reported greater motivation to do well in school (D'Souza, 2017; Fegley, 2010; Nairz-Wirth & Feldman, 2017).

The positive influence teachers have on students, by building trusting and supportive relationships, not only increases academic achievement of students, but those same students also reported improvement in life away from school (Reed & Spicer, 2003). This trend also included students identified as being at-risk. On average, at-risk students have fewer positive role-models in their lives than peers who come from healthier surroundings (Kassarnig et al., 2017; Zaff, 2017). Positive teacher-student relationships are shown to increase achievement and attendance in at-risk students (Reed & Spicer, 2003; Ruzek, 2012; Sandoval, 2018). Students' perceptions of their teacher relationships had a large impact on whether students pursued goals of following classroom expectations and classroom social norms or not (Ang, 2005; Ruzek, 2012). Students

and teachers differ in their opinions about what a strong teacher-student relationship looks like. Students found teachers' caring, helpful attitudes to be important pieces of a strong relationship and teachers found that if students sought help from teachers that was a sign of a strong relationship (Kavenagh et al., 2012). Boys are at a disadvantage because they misbehave more and isolate themselves from adult relationships, leading to poorer school performance, both in behavior and academics (Brito & Noble, 2014; Kavenagh, et al., 2012).

Schools focus most time and energy on academic related skills and building knowledge around curricular areas, and rightfully so (Reed & Spicer, 2003). However, research shows that much needs to be done to build students social and emotional skills as well (Allen, 2014; McWilliams, 2014). Schools problem-solve to effectively teach the child who comes to school hungry by finding a way to take care of that fundamental need of being fed. In the same way, schools should not look past a child sitting in the classroom who has social or emotional needs to be met. Both the hungry child and the social/emotional child need to be fed in some way before deep academic learning is going to take place (Allen, 2014). Grades can be predicted by the level of social skills a student has (McWilliams, 2014; Ruzek, 2012). Academic success can also be tied to students' ability to get along with teachers and to a student's overall enjoyment level of school as reported by students (Ruzek, 2012). If a student has a positive relationship with a teacher and feels good about being at school, that student is more likely to succeed (McWilliams, 2014; Ruzek, 2012; Westering, 2008). Adolescent students strongly value what others think of them (Bassi & Delle Fave, 2011). This means that a teacher, who spends a large part of each year with a student, has a significant influence on the overall development and self-esteem of that student (Allen, 2014; Bassi & Delle Fave, 2011; Nairz-Wirth & Feldman, 2017; Ruzek, 2012). Teachers affect the improvement of students' self-image and belief systems. If teachers want

students to be motivated, to show respect for learning, and to show perseverance during trying times, teachers need to model those same characteristics and beliefs (Nairz-Wirth & Feldman, 2017; Reed & Spicer, 2003).

The role and direction of schools are being impacted by research as more is learned about the importance of the teacher-student relationship (Bassi & Delle Fave, 2011; McWilliams, 2014; Nairz-Wirth & Feldman, 2017). For students to be successful, they need to be specifically targeted by teachers to build motivation, to be able to give more effort when challenged, and to take accountability for their actions (Bassi & Delle Fave, 2011; Reed & Spicer, 2003). These are skills teachers want their students to have, but when the students do not arrive with them at the beginning of the school year, then the skills must somehow be taught and instilled (Reed & Spicer, 2003; Ruzek, 2012). Conversely, educational policies that exclusively emphasize academic growth and achievement are going to find limits in success (Ruzek, 2012). Policies need to address the social and emotional needs of students of all ages, which are enhanced by strong teacher-student relationships. Those policies should also address student motivation through those same healthy relationships (Bassi & Delle Fave, 2011). Not all students have adults in their lives who are going to be caring and attentive enough. Some parents do not have the needed skill set to send their child to school the way educators would like all students to arrive (Bassi & Delle Fave, 2011; Collins, 2001; Ruzek, 2012).

Another consideration for schools is the importance of developing students' communication skills. Communication, in most societies, is recognized as an important factor in how people perceive one another. Communication also is a major piece of healthy relationships. Therefore, schools must help students speak and write effectively (Reed & Spicer, 2003). Students' biggest desires in the connection with a teacher is for the teacher to listen to concerns,

to take time to speak directly and genuinely to the student, to regularly check-in on personal

pursuits and academic needs, and to be empathetic when the child is going through a tough time

(Ang, 2005; Collins, 2001; Ruzek, 2012). In this same research, teachers reported having a lack

of time and that building relationships with all students is very challenging. Teachers also said

that emotionally investing in each child can be exhausting (Collins, 2001). Because of these

challenges on the teachers, student needs did not match with teacher efforts and the needed

teacher-student relationships were not always in place (Ang, 2005; Collins, 2001; Ruzek, 2012).

American history shows a pendulum swinging back and forth over time in terms of social

policy and programs when it comes to supporting at-risk youth in our communities and our

schools (Anthony & Jensen, 2009; Azzam, 2013). At-risk students are more likely to drop out

from school and schools need to look at specific skill-building to help these students overcome

the challenges before them (Azzam, 2013; McWilliams, 2014). The presence of resilience has

been connected to other positive characteristics and traits such as a healthy temperament or high

intelligence (Anthony & Jensen, 2009). At-risk students are more likely to be lacking resiliency

in school when compared to peers from more stable and supportive circumstances (Anthony &

Jensen, 2009; Azzam, 2013). Teacher and parental influence on a child can supersede a negative

relationship of a peer (Zaff, 2017). Those peer relationships are strong, but not as strong as the

positive influence of an adult in an adolescent's life (Ang, 2005; Azzam, 2013). Child-adult

relationships, whether it be parents, other family members, neighbors, teachers, etc., are a

protective factor for youth growing up in risk-filled environments. These relationships give hope

and add meaning to one's life (Ang, 2005; Benard, 2004). To best support at-risk children, the

mentoring adults should engage them in joint problem-solving and joint decision-making efforts

that build trust, higher skill levels, and self-worth. The adult and child should be accessible to

each other and meaningful relationships eventually get to the point of predictability to best

support the at-risk student and help create self-righting tendencies (Ang, 2005; Benard, 2004;

Ruzek, 2012).

Being surrounded by healthy and successful people generally makes an individual more

successful and productive (Azzam, 2013; Bradley & Corwyn, 2002). Similarly, being surrounded

by stressors, higher rates of crime, poorly educated role-models, an inability to get a high-paying

job due to a lack of experience, skills, or education generally makes an individual less likely to

find success beyond what that person is exposed to (Azzam, 2013; Bradley & Corwyn, 2002).

More recently, there has been agreement in research of the importance of looking at one's

resources and assets when determining socio-economic status (SES). These resources can

include a person's finances, human capital such as education, and social capital such as societal

connections in life (Azzam, 2013; Bradley & Corwyn, 2002; Nairz-Wirth & Feldman, 2017;

Reed & Spicer, 2003; Ruzek, 2012). The greater the positive resources, the less likely a person

will be at-risk. At-risk individuals tend to have fewer resources and assets, and these people are

more likely to find related at-risk by-products in life (Nairz-Wirth & Feldman, 2017; Sandoval,

2018).

At-risk students typically are higher on the radar of the professionals who work with

them in schools. Rightfully so, as research has shown that adolescents who grow-up in poverty

are more apt to do worse in school and show more violent behavior than their peers who do not

live in poverty (Stevenson & Zimmerman, 2005). Life's experiences significantly impact one's

cognitive and social skills (Brito & Noble, 2014). Students in lower SES households tend to have

fewer experiences that would help with healthy development (Brito & Noble, 2014). Experiences

in language, social opportunities, and brain stimulation are much less in high poverty students

when compared to peers who are not living in poverty. This advantage within the higher SES families is mostly due to opportunities that can be provided through higher educated parents and other caring adults, having the means to provide books, experiences, and other stimulating opportunities of daily life (Brito & Noble, 2014; Reed & Spicer, 2003; Ruzek, 2012; Zaff, 2017). There also tends to be less stress in higher SES homes. Stress has been shown to lead to poorer health and lower academic achievement in school (Bradley & Corwyn, 2002; Brito & Noble, 2014).

When looking at parental involvement at school, research is showing strong connections between the higher the parent involvement, the better a child performs at school, both academically and behaviorally (Ang, 2005; Bradley & Corwyn, 2002; Deslandes & Bertrand, 2005; Zaff, 2017). When parents' perception of teacher invitations to be involved at school was strong, then parents were more likely to be involved (Deslandes & Bertrand, 2005). Parents from low SES circumstances communicated less frequently with teachers than did parents who were from higher SES circumstances (Brito & Noble, 2014). Parent involvement also decreases dramatically as students move into secondary grades (Deslandes & Bertrand, 2005; McWilliams, 2014; Zaff, 2017). There is a correlation between positive teacher-student relationships and stronger parental involvement at school. If students reported benefiting from a healthy relationship with a teacher, parents were shown to be more involved with school, whether that be supporting from the home or supporting at the school in some way (Ang, 2005; Bradley & Corwyn, 2002; Deslandes & Bertrand, 2005).

Mindset

How a student ascertains personal abilities plays a key role in overall achievement. The mindset that one carries into school is going to profoundly influence motivation and, therefore, impact the level of success for that student (Bassi & Delle Fave, 2011; Dweck, 2008; Hansen, 2017; Yeager, Henderson, Paunesku, Walton, D'Mello, Spitzer, & Duckworth, 2014). This idea of a mindset is usually put into two categories. People either have a fixed mindset or growth mindset (D'Souza, 2017; Dweck, 2008; Garofalo, 2016). A student who believes intellect is fixed, or that it is what it is with no chance of improving, will far underperform the student who believes intellect can be developed over time and with practice (Dweck, 2008). A student with a fixed mindset is unable to see the benefits of bettering oneself because that student believes this is the way individuals are born, and nothing can change. The student with a growth mindset believes that through hard work one can learn and achieve at new levels because learning is a process. A growth mindset is not just about effort. It is an approach to growing that includes learning from others, trying new strategies, and increasing one's set of skills and strategies over time (D'Souza, 2017; Dweck, 2008; Hansen, 2017; Kristjansson & Tashijan, 2016). It was found that more students succeed if they take control of their learning and have an optimistic outlook on the future and their place in it (Kristjansson & Tashijan, 2016). The same can be said for students who take on experiences with a can-do attitude and a belief that they will grow from such experiences (Collins, 2001). Positive adults in the lives of students also have an impact on whether students have a fixed mindset or a growth mindset (Claro, Paunesku, & Dweck, 2016; Collins, 2001; Fegley, 2010). Students who believed they could be successful found higher levels of success simply because of their belief in themselves. Adolescent students who have an achievement-oriented approach to tasks also found higher success than those identified as being

dependent on others for motivation (Kristjansson & Tashijan, 2016) How might educators better

the odds for at-risk students? The work of Paxton (2008) centered on suicide prevention in at-

risk adolescents, but the skills and mindset findings connect to similar research tied to school

achievement. This research on suicide prevention spoke to the hopelessness of those who lack in

positive forward-thinking. The inability to see oneself in a positive future had students in the

study reporting negative expectations for themselves and a much higher tendency of suicidal

thoughts and intentions (Paxton, 2008). Achievement oriented students can be classified as

having growth mindsets (Dweck, 2008). These students show to be able to complete tasks, take

pride in the work being done, and identify themselves as hard-working (Duckworth et al., 2007;

Dweck, 2008; Kristjansson & Tashijan, 2016). A growth mindset has been linked to

commitment, goal achievement, and hope (Dweck, 2008; Paxton, 2008). A person with a growth

mindset sees failure or a set-back as an opportunity to learn, whereas a person with a fixed

mindset will take any failure as a way of supporting their belief that they will never be able to do

what they attempted (Dweck, 2008; Kristjansson & Tashijan, 2016). The fixed mindset person

tends to think they are either smart or dumb, that they can or can't, and that no amount of time or

practice will change their current state of being. The person with a growth mindset is just the

opposite, where anything is possible and through hard work and practice, knowledge can be

gained, and skills can be improved on (Dweck, 2008; Kristjansson & Tashijan, 2016).

While students with fixed mindsets may believe that achievable success levels in life are

predetermined, the good news is research has shown students can learn to have a growth mindset

(Claro et al., 2016; D'Souza, 2017; Fegley, 2010; Garofalo, 2016; Kristjansson & Tashijan,

2016). Research has shown regardless of socioeconomic status, students who exhibited having a

growth mindset consistently outperformed their peers who had a fixed mindset (Claro et al.,

2016; Fegley, 2010; Garofalo, 2016; Hansen, 2017). In a study done on seventh-grade students who were exposed to the idea intelligence is something that can be built upon with time, effort, and practice, those students demonstrated better effort and greater achievement than the students who were not introduced to this concept (Blackwell et al., 2007). This same work was duplicated with African American college undergraduate students and found very similar results (Blackwell et al., 2007). In these studies, the students who were convinced their intelligence was not fixed showed higher grades and more engagement in class than their colleagues who were not taught about a growth mindset (Blackwell et al., 2007).

In showing that students and teachers can work together to develop a growth mindset in students, Carol Dweck began workshops to train teachers in these skills. While success was found, the work was draining and laborious. Therefore, an online tool was created called the Brainology Program (Dweck, 2008). This tool is for students to teach themselves about how the brain works, hopefully leading to the understanding that a growth mindset can be cultivated. The results were positive. It was reported that the students who completed the online program conveyed a positive change in studying more often, as well as how effectively the students conducted that studying (Dweck, 2008; Kristjansson & Tashijan, 2016). The students had a more positive mindset in their approach to studying and to related schoolwork. Teachers also reported that these students were more attentive, improved their grades, and were more open to teacher feedback (Dweck, 2008; Kristjansson & Tashijan, 2016). These kinds of supportive tools are especially critical for students living in poverty, as they have been shown to be up to two times more likely to have a fixed mindset than peers who are not living in poverty (Claro et al., 2016; Hansen, 2016).

The idea of a growth mindset is tightly connected to the concept of personal efficacy, another area getting significant attention in research**.** With efficacy, people oversee the life being lived and the direction of that life. They are in charge of their life. There is a belief in people with high personal efficacy that they can affect change through their choices and actions (Paxton, 2008; Yeager et al., 2014). This is similar to having a growth mindset. If a student feels outcomes can be influenced by effort and choices, then that student will have hope in the future. With such belief, motivation, commitment, and determination will also be positively impacted (Yeager et al., 2014). The opposite is true as well. A student without self-efficacy will be unmotivated, will not seek to improve upon current skill levels, and will not have the same hope for a fruitful and meaningful future (McWilliams, 2014; Paxton, 2008; Yeager et al., 2014). If efficacy is present, then time and effort on-task will be greater (Yeager et al., 2014). Students who intrinsically see value and meaning in school work are going to benefit greatly from the learning at hand. It was found that nationally 69% of U.S. teachers reported that students' lack of interest was a big problem in their classroom. This lack of interest by students was the top cited problem by teachers in this study (Bridgeland et al., 2013). There is much that can be done to help students be less bored and more interested in class, but the research shows that positively impacting the level of efficacy in a student, and ultimately impacting that student's mindset, might be a wise place for educators to begin (Bridgeland et al., 2013)**.**

Adolescent students respond positively to being taught about resilience (Stevenson & Zimmerman, 2005). Resilience and a growth mindset are ideas that support one another. Adolescent students have also responded positively to an intervention of teaching life-skills (Rajan et al., 2017; Stevenson & Zimmerman, 2005). These specific life-skills, including resiliency, can help students cope with, and even flourish in, all the chaos that life presents in the

teenage years. Helping adolescent students develop skills, as well as assets and resources in their lives, has proven to not only keep them on track during these sometimes-tumultuous years, but also through life beyond high-school (McWilliams, 2014; Stevenson & Zimmerman, 2005). A student's level of success in secondary school has been directly correlated to the degree of success for that student in college (Terenzini & Reason, 2005). For educators, this means students' futures can greatly be influenced by teachers even if those students initially arrive at school lacking the expected skills and positive characteristics. This ability to influence and help change lives provides great hope to educators (Allen, 2014; Hansen, 2016; McWilliams, 2014; Terenzini & Reason, 2005).

Grit and Academic Success

It has been found that successful people often share similar traits and characteristics (Datu et al., 2017; McCain, 2017; Tough, 2012). One of the most prominent characteristics that continues to rise to the top in recent studies is grit or the idea of pursuing and reaching a goal despite challenges over a long time (Datu et al., 2017; Duckworth, et al., 2007; Hansen; 2016; McCain, 2017). The importance of nature versus nurture in human development has been a debate for centuries (Daw, 2015). Recent research has pointed to the fact that it is not a matter of one or the other, but a combination of nature and nurture that ultimately leads to the level of success and happiness in life (Duckworth, et al., 2007). If anything is settled in this debate, it is that when it comes to humans, internal and external factors play a role in human development (Bowers, 2010; Daw, 2015; Zaff; 2017). IQ is important, but research has shown some non-cognitive characteristics are just as important, if not more important, than one's IQ (Duckworth et al., 2007). The key two-factors included within the non-cognitive characteristic of grit are

perseverance and passion, both of which lead to greater success in life (McCain, 2017). Non-cognitive influences, specifically the idea of grit, are stronger predictors of success than IQ (Duckworth et al., 2007; Hansen; 2016; McCain, 2017; Mehrabian, 2000). Of course, "success" needs to be defined by researchers, but success generally can be thought of as a person's attainment of an intent or goal that leads to happiness in life. Success could also be described as fulfilling one's potential and reaching positive outcomes due to related efforts (Daw, 2015). In a study of 1,500 students who were identified as gifted, it was found that more than intelligence was impacting whether those students found success or not in life (Mehrabian, 2000). Traditional thinking would have assumed that each of these students would have found success since they were extraordinarily intelligent. However, it was concluded that non-cognitive characteristics were better predictors of success when compared to IQ in this group of gifted students (Mehrabian, 2000).

Students come to the beginning of high-school with unique ability levels. Some students are more advanced and prepared than others (Bowers, 2010). Adolescent years can be a trying time and research is being conducted on the importance of specific characteristics and abilities, not just IQ, to help students persevere and find success during these years (Duckworth & Gross, 2014; McCain, 2017; Mehrabian, 2000). Whether a student has grit or not is a strong predictor of whether that child can complete a challenging task or not (Duckworth et al., 2007). Considerable efforts are being made to teach helpful skills that are missing in students at school. In fact, that is the essential job of schools (Chang, 2014). Characteristics such as optimism, self-control, and curiosity are being considered as something that can be taught to students in the school setting if students are not getting nurtured in these areas at home (Meyer, 2013; Rajan et al., 2017; Tough, 2012). However, no characteristic is being as carefully examined as grit right now (Duckworth &

Gross, 2014; Meyer, 2013). Schools are implementing ways to help students set goals and persevere through trying times. Schools are working to instill grit into students, knowing that grit has been identified as a characteristic that helps individuals find success in school and in post high-school life (Datu et al., Duckworth & Gross, 2014; Hansen, 2016; McCain, 2017; Meyer, 2013; Tough, 2012).

Intelligence and grit, and their influence on success, are the current topics being focused on when it comes to educational research (Meyer, 2013). However, most of that same research also gives a nod to several other possible indicators and influences (Allen, 2014). How a student adapts to a new school environment, while moving from elementary to the mid-level, and again from the mid-level to high-school or moving from one school to another due to family circumstances, can play a significant role in that child's achievement (Allen, 2014; Meyer, 2013). Tinto (1975), an early pioneer on research related to the reasons students drop out of school, found that a primary reason that students drop out was that students had the inability to integrate or adapt. Students were entering new surroundings, or possibly new expectations, and did not have the skills to assimilate, leading to failure in that new setting (Tinto, 1975). Persistence is also a common characteristic researched in similar work. Lower academic grades from students in school have been connected to those students having less persistence (Gifford et al., 2006). Conversely, higher performing students reported having a higher level of persistence. Students who feel valued at school, and have shown to be motivated, are more likely to also be persistent and successful (Allen, 2014).

Self-control and conscientiousness have been linked to student achievement (Cross, 2013). While both similar and connected to grit, self-control and conscientiousness are not the same as grit. Conscientiousness implies a desire to do a task well and for the right reasons. As an

example, it is the ability to be organized because a person wants to be, as the person is thinking

about being organized at that time (Baumeister, 2012; Cross, 2013). It is also the ability to have

follow-through. This action is practiced, over and over, by an individual so as to become

conditioned in making it part of regular decision-making (Cross, 2013). Conscientiousness is the

capability to be self-reflective and to think about actions taken, decisions made, and even

includes the process of metacognition or thinking about one's thinking (Baumeister, 2012). Self-

control, on the other hand, is about choosing not to do a certain act or not to behave in a certain

way, maybe when emotions tell the person to do the opposite (Bernheim, Ray, & Yeltekin, 2013;

Cross, 2013). When tempted, if one can refrain, that person is showing self-control. This can be

in the form of words, actions, or even thought process (Baumeister, 2012; Bernheim et al., 2013).

Self-control and conscientiousness are actions, while grit is an internal characteristic (Cross,

2013). Self-control has been shown to be a major impact to families living in a low SES

situation. The absence of self-control has been connected to ongoing poverty in families that

seem to have an inability to get out of their circumstances (Bernheim et al., 2013). However, it is

unclear whether the lack of self-control has contributed to poverty or that poverty minimizes the

ability of those living in low SES circumstances to exercise self-control (Bernheim et al., 2013).

A person with self-control and conscientiousness is more likely to have grit, but those are not

prerequisites. However, Duckworth (2006) was skeptical of conscientiousness as an attribute that

led to higher achievement (Duckworth, 2006). She argued that conscientiousness has limitations.

Conscientiousness is an action that is tied to outcome-based decision-making. It is something one

fine-tunes and acts out. Therefore, it is more action-oriented than an internal characteristic and is

not the same as grit because grit is not an action, but rather part of who someone is. Similarly,

Cross (2013) pointed out that other related measures, like perseverance, can be identified as

outcomes rather than predictors, and this separates them further from the concept of grit (Cross, 2013).

The groundbreaking work in grit can be found with Duckworth (Duckworth, 2006). Her studies at the University of Pennsylvania around how character influences achievements are referenced by just about anyone working with the concept of grit. Years and years of research have pointed to grit being a principal factor in the level of success and achievement an individual may find in life (Datu et al., 2017; Duckworth, 2006; Duckworth & Gross, 2014: Eskreis-Winkler et al., 2014; Hansen; 2016; Vibeke, 2014).

Grit can be taught in schools to some degree. Interventions in the school setting may help students learn to work hard, overcome challenges and, ultimately build aspects of grit in their lives (Duckworth, 2006). Duckworth's research is extensive. For those showing grit, connections have been made to U.S. Military Academy cadets completing more challenging courses (Duckworth et al., 2007), teachers being more effective (Duckworth & Robertson-Kraft, 2014), Spelling Bee participants finding higher degrees of success (Duckworth et al., 2007), greater retention in the workforce (Eskreis-Winkler et al., 2014), marriages lasting longer (Eskreis-Winkler et al., 2014), students staying in college longer and having more academic success (Duckworth et al., 2007), as well as people achieving lifetime goals (Eskreis-Winkler et al., 2014). Competitive athletes were also used as research participants, and it was found that competitors who could create long-term goals, and stick to an action plan, found a higher level of success in reaching their goals. In other words, those with grit found more success (Duckworth et al., 2011). This same work pointed to competitors showing more persistence on a goal with intrinsic motivators than with any extrinsic motivator (Duckworth et al., 2011).

Researchers have found that while grit can be a predictor of success, it is not necessarily linked to talent (Duckworth et al., 2007; Duckworth et al., 2011; McCain, 2017). In fact, there is an inverse relationship between grit and intelligence (Duckworth et al., 2007). Those studies showed that if scores were high on grit, more likely those same individuals would have lower IQ scores. Grit was also shown to increase as people got older. This is thought to have been linked to life experiences and building of skills over time (Vibeke, 2014). Duckworth and her co-researchers have worked so extensively with grit that they have created a tool to measure the level of grit in individuals. The Grit Scale (Duckworth et al., 2007) is used to identify and score the degree of grit in a person, and that score can be correlated with success levels, quality of life, achievement in school, or any other achievement variable the researchers want to study. To date, Duckworth and her team have created several versions of the Grit Scale that vary in length based on the number of questions being asked of participants. One of Vibeke's (2014) goals for her research was to discover if the Grit Scale was valid in multiple languages or if anything was lost in translation. Vibeke concluded that it was valid but pointed out some specific word issues within the translation from English to Norwegian (Vibeke, 2014).

While working in the world of professional lawyers, Hogan (2013) discovered that women were not reaching top-end jobs like men were in this domain of business (Hogan, 2013). There was a steady decline in the number of women in leadership positions and an increase in women taking on the lower-end jobs of the profession. This discovery led back to the work of Angela Duckworth. Through research, it was discovered that women who were finding success in law were those who identified themselves as having grit. It was pointed out that climbing the corporate ladder was a challenging undertaking that took years (Hogan, 2013). This would be more probable for grittier people who overcome long-term challenges while working toward a

meaningful goal (Eskreis-Winkler et al., 2014). It was also discovered that less gritty lawyers would change their goals, or give up on them altogether, but the grittier professionals would persevere and continue on, knowing success took a long-term commitment and the ability to press through challenges (Hogan, 2013). Grit was tied to the notion of people being single-minded in the mission of reaching their goals (Duckworth & Robertson-Kraft, 2014; Eskreis-Winkler et al., 2014; Hogan, 2013; McCain, 2017).

Historically, successful people have had many characteristics in common. In looking at the likes of Einstein, Newton, and Darwin, it was concluded that the ability to persevere was just as critical as intelligence in predicting their success (Howe, 1999). This research showed again the importance of taking a close look at grit and other non-cognitive characteristics that can help people achieve more in life. Those same characteristics are pointed to as not only helping with achievement, but most likely helping overcome shortcomings in other areas, like intelligence (Howe, 1999). Not all research has been this optimistic. While much is written about grit and its promise of helping people achieve, little research has been done on how people with grit get through challenging times (Vibeke, 2014). Grittier people find success, but exactly how those people are finding success should be looked at more deeply (Vibeke, 2014). Much is now known about the positive link between grit and success, but less is known about the process involved. With Duckworth's Grit Scale (2007), measurements can be made on a person's grittiness, but the questions around how a person gets gritty and why a person is gritty are still relatively unknown (Vibeke, 2014).

There is also the question of whether grit can be taught. Early work has focused less on the teaching of grit and more about teaching students how to overcome obstacles and how to stay on-task (Datu et al., 2017; Duckworth et al., 2011; Farrington, Roderick, Allensworth, Nagoaka,

Keyes, Johnson, & Beechum, 2012). The actions of overcoming obstacles and committing to a goal are tied to grit, but they are not grit itself (Duckworth et al., 2007). Grit probably cannot be taught completely, but the skills that build grit or help sustain grit could be courses of action in schools (Vibeke, 2014). One specific study shared that there are five major non-cognitive elements that can be taught in school, or in the home, that can help students build upon aspects of grit. Those include the skills of attendance, having a growth mindset, perseverance, specific learning strategies, and social skills (Farrington et al., 2012). Encouragingly, much of this is already being taught in schools, but more emphasis needs to be given to these skills as studies have shown that these non-cognitive elements are especially vital to the success of at-risk students in the school setting (Farrington et al., 2012; McCain, 2017).

Conclusion

The adolescent years are challenging times for students (Bava & Tapert, 2010; Cooper, 2011; McWilliams, 2014). Much is still being learned about the changes taking place at this time in students' lives and how educators can best serve students (Allen, 2014; Bava & Tapert, 2010; McWilliams, 2014). Students have much to wrestle with. This is particularly the case for adolescent students who not only have to navigate the intricacies of early high-school, but also must get a handle on their relationships with peers and adults, acclimate to the physical changes taking place in their bodies, including in their brain, and adapt to the newfound freedoms in their lives (Driscoll & Nagel, 2010; Stevenson & Zimmerman, 2005; Wiest, et al., 2001). Because so much of a child's future lies in how they do during their ninth-grade year (Bowers et al., 2013; Burrus & Roberts, 2012; McWilliams, 2014; Ruzik, 2012), efforts were put forth in this study to find out to what degree grit is correlated with student academic achievement during

the freshmen year. Most research throughout this literature review focused either on younger

children, students approaching high-school graduation, or college level students. Research

specific to ninth-grade students was limited, and this fact was the key impetus for pursuing

factors that impact the freshman year.

Chapter III

Design and Methodology

The intent of this chapter is to clearly present the methodology used for conducting this research. Instruments used, population and the sample, data collection efforts, and how the data would be analyzed were all shared with the goal being that this study could be replicated by others and that similar outcomes would be discovered (Creswell, 2014). The next steps are for further analysis and explanation of the data derived from this study and those pieces are presented in the final two chapters.

The researcher chose to use a descriptive study method. A descriptive study is one where information is gathered without impacting the environment in which the researcher is working (Sandelowski, 2000). A descriptive study is sometimes referred to as correctional study or observational study because these are studies in which relationships are demonstrated and associations are made (Creswell, 2014). A key component of a descriptive method is that the researcher worked with participants with the intent of not changing them (Sandelowski, 2000), which was the case in this study. While students needed to pause their regular routine to complete the 12-point Grit Scale, their surroundings and routine were not otherwise changed or disrupted. A descriptive approach aims to provide information about a group of people and can involve a one-time interaction with its participants, often called a cross-sectional study. While no interviews were conducted, and no stories told directly by the student participants, this work provided information about students with grit and how grit may connect to their academic achievement at their given school. Because of interaction with student participants without the intent of changing them, it appeared that a descriptive approach was a suitable research method

for this study (Creswell, 2014; Sandelowski, 2000). In this study, a quantitative approach was used in gathering data that determined each participant's grit level, via the use of the 12-point Grit Scale, as well as the efforts made in determining correlations between student grit levels and student academic achievement levels.

Introduction

Improvements have been made in the United States to increase national high-school graduation rates, but there are still far too many students dropping out of high-school (Burrus & Roberts, 2012; Stark et al. 2015; Swanson, 2010). Acknowledging that the United States dropout rate has declined by more than half since 1967, there are still nearly one out of every five students not earning a diploma with their peer cohort (National Center for Education Statistics, 2017). Recent statistics show that the current graduation rate in the U.S. is still only 80.9% (National Center for Education Statistics, 2017). Two disturbing statistics to look at are that nearly one million students drop out from high-school annually and that equates to over 5,600 students daily (National Center for Education Statistics, 2017). The wide graduation rate disparities by race and SES are changing the way schools do business as staff members work to lower the "achievement gap" (Rumberger, 2013). Dropping out of high-school not only creates a bleak future for the individual, but the community suffers as well (Rumberger, 2013; Wood et al., 2017).

This study is specific to the challenges presented to those students in their ninth-grade year. This freshmen year has been identified as a pivotal year for overall high-school success and too many students at this level are not finding success in the school system (Bowers et al., 2013; Burrus & Roberts, 2012; Cooper, 2011; McWilliams, 2014; Ruzik, 2012). It is important to help

students in the ninth-grade achieve as much success as possible. This is the year that assembles foundational habits that support long-term success (Bava & Tapert, 2010). Students going through this adolescent period face many challenges. During this stage of life, brains are growing and changing, bodies are developing, students are finding more freedom, social groups are evolving, there is a need to adapt to new settings, and school is progressively getting more challenging (Cooper, 2011; Driscoll & Nagel, 2010; Stevenson & Zimmerman, 2005). Current research is looking at how to best support these adolescent students. Research has pointed out that successful people often have much in common, showing to have similar characteristics (Tough, 2012). One of the most researched non-cognitive characteristics in recent years is grit or the idea of pursuing and reaching a goal despite challenges over a long time (Duckworth, et al., 2007).

In studying the non-cognitive characteristic of grit at six junior-high schools in an urban school district in the state of Washington, the researcher used the procedures and research methods described within this chapter. This chapter outlines the key components, including: purpose of the study, research design, research questions, population and sample, setting, data collection plan and tools, analytical methods, rights of the participants involved, the theoretical frameworks used, and an examination of potential limitations to this study. To secure initial approval to work in the district, the researcher sent an email to the superintendent of the district who gave the desired approval (Appendix A).

Purpose of the Study

The purpose of this research was to study the correlation between the non-cognitive characteristic of grit and specific student achievement indicators at the ninth-grade level at six junior-high schools in the State of Washington. The intent of the study was to determine if there

was a correlation, or statistical measure, showing whether grit data and achievement data fluctuate together. Each student's self-reporting grit level was identified by using the 12-point Grit Scale, and the specific academic achievement data included state standardized test scores in English, Math, and Science, as well as first-semester grade-point averages and first-semester total absences. A goal of the research was to support educators by providing a clearer knowledge base for the concept of grit and increasing student academic performance by teaching aspects of grit, if indeed a correlation was found between grit and student achievement.

Research Design and Research Questions

A quantitative research approach was chosen for this study. A quantitative approach allowed the researcher to discover the correlational relationship between grit scores and academic achievement data in ninth-grade students. Prior research had shown correlations between grit and other aspects of success in life, such as military cadets, gifted students, Spelling Bee champions, married couples, etc., but research looking specifically at ninth-grade achievement data was limited (Duckworth, et al., 2007; Duckworth & Gross, 2014; Mehrabian, 2000; Tough, 2012). This quantitative approach supported the researcher's efforts in identifying whether the variables (grit and student achievement) had a relationship when looking at students in the first year of high-school (Creswell, 2014). After initially considering a mixed-methods approach, the researcher decided to focus on the quantitative direction of this study. Initial thoughts included also interviewing principals to see if and how school leaders may be teaching students to have grit. By helping the reader learn how the principals in the study were teaching grit, the researcher believed that additional step in this study could have added meaning and depth to the work (Yin, 2014). However, while already having six different variables, adding this qualitative approach greatly expanded the scope of the study and diverted from the initial intent,

which was to seek to understand the correlational relationship between grit and student achievement. Another reason for solely focusing just on a quantitative approach is that the researcher felt numerical data could establish the correlation levels between variables in a more controlled condition, any subjectivity of the researcher seen in the chosen methodology could be lessened (Creswell, 2014).

A researcher typically starts the journey with questions to be answered. A framework is developed, data tools are decided upon, and then the other elements of the study are all considered in how they relate to, and help answer, the guiding research questions. As this study progressed, these four key questions were revisited regularly to insure the work was focused on answering the questions posed. They served as a guide and kept the work focused (Ravitch & Riggins, 2012). The study was designed to seek answers to the following guiding research questions:

- What is the correlation between ninth-grade students' grit level and ninth-grade students' first-semester GPA?

- What is the correlation between ninth-grade students' grit level and ninth-grade students' first-semester total absences?

- What is the correlation between ninth-grade students' grit level and ninth-grade students' state test scores (ELA, Math, and Science)?

- What is the correlation among ninth-grade students' first-semester GPA, ninth-grade students' first-semester total absences, and ninth-grade students' state test scores (ELA, Math, and Science)?

The purpose of this research was to study the correlation levels between grit in ninth-grade students and their academic achievement levels. Every effort was made to be an ethical researcher. If done properly, this study could be replicated by following the steps shared in this study (Creswell, 2014). Ethical training took place through doctoral coursework. Permission was granted for this work by the superintendent of the district where the students in the study attend. Consent was granted by the university's Human Research Review Committee prior to working with participants. A comprehensive process was followed, as guided by expectations of the university, to complete this study. To conduct this study, the researcher intentionally used specific steps that could be replicated by others. Four research questions were constructed. A methodology was decided upon that matched the questions. Specific tools for data collection were selected that matched the intent of the research. The student population was selected, and a healthy sample was agreed upon between the researcher and the dissertation chair. Approval to carry out the research in the district was sought by the researcher and approved by the superintendent's designee (Appendix A). An introductory email to the selected principals of the schools in the study was sent, who then passed it on to specific ninth-grade teachers in the building (Appendix D). An email was also sent to the principals and teachers as a follow-up reminder prior to the researcher's school visit. A consent form was created and used for parental permission (Appendix C). The 12-point Grit-scale (Appendix E) was sent to the six junior-high schools for the teachers in advance. Grit data was captured by using the 12-point Grit-scale with students at the six junior-high schools. The researcher went to each school to meet with the students, explain the study, gather student assent (Appendix G), and have students take the survey (Grit Scale). Scores were obtained and scored for each participant on the Grit-scale (Fink, 2009). A numerical grit score was given to each participant based on the scoring criteria created

by Duckworth (Duckworth, 2007). Student achievement data for each participant was captured by working closely with the Director of Assessment within the district who served as the superintendent's designee. The grit score was compared to each of the five different data sets (SBA ELA test score, SBA Math test score, MSP Science test score, first-semester GPA, and first-semester Total Absences) for each participant using the Pearson's correlation test within SPSS. The data was analyzed and used in this study.

Population and Sample

The researcher worked to get a random sample of students at six junior-high schools in the same district in Washington State. The sampling was purposeful with a heterogeneous sampling of ninth-grade students for the 2017-2018 school year. Efforts were made to balance gender per proportional stratification. These six junior-high schools are six of the seven junior-high schools in this district. The researcher currently is employed in the seventh school, so no participants were used from that junior-high school (Creswell, 2014). The six schools were coded with letters (A-F) and eventually students were coded with letters and numbers to protect their identity. The schools' ninth-grade student populations, at the time of application to do the research in this district, were: School A = 230, School B= 219, School C = 259, School D = 283, School E = 151, and School F = 239, for a total of 1,381. The school district is a suburban district with a total K-12 student population of 22,659. The district is on the west side of the state and is in a suburban setting. It comprises one city and unincorporated areas in the county in which it resides. Due to history and geography, the district serves three distinct communities. The district was initially organized in 1854 and was the third school district formed in Washington State. It is the eighth most populous district in the state and currently has twenty-

three elementary schools, seven junior-high schools, and three comprehensive high-schools and one alternative school. It is a highly-recognized district academically with strong programs for highly capable students and special needs students, strong performing arts and athletics, a higher than average graduation rate (90.9% five-year cohort for 2016), and considerable pride as an inclusive district that partners strongly with all community stakeholders.

This study included several correlational methods while looking at the pivotal year of ninth-grade in adolescent students. A student's ninth-grade year officially begins the four-year high-school journey that so strongly influences one's life (McWilliams, 2014). Adolescence is the time of moving from being a child to becoming an adult. Educationally, this time presents challenges for many students. These trials can lead to a lack of motivation, students being turned-off by school, and even leading some to giving-up on school all together by some, leading to students dropping out of school (Meyer, 2011; Stark et al., 2015). School systems often create an incompatible environment for adolescent students (McWilliams, 2014). Common practices and systems within schools often do not meet the needs that students have at this time in their life. It is imperative that educators know as much as possible about students at this age so that students can be best served at this critical juncture in their lives (Driscoll & Nagel, 2010; Meyer, 2011).

A key goal of this study was to provide helpful information to educators. For this study, no students were excluded. The researcher worked to get as many students involved in the study as possible. In the end, 283 participants were included. While the population of ninth-grade students within the study schools was over 1,300 students and 1,047 students took the survey, only those who returned the consent form were included. The researcher chose to only go to each school once, so any students who were absent (about 6% on an average day) were also not

included. While the researcher asked teachers to include all students, the researcher did not control the teachers' efforts in having students return the consent form. Academic achievement was looked at through five main data points: 1) SBA ELA test scores (taken in the spring of the eighth-grade year), 2) SBA Math test scores (taken in the spring of the eighth-grade year), 3) MSP Science test scores (taken in the spring of the eighth-grade year), 4) Grade Point Average (first-semester), and 5) Total Absences (first-semester).

Participant data was collected by using the 12-point Grit-scale (Appendix E) that was created by Duckworth, et al. (2007) and the researcher received approval to use this tool in advance (Appendix F). Achievement data was collected, with permission from the district (Appendix A), by using 2016-2017 eighth-grade SBA and MSP data, 2017-2018 first-semester ninth-grade GPA and total absences data, and 2017-2018 ninth-grade Grit-scale data, all for the same cohort of students. This captured the expected data for a specific population of students that centered around the ninth-grade year. The setting of this study, for the proctoring of the Grit-scale survey, was ninth-grade classrooms or a Commons area within each of the six junior-high schools. The district in this study is a public K-12 district in the State of Washington. District demographics presented for the 2016-2017 school year showed (Office of Superintendent of Public Instruction, 2017): 60.3% of the student population as White, 16.4% Hispanic/Latino, 12.4% as Two or More Races, 5% as Asian, and 3.8% as African American as the top five Race/Ethnicity categories. Free and Reduced lunch for the entire district was at 32.2%, 13% of the student body was in Special Education, 5.7% in Section 504, and 5% were identified as bilingual. The unexcused absent rate was .7%, the 4-year Cohort Graduation Rate at 89.6%, and the Adjusted 5-Year Cohort Graduation Rate at 90.9%. The Average Year of Teacher Experience was 13.7 years, and 66.1% of the teachers have at least a Master's Degree. Comparatively, the

State of Washington as a whole shared the following state-wide averages: 55.2% of the student population as White, 22.8% Hispanic/Latino, 7.7% as Two or More Races, 7.5% as Asian, and 4.4% as African American as the top five Race/Ethnicity categories. Free and Reduced lunch for the entire state was at 42.9%, 13.8% of the student body was in Special Education, 3.2% in Section 504, and 11.3% were identified as bilingual. The unexcused absent rate was .7%, the 4-year Cohort Graduation Rate at 79.1%, and the Adjusted 5-Year Cohort Graduation Rate at 81.9%. The Average Year of Teacher Experience data was 13.1 years, and 66.9% of the teachers have at least a Master's Degree.

Analytical Methods

Grit surveys were given and received by the researcher and grit scores were calculated for each participant in the study. The Grit Scale, developed by Duckworth et al. (2007), was developed and validated through seven different studies by the team, plus the researcher reviewed two other studies, unrelated to Duckworth et al. (2007), to add to the validity of the tool (Mehrabian, 2000, Tough, 2012). It is a self-reporting questionnaire. Duckworth described the tool as one that measures "adolescents and adults pursuing goals in a variety of domains" and as having a "low likelihood of ceiling effects in high-achieving populations, and most important, a precise fit with the construct of grit" (Duckworth et al., 2007, p. 1089). The Grit Scale can break data down further into two other related characteristics, self-control and conscientiousness, but the researcher chose not to break-out those two characteristics and just used one comprehensive grit score for each participant. The researcher looked at several other tools that had essence of grit within, but they were not as a precise fit as Duckworth's Grit Scale. The Grit Scale is comprised of 12 questions, six in each of two sub-categories (self-control and conscientiousness), using a 5-point Likert scale for each question. With a possible score of 1-5

on each question, the final grit score is calculated by scoring each question, adding the scores together for all questions, then dividing the total score by the number of questions (12) to get a single (average) composite score that determines how gritty a student is. A score of 1 on the Grit Scale indicates zero presence of grit. A score of 2 indicates a low degree of grit, 3 indicates a moderate level, 4 indicates a high degree, and a score of 5 indicates the respondent has an extreme level of grit as scored by the answers presented. By creating an average of the points possible for all questions, decimals became part of participants' scores, so the researcher rounded to the nearest hundredth.

A Pearson correlation coefficient test was used to look at the relationship of grit and the various student academic achievement. This test, run through SPSS, is a measure of the strength of the linear association between the variables in the study. First, the relationship between grit and GPA was reviewed, then the relationship between grit and total absences was reviewed, and this process continued until all five of the student achievement data sets were compared. By choosing this test, the association between the variables was identified. The Pearson correlation coefficient test can take a range of values from +1 to -1. With this test, a value of 0 indicates that there is no association between the two variables, grit score and GPA, for example. With the Pearson correlation coefficient test, any value greater than 0 indicates a positive association between the variables. This means that as the value of one variable increases, like grit score, the value of the other variable also increases, like GPA, as an example. With the Pearson correlation test, any value less than 0 indicates a negative association between the tested variables. This means that as the value of one variable increases, the value of the other variable decreases. Again, when they do not move in the same direction, it is considered a negative association. To measure the strength of the association, researchers look at how closely the test shows data to be

to +1 or -1. The stronger the association of the variables within the test, the closer the Pearson

correlation coefficient will be to +1 or -1. The closer to +1, the more positive, the closer to -1,

the more negative. The data collected using the Pearson correlation coefficient test was used to

better understand the correlation between grit, a non-cognitive characteristic, and how it may be

associated with the five academic achievement data sets. The intent was to see if the students

with higher levels of grit also had higher levels of academic achievement when compared to their

less gritty classmates. The five academic achievement data sets were also compared to each other

in this same way to test for association strength. The following are guidelines for strengths of

association when using the Pearson correlation test:

Table 1

Pearson correlation strength of association guidelines

	Coefficient, r	
Strength of Association	Positive	Negative
Small	.1 to .3	-0.1 to -0.3
Medium/Moderate	.3 to .5	-0.3 to -0.5
Large/Strong	.5 to 1.0	-0.5 to -1.0

To do the needed data analysis for this study, the researcher primarily used IBM SPSS

Statistical Software 24 (IBM, 2017) and the Discovering Statistics Using IBM SPSS Statistics 4th

Edition textbook (Field, 2013). The researcher also regularly used Laerd Statistics, an online

tool, to support decision-making around the research (Lund & Lund, 2017). Analysis was

conducted to determine a correlation between the level of grit ninth-grade students were shown

to have and their academic achievement by comparing grit scores to five different achievement

data sets. The grit data and the achievement data has been saved to both a USB drive and onto a

computer. Initially, data was put into an Excel spreadsheet with coded school and student names. The hardcopies and USB drive have been stored in a locked filing cabinet in the researcher's locked office. This room can only be accessed by the researcher and the assistant administrator at the school. The USB and computer are both password protected and only the researcher knows the passwords. The hardcopy and e-copy of the data will be kept for three years by the researcher to follow the Federal Assurance Code (45 CRF 46.117).

Upon the three years passing, the data will be permanently destroyed. Prior to gathering data, the researcher acquired permission from the creators of the 12-point Grit Scale (Appendix E). The setting for administering the Grit Scale was either in classrooms or in the Commons of the six junior-high schools, based on prior conversations between the researcher and each school's principal. Participant grit scores fell between 1 and 5, based on the answers given, and a participant's final score was rounded to the nearest hundredth. Achievement data (test scores, GPA, and total absences) was captured from district and state online programs, and those numbers were put directly into the spreadsheet with no rounding by the researcher. The next step was to connect the grit scores and achievement data with each participant. Participants were assigned a code so that data and participant names were not connected, allowing the participants to remain anonymous in this study. The IBM SPSS program was used to keep the data sets separate, connect and organize the data, and begin the analysis of what had been gathered. The researcher chose to use the Pearson correlation coefficient test with this quantitative data. The researcher had also planned to eventually separate school data, while still keeping students anonymous, to share with each school's principal so they could see their school's specific data within this research. This latter data was not included in this study.

Role of the Researcher

Because of the human element of research, researchers enter each study with some level

of bias (Creswell, 2014). Admitting that upfront and then working to eliminate such bias at every

possible moment is the professional and ethical approach to research. The focus of this study is

grit. The researcher is a proponent of the concept and importance of grit and what it can mean for

public educators. Because of personal beliefs and being a public educator, the researcher admits

to having a positive bias about grit. However, ethical steps have been put into place to keep the

research data-driven and as free of bias as possible. Potential candidates were initially identified

in a district outside of the researcher's place of work. However, after running into roadblocks in

two other districts where research approval was sought, the researcher was given approval for

this study in the district in which the researcher is employed. The school at which the researcher

serves was not included in this study. Also, two attempts were made to use the district's "opt-in"

policy for the research, but the requests were denied so the researcher used hard-copy parental

consent forms. It is important to note that there were no previous interactions between the

researcher and the participants in this group. Achievement data that was collected is public in the

form of collective scores, as it can be found on the state's assessment website, but individual

scores and student identity were protected in the same way as the grit scores. The researcher's

role is to design a study, collect data, analyze the data, and report results with the hope of

moving the field of education forward in this area. The acknowledged challenge is to not let any

bias or preconceived notions influence the work in this study.

Limitations

Possible limitations of this study include survey fatigue. Students were asked to complete

a 12-point Grit Scale. There is the chance that students are tired of completing surveys and/or

they may have been fatigued due to the time and effort needed to complete this task. Participants

may have withheld true feelings or perceptions. Because the participants do not know the

researcher, they may have chosen not to fully disclose their true thoughts, perceptions, and

experiences. This could lead to data that does not give a true representation of the levels of grit in

these students. Of all potential limitations, this one was of most concern to the researcher. The

survey is self-reporting, so the researcher had little control over student honesty or the

seriousness in which they took the survey. There could be a lack of clarity in researcher

communication at various levels. Emails, letters, cover letters, directions, and surveys all went to

hundreds of potential student participants, as well as to teachers and principals who are assisting

in the study. If the researcher's communication was not understood fully, there could be

limitations to the effectiveness on completed tasks, timelines, and desired efforts. The same

communication concerns would apply to the survey itself. Confusion on specific survey wording

or what a survey question is asking is a potential limitation. Population size is of concern as well.

While hundreds of randomly selected students were in this study, these students may not be

representative of all ninth-grade students across the country. Students in a suburban mid-size

town in Washington State may not represent those in schools that are not similar. Because this

study was done within one school district, there are limitations to extending the findings to all

ninth-grade students across the country. Population size could also play a role in limitations. The

larger the population, the better the data will represent the national population, and this study

was limited to the number of ninth-grade students in one district, and only to a portion of the

total population of students within that district. Another limitation could be that the students who

returned the consent forms, those who were ultimately included in the study, may not

proportionately represent the total population. Also, the data collected for this study followed a

cohort of students, due to achievement data collection restrictions, over more than one school year. It is possible that grit levels or achievement levels fluctuated or changed during this time. Specifically, the SBA ELA, the SBA Math, and the MSP Science test scores were taken from these students while they were in the eighth-grade (there are no such tests in the ninth-grade in this district). The GPA and total absences data were collected at the end of their first-semester in ninth-grade. Participants took the grit survey in the fall of the ninth-grade year. Finally, bias could also be a limitation in this study. Researcher bias always has the chance of influencing data by swaying the questions asked, tools used, interpretation and analysis of the data, and other aspects of the research design.

Theoretical Frameworks

A theoretical framework can be compared to a blueprint for a new home. Critical thinking must be present for anyone developing a blueprint for a home and extensive planning must take place prior to the completion of the final product. The same can be said for choosing a theoretical framework for a doctoral dissertation (Grant & Osanloo, 2014; Ravitch & Riggan, 2012). The theoretical framework serves as both the structure and support for the justification for the research study that is about to take place. It should reflect personal beliefs of the researcher and should influence the tools that will be chosen within the study (Grant & Osanloo, 2014; Ravitch & Riggan, 2012). A theoretical framework provides clarity for the researcher throughout the dissertation and keeps the researcher on track (Ravitch & Riggan, 2012). Frameworks are used in a variety of disciplines and more are being created and utilized in various fields all the time. The match of researcher intent and the usage of the framework is important. The framework is to help any reader better understand how the researcher has positioned the problem of the study relative to the theoretical environment. In this study, grit, and its possible correlation

with academic success, is studied. The Social Cognitive Theory and Mindset Theory were healthy matches for this work. The connection between one's research questions and aspects of the chosen theoretical framework should be obvious (Grant & Osanloo, 2014).

The theoretical frameworks chosen to guide this work were Bandura's Social Cognitive Theory and Dweck's Mindset Theory. The Social Cognitive Theory was theorized about, and later expanded on, by Bandura, a Canadian psychologist, during the 1960's. The Social Cognitive Theory works to explain how people acquire behavioral patterns by observing and interacting with others (Bandura, 1989; Conner & Norman, 2005; Luszcynska & Schwarzer, 2013). The Mindset Theory, specifically looking at the idea of a growth mindset, came onto the scene when Dweck (2006) introduced the theory in her book, *Mindset: The New Psychology of Success.* The Mindset Theory works to explain why some people find more success in life than others and how a person's way of thinking contributes to that success level. The Mindset Theory includes aspects of grit like determination and goal setting, as well as the desire to constantly better oneself in life (Dweck, 2008). Human beings believe what they do, and act how they do, because of what is learned through experiences with others. Choices are made by what is learned through observing others. Humans mimic successful choices seen in those around us and when negative consequences are observed, humans work to avoid such destructive decision-making (Bandura, 1989). A growth mindset is the belief that humans have the ability to constantly grow, learn, and improve. One's lot in life is not set from birth, but rather hard-work and effort are rewarded with a better version of who we are (Dweck, 2008). These frameworks were chosen because grit is a characteristic that is influenced through our experiences with other people, as is explained in the Social Cognitive Theory, and with a growth mindset the characteristic of grit can grow over time, which is a key belief in Dweck's Mindset Theory. Grit is a characteristic

that can be taught. Grit can be learned. Grit is important to success and, fortunately studies are showing people can get grittier over time (Duckworth, Grant, Loew, Oettingen, & Gollwitzer, 2011).

With a focus on how academic success and grit interact, the Social Cognitive Theory appeared to be a proper approach and lens for this study. This theory not only explains how behavioral habits and skills are acquired, but how or why they are maintained over time. This study, in a lot of ways, is about overcoming adverse conditions, a trait that can be influenced by observing others (Conner & Norman, 2005). The Social Cognitive Theory is based on the idea that people build skills and specific behaviors while observing others through social interactions, life's experiences, and outside influences. A person's environment, the people one interacts with, as well as the behaviors of those people, all have a cyclical interaction and influence people's decision-making (Bandura, 1989). The core concept of the Social Cognitive Theory is that we learn from others and we work to replicate behaviors and actions we see in others to better who we are (Bandura, 1989; Conner & Norman, 2005). Grit is showing to be a characteristic that can be influenced by others. Parents can help instill it in their children, teachers can help develop it in students, and as people learn and grow through the influences of others, they are examples of the Social Cognitive Theory.

Social Cognitive Theory goes beyond using one's eyes, but also includes social interactions and experiences. While trial and error are part of human development, the Social Cognitive Theory states that we also replicate the actions we see others take based on their experiences and levels of success (Luszcynska & Schwarzer, 2013). The Social Cognitive Theory was chosen for this study because it has direct connections to human behavior which is a major theme within this work. Bandura did groundbreaking work in trying to make sense of why

people behave the way they do and concluded that we learn to behave through observations and interactions with people. His research was carried out in the 1960s and 1970s (LaBounty, 2008). Per Bandura (1989), "Knowledge and thinking skills provide the substance and tools for cognitive problem solving. Rather than solve problems solely by performing actions and suffering the consequences of missteps, people usually test possible solutions in thought and discard or retain them based on estimated consequences before plunging into action" (p. 9).

In this study, it is being determined whether grit plays a role in the academic success of high-school freshmen, so the Social Cognitive Theory was chosen as one of the guides to keep the study focused, along with Dweck's Mindset Theory. The conceptual framework of Social Cognitive Theory was a regular reminder that while humans are all different, all are influenced by the world around them. The Mindset Theory, as the other conceptual framework that served as a filter, was a reminder that our beliefs about "self" matters. If we think we can, we more likely can. If we believe we can learn and grow, having a growth mindset, then we will continue to better ourselves (Dweck, 2008). The characteristic of grit merges well with the Social Cognitive Theory and the Mindset Theory. Some students come to the school setting with the skills that they need to succeed, but it is also true those skills can be cultivated over time after students enter our schools (Azzam, 2013; Bradley & Corwyn, 2002; Stajkovic & Luthans, 1998). Non-cognitive characteristics, like grit, are often influenced by others and that is where the Social Cognitive Theory serves as a structure for this study and why it helped frame this dissertation (LaBounty, 2008). The Social Cognitive Theory helped tie together the prior research on grit and how that variable may influence success levels of ninth-grade students because the theory works to explain human behavior and how we learn from one another (Bandura, 1989; Luszcynska & Schwarzer, 2013). The Social Cognitive Theory explains how

human beings acquire specific behaviors throughout their lives and how those behaviors are maintained and changed for the better over time as one creates intervention strategies to make a better life based on lessons learned through observing others (Bandura, 1989; Stajkovic & Luthans, 1998) The three key parts of the Social Cognitive Theory are one's environment, personal factors, and the behaviors involved by self and others (Bandura, 1989; Luszcynska & Schwarzer, 2013). It is this lens that was used as a guide throughout this study. In Figure 1, you see the interactive relationship in these three key parts (Personal, Environmental, Behavior) of Bandura's Social Cognitive Theory.

Figure 1.

Representational image of Bandura's Social Cognitive Theory, by Origin Learning, 2015,

http://www.careers.govt.nz/fileadmin/image/rte/model-bandura.png
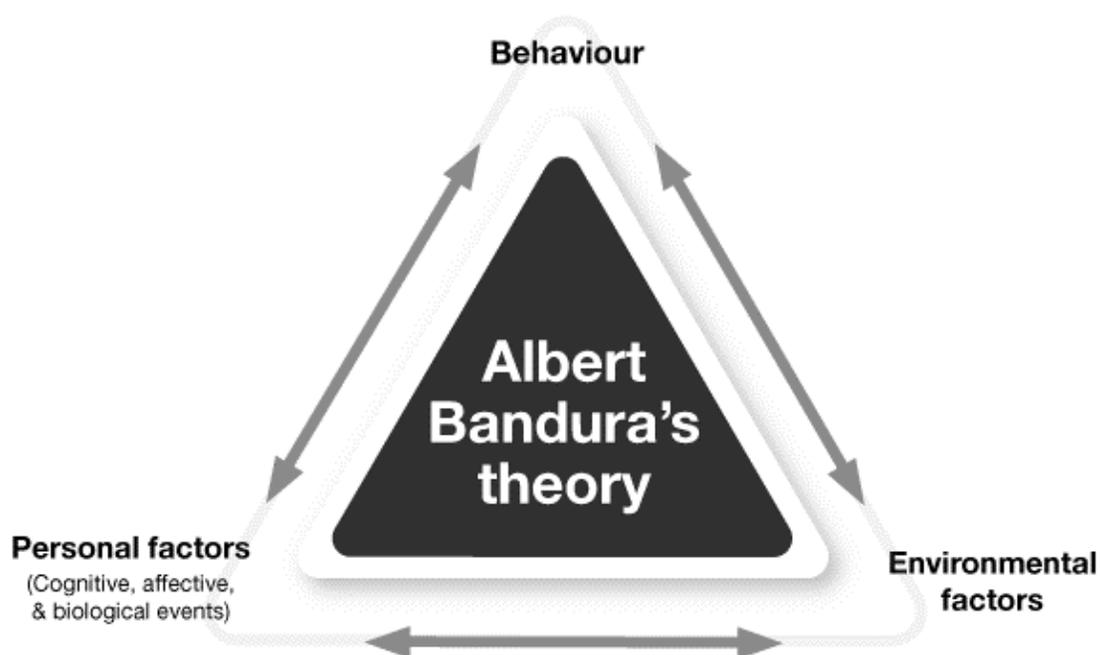
Grit, in part, is about reaching long-term goals. It is also about improvement in life, despite obstacles and roadblocks. Grit has to do with a person's mindset. Dr. Carol Dweck's Mindset Theory works to explain what makes people successful. It looks at how what we believe

makes a difference in our level of success in life. (Dweck, 2008; Wilkins, 2014). Dweck

differentiates between a fixed and a growth mindset in a person. She states that in the fixed

mindset, things are set and very little can change in a person. They are what they are. The

opposite way of thinking is having a growth mindset. A growth mindset is the belief that we are

constantly growing and bettering ourselves throughout our lives. It is the belief that we can and

should learn more and build our skills. Dweck states that our brain is a muscle that can be

developed and improved over time (Dweck, 2008). Our mindset is how we look at the world and

our place in it. It largely impacts who we believe we can become.

This study looks at student achievement and how that may be impacted by the presence

of grit in ninth-grade students. How a student believes in personal abilities and how those

abilities are acquired is critical to each student's overall achievement. This speaks to mindset.

The mindset that a student has in school is going to impact the level of success for that student

(Bassi & Delle Fave, 2011; Dweck, 2008; Yeager et al., 2014). Dweck's Mindset Theory places

a person's mindset into one of two categories: a fixed mindset or growth mindset (Dweck, 2008;

Garofalo, 2016). A student who believes a given characteristic, trait, or ability is fixed, or that it

has no chance of improving, will not find the same level of success when compared to a student

who has a growth mindset (Dweck, 2008; Wilkins, 2014). The student with a growth mindset

believes that the mind has an elasticity quality to it and that the more we work the mind, the

better our learning. A student with a growth mindset believes that through hard work anyone can

achieve at new levels. This way of thinking sees learning as a process and something that people

can get better at over time with effort (Wilkins, 2014). A growth mindset is an approach to life

that includes learning from others, as in Bandura's Social Cognitive Theory (Dweck, 2008;

Kristjansson & Tashijan, 2016). With a focus on how academic success and grit interact,

Dweck's Mindset Theory also appeared to be a proper framework to provide structure to the dissertation with while carrying out this study. In Figure 2, you see the key differences between a Fixed and a Growth Mindset.

Figure 2

Representational image of Dweck's Mindset Theory, by Ummah.com, 2018,

https://www.ummah.com/forum/forum/general/the-lounge/492538-the-growth-mindset

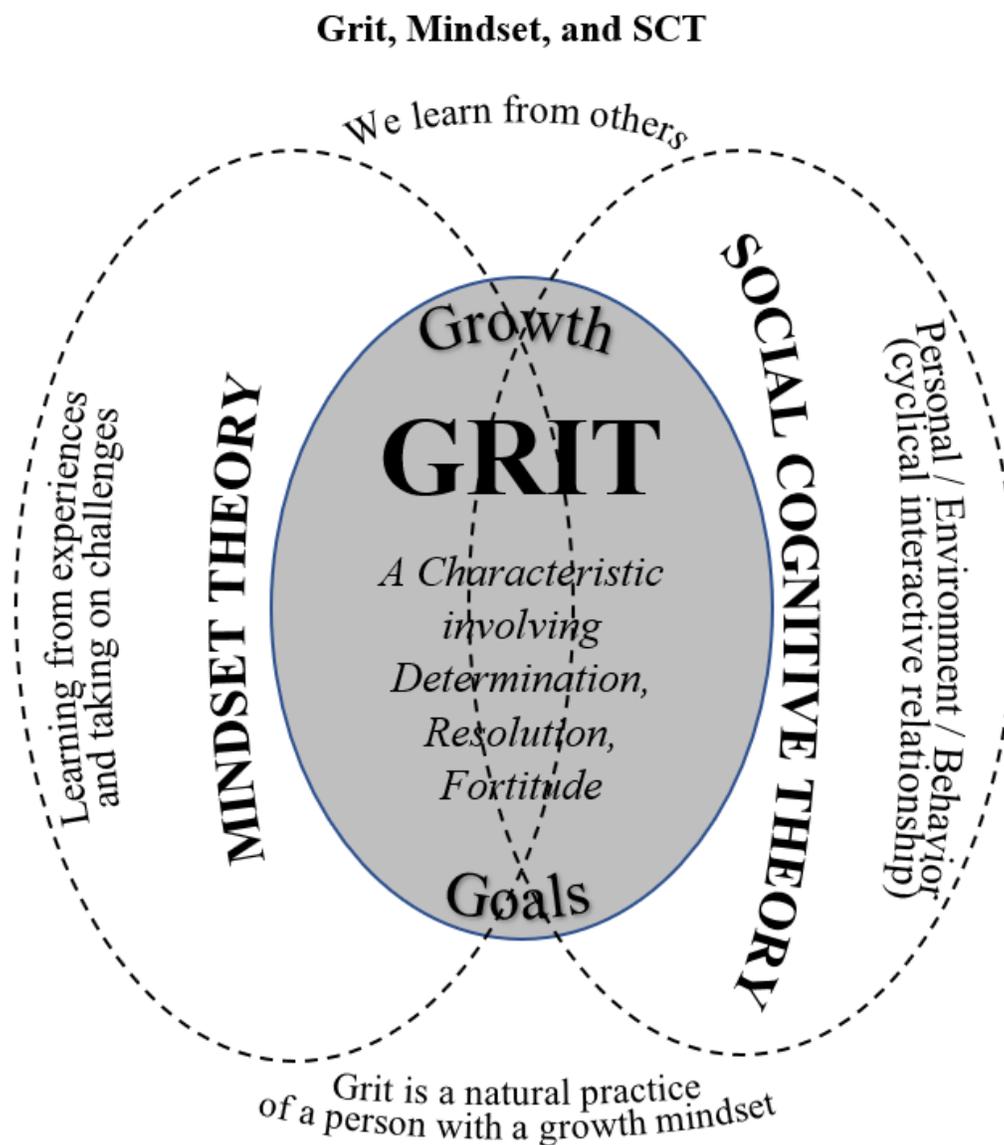| For those with a….	Fixed Mindset	Growth Mindset
Intelligence is…	immutable; given by genetics, chance, or God	mutable and can be developed, improved, and expanded.
Life is…	a test where we have to PROVE ourselves.	a journey where we get to IMPROVE ourselves.
The primary concern is…	managing others' impressions.	exploring one's own curiosity.
Failure…	demonstrates a lack of ability, unworthiness.	presents an opportunity for feedback.
Challenge…	generates fear.	creates excitement, eagerness for learning.
Effort…	shouldn't be needed.	is THE key to improving ourselves.
Others' success…	diminishes, exposes, or shames.	lifts up, offers a chance to learn and grow from greatness.
The end result is…	an early plateau, never reaching one's potential.	ever higher levels of achievement and a greater sense of personal agency.

The purpose of this chapter was to provide the approach that was taken to answer the four guiding research questions. Those included:

- What is the correlation between ninth-grade students' grit level and ninth-grade students' first-semester GPA? Pearson's correlation

- What is the correlation between ninth-grade students' grit level and ninth-grade students' first-semester total absences? Pearson's correlation

- What is the correlation between ninth-grade students' grit level and ninth-grade students' state test scores (ELA, Math, and Science)? Pearson's correlation

- What is the correlation among ninth-grade students' first-semester GPA, ninth-grade students' first-semester total absences, and ninth-grade students' state test scores (ELA, Math, and Science)?

In doing so, the purpose of the study was shared, research design and questions presented, population and sample explained, procedures described to support any replication of this study, analytical methods offered, the role of the researcher clarified, and potential limitations stated. The research methodology was a descriptive approach that worked to not change or significantly interrupt participants from their daily school life. The goal was to discover the correlational relationship between grit scores and academic achievement data in ninth-grade students. The achievement data looked at was SBA ELA test scores, SBA Math test scores, MSP Science test scores, GPA, and total absences, and grit was identified using the 12-point Grit Scale. Students from six junior-high schools participated in the study. The time and effort put into this study was with the hope of a better understanding how ninth-grade students function and how the presence of grit may possibly support them at this point in their lives. Another goal was to also give additional, and hopefully helpful, information to the professional educators who are working with these students. In Figure 3, the researcher to represents the connections between the idea of grit and the two frameworks used to guide this research.

Figure 3

Representational image of the connection between grit and both the Mindset Theory and the

Social Cognitive Theory, which were used as frameworks for this study.

Grit, Mindset, and SCT

We learn from others

Growth

GRIT

A Characteristic involving Determination, Resolution, Fortitude

Goals

MINDSET THEORY

SOCIAL COGNITIVE THEORY

Learning from experiences and taking on challenges

Personal / Environment / Behavior (cyclical interactive relationship)

Grit is a natural practice of a person with a growth mindset

Chapter IV

Data Analysis and Research Findings

Introduction

Graduation rates in the United States are an ongoing concern as there are still far too many students dropping out of high-school (Burrus & Roberts, 2012; Stark et al. 2015; Swanson, 2010). Statistics illustrate that the current graduation rate in the U.S. is still only at 80.9% (National Center for Education Statistics, 2017), meaning that about one in five high-school students do not graduate with their peer cohort. When looked at another way, that means nearly one million students drop out from high-school every year, equating to over 5,600 students dropping out daily (National Center for Education Statistics, 2017). Solutions are being sought and interventions implemented. A key year in making a positive difference in drop out statistics is the ninth-grade year, the beginning of high-school (Bowers et al., 2013; Burrus & Roberts, 2012; McWilliams, 2014; Ruzik, 2012). Looking at supporting students through the strengthening of non-cognitive characteristics is showing to be a positive path. The presence of non-cognitive characteristics, such as grit, have been identified as being strong predictors of success (Duckworth et al., 2007; Hansen; 2016; McCain, 2017).

The purpose of this survey research, which used quantitative data, was to first determine the level of grit in each participant by using a tool, created by Duckworth and her team, called the Grit Scale (Duckworth et al., 2007) and then to determine if those grit levels correlated with specific academic data from ninth-grade students. The academic data used included each student's SBA ELA score, SBA Math score, MSP Science score, first-semester GPA, and first-semester Total Absences. Participants in this study completed a 12-question survey which

produced a grit score and the researcher worked with the study district to gather the academic data. SBA ELA, SBA Math, and MSP Science scores were collected in the fall and the GPA and Total Absences data was collected once the first-semester of the participants' ninth-grade year was completed in the winter.

The following four research questions were examined:

- What is the correlation between ninth-grade students' grit level and ninth-grade students' first-semester GPA?

- What is the correlation between ninth-grade students' grit level and ninth-grade students' first-semester total absences?

- What is the correlation between ninth-grade students' grit level and ninth-grade students' state test scores (ELA, Math, and Science)?

- What is the correlation among ninth-grade students' first-semester GPA, ninth-grade students' first-semester total absences, and ninth-grade students' state test scores (ELA, Math, and Science)?

Statistical Approach

To assess whether the five academic sets of data were correlated with the students' grit level, several types of analyses were conducted. First, grit level was compared to each individual academic data set with a Pearson's correlation statistical test. The Pearson's correlation test is used to determine the strength of a linear association. With grit scores serving as the independent variable and the other academic data sets serving as the dependent variables, all of which were continuous variables, the Pearson's correlation test was used to first compare each of the

academic data sets to grit scores to determine levels of association. Then, the Pearson's

correlation test was used to see how all academic data sets were related to one another. Students'

Math test scores were compared to their GPA, then Math test scores were compared to Total

Absences, and so on, until all academic data sets had been compared to one another. Finally, the

researcher wanted to be able to share individual data with each school leader involved in the

study, so specific school data was explored as well, using the Pearson's correlation test with

school specific data. All data analysis was completed using the IBM SPSS Statistics 24 computer

programs with support from the Laerd Statistics online program. This chapter shares the data and

test results and the chapter that follows includes the researcher's discussion regarding what the

results mean and what educational implications could be taken from this study. When using the

Pearson correlation test and sharing related results, the following representative values were

used: r = Pearson Correlation, n = Sample Size, p = Statistical Criteria. The representation of r is

noted at either a small, moderate, or strong level of association based on the chart below (Table

1), according to Laerd Statistics (Lund & Lund, 2017). The representation of n was the same

throughout all the variables, being that the researcher had 283 complete data sets for all of the

participants. The level of statistical significance, p-value, shows whether there is a statistical

significant relationship between the two variables, or not, using $p < 0.01$ or $p < 0.05$, as

described by the note (*) after each related table. This means if the p-value is less than or equal

to the significance level (0.01 or 0.05), then a conclusion is made that the correlation is

significant.

Table 1

Pearson correlation strength of association guidelines

	Coefficient, r	
Strength of Association	Positive	Negative
Small	.1 to .3	-0.1 to -0.3
Medium/Moderate	.3 to .5	-0.3 to -0.5
Large/Strong	.5 to 1.0	-0.5 to -1.0

Demographics

For this study, the researcher included participants from six junior-high schools, as the school district uses a 7th-9th grade junior-high and 10th-12th grade high-school configuration. The ninth-grade populations of these schools ranged from 125 in the smallest school to 278 in the largest school. The researcher went to each school and had each available ninth-grade student take a pen/paper survey, with permission in advance from the district superintendent designee and each school's principal. A hardcopy of the consent form was given to each student by the researcher to take home and have signed and returned. Of the 1,047 students who took the survey, a total of 314 returned consent forms, for a return of 30%. Of that total, 21 consent forms were returned that denied consent, an additional 6 returned and approved consent forms could not be directly tied to a student survey because of the inability to decipher a student name and/or because a survey could not be found, and 4 students had missing assessment data and were not included in the study. This missing data was most likely due to those four students not being enrolled in one of the six schools used in the study during the time of testing (SBA ELA, SBA Math, and/or MSP Science) or they did not take the test for some reason. This left 283 students to be included in the study, or 27% of those who initially took the survey, so $n = 283$. The 283

freshmen in the study are categorized by the following demographics: 46% male and 54% female, with 7% from School A, 5% from School B, 12% from School C, 49% from School D, 9% from School E, and 18% from School F.

Factor Analysis

For clarity, the researcher used the following methods when working to identify correlations between data sets:

Grit Scores: Duckworth (2007) breaks the grit scale scores into five categories when using the Grit Scale survey. Each question has a possible score of 1-5 on a Likert scale. A final score is based on the total scored by adding the points of all twelve questions and dividing by twelve. The maximum score on this scale is 5 (extremely gritty) and the lowest score on this scale is 1 (not at all gritty), with score possibilities lying in-between those numbers. For this study, final scores were rounded to the nearest hundredth and those scores were inputted into the IBM SPSS Statistics 24 program, leading to a larger number of score possibilities.

Grade Point Averages (First-semester GPA): The GPA for each student was compiled after the first-semester of the ninth-grade year was completed, which came at the end of January. A traditional A, B, C, D, F scale was used in the district and GPAs were also calculated by traditional methods with an A being a 4.0, B being a 3.0, and so on, with pluses and minuses falling in-between those scores. For this study, the researcher used the raw GPA score for each participant.

Total Absences (First-semester): The total number of absences for each student was compiled after the first-semester of their ninth-grade year was completed, which came at the end

of January. Full-day absences were included and represented in the data. A whole number was used in this data set for each participant to show the number of absences in first-semester.

SBA ELA Scores: In Washington State, the Smarter Balanced Assessment, known as the SBA, is an annual assessment of student academic performance in ELA and Mathematics at various grade levels. Students do not take such assessments in the ninth-grade year, so data from the spring of their eighth-grade year was used for this study. In the ELA area, the following cut scores are used to determine a student's proficiency level in eighth-grade: Level 1 (Below Standard) 2097-2486, Level 2 (At/Near Standard) 2487-2566, Level 3 (At/Near Standard) 2567-2667, and Level 4 (Above Standard) 2668-3032. This test is taken in a window of time that typically runs from March through May. The district used in this study had 61.3% of eighth-grade students meeting or exceeding standard (Levels 3 or 4) on the SBA ELA assessment. It should be noted that the tool used for the state assessment changed the year prior.

SBA Math Scores: In Washington State, the Smarter Balanced Assessment, known as the SBA, is an annual assessment of student academic performance in ELA and Mathematics at various grade levels. Students do not take such assessments in the ninth-grade year, so data from the spring of their eighth-grade year was used for this study. In the Math area, the following cut scores are used to determine a student's proficiency level in eighth-grade: Level 1 (Below Standard) 2113-2503, Level 2 (At/Near Standard) 2504-2585, Level 3 (At/Near Standard) 2586-2652, and Level 4 (Above Standard) 2653-2993. This test is taken in a window of time that typically runs from March through May. The district used in this study had 48.0% of eighth-grade students meeting or exceeding standard (Levels 3 or 4) on the SBA Math assessment. It should be noted the tool used for the state assessment changed the year prior.

MSP Science Scores: In Washington State, the Measurements of Student Progress,

known as the MSP, is an annual assessment of academic achievement in Science at the fifth and

eighth-grade levels, then a related End-of-Course Exit Exam is used at or after the tenth-grade to

be used as one of many high-school graduation requirements. The earlier MSP tests are only

indicators and predictors of the End-of-Course Exit Exam, and therefore are not actually tied to

graduation requirements. In the Science area, the following cut scores are used to determine a

student's proficiency level in eighth-grade: Level 1 (Below Standard) 250-374, Level 2 (At/Near

Standard) 375-399, Level 3 (At/Near Standard) 400-430, and Level 4 (Above Standard) 431-550.

This test is taken in a window that typically runs from mid-May to early-June. The district used

in this study had 73.3% of eighth-grade students meeting or exceeding standard (Levels 3 or 4)

on the MSP Science assessment. This was the last year for this tool and eighth-grade students in

the current school year will take a new Science test based on standards within the Next

Generation Science Standards (NGSS).

The Descriptive Statistics of each variable are shown below (Table 2), including the total

number of participants (*n*), minimum and maximum number within each variable's scoring

options, mean, and the standard deviation.

Table 2

Descriptive Statistics of each of the six variables in this study

Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation
Grit Score	1.92	4.83	3.4316	.55251
GPA	93	4.00	3.3867	.64306
Total Absences	.00	18.00	4.48	4.117
SBA ELA	2361	2809	2606.85	84.049
SBA Math	2319	2926	2607.72	102.968
MSP Science	340	2553	421.21	129.098

[a] n = 283

Assumptions

The researcher chose to use the Pearson correlation coefficient test to compute the association between the variables in this study. The Pearson correlation coefficient test is a measure of both the strength and the direction of any association between the variables measured. After running a test, the Pearson correlation coefficient is produced and denoted as *r* in the results below. The intent of this test is to draw a line of best fit through the data of the two variables measured that demonstrates the association, with *r* representing how far away these data points stand to this line of best fit. However, to properly use the Pearson correlation coefficient, Laerd Statistics (Lund & Lund, 2017) recommends that four assumptions are met to be sure the right test is being used. Those assumptions are:

Assumption #1: The two variables involved in the Pearson correlation should be measured at the continuous level. All variables involved in this study are continuous variables

because each can be measured along a continuum and each has a numerical value, so this assumption was met.

Assumption #2: There needs to be a linear relationship between the two variables used when running the Pearson correlation test. The results showed a linear relationship between the two variables tested via the scatter plots shown, so this assumption was also met.

Assumption #3: When running a Pearson correlation, there should be no significant outliers**.** After exploring the data within descriptive statistics, via histograms and boxplots, there were no significant outliers in these tests (no extreme score depicted by a star/asterisk), except for the five cases mentioned here, so this assumption was met after the outliers were remedied. When dealing with the five outliers within Total Absences (cases 145, 150, 170, 221, & 248), the researcher used the Winsoring method. This method changes the value of the outliers but keeps the changed values within the data set. The method replaces the original value of those cases by the nearest value of an observation that is not seriously suspect, plus adds one to recognize the higher original value. In other words, it changes the outlier to the nearest value, plus one, that is not reported as an outlier in the boxplot. By using this Winsoring method, the researcher addressed the five outliers that had shown up in the data via the boxplot (Figure 11).

Assumption #4: When running a Pearson correlation, variables should be approximately normally distributed. The researcher ran a Shapiro-Wilk test for normality to check whether the variables being tested were approximately normally distributed, so this assumption was also met in GPA and MSP Science. Further analysis was needed on the other variables. With SBA ELA and SBA Math results, the assumption of normality was violated because the "Sig." values were less than .05, .001 and .021 respectively. SBA ELA and SBA Math scores were approximately distributed, as assessed by visual inspection of their histograms and their Normal Q-Q Plots,

which are shared below. Grit and Total Absences also had "Sig." values less than .05, both at

.000, so these variables were similarly assessed by visual inspection of their histograms and their

Normal Q-Q Plots and determined to be approximately distributed. The Grit and Total Absences

Normal Q-Q plots are also shared.

Below are the histograms, normal Q-Q plots, boxplots, and tables showing Skewness to

verify the assumptions above and to address the additional data analysis used for any

assumptions that were not initially met. The uniqueness of GPA data is addressed through a

histogram with a bell-shaped curve (Figure 8) as well as the skewness of the GPA data (Table 4).

GPA is skewed left and is negatively skewed. Skewness is statistically significant as it is greater

than 1.96 when comparing the z-value of -9.420 (dividing skewness by Std. Error). The Total

Absences outliers are shown in a boxplot (Figure 11) and the impact of using the Winsoring

method is shown in a second boxplot (Figure 12). This new Total Absences data is shown in a

bell-shaped curve on a histogram (Figure 13) and the Total Absences skewness of that new curve

is also presented (Table 5). Total Absences is skewed right and is positively skewed. Skewness is

statistically significant as it is greater than 1.96 when comparing the z-value of 7.786 (dividing

skewness by Std. Error).

Table 3

Shapiro-Wilk Tests for Normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Grit Score	.056	283	.034	.993	283	.000
GPA	.170	283	.000	.850	283	.254
Total Absences	.155	283	.000	.885	283	.000
SBA ELA	.072	283	.001	.982	283	.001
SBA Math	.047	283	.200[*]	.988	283	.021
MSP Science	.060	283	.014	.992	283	.133

*. This is a lower bound of the true significance.
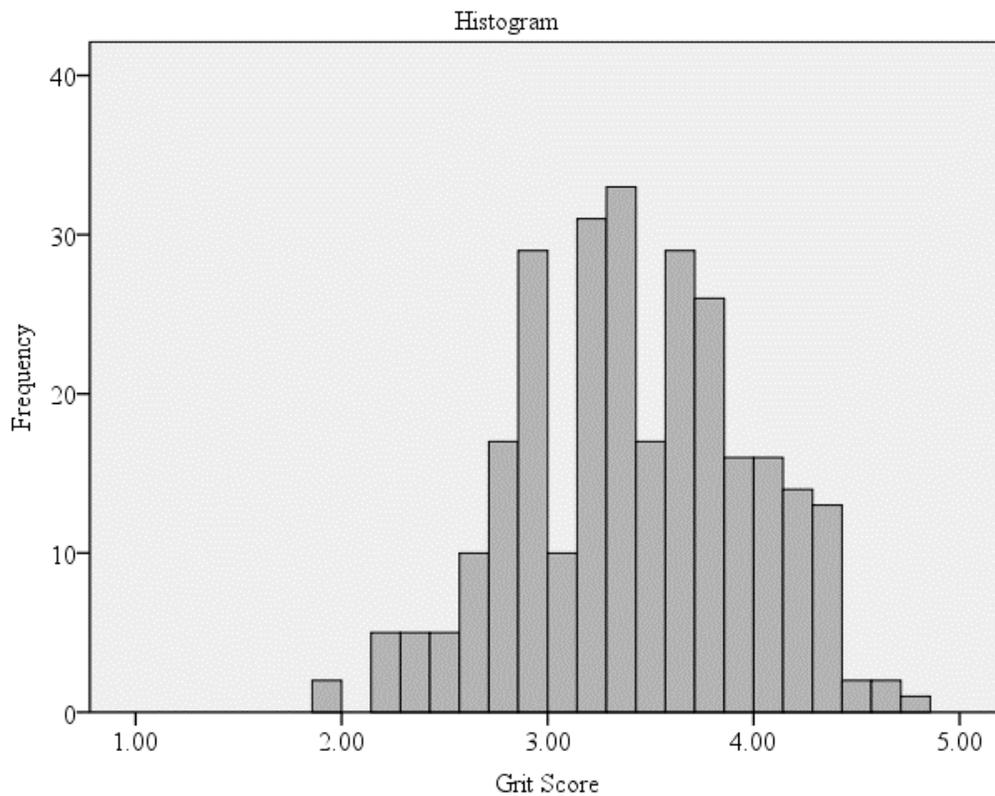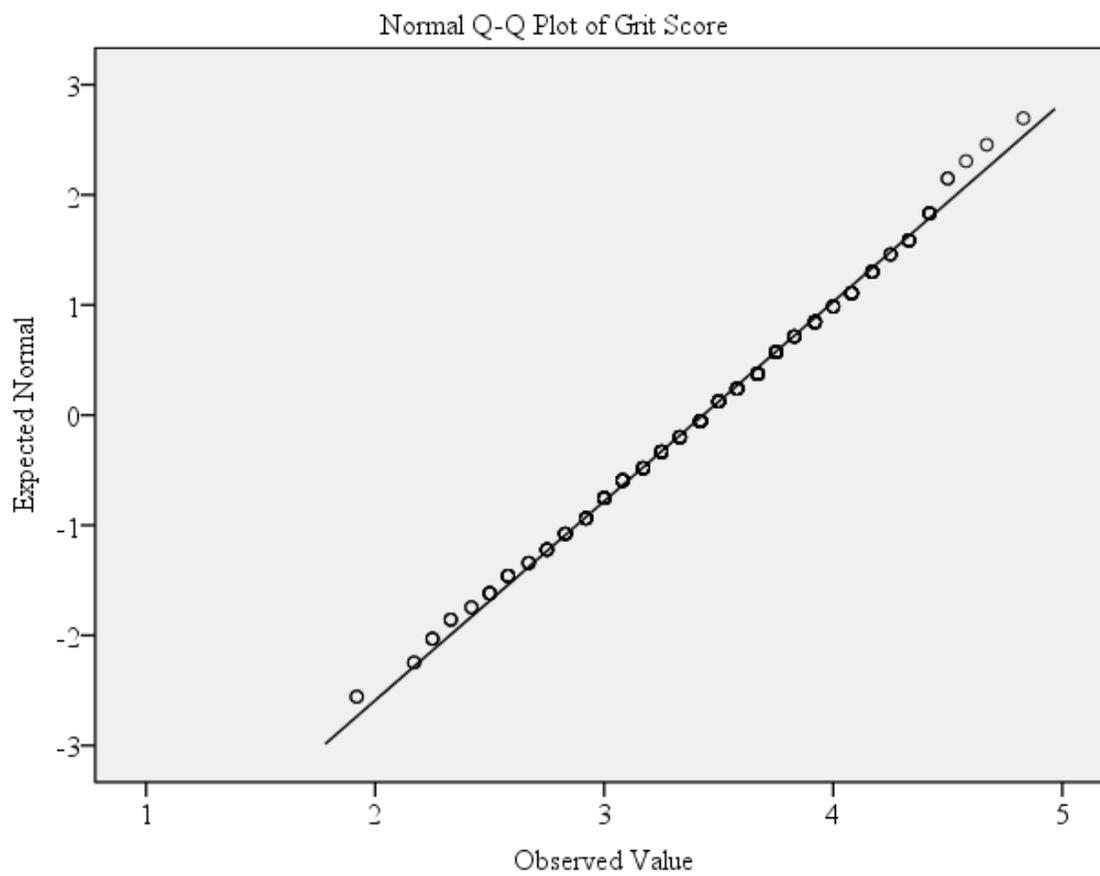
Figure 4

Histogram of Grit Score
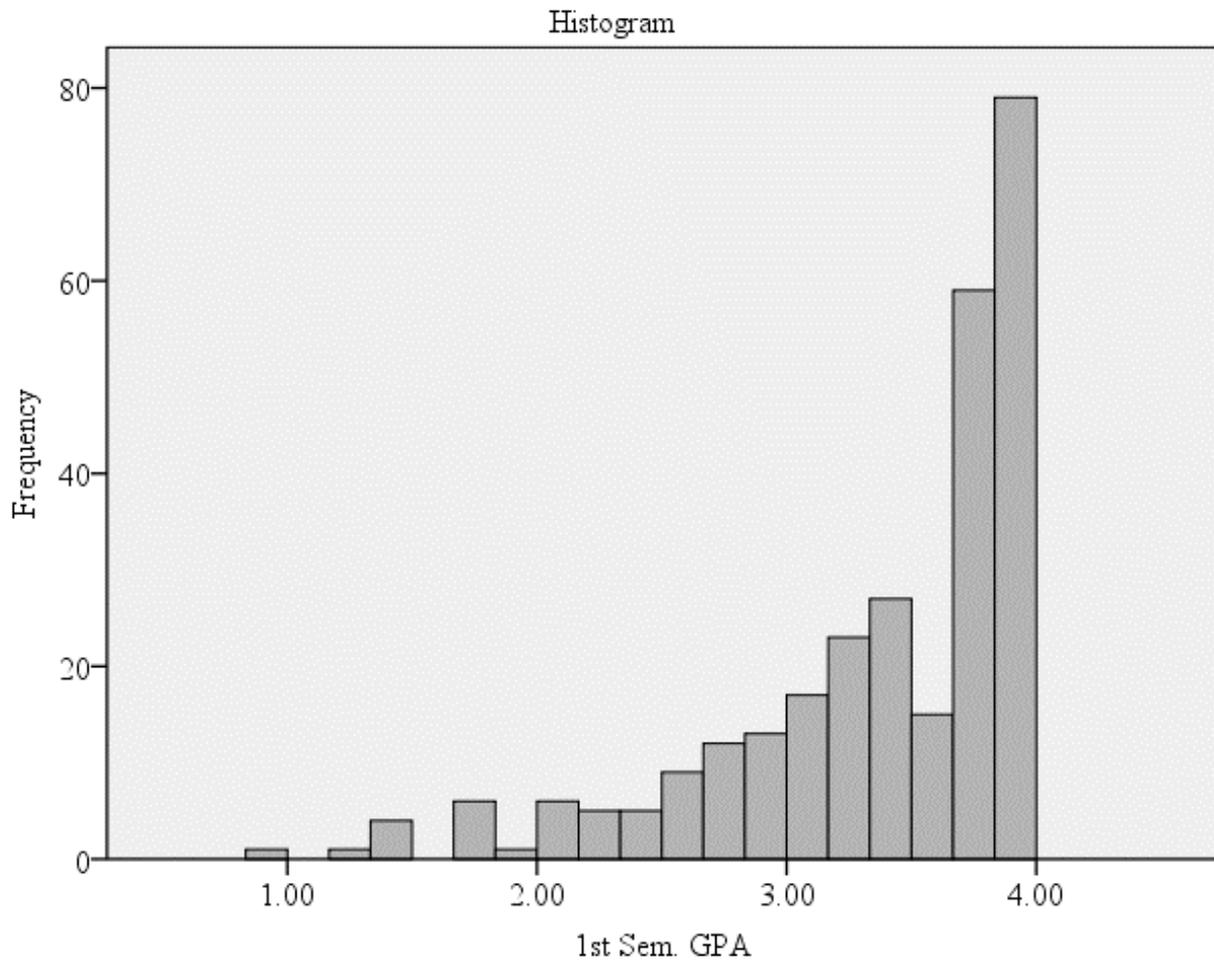
Figure 5

Normal Q-Q Plot of Grit Score

Figure 6

Histogram of First-Semester GPA

Figure 7

Normal Q-Q Plot of First-Semester GPA

Normal Q-Q Plot of 1st Sem. GPA
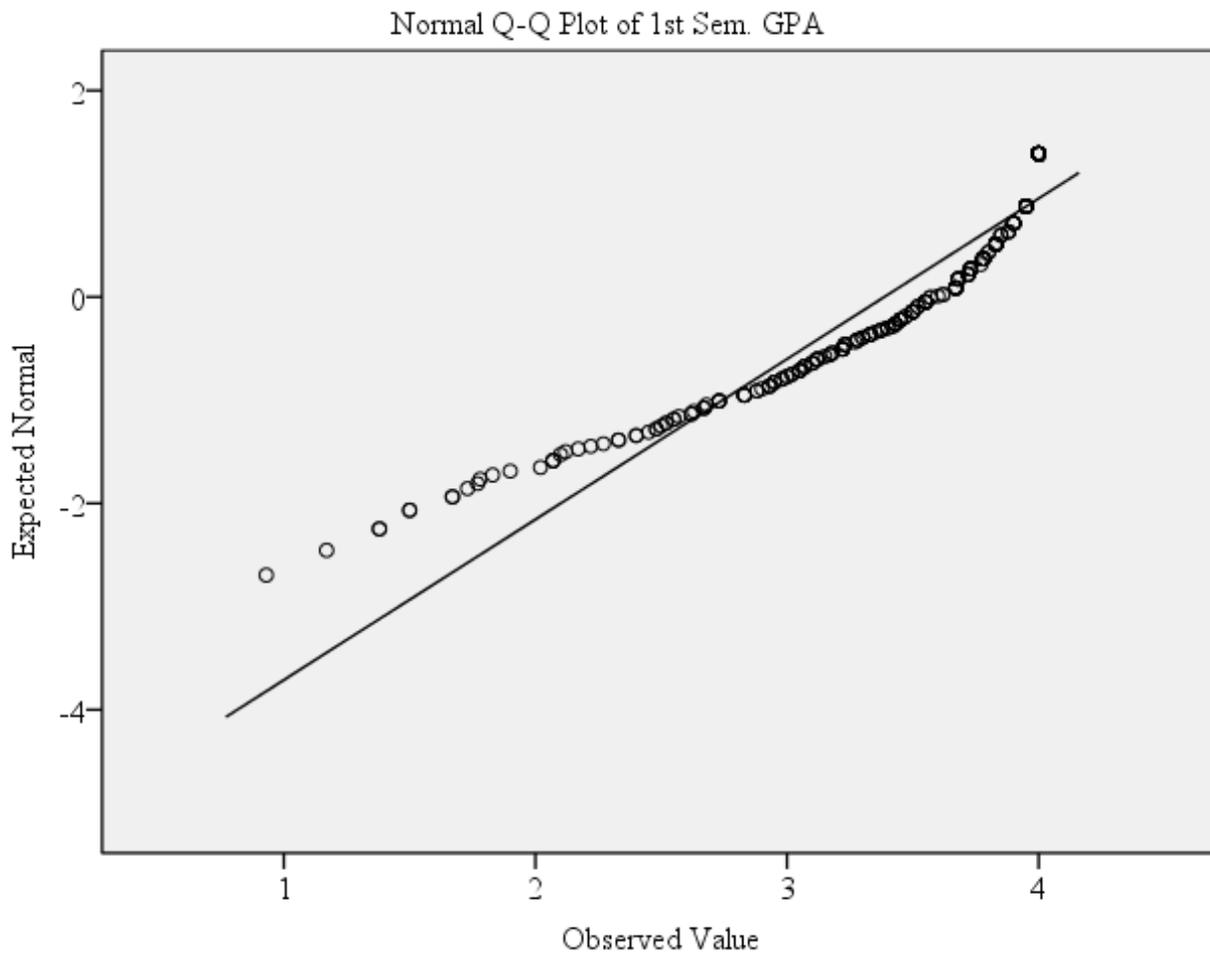
Figure 8

Histogram with Bell-Shaped Curve of GPA
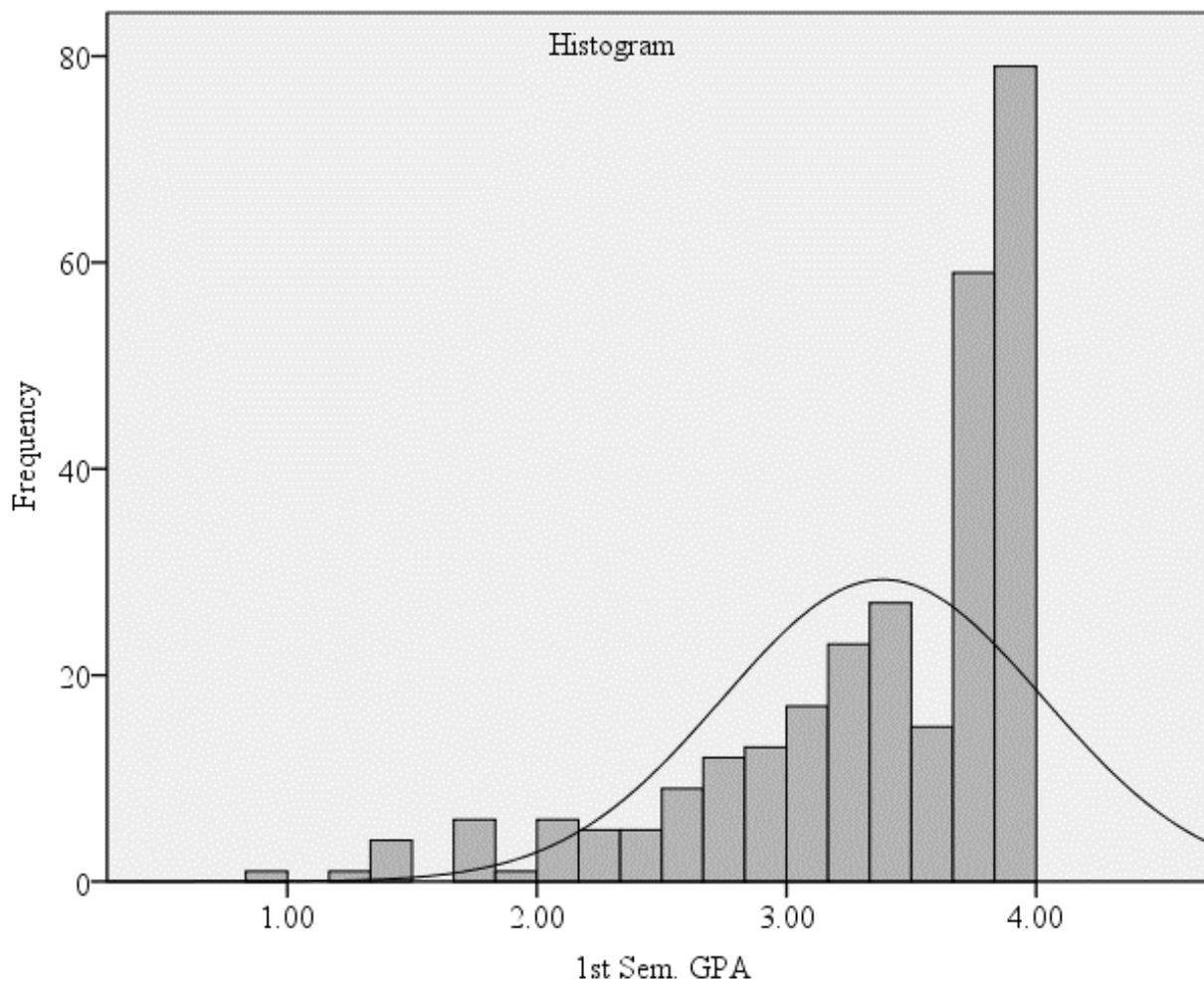
Table 4

Skewness of First-Semester GPA

1st Sem. GPA

N	Valid	283
	Missing	0
Skewness		-1.366
Std. Error of Skewness		.145

Figure 9

Histogram of First-Semester Total Absences
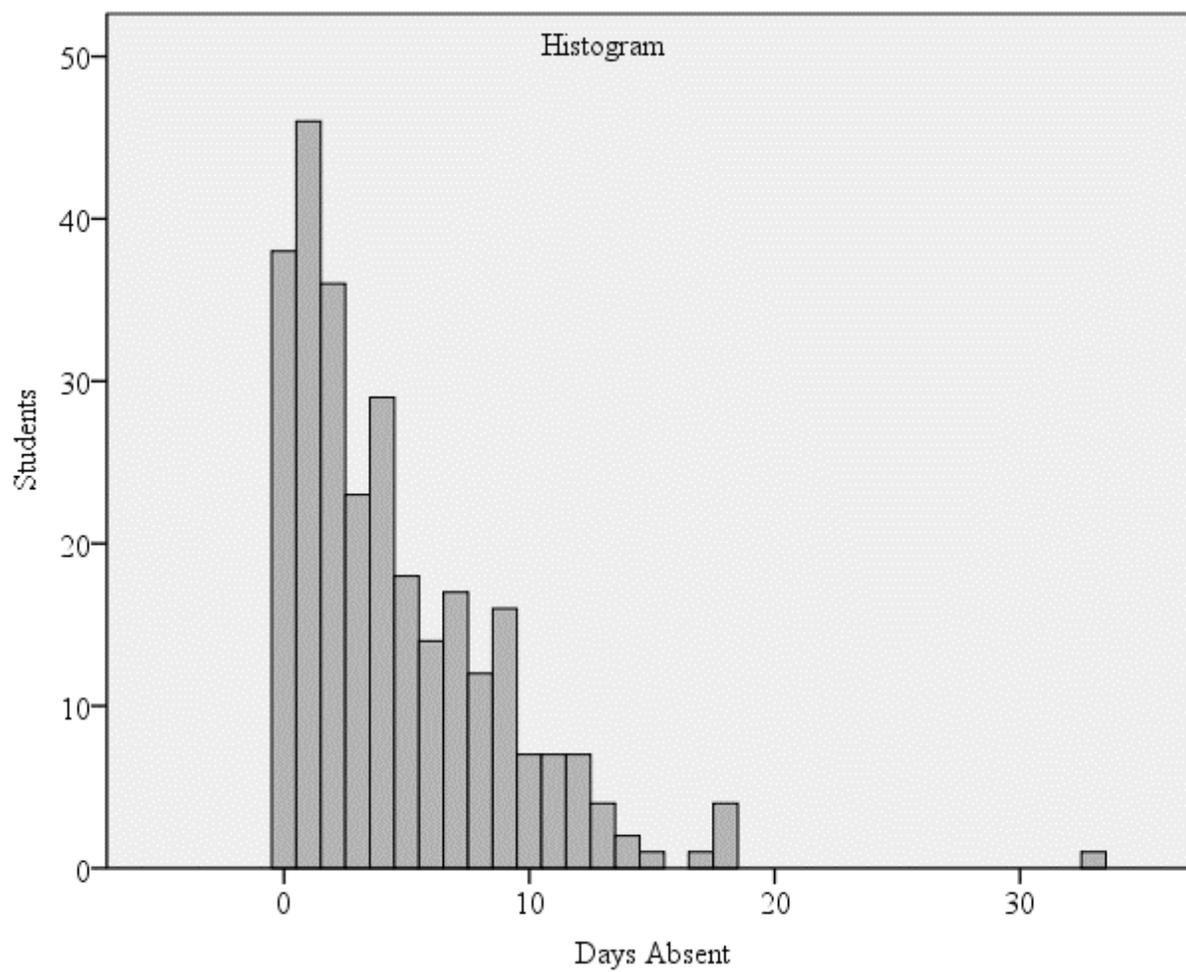
Figure 10

Normal Q-Q Plot of First-Semester Total Absences

Normal Q-Q Plot of 1st Sem. Total Absences
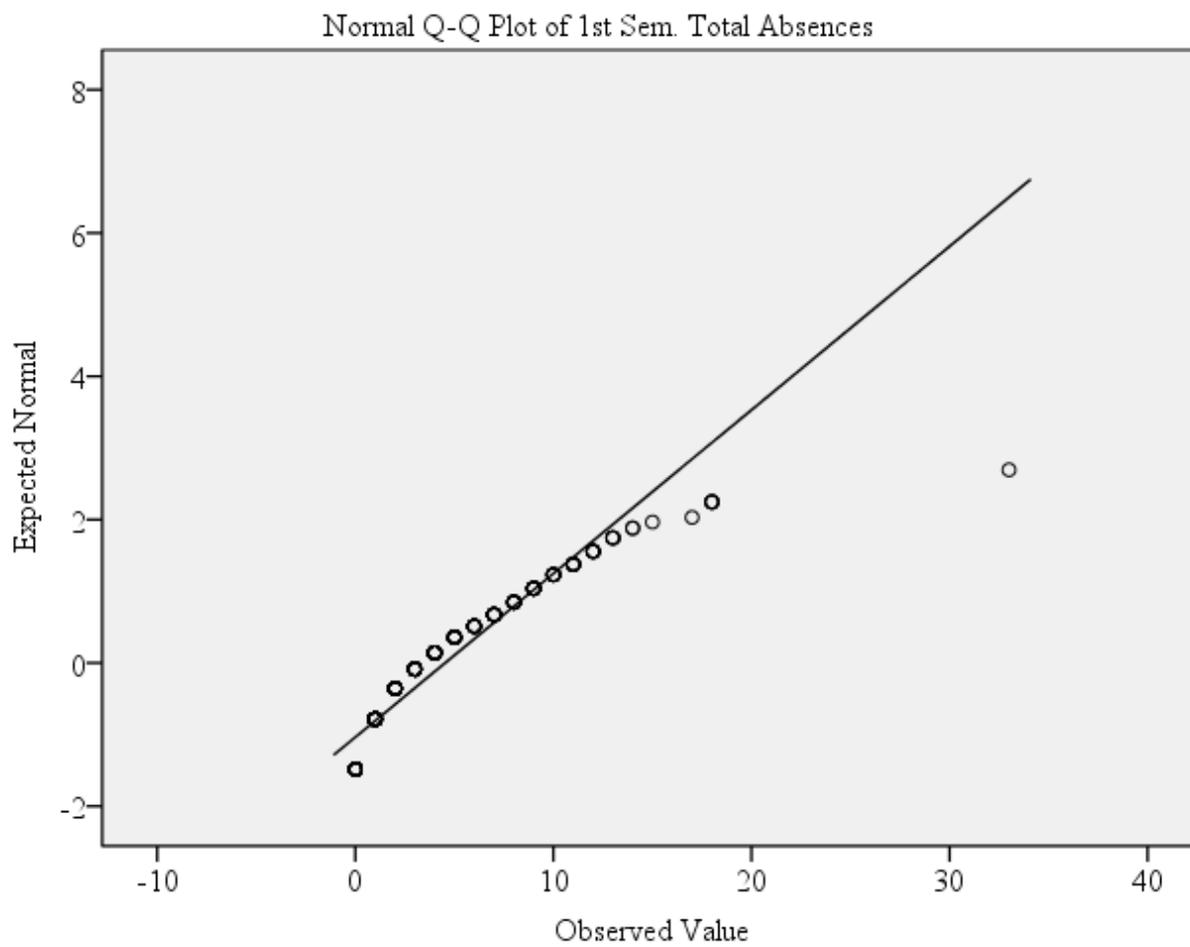
Figure 11

Boxplot of First-Semester Total Absences Showing Outliers
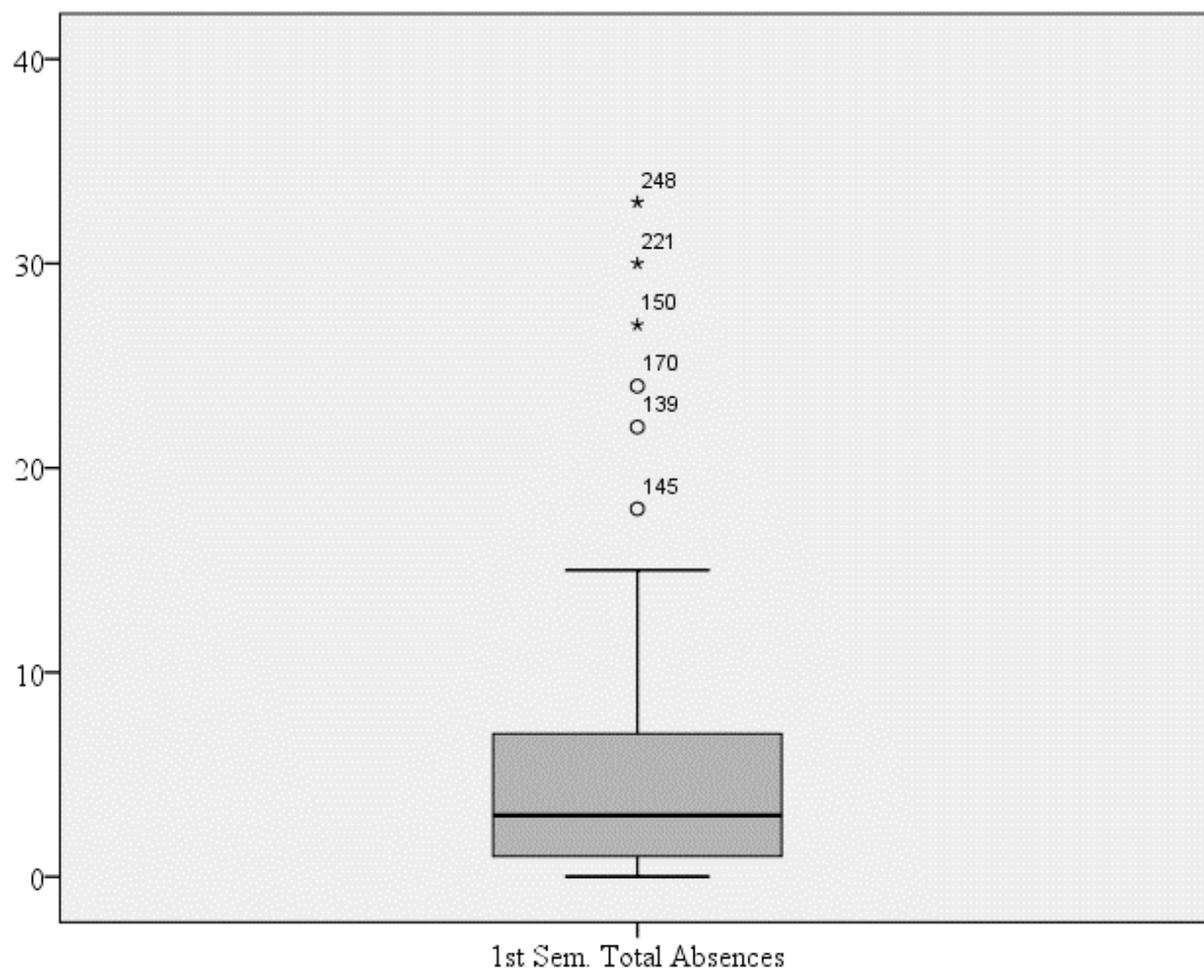
Figure 12

Boxplot of First-Semester Total Absences after Winsoring Method applied
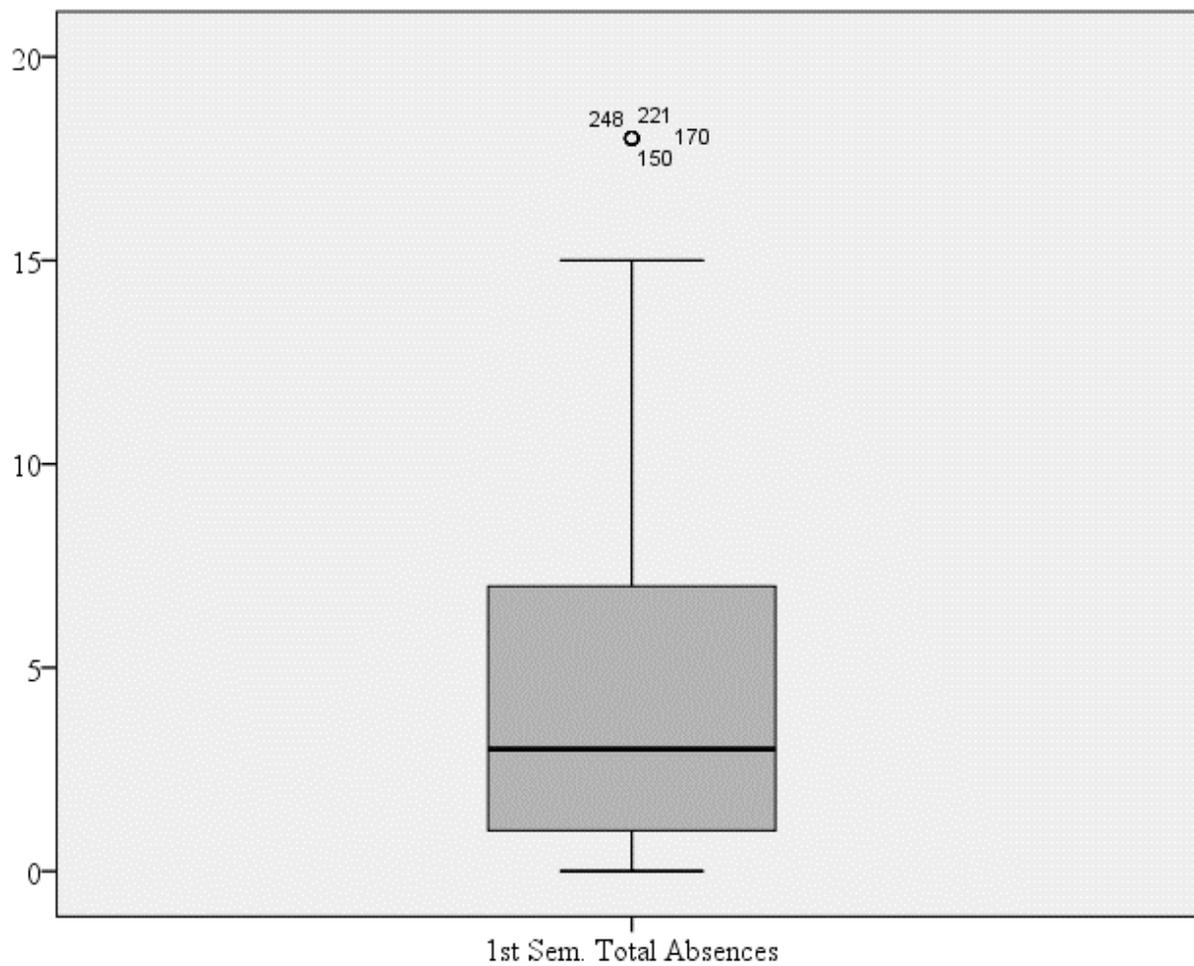
Figure 13

Histogram with Bell-Shaped Curve of Total Absences
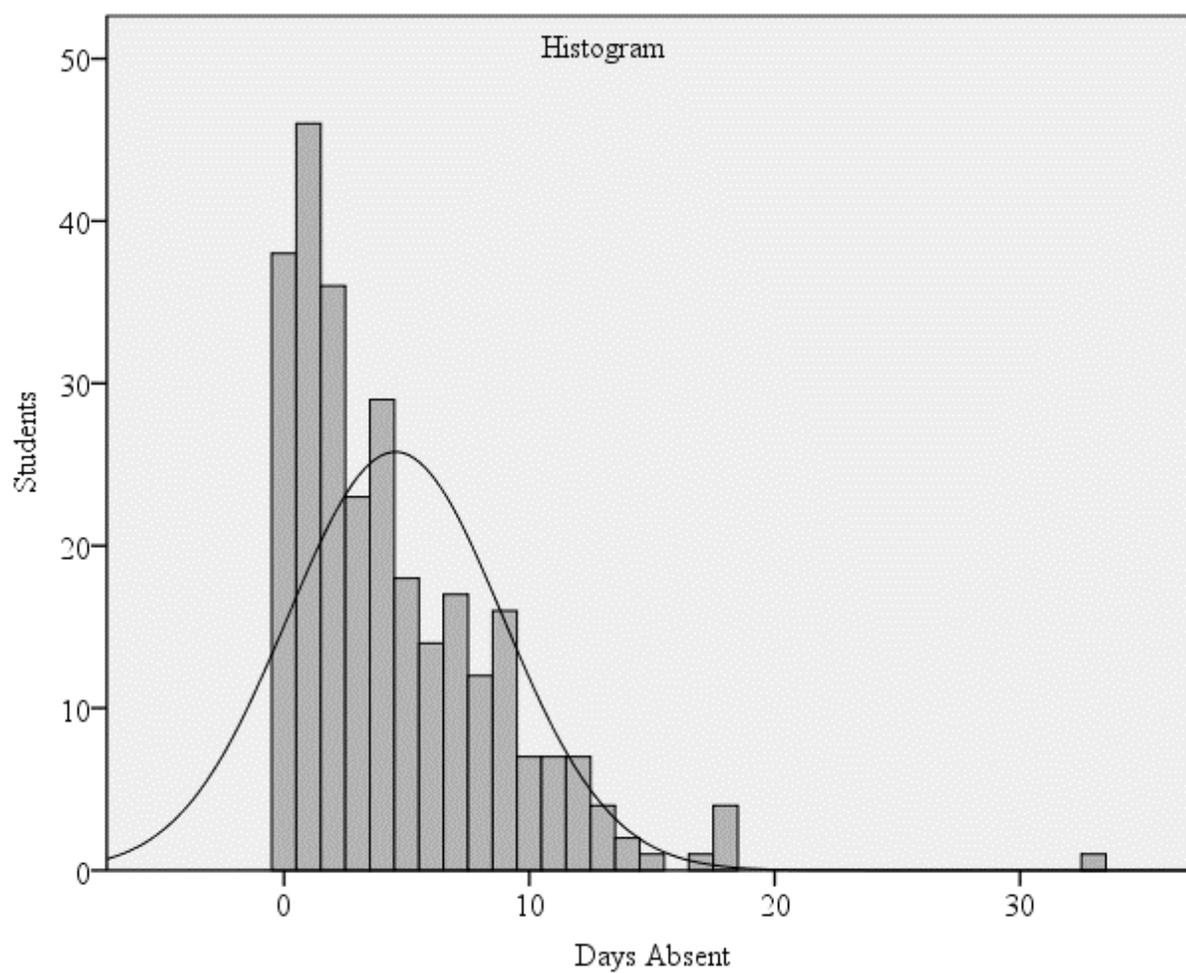
Table 5

Skewness of First-Semester Total Absences

Statistics

1st Sem. Total Absences

N	Valid	283
	Missing	0
Skewness		1.129
Std. Error of Skewness		.145

Figure 14

Histogram of SBA ELA
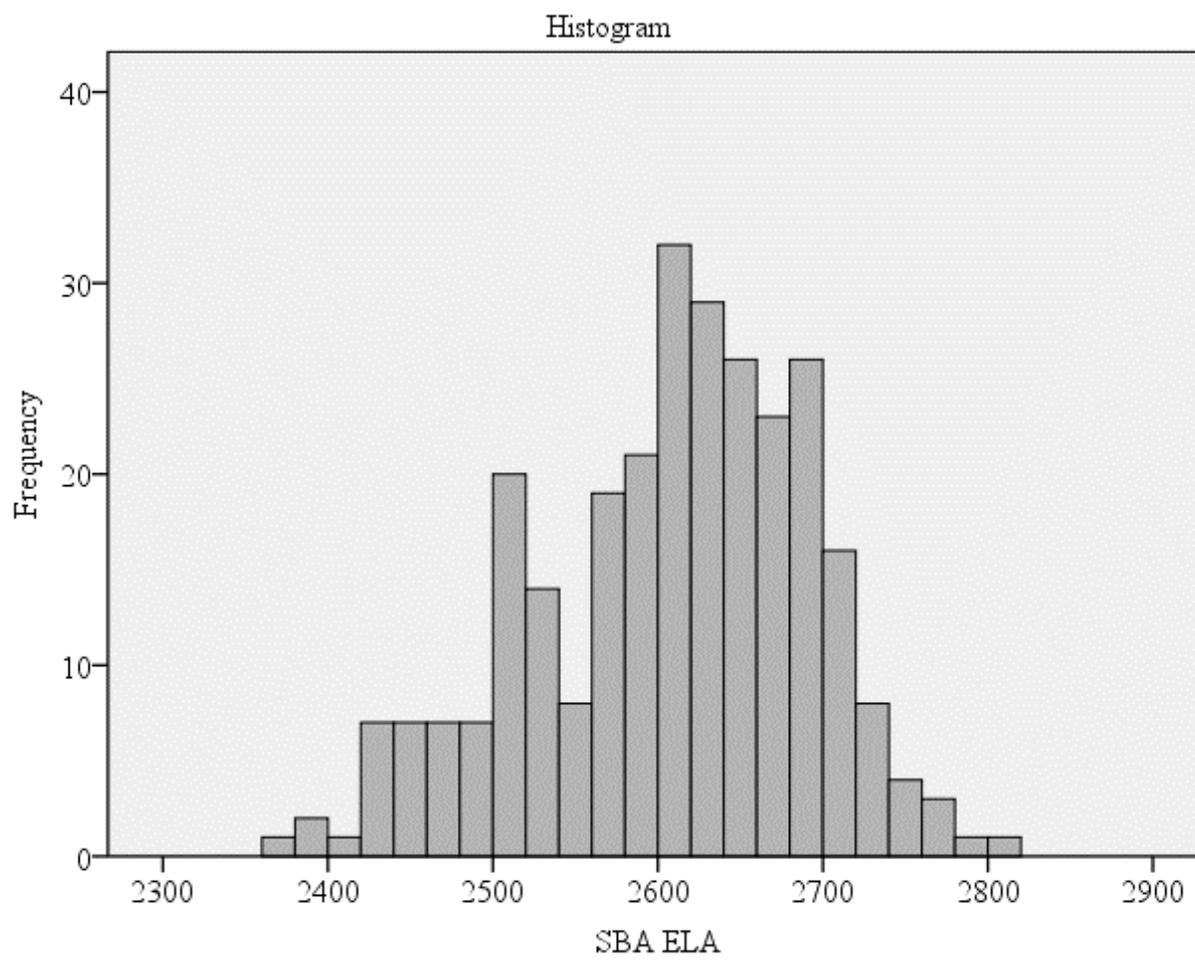
Figure 15

Normal Q-Q Plot of SBA ELA
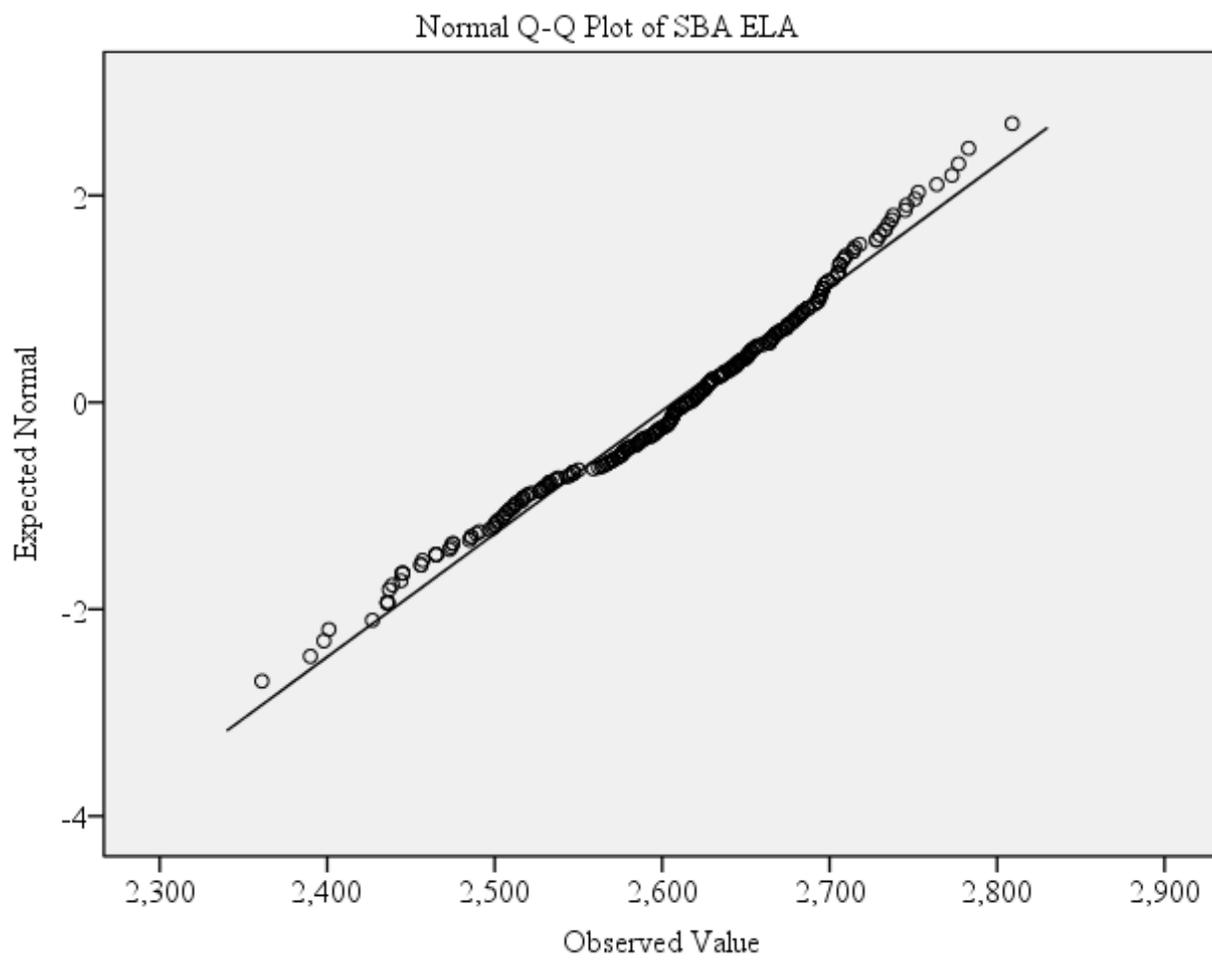
Figure 16

Histogram of SBA Math
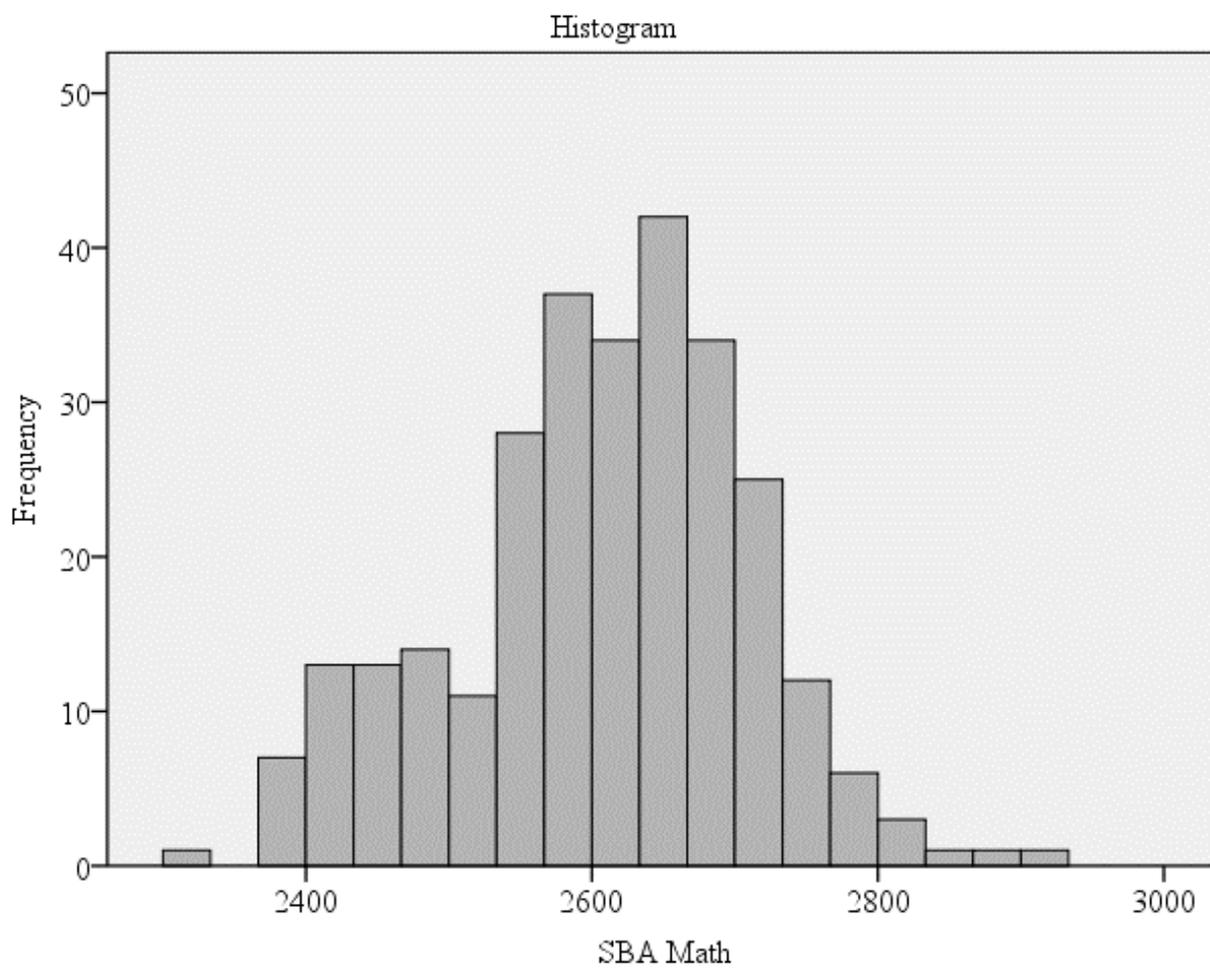
Figure 17

Normal Q-Q Plot of SBA Math

Normal Q-Q Plot of SBA Math
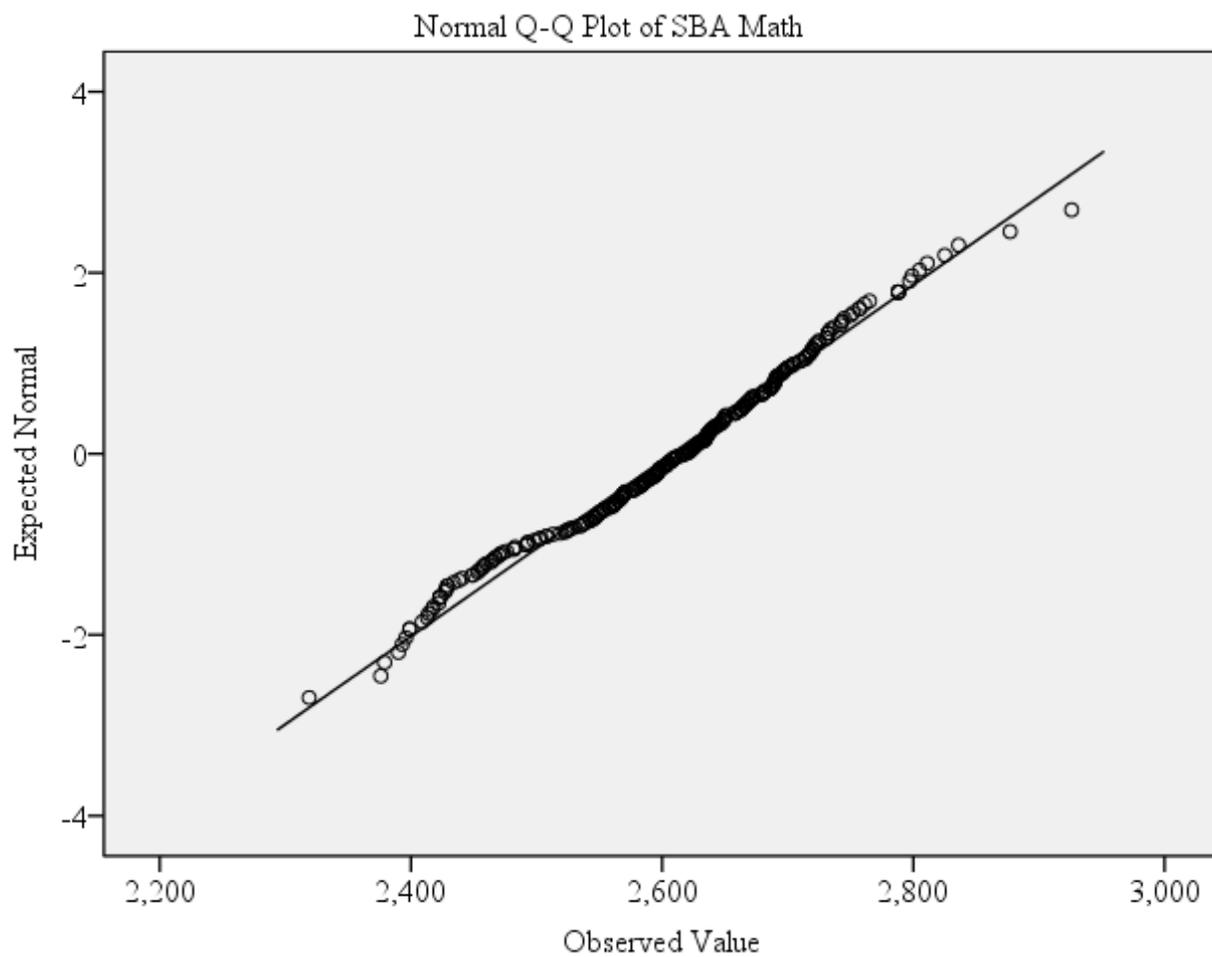
Figure 18

Histogram of MSP Science
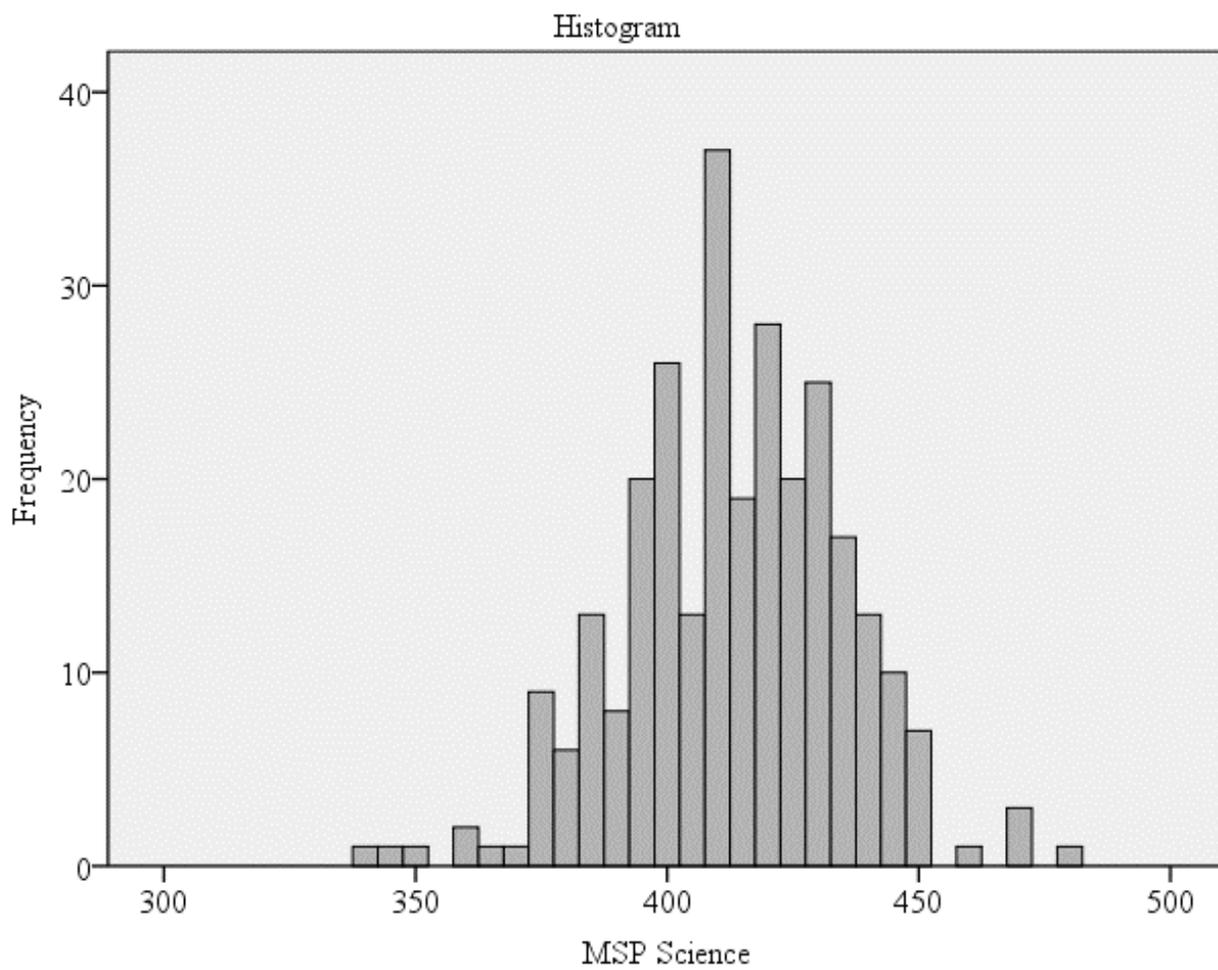
Figure 19

Normal Q-Q Plot of MSP Science

Normal Q-Q Plot of MSP Science
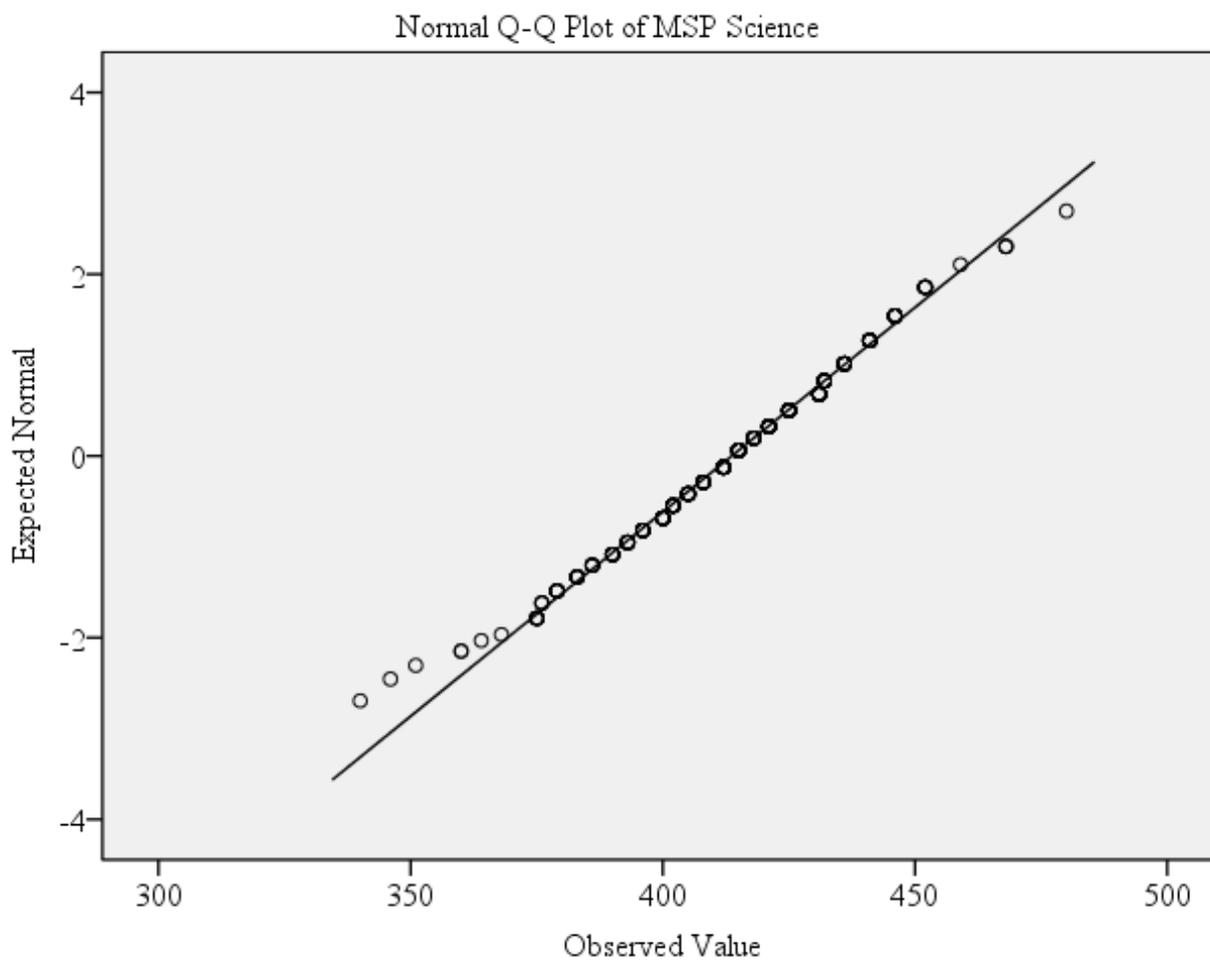
Quantitative Results of Study

As a reminder, in the results below the representation of *r* is noted at either a small,

moderate, or strong level of association based on the chart below (Table 1), according to Laerd

Statistics (Lund & Lund, 2017).

Table 1

Pearson correlation strength of association guidelines

	Coefficient, *r*	
Strength of Association	Positive	Negative
Small	.1 to .3	-0.1 to -0.3
Medium/Moderate	.3 to .5	-0.3 to -0.5
Large/Strong	.5 to 1.0	-0.5 to -1.0

Findings for Research Question 1 - *What is the correlation between ninth-grade students' grit level and ninth-grade students' first-semester GPA?*

Grit and GPA: A Pearson correlation coefficient was computed to assess the relationship between the level of grit in ninth-grade students and the first-semester GPA of those same students (Table 6). There was a positive correlation between the two variables, $r = 0.364$, $n = 283$, $p = 0.000$ ($p < .01$). A scatterplot summarizes the results (Figure 20). Overall, there was a moderate, positive correlation between grit levels and first-semester GPA. Increases in grit levels were correlated with increases in first-semester GPA.

Table 6

Pearson Correlation output for Grit and First-Semester GPA

Correlations

		Grit Score	1st Sem. GPA
Grit Score	Pearson Correlation	1	.364[**]
	Sig. (2-tailed)		.000
	N	283	283
1st Sem. GPA	Pearson Correlation	.364[**]	1
	Sig. (2-tailed)	.000	
	N	283	283

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 20

Scatterplot of Grit and First-Semester GPA
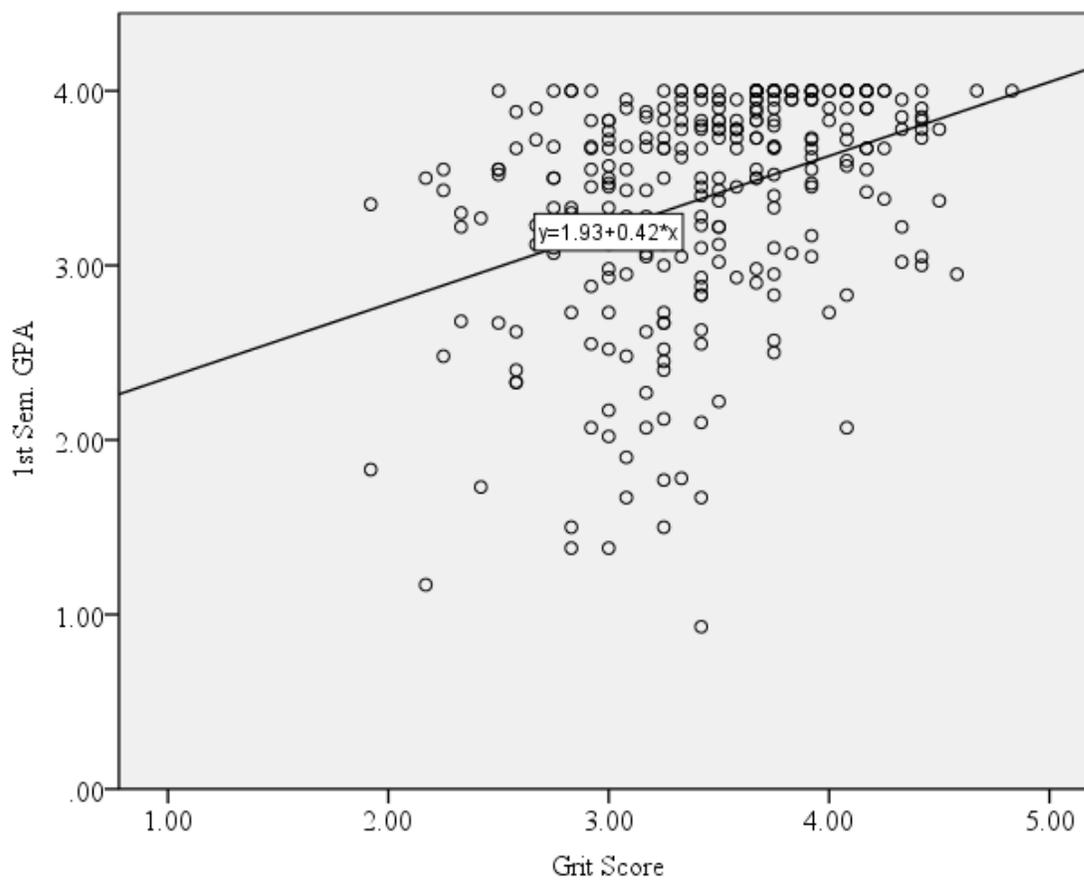
Findings for Research Question 2 - *What is the correlation between ninth-grade students' grit level and ninth-grade students' first-semester total absences?*

Grit and Total Absences: A Pearson correlation coefficient was computed to assess the relationship between the level of grit in ninth-grade students and the first-semester total absences of those same students (Table 7). There was a negative correlation between the two variables, $r =$ -0.125, $n = 283$, $p = 0.035$ ($p > .05$). A scatterplot summarizes the results (Figure 21). Overall, there was a small, negative correlation between grit levels and first-semester total absences. Increases in grit levels were correlated with decreases in first-semester number of absences.

Table 7

Pearson Correlation output for Grit and First-Semester Total Absences

Correlations

		Grit Score	1st Sem. Total Absences
Grit Score	Pearson Correlation	1	-.125[*]
	Sig. (2-tailed)		.035
	N	283	283
1st Sem. Total Absences	Pearson Correlation	-.125[*]	1
	Sig. (2-tailed)	.035	
	N	283	283

*. Correlation is significant at the 0.05 level (2-tailed).

Figure 21

Scatterplot of Grit and First-Semester Total Absences
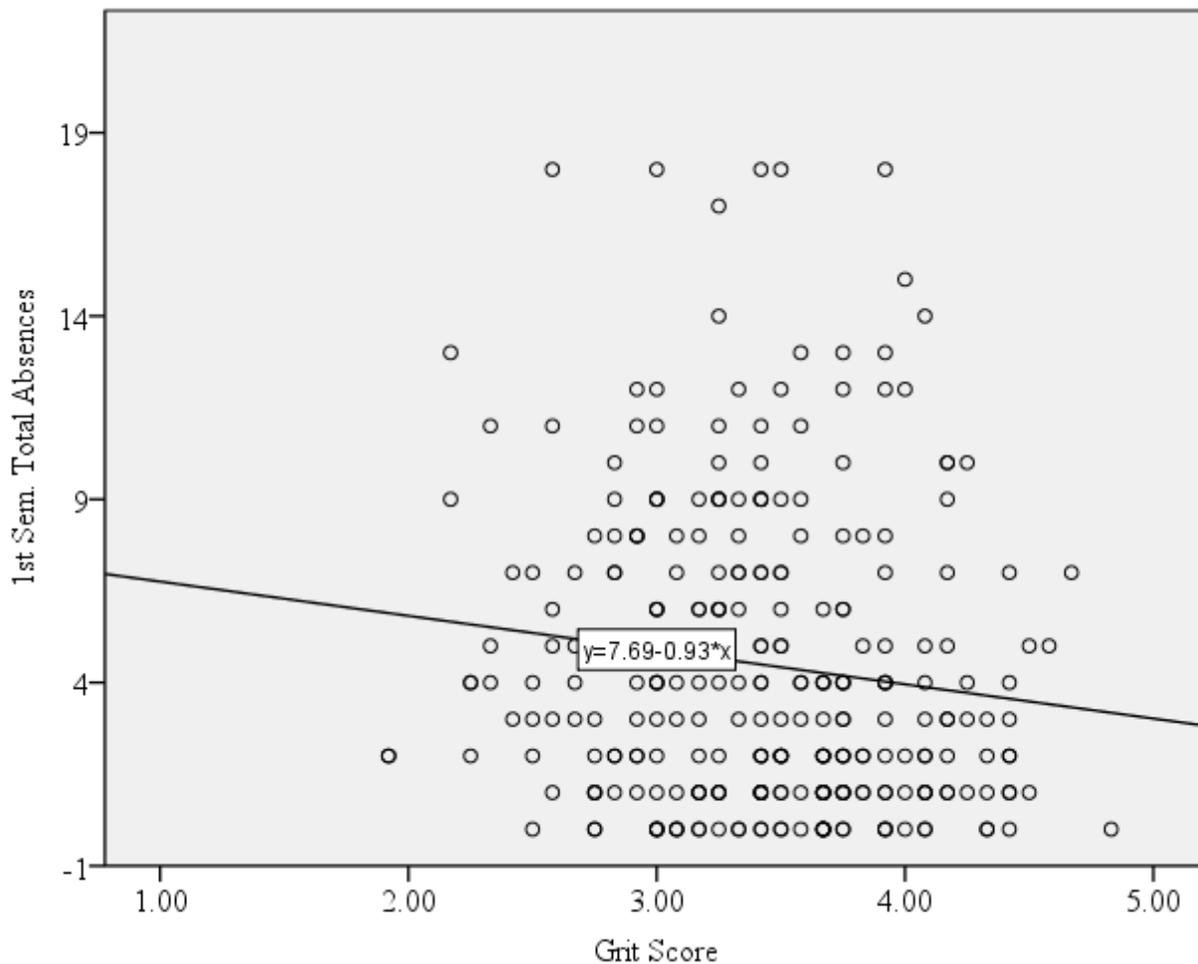
Findings for Research Question 3 - What is the correlation between ninth-grade students' grit

level and ninth-grade students' state test scores (SBA ELA, SBA Math, and MSP Science)?

Grit and SBA ELA: A Pearson correlation coefficient was computed to assess the relationship

between the level of grit in ninth-grade students and the SBA ELA test scores of those same

students (Table 8). There was a positive correlation between the two variables, $r = 0.361$, $n = 283$, $p = 0.000$ ($p < .01$). A scatterplot summarizes the results (Figure 22). Overall, there was a moderate, positive correlation between grit levels and SBA ELA scores. Increases in grit levels were correlated with increases in SBA ELA scores.

Table 8

Pearson Correlation output for Grit and SBA ELA test scores

Correlations

		Grit Score	SBA ELA
Grit Score	Pearson Correlation	1	.361[**]
	Sig. (2-tailed)		.000
	N	283	283
SBA ELA	Pearson Correlation	.361[**]	1
	Sig. (2-tailed)	.000	
	N	283	283

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 22

Scatterplot of Grit and SBA ELA test scores

Grit and SBA Math: A Pearson correlation coefficient was computed to assess the relationship between the level of grit in ninth-grade students and the SBA Math test scores of those same students (Table 9). There was a positive correlation between the two variables, $r = 0.338$, $n = 283$, $p = 0.000$ ($p < .01$). A scatterplot summarizes the results (Figure 23). Overall, there was a moderate, positive correlation between grit levels and SBA Math scores. Increases in grit levels were correlated with increases in SBA Math scores.

Table 9

Pearson Correlation output for Grit and SBA Math test scores

Correlations

		Grit Score	SBA Math
Grit Score	Pearson Correlation	1	.327[**]
	Sig. (2-tailed)		.000
	N	283	283
SBA Math	Pearson Correlation	.327[**]	1
	Sig. (2-tailed)	.000	
	N	283	283

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 23

Scatterplot of Grit and SBA Math test scores
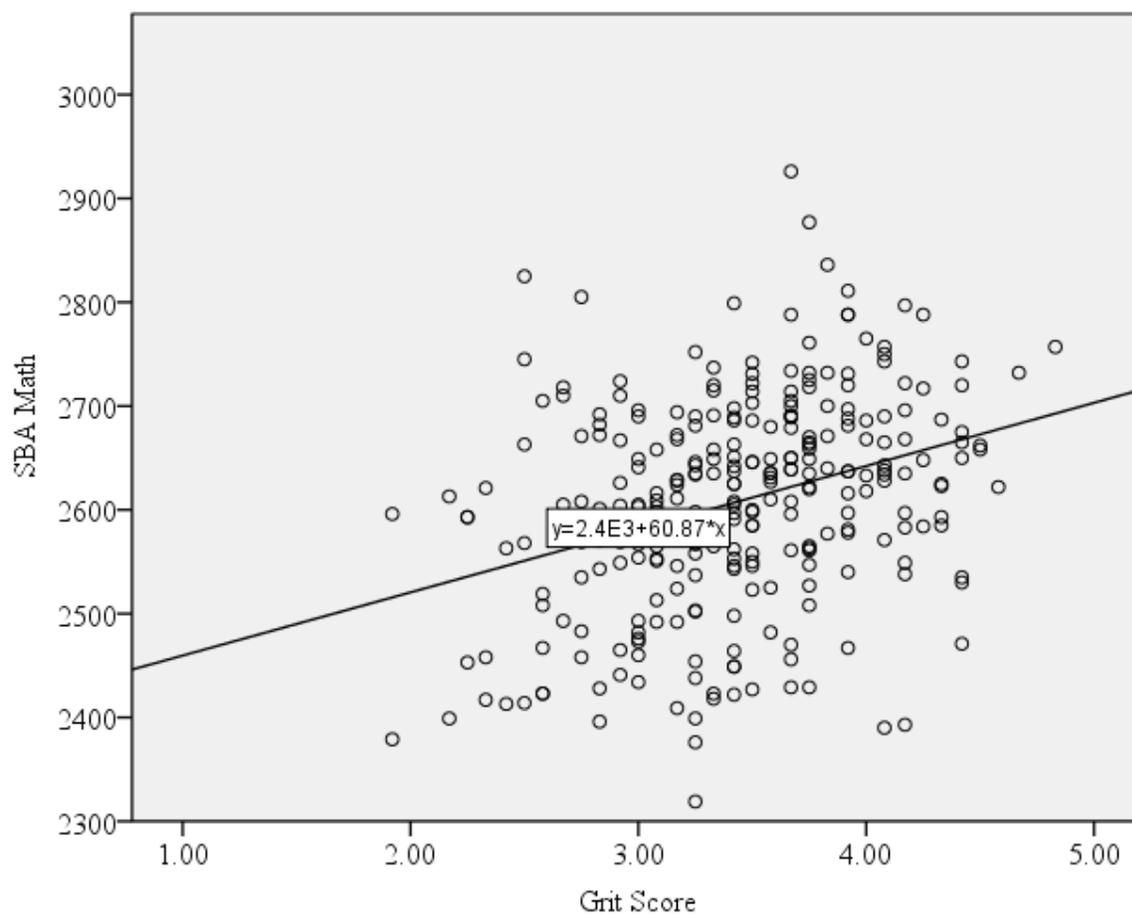
Grit and MSP Science: A Pearson correlation coefficient was computed to assess the

relationship between the level of grit in ninth-grade students and the MSP Science test scores of

those same students (Table 10). There was a positive correlation between the two variables, $r =$

0.332, $n = 283$, $p = 0.000$ ($p < .01$). A scatterplot summarizes the results (Figure 24). Overall,

there was a moderate, positive correlation between grit levels and MSP Science scores. Increases

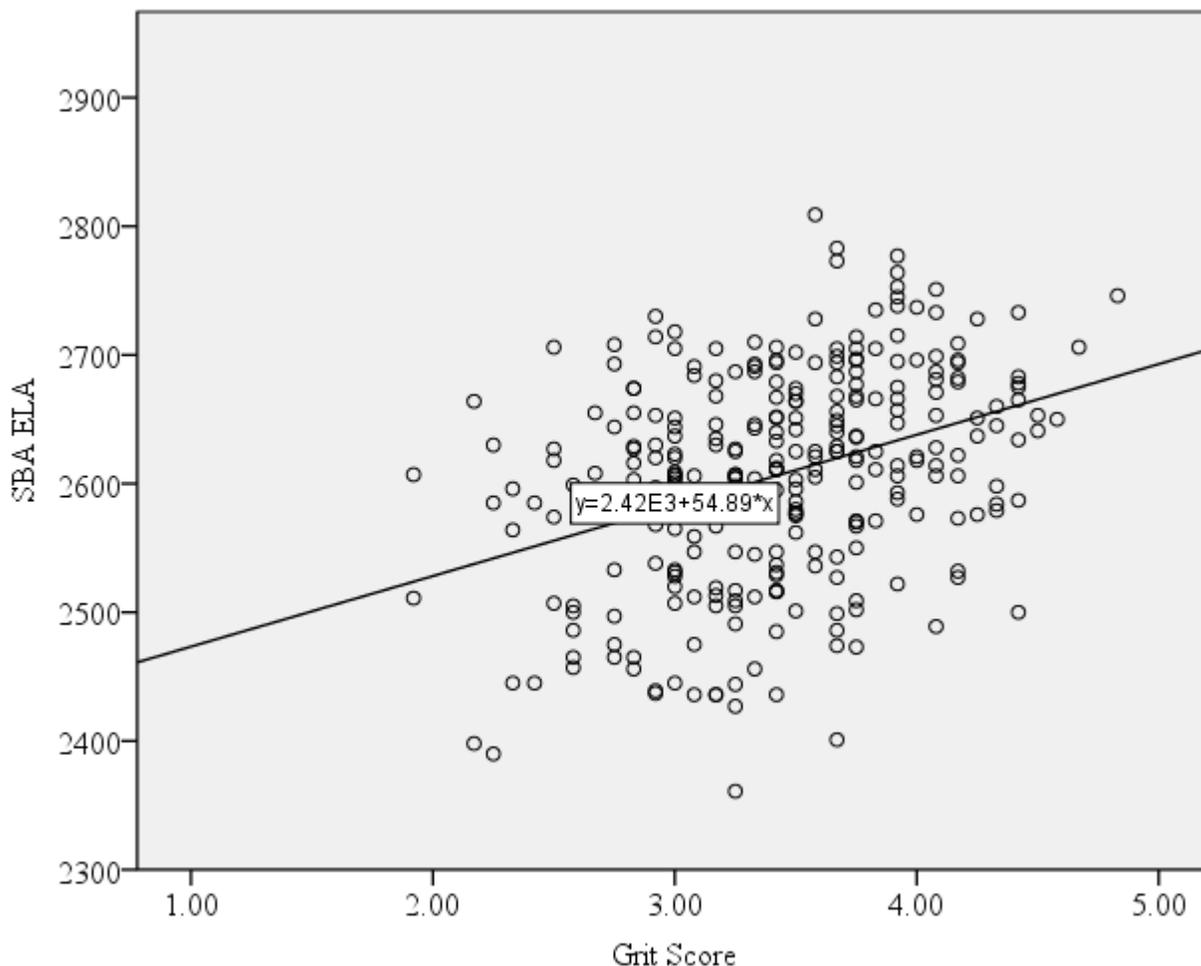in grit levels were correlated with increases in MSP Science scores.

Table 10

Pearson Correlation output for Grit and MSP Science test scores

Correlations

		Grit Score	MSP Science
Grit Score	Pearson Correlation	1	.332[**]
	Sig. (2-tailed)		.000
	N	283	283
MSP Science	Pearson Correlation	.332[**]	1
	Sig. (2-tailed)	.000	
	N	283	283

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 24

Scatterplot of Grit and MSP Science test scores
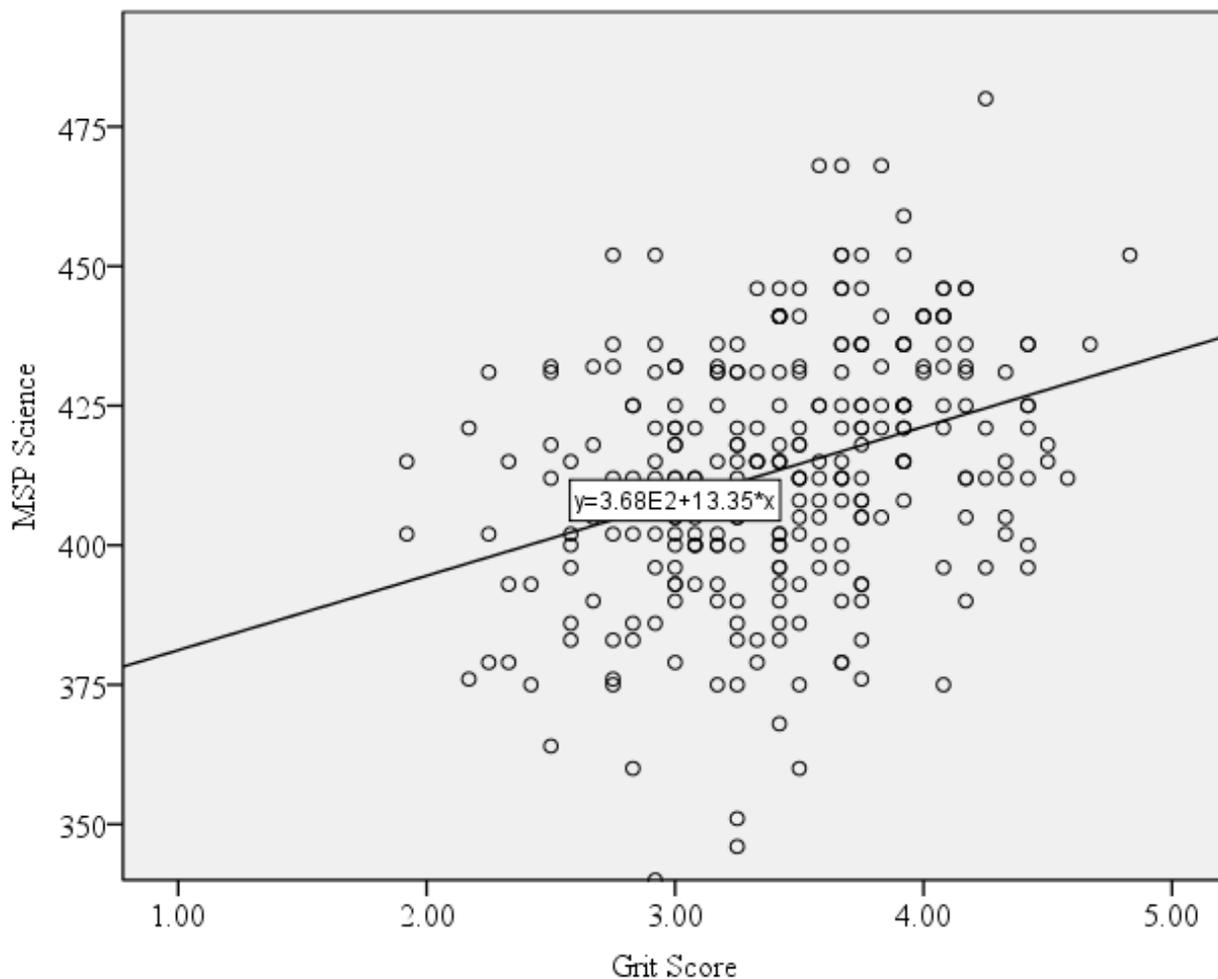
Findings for Research Question 4 - *What is the correlation among ninth-grade students' first-semester GPA, ninth-grade students' first-semester total absences and ninth-grade students' state test scores (ELA, Math, and Science)?*

SBA ELA and SBA Math: A Pearson correlation coefficient was computed to assess the relationship between the SBA ELA test scores and the SBA Math test scores of the same ninth-grade students (Table 11). There was a positive correlation between the two variables, $r = 0.778$,

$n = 283$, $p = 0.000$ ($p < .01$). A scatterplot summarizes the results (Figure 25). Overall, there was

a strong, positive correlation between SBA ELA test scores and the SBA Math test scores.

Increases in SBA ELA test scores were correlated with increases in MSP Math test scores.

Table 11

Pearson Correlation output for SBA ELA test scores and SBA Math test scores

Correlations

		SBA ELA	SBA Math
SBA ELA	Pearson Correlation	1	.779[**]
	Sig. (2-tailed)		.000
	N	283	283
SBA Math	Pearson Correlation	.779[**]	1
	Sig. (2-tailed)	.000	
	N	283	283

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 25

Scatterplot of MSP ELA test scores and MSP Math test scores

MSP Science and SBA ELA: A Pearson correlation coefficient was computed to assess the relationship between the MSP Science test scores and the SBA ELA test scores of the same ninth-grade students (Table 12). There was a positive correlation between the two variables, $r = 0.766$, $n = 283$, $p = 0.000$ ($p < .01$). A scatterplot summarizes the results (Figure 26). Overall, there was a strong, positive correlation between MSP Science test scores and the SBA ELA test scores. Increases in MSP Science test scores were correlated with increases in SBA ELA test scores.

Table 12

Pearson Correlation output for SBA ELA test scores and MSP Science test scores

Correlations

		MSP Science	SBA ELA
MSP Science	Pearson Correlation	1	.766[**]
	Sig. (2-tailed)		.000
	N	283	283
SBA ELA	Pearson Correlation	.766[**]	1
	Sig. (2-tailed)	.000	
	N	283	283

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 26

Scatterplot of MSP ELA test scores and MSP Science test scores
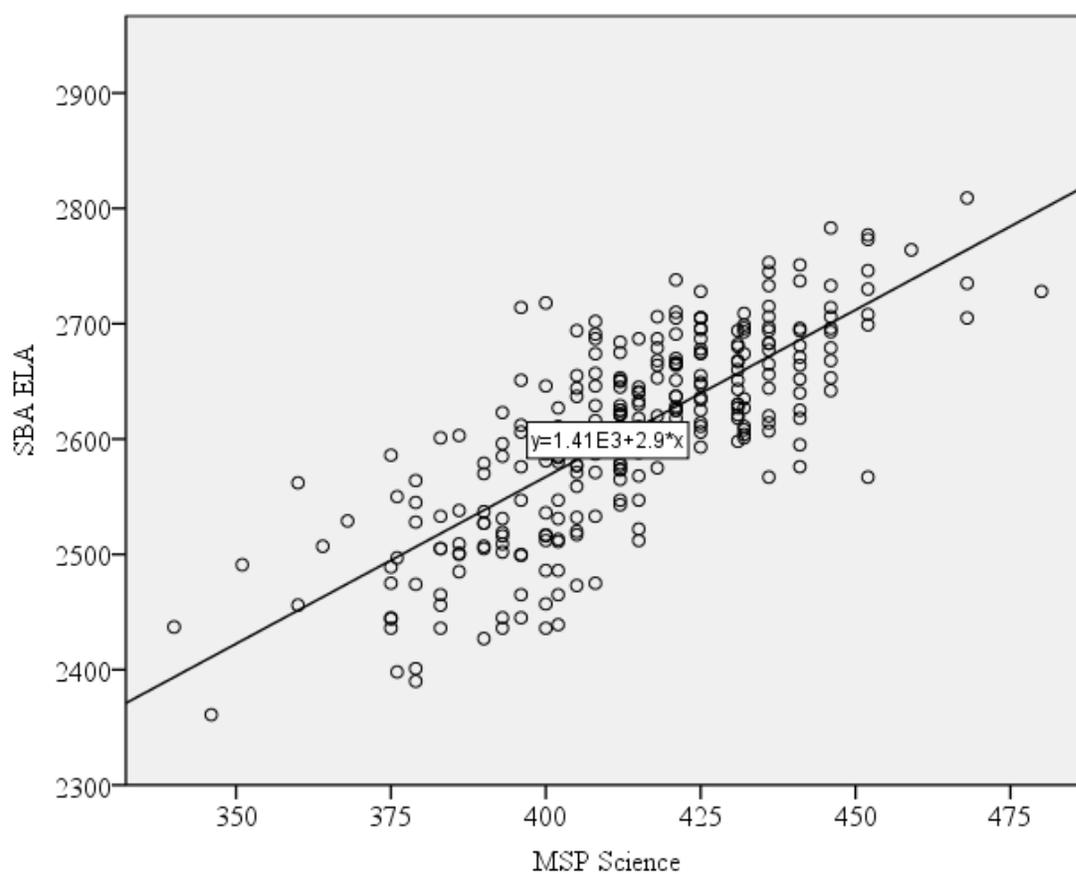
MSP Science and SBA Math: A Pearson correlation coefficient was computed to assess the relationship between the MSP Science test scores and the SBA Math test scores of the same ninth-grade students (Table 13). There was a positive correlation between the two variables, $r = 0.752$, $n = 283$, $p = 0.000$ ($p < .01$). A scatterplot summarizes the results (Figure 27). Overall, there was a strong, positive correlation between MSP Science test scores and the SBA Math test scores. Increases in MSP Science test scores were correlated with increases in SBA Math test scores.

Table 13

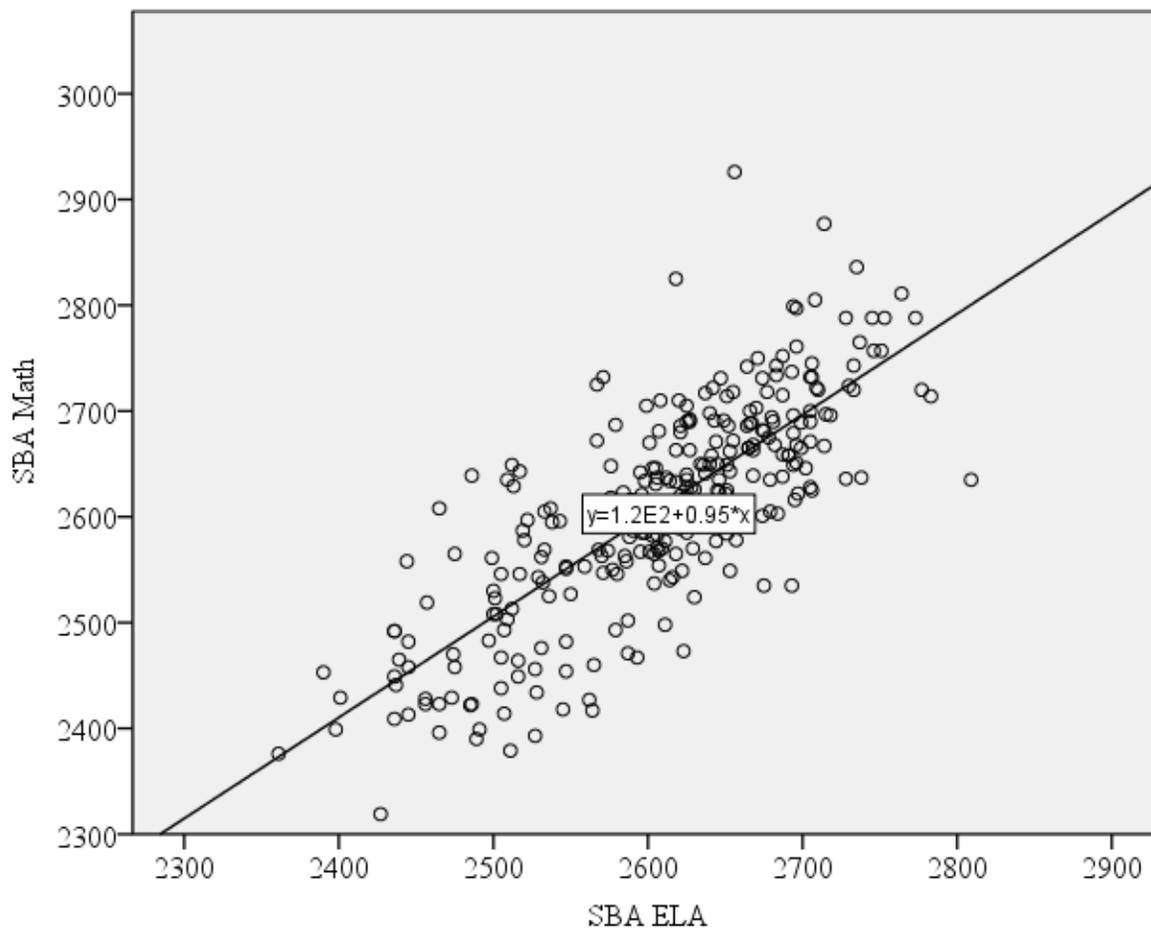*Pearson Correlation output for SBA Math test scores and MSP Science test scores*

Correlations

		SBA Math	MSP Science
SBA Math	Pearson Correlation	1	.760**
	Sig. (2-tailed)		.000
	N	283	283
MSP Science	Pearson Correlation	.760**	1
	Sig. (2-tailed)	.000	
	N	283	283

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 27

Scatterplot of SBA Math test scores and MSP Science test scores
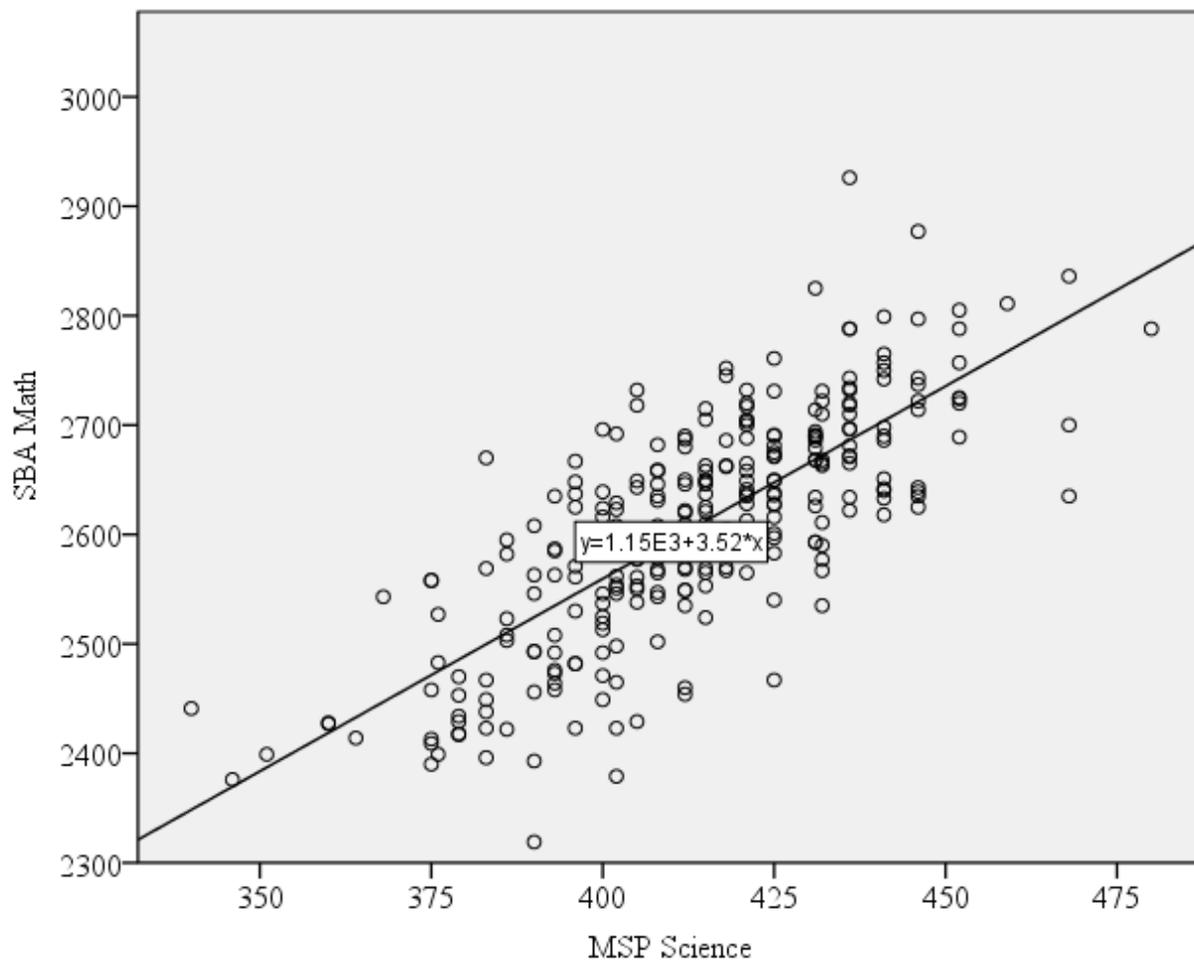
GPA and SBA ELA: A Pearson correlation coefficient was computed to assess the relationship between the GPA and the SBA ELA test scores of the same ninth-grade students (Table 14). There was a positive correlation between the two variables, $r = 0.603$, $n = 283$, $p = 0.000$ ($p <$ .01). A scatterplot summarizes the results (Figure 28). Overall, there was a strong, positive correlation between GPA and the SBA ELA test scores. Increases in GPA were correlated with increases in SBA ELA test scores.

Table 14

Pearson Correlation output for First-Semester GPA and SBA ELA test scores

Correlations

		1st Sem. GPA	SBA ELA
1st Sem. GPA	Pearson Correlation	1	.603**
	Sig. (2-tailed)		.000
	N	283	283
SBA ELA	Pearson Correlation	.603**	1
	Sig. (2-tailed)	.000	
	N	283	283

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 28

Scatterplot of First-Semester GPA and SBA ELA test scores
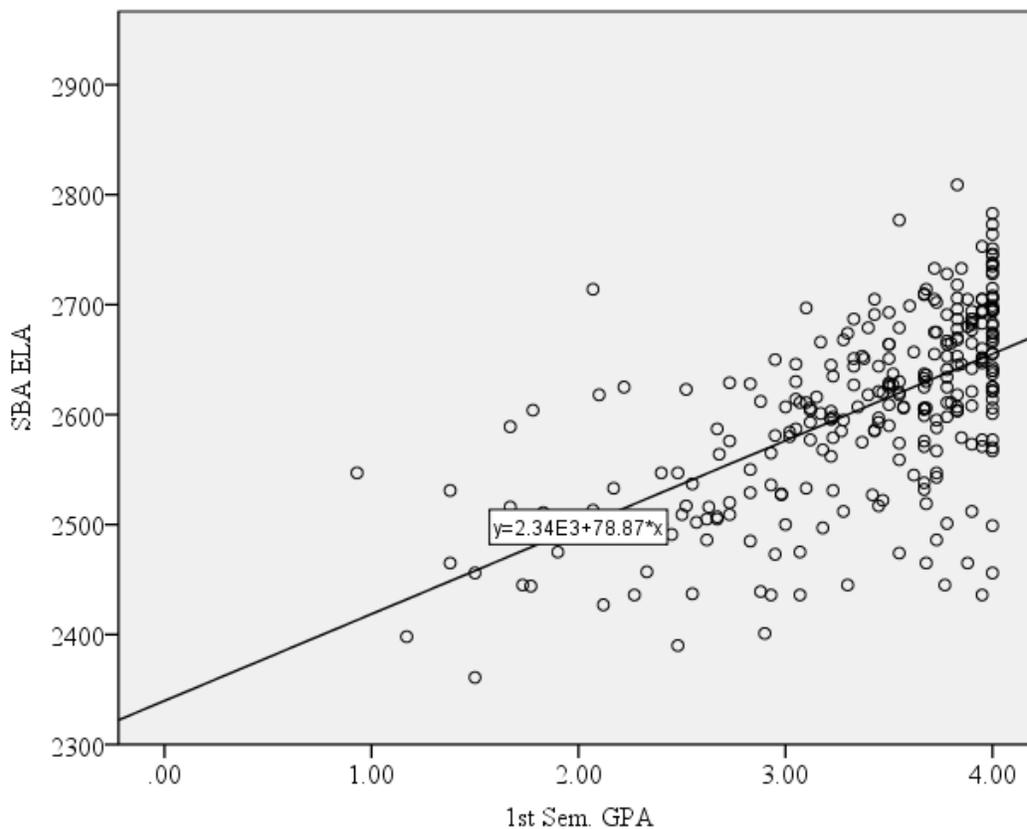
GPA and SBA Math: A Pearson correlation coefficient was computed to assess the relationship between the GPA and the SBA Math test scores of the same ninth-grade students (Table 15). There was a positive correlation between the two variables, $r = 0.621$, $n = 283$, $p = 0.000$ ($p < .01$). A scatterplot summarizes the results (Figure 29). Overall, there was a strong, positive correlation between GPA and the SBA Math test scores. Increases in GPA were correlated with increases in SBA Math test scores.

Table 15

Pearson Correlation output for First-Semester GPA and SBA Math test scores

Correlations

		1st Sem. GPA	SBA Math
1st Sem. GPA	Pearson Correlation	1	.621[**]
	Sig. (2-tailed)		.000
	N	283	283
SBA Math	Pearson Correlation	.621[**]	1
	Sig. (2-tailed)	.000	
	N	283	283

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 29

Scatterplot of First-Semester GPA and SBA Math test scores
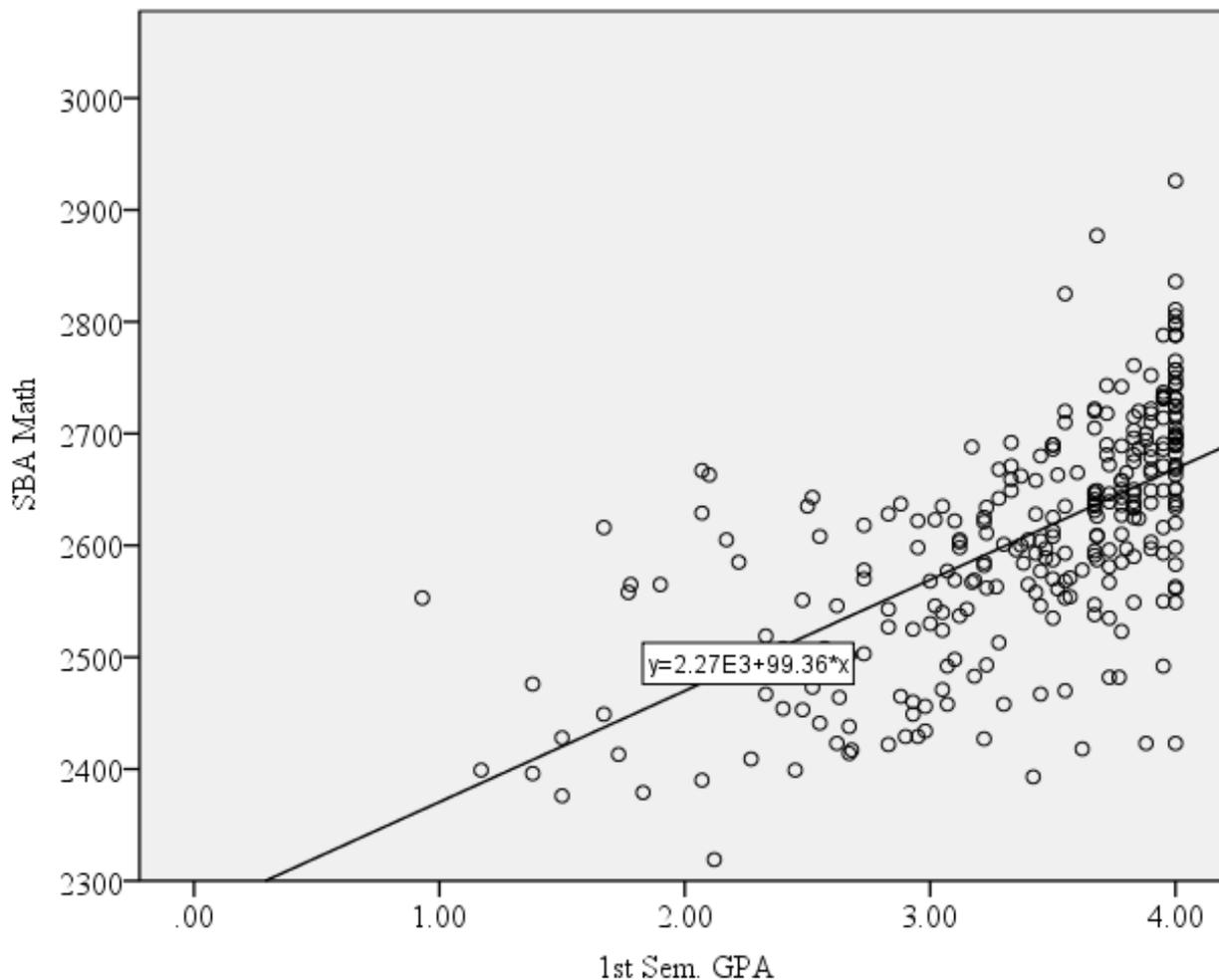
GPA and MSP Science: A Pearson correlation coefficient was computed to assess the

relationship between the GPA and the MSP Science test scores of the same ninth-grade students

(Table 16). There was a positive correlation between the two variables, $r = 0.573$, $n = 283$, $p =$

0.000 ($p < .01$). A scatterplot summarizes the results (Figure 30). Overall, there was a strong,

positive correlation between GPA and the MSP Science test scores. Increases in GPA were

correlated with increases in MSP Science test scores.

Table 16

Pearson Correlation output for First-Semester GPA and MSP Science test scores

Correlations

		1st Sem. GPA	MSP Science
1st Sem. GPA	Pearson Correlation	1	.573**
	Sig. (2-tailed)		.000
	N	283	283
MSP Science	Pearson Correlation	.573**	1
	Sig. (2-tailed)	.000	
	N	283	283

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 30

Scatterplot of First-Semester GPA and MSP Science test scores
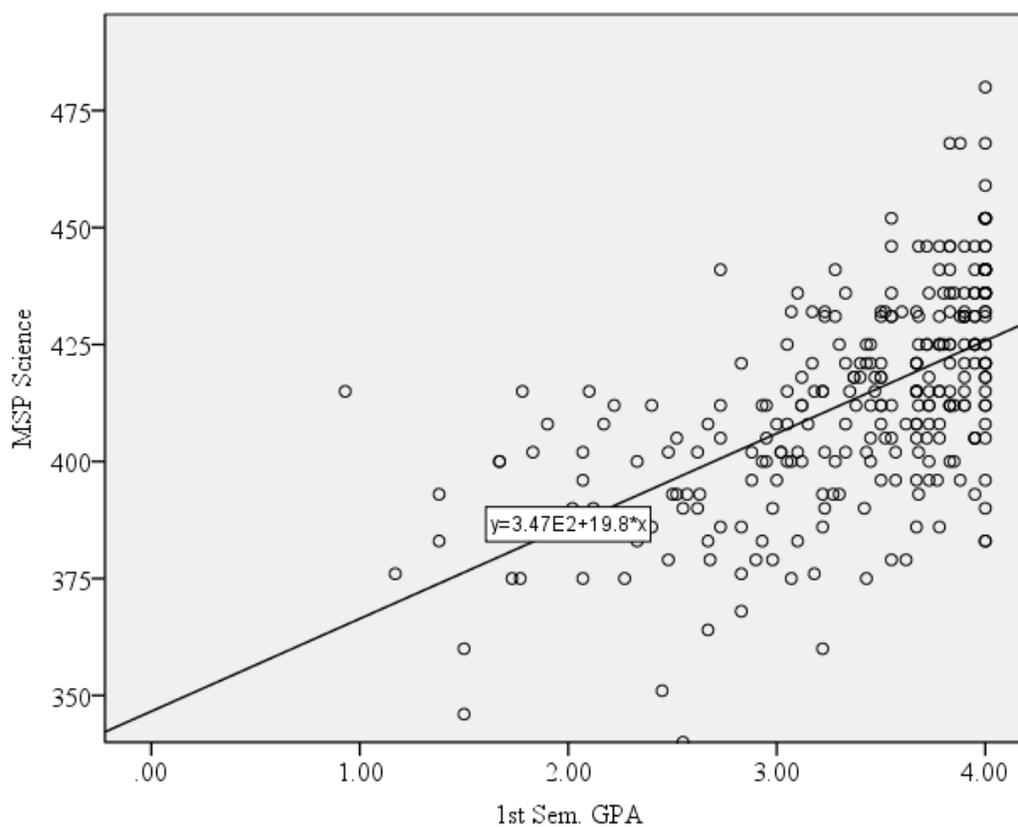
GPA and Total Absences: A Pearson correlation coefficient was computed to assess the

relationship between the GPA and Total Absences of the same ninth-grade students (Table 17).

There was a negative correlation between the two variables, $r = -0.342$, $n = 283$, $p = 0.000$ ($p <$

.01). A scatterplot summarizes the results (Figure 31). Overall, there was a moderate, negative

correlation between GPA and Total Absences. Increases in GPA were correlated with decreases

in first-semester number of absences.

Table 17

Pearson Correlation output for First-Semester GPA and First-Semester Total Absences

Correlations

		1st Sem. GPA	1st Sem. Total Absences
1st Sem. GPA	Pearson Correlation	1	-.342[**]
	Sig. (2-tailed)		.000
	N	283	283
1st Sem. Total Absences	Pearson Correlation	-.342[**]	1
	Sig. (2-tailed)	.000	
	N	283	283

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 31

Scatterplot of First-Semester GPA and First-Semester Total Absences
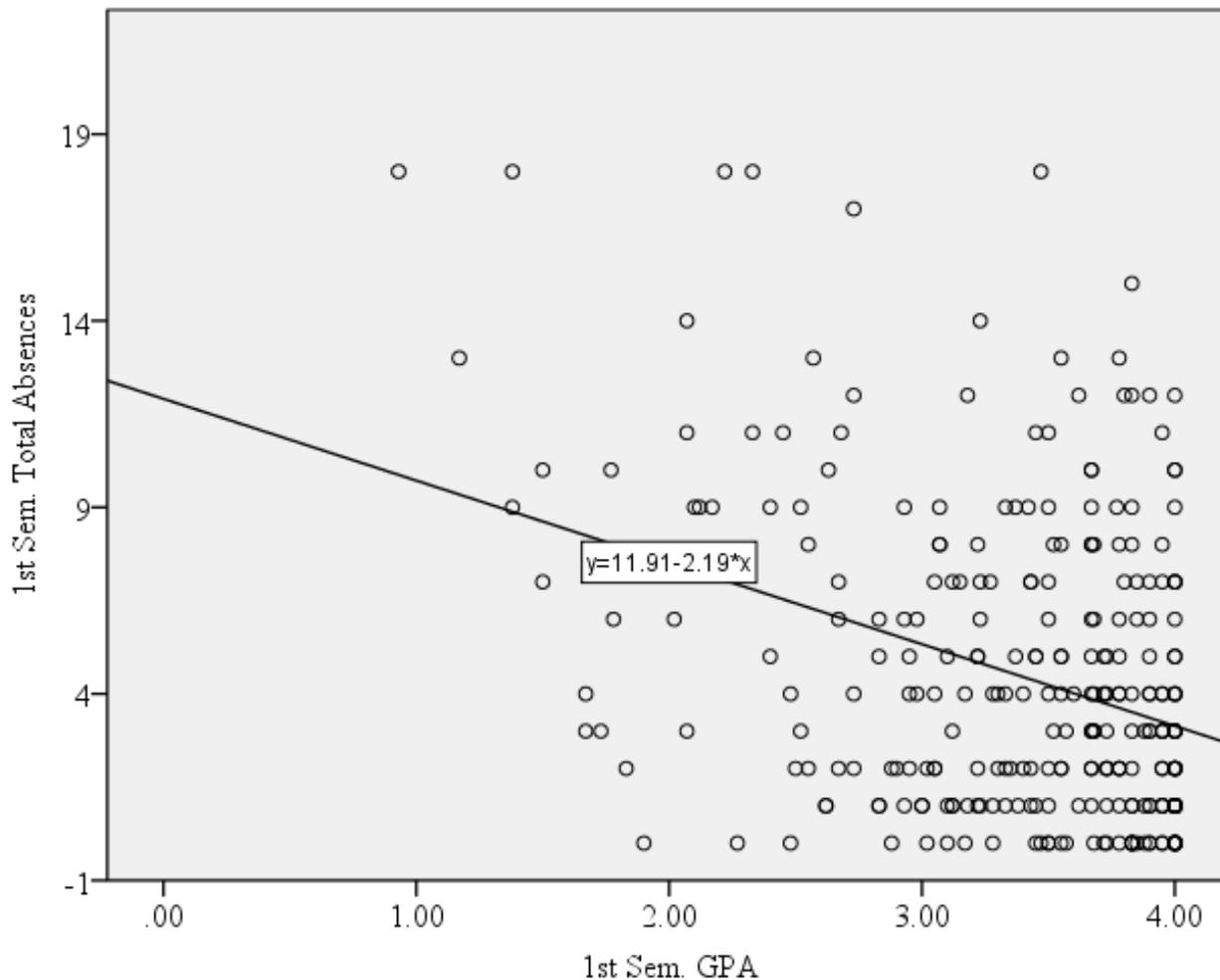
Total Absences and SBA ELA: A Pearson correlation coefficient was computed to assess the

relationship between Total Absences and SBA ELA test scores of the same ninth-grade students

(Table 18). There was a negative correlation between the two variables, $r = -0.194$, $n = 283$, $p =$

0.001 ($p < .01$). A scatterplot summarizes the results (Figure 32). Overall, there was a small,

negative correlation between Total Absences and SBA ELA test scores. Increases in first-

semester number of absences were correlated with decreases in SBA ELA test scores.

Table 18

Pearson Correlation output for First-Semester Total Absences and SBA ELA test scores

<u>Correlations</u>

		1st Sem. Total Absences	SBA ELA
1st Sem. Total Absences	Pearson Correlation	1	-.194[**]
	Sig. (2-tailed)		.001
	N	283	283
SBA ELA	Pearson Correlation	-.194[**]	1
	Sig. (2-tailed)	.001	
	N	283	283

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 32

Scatterplot of First-Semester Total Absences and SBA ELA test scores

Total Absences and SBA Math: A Pearson correlation coefficient was computed to assess the relationship between Total Absences and SBA Math test scores of the same ninth-grade students (Table 19). There was a negative correlation between the two variables, $r = -0.245$, $n = 283$, $p = 0.000$ ($p < .01$). A scatterplot summarizes the results (Figure 33). Overall, there was a small, negative correlation between Total Absences and SBA Math test scores. Increases in first-semester number of absences were correlated with decreases in SBA Math test scores.

Table 19

Pearson Correlation output for First-Semester Total Absences and SBA Math test scores

Correlations

		1st Sem. Total Absences	SBA Math
1st Sem. Total Absences	Pearson Correlation	1	-.245[**]
	Sig. (2-tailed)		.000
	N	283	283
SBA Math	Pearson Correlation	-.245[**]	1
	Sig. (2-tailed)	.000	
	N	283	283

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 33

Scatterplot of First-Semester Total Absences and SBA Math test scores
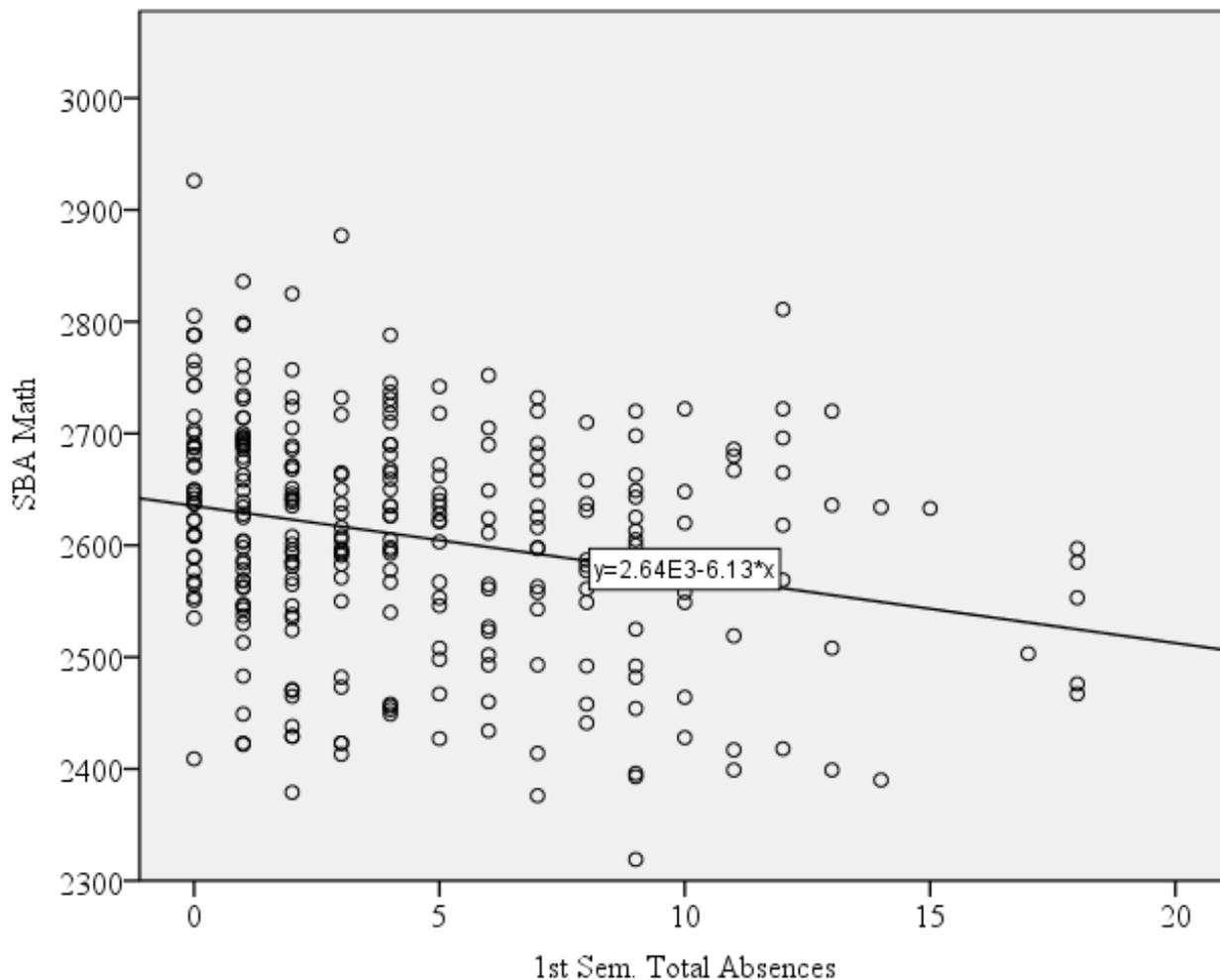
Total Absences and MSP Science: A Pearson correlation coefficient was computed to assess the relationship between Total Absences and MSP Science test scores of the same ninth-grade students (Table 20). There was a negative correlation between the two variables, $r = -0.193$, $n = 283$, $p = 0.001$ ($p < .01$). A scatterplot summarizes the results (Figure 34). Overall, there was a small, negative correlation between Total Absences and MSP Science test scores. Increases in first-semester number of absences were correlated with decreases in MSP Science test scores.
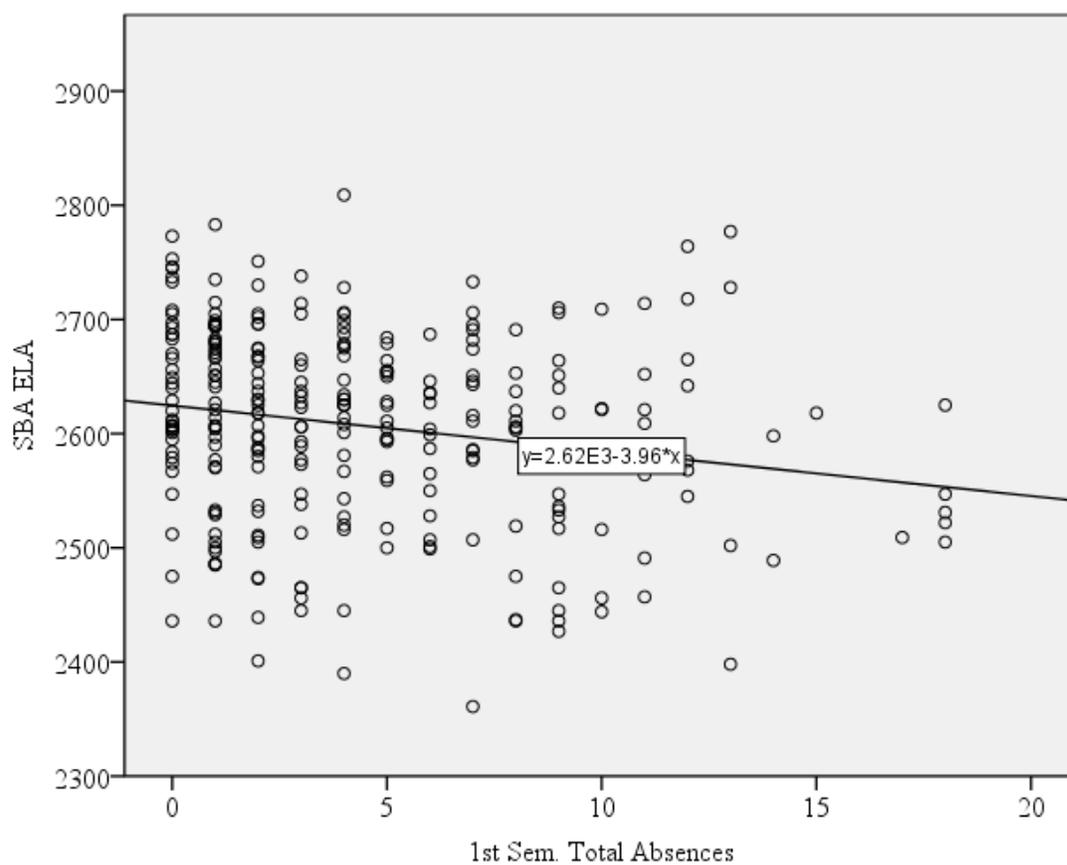
Table 20

Pearson Correlation output for First-Semester Total Absences and MSP Science test scores

Correlations

		1st Sem. Total Absences	MSP Science
1st Sem. Total Absences	Pearson Correlation	1	-.193[**]
	Sig. (2-tailed)		.001
	N	283	283
MSP Science	Pearson Correlation	-.193[**]	1
	Sig. (2-tailed)	.001	
	N	283	283

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 34

Scatterplot of First-Semester Total Absences and MSP Science test scores
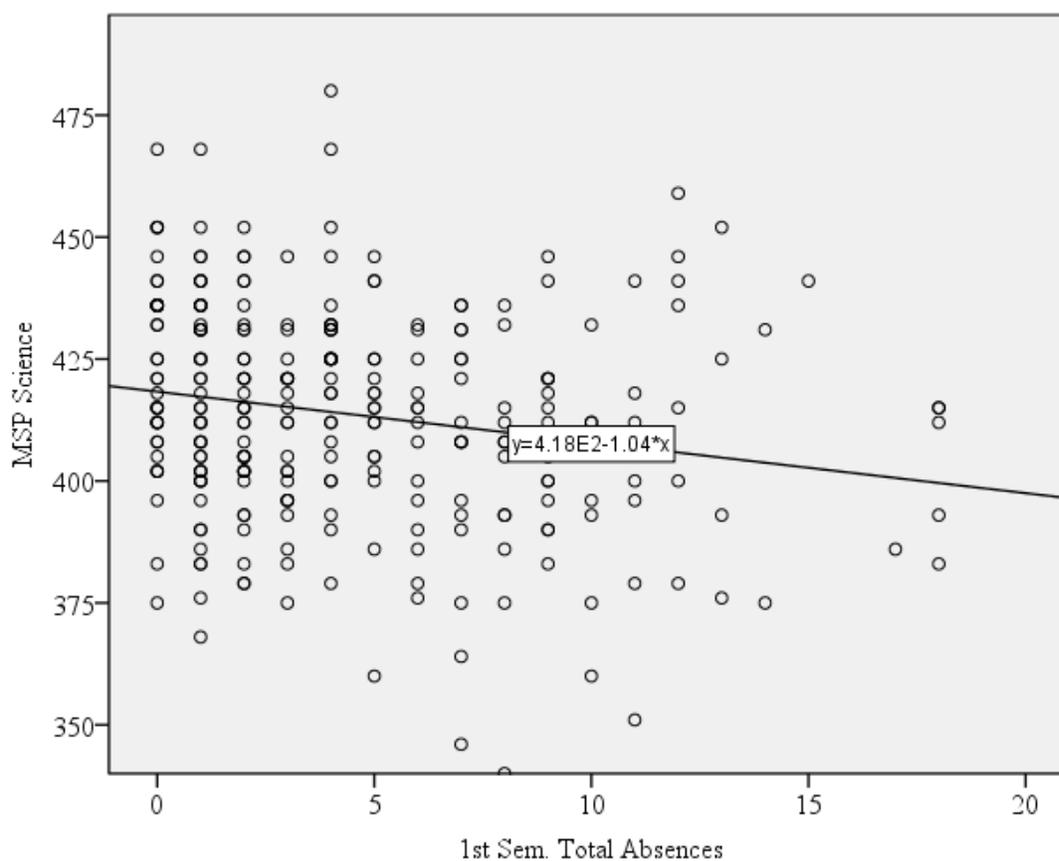
Conclusion

Chapter IV presented the results from the quantitative data as it relates to the topic of grit and ninth-grade student academic success. A Pearson correlation test was run on each combination of the variables to determine the strength of any associations to answer the four questions posed in this study. The findings showed both positive and negative associations between variables, and the strengths of the associations ran the spectrum from small to strong. The details of those associations are shared below, and the implications of the data is shared in the next chapter.

The results for Research Question 1, which observed the correlation between ninth-grade students' grit level and ninth-grade students' first-semester GPA, found that there was a positive correlation between the two variables, $r = 0.364$, $n = 283$, $p = 0.000$ ($p < .01$). Increases in grit levels were correlated with increases in first-semester GPA. Overall, there was a moderate, positive correlation between grit levels and first-semester GPA, meaning that when a student had a higher grit score it can be anticipated that the same student would have a higher GPA. This moderate association is in line with prior research that shows grittier people tend to find greater academic success. This is valuable information for educators as it points to the importance of paying attention to grit in the school setting. To determine the variance explained, or the amount of variance explained between two variables, R^2 (the coefficient of determination) was calculated. In this case, R^2 (squaring the Pearson Correlation of .364) equaled .132. Therefore, the variance explained was 13.2%. This also meant that 86.8% of the variance was unexplained. In terms of percentage of variance explained, small is identified as a 1% variance, medium at 9%, and large at 25% or more (Lund & Lund, 2017), so this was a medium range variance.

The results for Research Question 2, which observed the correlation between ninth-grade students' grit level and ninth-grade students' first-semester total absences, found there was a negative correlation between the two variables, $r = -0.125$, $n = 283$, $p = 0.035$ ($p > .05$). Increases in grit levels were correlated with decreases in first-semester absences. Overall, there was a small, negative correlation between grit levels and first-semester absences, meaning that when a student had a higher grit score it can be anticipated that the same student would have healthier attendance patterns, or fewer absences. While this association was found only to be small, the results are confirming school attendance is important and that students with perseverance related characteristics, like grit, are more likely to find success in school. To determine the variance explained, R^2 was calculated. In this case, R^2 (squaring the Pearson Correlation of .125) equaled .016, so the variance explained was 1.6%. This also meant that 98.4% of the variance was unexplained. In terms of percentage of variance explained, this was a small range variance.

The results for Research Question 3, which observed the correlation between ninth-grade students' grit level and ninth-grade students' state test scores (SBA ELA, SBA Math, and MSP Science), found there were positive associations with each. With grit and SBA ELA, there was a positive correlation between the two variables, $r = 0.361$, $n = 283$, $p = 0.000$ ($p < .01$). Increases in grit levels were correlated with increases in SBA ELA scores. Overall, there was a moderate, positive correlation between grit levels and SBA ELA scores. With grit and SBA Math, there was a positive correlation between the two variables, $r = 0.338$, $n = 283$, $p = 0.000$ ($p < .01$). Increases in grit levels were also correlated with increases in SBA Math scores. Overall, there was a moderate, positive correlation between grit levels and SBA Math scores. With grit and MSP Science, there was a positive correlation between the two variables, $r = 0.332$, $n = 283$, $p =$

0.000 ($p < .01$). Increases in grit levels were correlated with increases in MSP Science scores. Overall, there was a moderate, positive correlation between grit levels and MSP Science scores.

These results pointed to the idea that grittier students would do better on standardized assessments. The associations were found to be moderate and not strong, but those moderate associations still point to prior research that connect grit to academic success and continue to validate the importance of grit in the school setting. Specifically, a student with higher levels of grit is more likely to meet or exceed standard on the three specific assessments used as variables in this study. SBA ELA, SBA Math, and MSP Science test scores all had moderate associations with grit, meaning grittier students are more likely to find higher scores on these specific standardized tests that the participants in this study had taken.

To determine the variance explained when comparing grit and the state test scores, R^2 was calculated. With grit and SBA ELA, R^2 (squaring the Pearson Correlation of .361) equaled .130, so the variance explained was 13%. This also meant that 87% of the variance was unexplained. In terms of percentage of variance explained, this was a medium range variance. With grit and SBA Math, R^2 (squaring the Pearson Correlation of .338) equaled .114. The variance explained was 11.4%. This also meant that 88.6% of the variance was unexplained. In terms of percentage of variance explained, this was also a medium range variance. With grit and MSP Science, R^2 (squaring the Pearson Correlation of .332) equaled .110. The variance explained was 11%. This also meant that 89% of the variance was unexplained. In terms of percentage of variance explained, this was also a medium range variance.

Table 21

Pearson Correlation output for the five variables in Question 4

		SBA ELA	SBA Math	MSP Science	1st Sem. Total Absences	1st Sem. GPA
SBA ELA	Pearson Correlation	1	.779**	.766**	-.194**	.603**
	Sig. (2-tailed)		.000	.000	.001	.000
	n	283	283	283	283	283
SBA Math	Pearson Correlation	.779**	1	.760**	-.245**	.621**
	Sig. (2-tailed)	.000		.000	.000	.000
	n	283	283	283	283	283
MSP Science	Pearson Correlation	.766**	.760**	1	-.193**	.573**
	Sig. (2-tailed)	.000	.000		.001	.000
	n	283	283	283	283	283
1st Sem. Total Absences	Pearson Correlation	-.194**	-.245**	-.193**	1	-.342**
	Sig. (2-tailed)	.001	.000	.001		.000
	n	283	283	283	283	283
1st Sem. GPA	Pearson Correlation	.603**	.621**	.573**	-.342**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	n	283	283	283	283	283

**. Correlation is significant at the 0.01 level (2-tailed).

Finally, the results for Research Question 4, which observed the correlation among ninth-grade students' first-semester GPA, ninth-grade students' first-semester total absences, and ninth-grade students' state test scores (ELA, Math, and Science), found both positive and negative associations, as well as varied strengths of associations between the variables. The table

above (Table 21) shows the results of the Pearson correlation tests for the combinations of variables in Research Question 4. It was in this question that paired variables showed the strongest correlation and some of the more definitive associations that can be pointed to in this study. The associations between GPA and the three test scores, as well as the three test scores compared to one another, showed strong, positive associations. This means that as a student's GPA gets stronger, that student is more likely to do better on the standardized assessments used as variables. Also, as a student does well on one of the tests, whether it be SBA ELA, SBA Math, or MSP Science, it is more likely that student will also do well on the other standardized assessments. This is valuable information to educators. It is not surprising, but it does support the connections between GPA and test scores and connections between success on various standardized test scores. The same cannot be said when comparing these variables to Total Absences. While there were negative associations when comparing Total Absences (the number of absences) to GPA and the test scores, the level of those associations was small. When there were fewer absences, GPA went up and test scores improved, but not at an association level that can be definitive as it was statistically a small association. This small association with Total Absences came as a bit of a surprise to the researcher and is discussed in the next chapter.

As shown through results from a Pearson correlation test on each set of variables, there was a strong, positive association between SBA ELA and SBA Math (.779) and between SBA ELA and MSP Science (.766). There was also a strong, positive association between SBA Math and MSP Science (.760). GPA had a strong, positive association with all three test scores. When testing with GPA, SBA ELA (.603), SBA Math (.621), and MSP Science (.573) all had results over the .5 threshold, which is considered large or strong. All variables in the table above had a negative association with Total Absences, but most at the small level. When testing with Total

Absences, SBA ELA (-.194), SBA Math (-.245), and MSP Science (-.193) all fell in the small association range (between -0.1 to -0.3), while GPA (-.342) was in the moderate level of association (between -0.3 to -0.5).

To determine the variance explained when comparing variables other than grit, R^2 was calculated. With SBA ELA and SBA Math, R^2 (squaring the Pearson Correlation of .779) equaled .607. The variance explained was 60.7%. This also meant that 39.3% of the variance was unexplained. In terms of percentage of variance explained, this was a large range variance, when following the guidelines of percentage of variance being explained as small at 1%, medium at 9%, and large at 25% and over (Lund & Lund, 2017). With SBA ELA and MSP Science, R^2 (squaring the Pearson Correlation of .766) equaled .587, therefore the variance explained was 58.7%. This meant that 41.3% of the variance was unexplained. In terms of percentage of variance explained, this was a large range variance. With SBA Math and MSP Science, R^2 (squaring the Pearson Correlation of .760) equaled .578. The variance explained was 57.8% or that 42.2% of the variance was unexplained. In terms of percentage of variance explained, this was also a large range variance. With GPA and SBA ELA, R^2 (squaring the Pearson Correlation of .603) equaled .364. The variance explained was 36.4% and 63.6% of the variance was unexplained. In terms of percentage of variance explained, this was also a large range variance. When using the same calculations, GPA and SBA Math variance explained was 38.6% and GPA and MSP Science variance explained was 32.8%, placing both of those in the large range variance category. When calculating for Total Absences and the other variables, except for grit, R^2 was .038 for SBA ELA, .060 for SBA Math, .037 for MSP Science, and .117 for GPA. Respectively, the variances explained were 3.8% (small), 6% (between small and medium), 3.7% (small), and 11.7% (medium).

Chapter V

Discussion and Implications of This Study

Overview of the Study

The purpose of this research was to measure the strength of the linear association between the variables chosen, specifically looking at grit and a series of academic indicators in ninth-grade students. A quantitative research approach was chosen for this study. Research points to the importance of the ninth-grade year being a vital year for the success of students in high-school (Bowers et al., 2013; Burrus & Roberts, 2012; McWilliams, 2014; Ruzik, 2012). Research also shows that non-cognitive characteristics play a significant role in the level of success students find. Intelligence is not as strong of a predictor for success as some non-cognitive characteristics that have been identified, such as the characteristic of grit (Duckworth et al., 2007; Hansen; 2016; McCain, 2017). This study set out to examine the association between grit and student success. A main goal of this study was to add to the depth of understanding around these associations. Four main research questions guided this study. They included:

- What is the correlation between ninth-grade students' grit level and ninth-grade students' first-semester GPA?
- What is the correlation between ninth-grade students' grit level and ninth-grade students' first-semester total absences?
- What is the correlation between ninth-grade students' grit level and ninth-grade students' state test scores (ELA, Math, and Science)?

- What is the correlation among ninth-grade students' first-semester GPA, ninth-grade students' first-semester total absences, and ninth-grade students' state test scores (ELA, Math, and Science)?

The researcher set out to determine the grit level of ninth-grade students, then compared those grit scores to five academic sets of data, including GPA, Total Absences, SBA ELA test scores, SBA Math test scores, and MSP Science test scores. Each student's grit level was compared to each individual academic data set with a Pearson's correlation statistical test which is used to determine the strength of a linear association. Grit was compared to GPA to answer the first question and grit was compared to total absences to answer the second question. In the third question, grit was compared to each of the three test scores that were collected for each student, then, a Pearson's correlation test was used to determine how all variables, minus grit, were associated with one another for the fourth question. Data analysis was completed using the IBM SPSS Statistics 24 program with support from the Laerd Statistics online program. When sharing the results of the Pearson correlation tests, the following representative values were used: $r =$ Pearson Correlation, $n =$ Sample Size, $p =$ Statistical Criteria ($>.01$ or $> .05$). Correlation coefficients significant at the 0.05 level are identified in each results table with a single asterisk and those significant at the 0.01 level are identified in each results table with two asterisks, with notes provided at the bottom of each table as well. An association was represented by r and was either noted as a small, moderate, or strong level of association (Lund & Lund, 2017). The representation of n was the same throughout all the variables, being that the researcher had 283 complete data sets for all the participants in the study. The participants were ninth-grade students in six junior-high schools in a suburban district within the state of Washington.

The theoretical frameworks chosen to guide this work were Bandura's Social Cognitive Theory and Dweck's Mindset Theory. The Social Cognitive Theory works to explain how people acquire behavioral patterns by observing and interacting with others (Bandura, 1989; Conner & Norman, 2005; Luszcynska & Schwarzer, 2013). The Mindset Theory explains why some people find more success in life than others and how a person's way of thinking contributes to that success level. These two frameworks provided clarity for the researcher throughout this work. The frameworks provided focus for the research, with the researcher returning regularly to the guiding questions that had been posed. The Social Cognitive Theory identifies how people learn behaviors. At the center of this study is the characteristic of grit. Some people have an abundance of grit while others seem to have very little. Grit appears to be something that can be taught and learned (Duckworth, 2006, Duckworth et al., 2007; Duckworth et al., 2011; McCain, 2017. It is something we learn by observing others and the cyclical relationship we have with our environment and those around us, a regular series of watching and learning (Bandura, 1989; Conner & Norman, 2005; Luszcynska & Schwarzer, 2013). Dweck's Mindset Theory shares the idea that people either have a fixed or a growth mindset. The fixed minded person does not strive to be better and believes that traits, talents, skills, and characteristics, are somewhat predetermined with little chance of change or improvement over time. The growth minded person is just the opposite, going through life looking to grow, to expand the mind, to learn new skills and knowledge, and to add positive characteristics over time through hard-work and determination (D'Souza, 2017; Dweck, 2008; Garofalo, 2016). Grit is closely tied to these frameworks and they served well as the blueprints for this study.

Duckworth's research on grit is extensive. Connections have been made, for those showing high levels of grit, to U.S. Military Academy cadets completing more rigorous courses

(Duckworth et al., 2007), teachers being identified as being more effective with their students (Duckworth & Robertson-Kraft, 2014), Spelling Bee participants having greater degrees of success in competitions (Duckworth et al., 2007), higher retention in the workforce (Eskreis-Winkler et al., 2014), how long married couples stay together (Eskreis-Winkler et al., 2014), college students staying in school longer and showing to have more academic success (Duckworth et al., 2007), as well as individuals realizing life-long goals (Eskreis-Winkler et al., 2014). It was also determined that competitive athletes with grit found a higher level of success in reaching acknowledged goals. People who identified as having grit simply found more success (Duckworth et al., 2011).

Along with Grit and Academic Success, the core components covered in the literature review of this study included: Adolescent Development, Motivation in Adolescent Students, Teacher-Student Relationships and Academic Achievement, and Mindset. There are typical and predictable developmental transformations at each stage of life for human beings. The students in this study were in the ninth-grade, a time when most are 14 or 15 years old. Students at this stage in life are experiencing physical, emotional, relational, and spiritual changes (Bava & Tapert, 2010; Lerner & Galambos, 1998). It is a time when vocabulary and opinions are expanded. As students move from the elementary school setting into the middle-school setting, then again from middle-school to the high-school, they are often placed into a new environment that is more competitive and less personal than the one before. At this point in school, there is also a stronger emphasis on grades and following more mature expectations (Bava & Tapert, 2010; Cooper, 2011; Lerner & Galambos, 1998). Students at this age are excited about new-found abilities to think more abstractly and understand more multifaceted issues (Bava & Tapert, 2010; Driscoll & Nagel, 2010). It is also during this time when students begin looking for their first job or getting

more involved in sports or other extra-curricular activities (Bava & Tapert, 2010; McWilliams, 2014). There is a longing for more independence and this has students spending more time with friends than with family (Bava & Tapert, 2010; Cooper, 2011). Physical changes are taking place as well. There is significant growth in the prefrontal cortex of the brain, as well as changes to the limbic system and nerve fibers (Driscoll & Nagel, 2010). While brain growth and continued physical developments can be positive changes, adolescent students also show greater tendencies toward risk-taking and increased susceptibility around mental and behavioral well-being (Bava & Tapert, 2010: Driscoll & Nagel, 2010). The challenge for students going through this time is a blend of dealing with the physical changes taking place and how that student is finding success in adapting to new learning environments (Driscoll & Nagel, 2010; Stevenson & Zimmerman, 2005).

Motivation often declines drastically in teenage students and learning is negatively impacted by this decrease in motivation (Finn & Zimmer, 2012). This declining motivation for students in the middle-school or junior-high school level is influenced by both the often-disjointed transition from elementary school and the need for students to be more independent and the desire have more control in their lives (Bava & Tapert, 2010; Ruzik, 2012). In the elementary school, there is usually one teacher for the student and there is a focus on the whole-child from the school as a system. That whole-child approach supports the social and emotional growth of students (Ruzik, 2012). Students are presented with more independence and accountability as they move into the middle-school or junior-high system. A lack of motivation can also come to be through students not having a healthy relationship with a teacher. A lack of motivation could be caused by not having a clear understanding of how a task may impact the future, or by not having a supportive household, or by having too many other risk factors. If a

person's focus is on survival, there would naturally be less focus on academic achievement (Bava & Tapert, 2010; McWilliams, 2014; Ruzik, 2012). This is also a time when students need stronger relationships with adults outside of the home, like teachers, even though relationships with teachers tend to be weaker in secondary schools than when students where in an elementary school (Fegley, 2010; McWilliams, 2014).

How students grow and mature in a healthy manner can be linked to positive teacher-student relationships. In the ninth-grade, students long for hearty and healthy relationships with their teachers (D'Souza, 2017; Fegley, 2010; Nairz-Wirth & Feldman, 2017). Research points to motivation increasing in students when teachers work to build individual relationships and show that they care (McWilliams, 2014; Ruzek, 2012;). These relationships powerfully influence student resolve and determination in behavioral and academic choices at school (Allen, 2014; Collins, 2001; Nairz-Wirth & Feldman, 2017). A strong teacher-student relationship can be a causal factor for resiliency in students who have been identified as being at-risk (Collins, 2001; Reed & Spicer, 2003).

Research is also showing the importance of the mindset one chooses to live with. A person's mindset will profoundly influence motivation and the level of success a student will find (Bassi & Delle Fave, 2011; Dweck, 2008; Hansen, 2017; Yeager, Henderson, Paunesku, Walton, D'Mello, Spitzer, & Duckworth, 2014). Mindset Theory shares there are two distinct and opposite mindsets a person can have. People either have a fixed mindset or growth mindset (D'Souza, 2017; Dweck, 2008; Garofalo, 2016). This Mindset Theory was one of two theoretical frameworks used for this study. A student who believes intellect is fixed will underperform when compared to the student who believes intellect can be advanced over time. With hard-work and practice people with growth mindsets continue to evolve and improve (Dweck, 2008). A student

with a fixed mindset tends not to strive to get better. That student is unable to see the benefits of bettering oneself. A growth mindset is not just about effort or optimism. A growth mindset is an approach to growing in life that includes learning from others. It also includes trying new strategies and working to improve skills and abilities over time (D'Souza, 2017; Dweck, 2008; Hansen, 2017; Kristjansson & Tashijan, 2016).

The results of this study could help readers determine how to best teach students. The more educators know about personal characteristics that lead to success, the better the opportunity to create and adapt curriculum to best serve students. The results here can be used to increase understanding of the importance of grit and what that means in the educational setting. Can grit be taught? Should grit be taught? If there is a correlation between grit and specific academic indicators, why would educators not take notice and act on such findings?

Variables

This study involved students enrolled at six junior-high schools in a suburban school district in the state of Washington. The district is the eighth most populous district in the state and currently has twenty-three elementary schools, seven junior-high schools, and three comprehensive high-schools and one alternative high-school. The district still uses a junior-high configuration model, with 7th-9th grade students in junior-high buildings and 10th-12th grade students in high-school buildings. It is a highly-recognized district academically with strong programs for highly capable students and special needs students, strong performing arts and athletics, and a higher than average graduation rate (90.9% five-year cohort for 2016). Consent forms were sent home and only those participants who returned the consent form were included

in the study. No students were excluded by the researcher. With the permission of the district superintendent's designee, the researcher went to each junior-high school and had students take the 12-point Grit Scale. There were 283 students included in this study. The 12-point Grit Scale, once calculated, produced a number that represented a grit score and that grit score was compared to the following variables:

- Grade Point Averages (Question 1): The GPA for each student was compiled after the first-semester of the ninth-grade year was completed, which came at the end of January.

- Total Absences (Question 2): The total number of absences for each student was compiled after the first-semester of their ninth-grade year was completed, which came at the end of January.

- SBA ELA Scores (Question 3): In Washington State, the Smarter Balanced Assessment, known as the SBA, is an annual assessment of student academic performance in ELA and Mathematics at various grade levels.

- SBA Math Scores (Question 3): In Washington State, the Smarter Balanced Assessment, known as the SBA, is an annual assessment of student academic performance in ELA and Mathematics at various grade levels.

- MSP Science Scores (Question 4): In Washington State, the Measurements of Student Progress, known as the MSP, is an annual assessment of academic achievement in Science at the fifth and eighth-grade levels, then a related end-of-course exit exam is used at or after the tenth-grade to be used as one of many high-school graduation requirements.

The final question in this study removed grit from the equation and looked at the correlation between GPA, Total Absences, and the three academic data sets (SBA ELA, SBA Math, and

MSP Science) that were obtained for each student to determine the strength of each pair's

association. When reporting the strength of the association between two variables, small,

medium/moderate, large/strong were used as descriptors based on Table 1 below (Lund & Lund,

2017).

Table 1

Pearson correlation strength of association guidelines

	Coefficient, r	
Strength of Association	Positive	Negative
Small	.1 to .3	-0.1 to -0.3
Medium/Moderate	.3 to .5	-0.3 to -0.5
Large/Strong	.5 to 1.0	-0.5 to -1.0

Summary of the Results

After running a Pearson correlation test on the many combinations of variables in this

study, associations were found between all combinations. Those associations varied in strength,

with some being small, some moderate, and some strong. All associations were positive,

meaning that as one variable increased, the other did as well, except for when Total Absences

was involved and in those cases the association was negative, which meant that as Total

Absences went down the other variable went up. Again, all the data for this study was specific to

283 ninth-grade students. When identifying the strength of association, a small association fell

between .1 and .3 (or -0.1 and -0.3), a moderate association fell between .3 and .5 (or -0.3 and -

0.5), and a strong association fell between .5 and 1.0 (or -0.5 and -1.0) as shown in Table 1 above.

The results for Research Question 1, which observed the correlation between grit and GPA, found there was a moderate, positive correlation. Increases in grit were correlated with increases GPA. Specifically, $r = 0.364$, $n = 283$, $p = 0.000$ ($p < .01$).

The results for Research Question 2, which observed the correlation between grit and total absences, found there was a small, negative correlation. Increases in grit were correlated with decreases in total absences. Specifically, $r = -0.125$, $n = 283$, $p = 0.035$ ($p > .05$).

The results for Research Question 3, which observed the correlation between grit and state test scores (SBA ELA, SBA Math, and MSP Science), found there were positive associations with each. With grit and SBA ELA, there was a moderate, positive correlation. Increases in grit were correlated with increases in SBA ELA. Specifically, $r = 0.361$, $n = 283$, $p = 0.000$ ($p < .01$). With grit and SBA Math, there was a moderate, positive correlation. Increases in grit were correlated with increases in SBA Math. Specifically, $r = 0.338$, $n = 283$, $p = 0.000$ ($p < .01$). With grit and MSP Science, there was also a moderate, positive correlation. Increases in grit levels were correlated with increases in MSP Science. Specifically, $r = 0.332$, $n = 283$, $p = 0.000$ ($p < .01$).

Finally, the results for Research Question 4, which observed the correlation between GPA, Total Absences, and the state test scores (ELA, Math, and Science), found both positive and negative associations, as well as varied strengths of associations between the variables. There was a strong, positive association between SBA ELA and SBA Math (.779), between SBA ELA and MSP Science (.766), and between SBA Math and MSP Science (.760). GPA had a

strong, positive association with all three test scores, SBA ELA (.603), SBA Math (.621), and MSP Science (.573). All variables had a negative association with Total Absences, but most at the small level. When testing with Total Absences, SBA ELA (-.194), SBA Math (-.245), and MSP Science (-.193) all had a small, negative association, while GPA (-.342) had a moderate, negative association with Total Absences.

Discussion

This study's focus was to determine the association between grit and data sets that would point to academic success in ninth-grade students. With prior research substantiating grit as a strong indicator of success, the researcher chose to specifically look at grit in students in the first year of high-school. The discussion here follows the order of the four main questions that guided the work in this study. The first question sought to determine the correlation between grit and GPA. Overall, there was a moderate, positive correlation between grit levels and first-semester GPA ($r = 0.364$). Increases in grit levels were correlated with increases in first-semester GPA. Prior research has made connections between grit and U.S. Military cadet success, college students staying in school longer and showing to have more academic success, and even Spelling Bee participants having greater degrees of success in competitions (Duckworth et al., 2007). The positive association between Grit and GPA, while only moderate, supports such prior findings and shares similar results with this population specific to the ninth-grade. If a student has a higher level of grit, it can be assumed that the student has a moderately better chance of having a higher GPA. A student's GPA tends to be the main representation of how that student has done in school. While there are debates about what grades actually mean and how some teachers are not consistent in grading practices, a student's GPA is still looked at as perhaps the top indicator

of the level of school success being found by that student. The results here indicate that a student with a higher level of grit is going to also have a higher GPA, therefore, this concept of instilling grit in students proves to have merit and needs to be looked at closely.

The second question set out to determine the correlation between grit and student total absences. Overall, there was a small, negative correlation between grit levels and first-semester total absences (r = -0.125). Increases in grit levels were correlated with decreases in first-semester total absences, but that correlation was deemed to be small. If students are not at school, research shows that overall performance in school decreases (Reed & Spicer, 2003; Ruzek, 2012; Sandoval, 2018). Students who are absent miss presented lessons, key concepts, fall behind in understanding, and can even create long-lasting learning gaps. Low attendance is often looked at as an at-risk behavior by educators due to its cyclical negative impact to students. Self-esteem can be impacted due to lower grades and the learning gaps created by students who miss a lot of school (Reed & Spicer, 2003; Ruzek, 2012; Sandoval, 2018). Attendance was used in this study because, generally, higher achieving students seem to have healthier attendance patterns, or at least that is an assumption for those working in schools. Surprisingly, the correlation between grit and total absences was small, meaning that there was a minimum negative association between the two variables.

The third question compared the three test scores (SBA ELA, SBA Math, and MSP Science) to grit to determine specific strengths of association. With research making clear connections between grit and student achievement in prior studies (Duckworth et al., 2007), results from this question furthered such associations. Duckworth and her team did extensive work connecting grit and success with Military cadets, college age students, Spelling Bee participants, and even conducted related research with married couples and those finding success

in the work force (Duckworth et al., 2007). When comparing grit to SBA ELA, there was a moderate, positive correlation (r = 0.361). Increases in grit levels were correlated with increases in SBA ELA scores. When comparing grit to SBA Math, there was also a moderate, positive correlation (r = 0.338). Increases in grit levels were correlated with increases in SBA Math scores and the same can be said for Science test scores. When comparing grit to MSP Science scores, there was also a moderate, positive correlation (r = 0.332). Increases in grit levels were correlated with increases in MSP Science scores. While these positive associations could be expected, based on results from prior research, the researcher was surprised that grit was not associated with any of the test scores at a stronger level. However, these results still point to a healthy association between grit and the three test scores that are used as academic indicators, especially in today's high-stakes testing environment. Again, the results here indicate that a student with a higher level of grit is going to find greater success on state standardized tests, giving even more merit to educators paying close attention to grit.

The final research question sought to determine the correlations between GPA, Total Absences, and the three test scores (SBA ELA, SBA Math, and MSP Science), running each possible pair through a Pearson's correlation test. These results showed the strongest associations and perhaps give educators the most helpful information on how to best connect such variables when making curricular related decisions in schools. The main intent of this study was to make connections to grit, but this final research question left grit out of the equation. Overall, there was a strong, positive correlation between SBA ELA test scores and the SBA Math test scores (*r* = 0.778). Increases in SBA ELA test scores were correlated with increases in MSP Math test scores. When looking at MSP Science test scores and the SBA ELA test scores, overall there was a strong, positive correlation (*r* = 0.766). Increases in MSP Science test scores were correlated

with increases in SBA ELA test scores. With MSP Science test scores and the SBA Math test scores, there was also a strong, positive correlation ($r = 0.752$). Increases in MSP Science test scores were correlated with increases in SBA Math test scores. The researcher works directly with students taking these tests and has seen very clear connections between success on one test leading to success on another, and also witnessing that students who struggle with one of these tests also struggles on another. The strong association between these three standardized test scores statistically show what many educators already believed. Students who find success in one of these areas typically find success in all, and vice versa. The strong *r*-values for each combination between the SBA ELA, SBA Math, and MSP Science were encouraging and can be used to deepen understanding of the association between these standardized tests. While construction of these tests seems to change every few years and their merit is argued between policy-makers, they are still important predictors of student success and the more educators know about associations between the tests, the more educators can support students in their schools.

Also, within the final question, GPA was compared to the three standardized test scores and Total Absences. Overall, there was a strong, positive correlation between GPA and the SBA ELA test scores ($r = 0.603$), GPA and SBA Math test scores ($r = 0.621$), and GPA and MSP Science test scores ($r = 0.573$). Respectively, increases in GPA were correlated with increases in SBA ELA test scores, increases in GPA were correlated with increases in SBA Math test scores, and increases in GPA were correlated with increases in MSP Science test scores. These strong correlations were also encouraging to the researcher. Again, the researcher works with ninth-grade students and experience has been that test scores are indeed tied to overall GPA, but now that assumption is quantified with the Pearson's correlation tests for these ninth-grade students.

When GPA was correlated with Total Absences, the association was not as strong. Overall, there was a moderate, negative correlation between GPA and Total Absences (r = -0.342). Increases in GPA were correlated with decreases in Total Absences. Initially, the researcher thought the association between these two variables would be stronger because experience has shown that students who do not have healthy attendance tend to be some of the most struggling students in a school. However, as scores were being inputted within this study, it was becoming clear that many students with higher number of absences were still finding academic success. This could be attributed to a number of factors such as the use of online communication tools between school and home that help absent students stay connected and know what work has been missed make-up and re-take policies that allow students to catch-up more quickly, or perhaps even the make-up of each student in the study, with some having qualities that allow them to overcome a larger number of absences.

The final associations made within question four all had to do with Total Absences, and all pair combinations found negative associations. When looking at Total Absences and SBA ELA, there was a small, negative correlation between Total Absences and SBA ELA test scores (r = -0.194). Increases in Total Absences were correlated with decreases in SBA ELA test scores. Total Absences and SBA Math also discovered a small, negative association (r = -0.245), with increases in Total Absences being correlated with decreases in SBA Math test scores. Finally, when comparing Total Absences and MSP Science test scores, there was also a small, negative correlation (-.193). Increases in Total Absences were correlated with decreases in MSP Science test scores. As the researcher computed results through Pearson's correlation tests, it became clear that Total Absences was proving to be associated consistently at a smaller strength than some of the other variable combinations. As mentioned above, this could be attributed to many

factors, including, but not limited to, online resources for students, grading policies, and characteristics of each student.

Implications for Professional Practice

So, how can professional educators be impacted by the findings of this study? First, this work adds to the growing body of research that points to the importance of grit. Studying grit in ninth-grade students was limited in a review of the literature related to prior research, so this research brings that specific population more into the conversation. While the strength of association between grit and GPA was found only to be at the moderate level in this study, and the association between grit and total absences even less strong, a moderate association is still one to pay attention to. If possessing grit increases a student's chances of success at the beginning of high-school, then educators should work to: 1) take the time to determine grit levels in students, 2) teach grit to those who need it, or at least teach aspects of grit that can build long-term determination and perseverance, and 3) look for lessons, strategies, and materials that help build the characteristic of grit in students. One such resource example is the Brainology Program that was originally created by Dweck and can now be found on the comprehensive *mindsetworks* webpage that shares resources for schools, teachers, and parents. Another resource is the *Character Lab* resources created by Duckworth, which speaks to teaching specific characteristics such as grit, curiosity, and self-control. Having students learn about how the brain works has supported increased student achievement (Dweck, 2008; Kristjansson & Tashijan, 2016), so that practice is another practical step educators can take to help their students. This study reported increases in grit were associated with increases in GPA and to a lesser extent, increases in grit were associated with decreases in Total Absences. GPA and Total Absences are regularly looked

at as key indicators for success at school. If these connections can be made, then grit should be getting significant attention in the school setting.

Another practical implication for professional practice would be related to the results in associations between grit and specific standardized test scores. The strength of association between grit and SBA ELA, SBA Math, and SBA Science test scores was at the moderate level. Such associations should be considered while working to influence next-steps in professional practices. Teachers should know about non-cognitive characteristics, like grit, and the related research connecting those characteristics to student achievement. This seems like a practical place to serve as a foundation for staff professional development. Schools across the country are held accountable to state test scores. There is much debate about the validity and impact of such high-stakes testing, but it is a current reality that educators need to deal with. Schools work toward ongoing increased test scores and closing the achievement gap for underrepresented groups within their own population. If grit is related to improving test scores, then such non-cognitive characteristics should be instilled in students who need it. Research specifically points to the importance of the non-cognitive characteristics of grit, perseverance, and motivation in at-risk students (Bava & Tapert, 2010; McWilliams, 2014; Ruzik, 2012). Those at-risk students have the greatest need for grit to help them overcome the challenges in their lives. If all school systems continue to do is focus on students' academic skills, this will not bridge this gap. A whole-child approach is needed all the way through high-school. Students are going through vast developmental changes during the adolescent years and educators can be of immense support during that time. Based on the research found in the literature review of this study, educators should continue to emphasize the importance of grit, along with motivation, teacher-student relationships, and growth mindset, as curricular decisions are made.

Throughout this study, the importance of the ninth-grade year was cited. Whether students are sitting in a high-school building or in a junior-high setting, as in this study, research is showing the freshman year to be vital for success throughout high-school (Bowers et al., 2013; Burrus & Roberts, 2012; McWilliams, 2014; Ruzik, 2012). While not specifically a result shown in the data of this study, the importance of the ninth-grade year highlighted within the literature review should not be overlooked. This study does add to the understanding of adolescent students and how schools can best support those students. Educators need to pay attention to the transition of students between levels, creating supports as students move from the elementary level to the mid-level, then again from the mid-level on to the high-school level. Helping students understand the new structure they are walking into can make a significant difference in that transition. The importance of supporting students during key educational transitions was highlighted in the literature review. When educators put purposeful thought to helping students during these transitions, with specific plans, activities, and communication, then fewer students fall through the cracks. What are the new rules? How do students best navigate the school and school system? What expectations will change during this transition? How do students get involved, ask for help, communicate with teachers, or use new e-tools? Knowing the importance of the ninth-grade year, and how to best support students during that transitional time, is also something educators should take away from this study.

Finally, the strongest associations in this study came in the comparison of all the academic indicators to one another, not including grit. When associating the three test scores to one another, as well as associating those to GPA and Total Absences, strong associations resulted when comparing GPA to SBA ELA, GPA to SBA Math, GPA to MSP Science, SBA ELA to SBA Math, SBA ELA to MSP Science, and SBA Math to MSP Science (Table 11). The

GPA associations appear to validate what most educators already believe, that a cumulative numerical representation of a student's body of work in high-school should correlate with how that student performs on standardized test scores. If grades are a true representation of learned skills and the tests are a true assessment of the content and skills that were to be taught and learned, then there should be a strong correlation. However, it is fair to say that few districts are to a point to where it could be said that grades are purely tied to the standards that are expected to be learned. While the related data in this study is encouraging in this area, it may spark more questions than answers. What do grades really represent in each district? Do teachers know and teach to specific grade-level subject-matter standards with fidelity? Does the district grading policy hold teachers accountable to standards-based grading? What are district expectations on missing work, re-assessments, and grading soft-skills or employment skills? Do teachers or districts believe that standardized tests are assessing the right standards? While many districts still need to tackle those questions, and others, the associations between the variables mentioned here, and the strong strength of those related associations between those variables, add support and data to such discussions.

To succinctly reiterate recommendations here to professionals, policymakers, and other stakeholders, the results in this study indicate: 1) grit having a moderate association with GPA, therefore acknowledging the importance of grit in academic success, 2) the ninth-grade year being an extremely important one for students and there is a need for educators need to pay special attention to helping students find success at this grade level, 3) grit having a moderate association with state standardized test scores, meaning educators can anticipate increased test scores with increased levels of grit, 4) when removing grit from the equation, several other variables have strong associations with one another and educators can benefit by understanding

those associations, and finally, 5) how grit should become more of a focus in school curricula. Students at all grade levels should be given opportunities to learn more about grit and to instill aspects of grit in themselves, as guided by their teachers.

Recommendations for Further Research

While this study provides more depth into the understanding of grit and how it is associated with student achievement, it also leads to areas of interest that need to be explored that are outside the scope of this study. The three main areas that need further illumination, for this researcher, are: 1) the idea of how to teach grit, 2) investigating districts that are teaching grit and looking at related results, and 3) how the results of this study may have been different had there been a larger or different population.

The literature review used in this study was a preliminary review of how and when grit is taught. Much of the research in the literature review pointed to aspects of grit, like perseverance and motivation, being easier topics to be taught than grit itself. This study looked at whether grit was associated with academic success indicators, but a more thorough study is needed on how to teach grit in the school setting. Success stories of teaching grit need to be researched and specific materials and lessons need to be discovered. Time would be a major factor for most teachers when asked to include grit in what is being taught in the classroom. Teachers already feel like there is too much to teach in the time given, so teaching grit would most likely be seen as an add on. Advisory and other non-traditional class times could be used for teaching grit. Dweck's *mindsetworks* is a starting point for such a study. Another resource could be the *Character Lab* online resources by Duckworth.

Another professional next-step would be a study on districts that are already teaching grit. Grit has been studied for years now, with positive results showing connections to success, both in and out of school settings. There are districts already moving on making grit part of the standard curriculum. Data could be collected on the effectiveness of this work. Interviews could take place that speak to implementation, recommendations, attitudes, lessons-learned, and materials. Teacher collaboration is one of the profession's greatest strengths and technology has made it easier and more convenient. This collaboration needs to happen in the area of teaching non-cognitive characteristics and the importance of instilling grit in students. These pioneer districts could help other districts effectively include the teaching of grit and other non-cognitive characteristics as part of the curriculum. Such a future study could serve as a roadmap for needed changes.

One of the limitations of this study was which participants were included. While all students were welcome to participate, only those who returned the consent form were part of the 283 students in the study. It is possible that more organized students returned their consent forms or that students with more support at home returned their consent forms. Was a true representation presented in this study of the ninth-grade students in this district? Did some teachers work harder to get more consent forms back? Why was one school over-represented? Students who returned consent forms had higher-than-average test scores. Does this mean they also had higher than average grit scores? Was a section of the student population left out because of barriers or a lack of motivation in returning the consent form? More research should be done specifically looking at the ninth-grade year and how grit is associated with academic success to deepen understanding of related associations. Further steps should be taken to ensure a true representation of the student population is included.

Specific to this study, some aspects of grit such as goal-setting, perseverance, or motivation could be further investigated in future studies. Would classroom-based assessments be a better academic achievement indicator than state assessments? Would looking at failing grades be a stronger association to grit than GPA? The 12-point Grit Scale can be broken down to two smaller categories: Self-Control and Conscientiousness. A future study could look more closely at these two aspects of grit to achieve more detailed results. Much of the research that points to teaching grit speaks to teaching to specific parts within grit, like motivation or the ability to attend to a task. If the two Grit Scale parts, Self-Control and Conscientiousness, were used in a future study, perhaps more helpful next-steps in teaching to these parts of grit could be offered. Similarly, studies could take place on several of those related aspects of grit that have been mentioned to continue to shed light on these topics. A mirrored study could be done on perseverance, motivation, the importance of one's mindset, the power of teacher-student relationships, or goal-setting, to name a few.

There are a few follow-up studies that could be conducted to help add clarity to the results of this study. Outliers were discovered in the Total Absences data. The researcher chose to use a Winsoring technique to deal with and include those outliers in the data. How might results be different if the outliers were excluded or kept in the initial form? Also, in looking at Total Absences, the strengths of association were generally small, negative associations. Research to help better understand how these six junior-high schools are combating potential negative impacts of higher absent counts in students could be investigated. Why students were absent and related grading policies were beyond the scope of this study. Finally, grit scores were a crucial variable in this study. Grit scores were generated by students self-reporting on a pen and paper survey. The researcher pointed out self-reporting is a possible limitation in this study.

Duckworth speaks to being cautious in how to use grit scores because of the participant's ability to fake a higher grit score and the idea of reference bias being present. Duckworth defines reference bias as the distortion that could be found in scores based on how people hold themselves to different standards by which behavior is judged (Duckworth, 2006). A further study could be done to minimize the potential for reference bias and further validate scores from the Grit Scale.

Summary of Study

The results of this study can provide insight to, and be helpful for, educators who work with ninth-grade students. The results can help educators better understand the importance of grit and perhaps guide practices toward the teaching of such characteristics. One of the many charges of educators should be the development and fostering of grit in all students, especially those who are coming to school without this important characteristic. Grit involves motivation, commitment, perseverance, a growth mindset, goal-setting skills, and a large number of other facets that we generally believe help people be more successful. In education, much work is put forth to align appropriate curriculum and improve test scores, and educators give great effort toward improving academic specific skills and closing achievement gaps. Educators also work to be data-driven and use researched-based best-practices. Why, then, would educators not pay attention to such research to help improve the child as a whole and set students up for success in all areas of life by adding grit to the equation?

This study examined a small sample population of ninth-grade students in a suburban district in Washington State. Students took a survey that self-reported a grit score. That grit score

was compared to the first-semester GPA and first-semester Total Absences of those same students, and the grit score was also compared to state standardized test scores taken in the spring of the eighth-grade year of those students. A Pearson correlation test was run on each set of variables to determine the strength of any association between the variables. Also, the five variables other than grit were compared to one another to determine strengths of association. Associations were made in all cases. Some stronger than others, but important associations none-the-less. Results of this study offer potential improvements in instructional practices across all grade levels. It is the hope of the researcher that this study adds to the depth of research on grit and its association with students' academic success in schools.

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Appendix A

Site Approval Letter
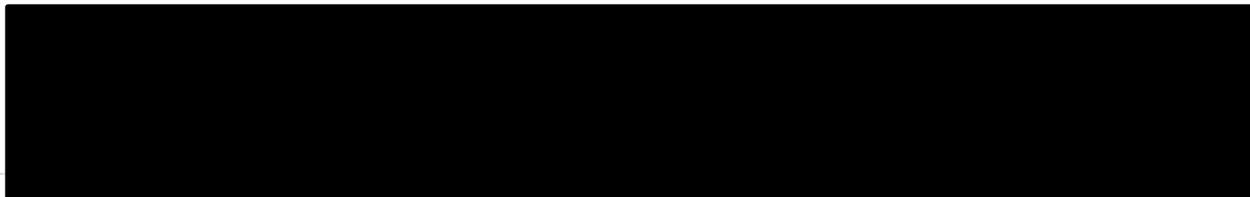
April 19, 2017

Dr. Heidi Curtis
Northwest Nazarene University
623 S. University Blvd
Nampa, ID 83686

Re: Research Authorization for Guy Kovacs

To Whom It May Concern,

Guy Kovacs has been granted permission to conduct dissertation research in the ████ School District. Administration of the ████ School District have reviewed Mr. Kovac's proposal, *A Quantitative Study Investigating the Critical Ninth-Grade Year and How Grit Influences Student Academic Success,* including proposed research methods (both qualitative and quantitative methods), subjects, data and collection procedures, and data analysis.

This site authorization is offered with the following stipulations:
- Research is to be conducted between Summer/2017 and April/2018
- Participation by ████ School District employees in the research study is voluntary
- The school district will receive a copy of the research study results and/or dissertation

I support this effort and will provide assistance for the successful research implementation of the proposed study. If you have any questions, please call me at (253)841-1301.
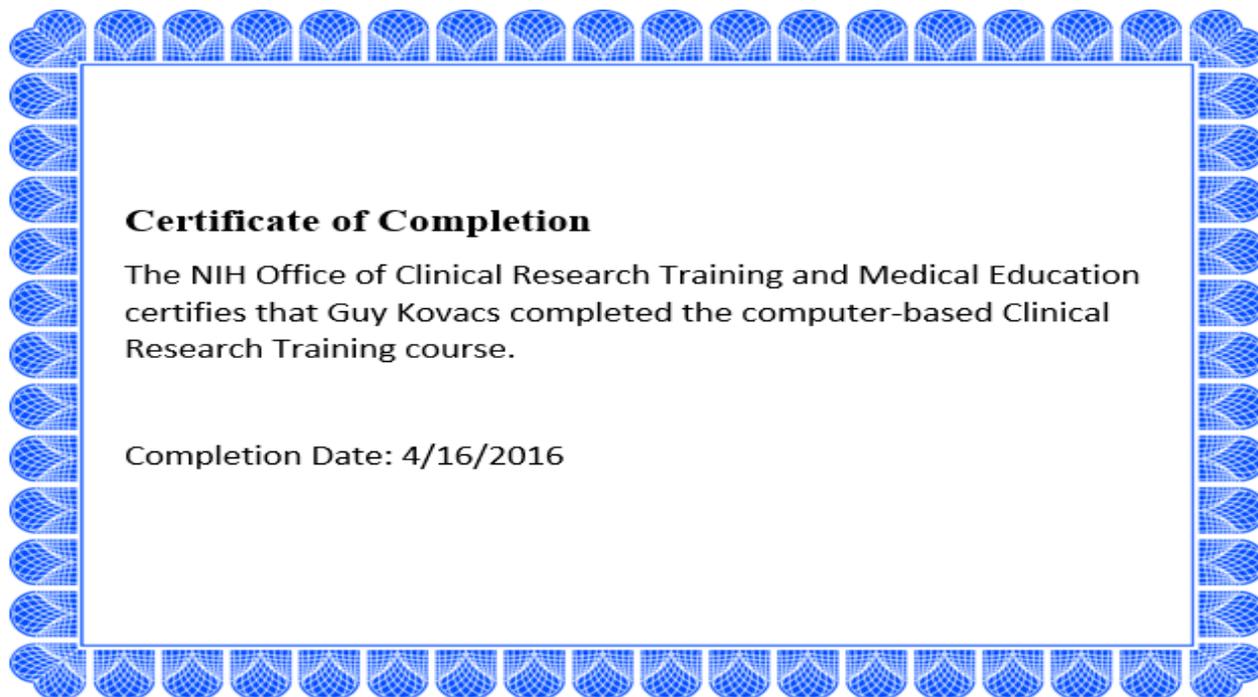
Sincerely,

████████████████

Chief Assessment and Accountability Officer

Appendix B

NIH Certificate

THE NORTHWEST NAZARENE UNIVERSITY HUMAN RESEARCH REVIEW
COMMITTEE HAS REVIEWED THIS PROJECT FOR THE PROTECTION OF HUMAN
PARTICIPANTS IN RESEARCH.

Certificate of Completion

The NIH Office of Clinical Research Training and Medical Education
certifies that Guy Kovacs completed the computer-based Clinical
Research Training course.

Completion Date: 4/16/2016

Northwest Nazarene University hrrc@nnu.edu via email.submittable.com

Dear Guy,

The HRRC has reviewed your protocol: Protocol #1052017 - A QUANTITATIVE STUDY
INVESTIGATING THE CRITICAL NINTH-GRADE YEAR AND HOW GRIT INFLUENCES
STUDENT ACADEMIC SUCCESS. You received "Full Approval". Congratulations, you may
begin your research. If you have any questions, let me know.

Northwest Nazarene University
Kimberly Lowe
HRRC Member
623 S University Blvd
Nampa, ID 83686

You can go here to view the submission:
https://nnu.submittable.com/user/submissions/7763320

Appendix C

Consent of a Minor

This year, I have the opportunity to conduct a research study with your child and his/her high school classmates as part of my doctoral program at Northwest Nazarene University. The study has been reviewed by the Research Review Committee at Northwest Nazarene and has been successfully approved and has gone through the PSD approval process as well.

I authorize Guy A. Kovacs of the Educational Department, Northwest Nazarene University, Nampa, ID, and/or any designated research assistants to gather information from my child on the topic grit through a short 12 question survey. I understand that the general purposes of the research are to further the understanding of the topic of grit and how it may serve as a predictor for academic success and to also help educators help students by learning more about this topic. I understand that my child's participation will involve: completing the 12-point Grit-scale (Duckworth, et al., 2007) at my child's school. The approximate total time of my child's involvement on the survey will be 10 minutes. The procedures are as follows:

- Data will be collected from student surveys during the 2017-2018 school year.
- Students specifically will take the 12-point Grit-scale (Duckworth, et al., 2007) in a class during the school day. Total time needed for completion will be approximately 10 minutes. This time includes passing out materials and giving directions.
- Student attendance, GPA, and achievement data will be used to compare to grit levels, but no student's name will be shared.
- The researcher worked to get a random sample of current ninth-grade students in the PSD.
- Parents/Guardians may ask to see the 12-point Grit-scale at any time.
- The school/PSD is neither conducting nor sponsoring the project.

My child and I have been assured that my child may refuse to participate due to any discomfort, any perception of unwanted invasion of privacy, or for any other reason that the parent or the minor present. I understand that my child's participation is voluntary and that my child may refuse to participate or discontinue participation at any time without penalty or loss of benefits to which my child may be otherwise entitled. This study is unlikely to cause my child

distress. However, I understand that if, after participation, my child experiences any undue anxiety or stress or has questions about the research or his/her rights as a participant that may have been provoked by the experience, Guy A. Kovacs will be available for consultation and related advice. It is understood that Guy A. Kovacs will put safeguards are in place to eliminate risk to all the participants of this study. No data collected will become part of any child's record.

The benefits that may result from the research are: improvement in the understanding of how grit may influence student achievement and how educators may best support students, especially at the ninth-grade level. I understand that confidentiality of research results will be maintained by the researcher. No individual results will be released without my written consent as the parent or guardian of the child involved as a participant in this study. Again, I authorize my child to participate in the 12-point Grit-scale as it pertains to Guy A. Kovacs and his research on this study entitled "A Quantitative Study Investigating the Critical Ninth-Grade Year and How Grit Influences Student Academic Success".

I have read this form. I understand its contents and voluntarily agree to let my child participate in this study as follows:

(please circle one)

Yes _____ may participate in this study.

No _____ may NOT participate in this study

Child's printed name: _____

Parent/Guardian printed name: _____

Parent/Guardian Signature: _____

Date: _____

There are two copies of this consent form included. Please sign one and return it to the researcher. The other copy you may keep for your records. Questions and comments may be addressed to Guy A. Kovacs or Dr. Sanchez, Northwest Nazarene University, 623 S. University Blvd., Nampa, ID, 83686, Phone (208) (467-8457).

Duckworth, A.L., Peterson, C., Matthews, M.D., & Kelly, D.R. (2007). Personality processes and individual differences Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology*, *92*(6), 1087-1101.

Appendix D

Email Recruitment Letter for Classroom Teachers

Dear _____: Date: April 16, 2016

My name is Guy A. Kovacs and I am a doctoral student from Northwest Nazarene University. I am conducting a research study for my dissertation titled "A QUANTITATIVE STUDY INVESTIGATING THE CRITICAL NINTH-GRADE YEAR AND HOW GRIT INFLUENCES STUDENT ACADEMIC SUCCESS".

The purpose of this email is to solicit your support and participation in this study. The study will allow me to share fundamental knowledge about grit and this non-cognitive characteristic's association with student achievement levels. My goal for teachers is to simply help me when I come to your school to have students do a brief survey. I am also asking student participants to complete the Grit Scale. Total participation in the survey will take approximately 15 minutes, with the Grit Scale itself taking about 5 minutes, but also giving time for directions, questions, and passing out and collecting materials. Findings of the study will be shared with your principal upon completion of the study. Your participation in this research is voluntary. If you decide to participate in the study, you may withdraw your consent and stop participation at any time without penalty.

The information from the surveys will remain anonymous and any input cannot connect to your students in any way. The data will only be analyzed by me. There will be no direct compensation for your time. Your input is extremely valuable, and your participation would be greatly appreciated. By participating in this study, there are no known risks. It is not possible to identify all potential risks in research procedures, but I have taken reasonable safeguards to minimize any known and potential, but unknown, risks. I have worked closely with your principal and the superintendent's designee on this study. If willing to help with this study, please respond to the email at gkovacs@nnu.edu and provide the best location for me to send you the Grit Scale for you to view in advance. Thank you for your consideration.

Guy A. Kovacs

Doctoral Student - Northwest Nazarene University

Appendix E

12- Item Grit Scale with Scoring Guide

Directions for taking the Grit Scale: Please respond to the following 12 items. Be honest – there are no right or wrong answers!

1. I have overcome setbacks to conquer an important challenge.
- ❑ Very much like me
- ❑ Mostly like me
- ❑ Somewhat like me
- ❑ Not much like me
- ❑ Not like me at all

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

3. My interests change from year to year.*
- ❑ Very much like me
- ❑ Mostly like me
- ❑ Somewhat like me
- ❑ Not much like me
- ❑ Not like me at all

4. Setbacks don't discourage me.
- ❑ Very much like me
- ❑ Mostly like me
- ❑ Somewhat like me
- ❑ Not much like me
- ❑ Not like me at all

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

6. I am a hard worker.
- ❑ Very much like me
- ❑ Mostly like me
- ❑ Somewhat like me
- ❑ Not much like me
- ❑ Not like me at all

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

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

9. I finish whatever I begin.
- ❏ Very much like me
- ❏ Mostly like me
- ❏ Somewhat like me
- ❏ Not much like me
- ❏ Not like me at all

10. I have achieved a goal that took years of work.
- ❏ Very much like me
- ❏ Mostly like me
- ❏ Somewhat like me
- ❏ Not much like me
- ❏ Not like me at all

11. I become interested in new pursuits every few months.*
- ❏ Very much like me
- ❏ Mostly like me
- ❏ Somewhat like me
- ❏ Not much like me
- ❏ Not like me at all

12. I am diligent.
- ❏ Very much like me
- ❏ Mostly like me
- ❏ Somewhat like me
- ❏ Not much like me
- ❏ Not like me at all

12- Item Grit Scale - Scoring Guide for Researcher Only (Scoring)
1. For questions 1, 4, 6, 9, 10 and 12 assign the following points:

5 = Very much like me
4 = Mostly like me
3 = Somewhat like me
2 = Not much like me
1 = Not like me at all
2. For questions 2, 3, 5, 7, 8 and 11 assign the following points:

1 = Very much like me
2 = Mostly like me
3 = Somewhat like me
4 = Not much like me
5 = Not like me at all

Add up all the points and divide by 12. The maximum score on this scale is 5 (extremely gritty), and the lowest scale on this scale is 1 (not at all gritty).

Duckworth, A.L., Peterson, C., Matthews, M.D., & Kelly, D.R. (2007). Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology, 9*, 1087- 1101.

Appendix F

Permission from Angela Duckworth to use the 12-Point Grit-scale

Hi Guy,

As detailed here, http://angeladuckworth.com/research/, the Grit Scale can be used for educational or research purposes. However, it cannot be used for any commercial purpose, nor can it be reproduced in any publication. You are free to use it in your research as long as you follow these guidelines.

Note that we discourage using he scale to evaluate students or employees. As Angela discusses in this paper and this Q&A and this op-ed, the scale is not ready for high-stakes assessment; it is ready for research and internal use.

Thanks for all the work you do!

Best,
Duckworth Team

Research My research focuses on two traits that predict achievement: grit and self-control. Grit is the tendency to sustain interest in and effort toward very long-term goals (Duckworth et al., 2007). Self-control is the voluntary regulation of impulses in the presence of momentarily gratifying temptations (Duckworth & Seligman, 2005; Duckworth & Steinberg, 2015). On average, individuals who are gritty are more self-controlled, but the correlation between these two traits is not perfect: Some individuals are paragons of grit but not self-control, and some exceptionally well-regulated individuals are not especially gritty (Duckworth & Gross, 2014).

Measures Researchers and educators are welcome to use the scales I have developed for non-commercial purposes.

On a cautionary note, these scales were originally designed to assess individual differences rather than subtle within-individual changes in behavior over time. Thus, it's uncertain whether they are valid indicators of pre- to post-change as a consequence of interventions. I also discourage the use of these scales in high-stakes settings where faking is a concern (e.g., admissions or hiring decisions). Please see the article Measurement Matters for more information.

These scales are copyrighted. They cannot be published or used for commercial purposes or wide public distribution. Therefore, journalists and book authors should not reproduce these scales nor any part of them.

Appendix G
Assent for Students

A. Purpose and Background

Students – you are about to take a quick survey to help with a study being done by me (Guy A. Kovacs), a doctoral student in Educational Leadership at Northwest Nazarene University. Please take this survey seriously, as the information from this study will help educators in the future. I am conducting a research study related to the importance of the ninth-grade year in school and how grit may be tied to academic achievement. You are being asked to participate in this study because you are a potential volunteer within the grade levels needed for the research.

B. Procedures

If you agree to be in the study, the following will occur:

1. Your parents will have given written permission for you to do so.
2. By participating further at this point, you are giving your own permission to participate. We call this minor assent. You may also choose not to participate at all, you may choose to not answer certain questions, or you choose to stop participating at any time after starting the survey.
3. You will be asked to complete a short, 12 question survey and I will go over the directions and answer any questions before you start.

C. Risks/Discomforts

1. While not intentional, there is a chance that some of the survey questions may make you uncomfortable, but you are free to decline to answer any questions you do not wish to answer or to stop participation at any time.
2. For this research project, know that the researcher is requesting demographic, attendance, and achievement information, but your name will not be tied to any data within the research. In fact, your name will not be shared at all.
3. Participation in research may involve a loss of privacy; however, your records will be handled as confidentially as possible. No individual identities will be used in any reports or publications that may result from this study. Data is being coded, so names will not be

used. All data from surveys, and on the researcher's computer, will be kept in a locked office. In compliance with the Federalwide Assurance Code, data from this study will be kept for three years, after which all data from the study will be destroyed (45 CFR 46.117).

4. Only the primary researcher will be privy to data from this study.

D. Benefits

There will be no direct benefit to you from participating. However, the information provided may help educators and students better understand how grit is connected to achievement. Goals of the study include deeper research in this area and positively impacting student achievement.

E. Payments

There are no payments for participating in this study.

F. Questions

If you have questions or concerns about participating in this study, you should first talk with me. I can be contacted via email at gkovacs@nnu.edu, via telephone at 253-841-8729. If for some reason, you do not wish to do this, you may contact Dr. Lori W. Sanchez, Doctoral Committee Chair at Northwest Nazarene University, via email at lsanchez@nnu.edu, via telephone at 208-467-8457, or by writing: 623 university Drive Nampa, Idaho, 83686.

G. Consent

You will be given a copy of this consent form to keep. Participation in this research is voluntary. You are free to decline to be in this study, or to withdraw from it at any point. Your decision as to whether to participate in this study will have no influence on your present or future status as a student at your school.

At this point, if you proceed, you are giving assent to participate. The 12-poing Grit-scale will be distributed. If you would not like to participate, just let me know as I come around. Thank you for considering to be a part of this study.