

**The Relationship Between Student Resiliency and Student Achievement in  
Upper Elementary Students**


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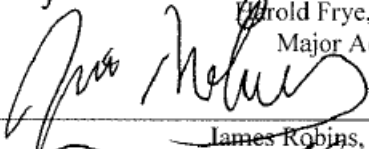
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## **Abstract**

The purpose of this research was to examine the relationship between fifth and sixth grade students' self-reported levels of resiliency, as measured by grit scores, and their performance on the communication arts MAP assessment. An additional purpose of this study was to determine whether the relationship between fifth and sixth grade students' grit scores and student achievement, as measured by MAP, was affected by student gender, minority/non-minority status, or lunch pay status. The sample for this study was comprised of fifth and sixth grade students in District C. The sample of students included only those fifth and sixth grade students who were enrolled in the school district for the entire 2016-2017 school year, participated in the testing, and completed the survey.

Statistically significant relationships were found between students' self-reported grit scores and their achievement on the communication arts MAP assessment. Gender data was disaggregated and further testing indicated that a statistically significant relationship between both male and female students' grit scores and MAP scores existed. Additionally, the minority and non-minority status was a variable tested within the study. The correlation for both minority and non-minority students revealed a marginally significant relationship between students' grit scores and MAP scores. For the final variable tested, lunch pay status, a statistically significant relationship was found between free/reduced pay and full pay students' grit scores and MAP scores.

In addition to academic interventions for all students, educators can use available resources to teach and build resiliency in students at every level of the educational

system. The results from this study indicate that time spent focusing on non-cognitive attributes, including resiliency, has the potential to raise achievement scores in students.

## **Dedication**

This dissertation is dedicated to my father-in-law, Robert Bruce Steward, and my wife, Faith Christine Davison. Robert Bruce was diagnosed with Multiple Sclerosis in 1969, and Faith Christine in 2012. I have personally witnessed the pain and suffering they have endured throughout their lifetimes...I have never known anyone more “grittier” than them.

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I have been blessed with a church family who seek to honor and glorify the Lord. Thank you to my brothers and sisters in Christ who have prayed for me and have given up their time to support my family. I could not have completed my coursework and dissertation without your love and support.

Finally, I have been blessed beyond measure with an incredible family. To my wife, Faith...words cannot express how important you have been throughout this work. You have encouraged me from beginning to end and never once did you complain. To my children, Chris, Emma, Nick, and Anna...thank you for your understanding, patience, and the sacrifices that you have made during this time. Without my family walking beside me every day, my coursework and dissertation would have never been completed.

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## Chapter 1

### Introduction

“In order to succeed, people need a sense of self-efficacy, to struggle together with resilience to meet the inevitable obstacles and inequities of life” (Bandura, 1977, p. 191). History is full of men, women, and children who have overcome obstacles through resilience to accomplish great things. The number of times Thomas Edison failed before discovering the correct material for his incandescent light bulb has been well documented. Rosa Parks, as she refused to leave her seat on the bus, displayed unmeasurable resiliency during this event and many others throughout her lifetime (Theoharis, 2015). Captain Howard Rutledge, a navy pilot who was shot down and captured during the Vietnam War, endured seven years of solitary confinement, starvation, and extreme torture at the hands of his captors (Rutledge, 1973). None of these people would have used the word “resilient” to describe themselves, however, the term describes each of them very well.

Thomas Edison, Rosa Parks, and Howard Rutledge are only a few examples of the thousands of people who have demonstrated the non-cognitive attribute of resiliency. The American Psychological Association describes resiliency as “the human ability to adapt in the face of tragedy, trauma, adversity, hardship, and ongoing significant life stressors” (Newman, 2005, p. 227). Ungar (2008) describes resiliency as the “capacity of individuals to navigate their way to health-sustaining resources, including opportunities to experience feelings of well-being, and a condition of the individual’s family, community and culture to provide these health resources and experiences in culturally meaningful ways” (p. 225). Researchers in the educational field, such as (Sagor, 1996),

have defined resiliency “as the set of attributes that provides people with the strength and fortitude to confront the overwhelming obstacles they are bound to face in life” (p. 38). Regardless of the definition, the term has gained an increased emphasis in American schools. Educators are searching for answers to serious academic deficiencies that have plagued every state in the country. Researchers are studying resiliency in academic settings with the hopes of providing educators with insight and interventions to ensure that all students succeed, regardless of their gender, ethnicity, or socioeconomic status.

### **Background**

The current study was conducted in District C, a large suburban school district located in Missouri. The student population of District C in 2016 was slightly fewer than 12,000 students, with nearly an equal proportion of females (56 %) to males (54%) (Missouri Department of Elementary and Secondary [DESE], 2017a). In this same year, District C had a homogenous population of students with 76% identified as Caucasian, 8% identified as Hispanic, and 7% identified as African-American (Missouri DESE, 2017a). This district included Pre-K to grade 12 and had an average student-to-teacher ratio of 18:1, with an average student-to-administrator of 243:1 during the 2016-2017 school year. (Missouri DESE, 2017a). In addition, over half of the schools in this district received supplemental federal funds (Title 1) and 62% of its students qualified for free or reduced lunch during the 2016-2017 school year (Missouri DESE, 2017a).

Every year, the Missouri DESE creates and distributes state and district report cards that indicates detailed information about the grade-level achievement assessments. In the state of Missouri, every elementary student in grades 3-6 is required to take the Missouri Assessment Program (MAP) in the content areas of communication arts and

mathematics (Missouri DESE, n.d.). The Missouri DESE, as well as many other stakeholders in education, have the expectation that all students score in the Proficient or Advanced categories of the MAP assessments. Below is a table that indicates the percentage of students who earned proficient or advanced scores on the communication arts MAP assessment in District C for the 2015-2016 school assessment years.

Table 1

*Percentage of Students Who Earned Proficient or Advanced on the Communication Arts MAP Assessment: SY 2015-2016*

Demographics	Assessment 2015	Assessment 2016
African-American	46.90	47.10
Hispanic	45.20	46.30
Caucasian	59.70	62.70
Free/Reduced Lunch	46.50	49.70

*Note.* Adapted from [REDACTED] *District Report Card*, by Missouri Department of Secondary and Elementary Education, (2017a). Retrieved from <https://mcds.dese.mo.gov/guidedinquiry/Pages/Accountability>

### **Statement of the Problem**

In 2011, the Missouri DESE launched their four-goal improvement plan for student achievement across the state. The first goal, relevant to this study, stated that “all Missouri students will graduate college and career ready” (Missouri DESE, 2017b, p.1).

The second objective under this goal stated:

The percentage of students scoring at or above the proficient level on state assessments will increase each year to meet or exceed the annual ‘on track’ MSIP targets for all students and subgroups, placing the

state on track to Top 10 performance by 2020 and the percentage of students scoring below basic will decrease by 1%. (Missouri DESE, 2017b, p. 1)

A review of historical student data over the last 10 years between 2005 and 2015 indicated that student achievement has not met the benchmark assessment standards set by the State of Missouri's *Top 10 by 20 Plan* (Missouri DESE, 2017b). The year that this research was conducted, Missouri did not meet the goal as a top performing state in the area of student achievement. As a result, educators across the state have been looking for new and innovative ideas to meet the needs of all students, including an increased focus on non-cognitive attributes. Duckworth and Quinn (2009) concluded after extensive research that the non-cognitive construct of resiliency, or grit, is a significant factor in student achievement. A self-report questionnaire, called the Short Grit Scale (Grit-S), was developed by Duckworth and Quinn (2009) to measure students' ability to persevere and develop long term goals for themselves. Based upon the claims by these authors, it was warranted to further investigate the impact that student resiliency had on student achievement in an elementary school setting.

### **Purpose of the Study**

The first purpose of this study was to examine the relationship between fifth and sixth grade students' self-reported levels of resiliency, as measured by grit scores, and their performance on the communication arts MAP assessment. The second purpose of this study was to determine whether the relationship between fifth and sixth grade students' grit scores and student achievement, as measured by MAP, was affected by student gender. Another purpose of this study was to determine whether the relationship

between fifth and sixth grade students' grit scores and student achievement, as measured by MAP, was affected by student minority/non-minority status. The last purpose of this study was to determine whether the relationship between fifth and sixth grade students' grit scores and student achievement, as measured by MAP, was affected by student lunch pay status.

### **Significance of the Study**

The results of this study provided building and district administrators with potential conclusions and applications drawn from evidence provided by the results of statistical analysis that provided information on the relationship between student resiliency and student achievement. This study provided information that can be used by district officials in determining the significant areas of focus in the non-cognitive attributes of the school educational programs. The results from this study also adds to the body of research used to advise professional development efforts for elementary teachers, counselors, and other staff members in the area of non-cognitive attributes.

### **Delimitations**

Delimitations are “self-imposed boundaries set by the researcher on the purpose and scope of the study” (Lunenburg & Irby, 2008, p.134). The following are delimitations for this study:

1. The content area for this study consisted of communication arts. The results of this study potentially cannot be generalized to other content areas.
2. Student achievement data were collected from grades five and six. The results of this study potentially cannot be generalized for all grade levels.

3. Student Grit scores were measured using a single survey, the 8-Item Grit Scale Child Adaptive Version 4, developed by Duckworth and Quinn (2009).
4. The researcher used student MAP data collected from the 2017 school year.

### **Assumptions**

Lunenburg and Irby (2008) defined assumptions as the “postulates, premises, and propositions that are accepted as operational for the purposes of the research” (p. 135).

This study was based on the following assumptions:

1. Students understood the questions on the grit scales and answered honestly to all survey questions.
2. Grit scores were calculated correctly and reported accurately.
3. Students performed to the best of their ability on all communication arts (MAP) sessions.
4. Student demographic data were downloaded from Google forms and collected accurately.
5. All MAP data retrieved from District C were complete and accurate.

### **Research Questions**

The current study investigated whether there was a relationship between fifth and sixth grade students’ self-reported levels of grit and their performance on the communication arts MAP test. The effect of gender, minority/non-minority status, and lunch pay status on the relationship between grit and achievement was also studied. Creswell (2013) stated research questions (RQ) “shape and specifically focus the purpose of the study” (p. 132). The following research questions were addressed in this study:

**RQ1.** To what extent is there a relationship between fifth and sixth grade



students' grit scores and students' MAP scores in communication arts?

**RQ2.** To what extent is the relationship between fifth and sixth grade students' grit scores and students' MAP scores in communication arts affected by student gender?

**RQ3.** To what extent is the relationship between fifth and sixth grade students' grit scores and students' MAP scores in communication arts affected by student minority/non-minority status.

**RQ4.** To what extent is the relationship between fifth and sixth grade students' grit scores and students' MAP scores in communication arts affected by student lunch pay status?

### **Definition of Terms**

This section provides definitions of terms used throughout the current study in order to prevent misunderstanding. Terms have been defined in the current study when clarity of language was needed for those outside the field of expertise (Creswell, 2013).

**At-Risk.** For this study, at-risk refers to students whose household income qualifies for free or reduced lunch assistance under the National School Lunch Program (U.S. Department of Agriculture, Food and Nutrition Service, 2016).

**Grit.** Grit is “perseverance and passion for long-term goals. Grit entails working strenuously toward challenges, maintaining effort and interest over years despite failure, adversity, and plateaus in progress” (Duckworth, Peterson, Matthews & Kelly, 2007, p. 1087-1088).

**Low Income.** Low-income includes the category of households below the 100% federal poverty threshold and the category between 110% and 199% of the federal poverty threshold (Jiang, Granja, & Koball, 2007).

**Lunch Pay Status.** For the purpose of this research, lunch pay status was subdivided into two categories: those students who received free or reduced lunches and those students who were required to pay the full amount for lunch.

**Missouri Assessment Program (MAP).** Developed by the Missouri Department of Secondary and Elementary Education, the MAP is a series of assessments administered in communication arts, mathematics, and science in grades three through eight. The MAP measures student proficiency on academic standards in Missouri. It is comprised of multiple item types, including selected response items, short text items, technology-enhanced items, and a writing prompt (Missouri DESE, 2016a).

**Title 1.** Federal assistance program that provides funding for K-12 education in school districts with high proportions of low income families (Leachman & Mai, 2014).

### **Organization of the Study**

This study was organized and presented in five chapters. Chapter 1 included the introduction and background information, as well as the statement of the problem, the purpose, and the significance of the study. The chapter also included the delimitations, assumptions, definition of terms, and research questions for the study. The second chapter presents relevant literature to this study. Chapter 2 includes information on the history of resilience and the demographic attributes that affect student achievement. Chapter 3 presents the methodology of the study in further detail. Chapter 4 presents the results of the study based upon the research questions in chapter 1. The concluding chapter, chapter 5, includes a study summary and findings related to the literature. The final section of chapter 5 includes the conclusion section, which consists of the implications for action, recommendations for future research, and concluding remarks.

## **Chapter 2**

### **Review of the Literature**

The purpose of this research was to examine the relationship between upper elementary students' self-reported levels of resiliency, as measured by grit scores, and their performance on the communication arts Missouri Assessment Program (MAP) test. An additional purpose of this study was to attempt to determine whether the relationship between students' grit scores and student achievement, as measured by MAP, was affected by student gender, minority/non-minority status, or lunch pay status. The relationship between these variables provides district and building administrators with a course of action around student resiliency and student achievement. Results from this study can be used by district officials in determining the significant areas of focus in the non-cognitive attributes of the school educational programs.

In this chapter, research was examined regarding five topics applicable to this study. First, research was explored around the history of the non-cognitive construct of resiliency. Secondly, research was presented regarding the effects of resiliency and reading. Next, research was examined regarding gender and achievement and also between minority/non-minority status and achievement. Finally, research was presented that examined the relationship between poverty and achievement.

#### **History of Resiliency**

“The idea of individual resilience in the face of diversity has been around for a very long time, as evidence in myths fairy tales, art, and literature that portray heroes and heroines who surmount great obstacles” (Campbell, 1970). The shelves within the walls of libraries, book stores, and universities are filled with millions of copies of literature

that are filled with men, women, and children who have overcome great obstacles. To these individuals, the obstacles before them were not permanent, but instead, simply a part in their life's journey. The systematic study of resiliency began during the mid-nineteenth century, beginning with the studies of children at risk for emotional disturbances (Lopez & Snyder, 2009). One of the prominent figures in the study of children and resiliency was John Bowlby. Following World War II, John Bowlby studied the effects of adversity suffered by small children who were being raised in state institutions (Scheper-Hughes, 2008). Following his research, Bowlby's concept of the "vulnerable child" was developed in part by the conclusions made from the effects of trauma suffered by children during separation, attachment, and loss (Scheper-Hughes, 2008). Building upon his work and other psychologists, Werner (1992) conducted a longitudinal study of 505 people on the island of Kauai, ranging from infants to young adults. The goal of this study was to observe the implications of children and adults living under adverse living conditions. In this study, Werner first used the term resiliency to describe children whose behavior was in stark contrast compared to "their high-risk peers of the same age and sex who had developed serious coping problems within the first two decades of life" (p.263). Following the research conducted by Dr. Werner, the term resiliency was widely used throughout the study of non-cognitive skills research. According to (Lopez & Snyder, 2009),

In the early publications on resilience and in the press about such phenomena, successful high-risk children were referred to variously as "invulnerable," stress-resistant, "or resilient." Eventually, "resilient" became the dominant descriptors for such individuals, and the domain of research was labeled the

study of resilience. (p. 118)

In current research of non-cognitive skills, such as resiliency, a new and synonymous term had become popular within the research field. A former high school math teacher and professor of psychology at the University of Pennsylvania, Angela Duckworth was intrigued by the possible connection between a person's effort and their success (Hanford, 2012). Duckworth, Peterson, Matthews, and Kelly (2004) conducted hundreds of interviews with prominent and successful professionals in the banking community, military, academia, medicine, and law with the goal to determine why some people with equal intelligence achieve at a higher standard. During the interviews, a common list of attributes among the professionals emerged: creativity, vigor, emotional intelligence, charisma, self-confidence emotional stability, physical attractiveness, and other positive qualities emerged, however, the one attribute that was common in all the high achieving professionals was grit (Duckworth et al., 2004). The researchers stated that,

Grit entails working together strenuously toward challenges, maintaining effort and interest over the years despite failure, adversity, and plateaus in progress. The gritty individual approaches achievement as a marathon; his or her advantage is stamina. Whereas disappointment or boredom signals to others that it is time to change trajectory and cut oneself out, the gritty individual stays the course. (Duckworth et al., 2004, p.1087)

Without finding an adequate measurement for the non-cognitive construct of grit, Duckworth et al. (2004) created and validated a self-report questionnaire for this purpose. This questionnaire, called the Grit Scale, had "its emphasis on focused effort and interest

over time, to have incremental predictive validity for high accomplishment over and beyond these other constructs" (Duckworth et al., 2004). Since the development of the Grit Scale, Duckworth has used it to study the relationship between resilience and achievement.

Using the grit scale, Duckworth and Quinn (2009) conducted a series of studies to determine if there was a link between grit and various forms of success. The first research sample was comprised of 1248 cadets from the US Military Academy, West Point. They concluded that a candidate's self-reported grit score was a more accurate predictor of the successful completion of a physically and mentally rigorous summer training program as compared to admission requirements determined by the Whole Candidate Index; SAT score, high school rank, activity involvement, and physical evaluation. Duckworth and Quinn (2009) concluded that "grittier West Point Cadets were less likely to drop out during their first summer of training" (p. 173). The next sample of participants for their studies were finalists in the Scripps National Spelling Bee. As expected by Duckworth and Quinn (2009) the "participants who scored 1 *SD* higher on the Grit-S than same-aged peers were 38% more likely to advance to further rounds" (p. 171-172). The final sample consisted of Ivy League undergraduate students and their cumulative GPAs along with the grit scale; the results of this study had similar conclusions as the spelling bee finalists and West Point Cadets. Adding to the body of research, Rojas, Reser, Usher, and Toland (2012) administered the grit scale to 2,426 students in grades 4-8. Following the completion of the grit scale, the student responses were analyzed with various achievement surveys and assessments. Key findings from this research indicated that "there is evidence for the reliability and validity of scores

from the grit scales among public school students” and “educational interventions to promote perseverance among students should be developed and tested” (Rojas et al. 2012, p. 1).

Research similar to the studies by Duckworth was conducted by Carol Dweck of Stanford University. Dweck studied academic successes and failures of students to determine a possible relationship between a belief in failure and lack of achievement (Hochanadel & Finamore, 2015). Hochanadel and Finamore (2015) stated that “Dweck’s studies were demonstrating that teaching young students how the brain is capable of change when faced with challenges helped them persevere and develop a growth mindset” (p. 48). Duckworth had made the connection between a growth mindset in students and their ability to develop grit (Hochanadel & Finamore, 2015).

Despite the advancements in research in the area of grit, few studies have been conducted to determine a relationship between grit and academic achievement. (Duckworth and Quinn, 2009; Rojas et al., 2012).

### **Resiliency and Reading Achievement**

Every two years, millions of students across the United States participate in the National Assessment of Educational Progress (NAEP). The NAEP is the largest nationally representative and continuing assessment of what students in the United States know and can do in various subjects (National Center for Education Statistics, 2016). The NAEP assessment is a common measure of achievement that is used to make comparisons between states and nations around the world (NCES, 2016). The information gathered from the latest NAEP assessment conducted in 2015 indicates that less than half of all fourth, eighth, and twelfth graders are proficient readers and are on

grade-level (National Center for Education Statistics [NCES], 2016). Below is a table of results for the NAEP assessment years 2003-2015.

Table 2

*Percentage of Students Scoring Proficient on the NAEP Assessment: SY 2003-2015*

Grade Level	2003	2005	2007	2009	2011	2013	2015
Fourth	31%	31%	33%	33%	34%	35%	36%
Eighth	32%	31%	31%	32%	34%	36%	34%
Twelve	No Test	35%	No Test	38%	No Test	38%	37%

*Note.* Adapted from *The condition of education 2016* (NCES Report #2016-144), by National Center for Education Statistics (2016). Retrieved from <https://eric.ed.gov/?id=ED565888>

In addition to low reading proficiently levels among school aged children, the Literacy Project Foundation (2016) reported that 85% of juvenile offenders have reading difficulties and 3 out of 5 incarcerated adults cannot read at an 8<sup>th</sup> grade level. These statistics, along with the NAEP assessment results, highlight the need to study variables that can potentially impact reading achievement across all settings, including student resiliency.

Educators and others interested in literacy have tried to determine the causes and links to reading deficiencies in children and young adults. Subsequently, these same researchers have tried to find solutions and interventions to increase student literacy. The greatest amount of research conducted to explain reading deficiencies in students is represented in medical research. Buttner and Hasselhorn (2011) said “the most common scientific approach to dealing with an unexpected poor performance in an academic domain is the aptitude-achievement discrepancy, with aptitude represented by general intelligence and specific performance in reading, written expression or mathematics



representing academic achievement” (p. 76). The latest definition of a specific learning disability comes from special education law, the Individuals with Disabilities Education Act (1975):

a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which disorder may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations.

Such term includes such conditions as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia.

Such term does not include a learning problem that is primarily the result of vision, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage. (U.S. Code, Title 20, Chapter 33, Subchapter I, § 1401)

The number of students who have been identified with a learning disability in the United States is significant. Nearly 2.4 million students (5% of the total population) have been identified with a specific learning disability, which is the largest category of students who receive special education services in public schools in the United States (Cortiella & Horowitz, 2014). Research studies have indicated that an equal number of males and females share the most common form of learning disability, which is difficulties in reading (Cortiella & Horowitz, 2014).

The presence of a learning disability has accounted for a large number of researchers and educators to focus their studies and attention to this area. The most commonly held belief is that a learning disability is caused by a “biologically-based

cognitive deficit or cognitive dysfunctions that hinder their adequate acquisition of fundamental skills” (Buttner & Hasselhorn, 2011, p. 78-79). Research studies support this claim (Landrel, Fussenegger, Moll, & Willburger, 2009; Swanson, Harris, & Graham, 2006; van der Sluis, van der Leij, & de Jong, 2005; Wong, Graham, Hoskyn, & Berman, 2011;), however, research remains unclear if learning disabilities are caused by biology or mere consequences (Buttner & Hasselhorn, 2001). It is clear that more research needs to be conducted in this area so that educators and those in the medical field can best develop interventions to assist families and students.

Another theory focuses on student motivation. Students who are not motivated to read will chose to spend their time with other activities. By contrast, those who are motivated and enjoy reading “are engaged, curious, and anxious to talk about what they are reading. They are able to read from several texts at the same time, look forward to new challenges, and value text and time to engage with print” (Marinak, Malloy, & Gambrell, 2010, p. 503). A term that researchers have closely associated with student motivation is self-efficacy; one’s perceived ability to complete a task (Bandura 1997). When self-efficacy and motivation are applied to literacy, students who identify themselves as skilled readers most likely value the reading process, and practice regularly out of enjoyment (Hedges & Gable, 2016). In contrast, Morgan, Fuchs, Compton, Cordray, and Fuchs (2008) concluded that when struggling readers are already behind their peers at the beginning of their educational career, they will remain behind unless successful interventions are put into place during early childhood programs. The implications for action as a result of research in the area of motivation is that educators should focus their instruction strategies on both reading skills and motivation (Morgan &

Fuchs, 2007). “Due to its ever-changing nature, motivation is a struggle all educators face, yet, there is no definitive approach or solution. Students’ needs and personalities continue to influence motivational tactics, and further exploration is required to meet these demands” (Hodges & Gable, 2016, p. 5).

Another area of research that has been debated over the years is the possible relationship between student achievement and physical fitness. This area of research has grown in popularity mainly due to the rise of obesity among children. Trends from 1999 to 2014 have shown a steady increase in childhood obesity, with a current percentage of 17.2% (Ogden, Carroll, Fryar, & Flegal, 2015). “Education and health professionals have intuitively believed that individuals who are physically active and fit perform better in school” (Castelli, Hillman, Buck, & Erwin, 2007, p. 240). Some studies have found a positive relationship between the two variables (Maynard, Coonan, Worsley, Dwyer, & Baghurst, 1987; Shephard, Lavalley, Volle, Labarre, & Beaucage, 1994; Shephard, Volle, LaValley, LaBarre, JeQuier, & Rajic, 1984). One study that researchers found a positive relationship between physical fitness and student achievement was conducted by Castelli, Hillman, Buck, and Erwin (2007). The sample population for the study consisted of 259 third and fourth graders in different elementary schools throughout one district. The students were measured by the series of fitness tests, including a pacer, push-ups, sit-ups, sit and reach, and their body mass index (BMI); the students were measured academically by state assessment. Castelli et al. (2007) concluded that “physical fitness is generally associated with academic performance in elementary school children,” but they also stated that “continued research is needed to gain a more causal understanding of the relationship between physical fitness and cognition in children” (p. 250). More research

is needed in this area of study because the conclusions are not consistent; some studies have found no correlation (Daley & Ryan, 2000; Dwyer, Coonan, Leitch, Hetzel, & Baghurst, 1983) and other research has shown a negative relationship between physical fitness and achievement (Tremblay, Inman, & Williams, 2000).

Researchers have not found one definite link between tested variables and reading achievement. Until one is found, researchers will continue to hypothesize and test theories. Researchers will exhaust all possibilities, including school start times, school dismissal times, teacher gender (Dupuis, 2015; Sokal, Katz, Chaszewski, & Wojcik, 2007) and other variables until a significant link has been made.

The research is clear that reading achievement is an important indicator for a student's future success. What continues to be unclear is a definitive answer to the causes of reading deficiencies in students. Learning to read and acquiring the high order reading skills is a complex and rigorous task. Coyne, Kame'enui, and Simmons (2001) stated that "we face a difficult task. Drawing on our knowledge base, we are only now beginning to truly understand the considerable challenges associated with the immense task of teaching reading" (p. 62).

### **Gender and Achievement**

The study of gender differences has been a topic of many research studies. A search of academic and medical databases would reveal thousands upon thousands of articles and dissertations on the topic, so the question remains the same; why study the differences? Halpern (2013) stated that the reasons behind the studies are to understand the source of inequalities, to improve achievement, and to better understand how children of both genders learn. "Gender differences point to areas where student background and

characteristics significantly affect student performance. Understanding what drives differential student performance can foster the design of effective educational policies to address quality and equity concerns” (Halpern, 2013, p. 25-26).

Gender differences are apparent from early childhood, but the impact on achievement is still unclear. Edwards (1993) noted seven differences between the activities of males and females in early stages of development:

- From age three, girls spend more time working, whereas boys spend more time in play.
- When playing in groups, children self-segregate by sex, in addition to age.
- Boys begin to spend more time than girls away from home and their mothers.
- Girls engage in more infant contact and care.
- Boys engage in more rough play than girls do.
- Boys engage in more practice play with weapons and vehicles than girls do.
- Girls engage in more grooming (real and play) than boys do. (pp. 330-331)

Phillips and Shonkoff (2000) stated that “from birth to age 5, children rapidly develop foundational capabilities on which subsequent development builds. In addition to their remarkable linguistic and cognitive gains, they exhibit dramatic progress in their emotional, regulatory, and moral capacities” (p. 5). This stage of development is precisely the same time in which phonological processes needed in learning to read takes place. (Adams, 1990; Blachman, 2013; Share, 1995; Shaywitz & Shaywitz, 2005).

As children enter early childhood programs and elementary school, the discrepancies between reading ability and achievement quickly manifest themselves. Some students, for various reasons and factors, grasp letter recognition, sound production, and blending of sounds to make meaning out of print material. Unfortunately, there are many students who look at the words of a book and see them only as a distraction to the pictures on the page. The gender differences at the time of early stages of reading have appeared, and with the emergence of academic and social expectations, these differences only multiple in number. Many studies show a gap in reading achievement as early as the fall of kindergarten followed by a consistent gap through elementary school (Chatterji, 2006; Husain & Millimet, 2009; Robinson & Lubienski, 2011;). Chudowsky and Chudowsky (2010) reviewed achievement data from every state and concluded that the most pressing issue between the gender differences is the reading performance of boys. Compared to girls, “in many states, the percentage proficient for girls is more than 10 points higher than the percentage for boys” (Chudowsky & Chudowsky, 2010, p. 13). In a 2014 report from the National Center for Learning Disabilities, Cortiella and Horowitz (2014) determined from surveys and data collection that nearly two-thirds (66%) of all students with learning disabilities were boys. Following their extensive research, they stated emphatically that “further investigation into gender disparity is warranted. In what ways and to what extent do the changes in the identification criteria for learning disabilities impact gender distribution are questions that deserve attention and further study (Cortiella & Horowitz, 2014).

One area of gender differences at this stage is in reading ability and attention to tasks. Reading disabilities and Attention Deficit Hyperactive Disorder are more

prevalent in boys than girls, anywhere from ratios of 3:1 to 15:1 (Willcutt & Pennington, 2000). Willcutt and Pennington (2000) studied boys and girls with both a reading disorder and ADHD and concluded that girls were characterized with elevations of inattention alone, whereas the boys showed nearly all of the 18 symptoms of ADHD. Recent advances in brain imagining have led some researchers to conclude that there is a strong genetic link between the prevalence of ADHD and children (Klein et al., 2017). The connection between reading disabilities and the reading achievement discrepancies between girls and boys have led many to conclude that reading achievement is strongly affected by gender.

Some researchers have concluded that the differences in reading achievements are due to society norms and school culture. Willis (1977) conducted a series of five different studies of working class boys and following his research, he argued that their anti-school attitude that school hindered their opportunities to work, which subsequently, resulted in poor academic achievement. Building on the work of Willis, Legewie and DiPerte (2012) argued that the educational achievement gap continues to widen because school and class environments determine how masculinity is constructed in peer culture, thus, influencing boys' attitudes towards school. In order for boys to achieve, they need to be surrounded by a learning rich environment, and if not, there is a limited number of factors that will allow them to succeed. "Girls' peer groups, by contrast, do not vary as strongly with the social environment in the extent to which they encourage academic engagement, and they are less likely to stigmatize school engagement as un-feminine" (Legewie & DiPerte, 2012, p.480). McGeowin, Goodwin, Henderson, and Wright (2012) supported the previous research after concluding that boys' intrinsic and extrinsic

motivation can become barriers to their academic achievement, particularly in the academic area of literacy.

Interestingly enough, studies have shown a different relationship between math and reading achievement among girls and boys. Using the Programme for International Student Assessment (PISA), Stoet and Geary (2013) not only supported previous studies that girls on average score lower in math achievement than boys, and boys score lower in reading than girls, but they also found out that this disparity between the two achievements are much higher than thought. In the 2009 PISA, the average gender difference in reading was nearly three times as larger than the gender difference in mathematics and the “bottom 5% of boys in reading skills scored lower than the bottom 5% of girls” (Stoet & Geary, 2013, p.2). Their study, since the PISA is an international assessment administered to students in over 70 countries, revealed that the gender differences in mathematics and reading are not isolated to the United States. They concluded that no country in the world has been able to successfully eliminate the gender difference in mathematics and the gender difference in reading; this is a critical challenge for educators across the globe to solve (Stoet & Geary, 2013).

Research has also been conducted in non-cognitive area of self-discipline as a possible link between reading achievement and gender differences. Examples of self-discipline include completing a homework assignment despite frustration and boredom, putting money into a savings account rather than buying a new phone, keeping notes in class despite mental and physical fatigue, and eating a garden-fresh salad instead of a bucket of fried chicken in order to lose weight. Studies conducted by Duckworth and Seligman (2006) with children determined that girls displayed a higher tendency to



demonstrate self-discipline than boys the same age. Relationships were also recognized in these studies between students with a high level of self-discipline and reading achievement; girls had a higher level of self-discipline than boys, and subsequently the girls had higher level of reading achievement when compared to boys.

Gender differences in reading and academic achievement are not the only areas that researchers have identified through studies. A review of literature indicates studies dedicated to gender differences in risk-taking (Byrnes, Miller, & Schafer, 1999; Harris, Jenkins, & Glaser, 2006; Laasch & Conaway, 2009), differences in gender reactions to stress and trauma (Breslau & Anthony, 2007; Olf, Langeland, Draijer, & Gersons, 2007; Tolin & Foa, 2006), and even in gender differences in keeping secrets (Cumsille, Darling, & Martínez, 2010; Keijsers, Branje, Frijns, Finkenauer, & Meeus, 2010).

The study of gender differences will continue to be a well-researched topic. Halpern (1997) stated that gender differences are of interest because they can often lead to important theoretical advances in a particular study (Halpern, 1997). For educators, this lack of understanding is not viewed as a roadblock, but rather an obstacle that must be removed in order to see that both boys and girls succeed in all areas of their lives.

### **Ethnicity and Achievement**

The achievement gap that exhibits between different ethnic groups is also a topic that has been researched and debated for many years. Based on data reported by NAEP, there is an urgency to this topic of study; the achievement gap between minority and non-minority students continues to exist despite the best interests of educators. The latest report by the National Center for Education Statistics (2016) provides the latest

information concerning this gap. Below is a table that indicates the average mean score on the NAEP assessment based on grade level and ethnicity.

Table 3

*Average NAEP reading scale scores by ethnicity and grade level: SY 1992, 2013, 2015*

Ethnicity	4 <sup>th</sup> Grade			8 <sup>th</sup> Grade			12 <sup>th</sup> Grade		
	1992	2013	2015	1992	2013	2015	1992	2013	2015
White	224	232	233	267	276	274	297	297	294
Black	192	206	206	237	250	248	273	268	266
Hispanic	197	207	208	241	256	253	279	276	276

*Note.* Adapted from *The condition of education 2016* (NCES Report #2016-144), by National Center for Education Statistics (2016). Retrieved from <https://eric.ed.gov/?id=ED565888>

Although racial group comparison studies are instrumental in identifying group differences in reading achievement, they often mask the specific issues and factors that affect reading achievement. McKown (2013), along with other researchers, have noted that there is a multitude of possible reasons for the discrepancy in the academic achievement of ethnic groups. One possible explanation is that early language development, or the lack thereof, affects literacy development during students' elementary school years (Craig, Connor, & Washington, 2003). Researchers have acknowledged that letter and sound recognition, language skills, and phonological awareness skills are significant predictors of reading achievement with minority and non-minority children (Jacobson et al., 2017). The consensus among researchers is that early prevention is the key to developing strong literacy skills (Bishop, 2003; Torgesen, 2002; Reading & Van Deuren, 2007; McNamara, Scissons, & Gutknecht, 2011).

Another theory to explain the achievement gap between minority and non-minority students is the influence of family in relation to early childhood exposure to

literacy. Metsala and Ehri (2013) noted that “virtually every study of home influences on children’s literacy developments includes surveys, questionnaires, or interviews designed to acquire information about children’s experiences with print” (p. 264). Baker, Scher, and Mackler (1997) conducted a longitudinal study, known as the Early Childhood Project, in an effort to study the impacts of early exposure to literacy in the home. This project “illustrated that preschool children who have a variety of experiences with reading at home are likely to foster positive motivations for reading” (Baker, Scher, & Mackler, 1997, p. 80.). These researchers acknowledge at the time of the study the body of knowledge in this area is quite limited, however, in the last two decades a surge of studies have provided evidence to support earlier conclusions (Baker, 2003; Barron, & Brunello, 2000; Bracken & Fischel, 2008; Frijters, Weigel, Martin, & Bennett, 2006; Mol & Bus, 2011; Saint-Laurent, & Giasson, 2005).

Other researchers have made conclusions about the relationship between the achievement gap in reading and ethnicity, each providing evidence that supports their claim. Some of the additional theories include inadequate childcare (Burchinal, & Cryer, 2004; Magnuson, & Waldfogel, 2005; Rouse, Brooks-Gunn, & McLanahan, 2010), teaching inequality (Clotfelter, Ladd, & Vigdor, 2005; Flowers, 2007; Scafidi, Sjoquist, & Stinebrickner, 2007), and ethnically-biased assessments (Camilli, 2006; Walton, & Spencer, 2009). While many scholars have contributed greatly to the research literature pertaining to minority achievement, additional research is needed to examine in more detail the factors that influence student success (Flowers, 2007).

The difficulty that researchers have had in the past, including those who have studied minorities and achievement, has been the inability to isolate one variable from

several variables in order to determine the relevancy and scope of their impact. Aratani, Wright, and Cooper (2011) used the Early Childhood Longitudinal Study birth data, which included a sample population of nearly 11,000 children, to study the correlations between early childhood achievement and ethnicity. Included in the design of their study were specific controls intended to isolate student achievement from social economic status, parent education levels, single-parent households, and other family characteristics. The results of the study indicated several key findings. Without controls in place for demographic characteristics, African-American boys scored significantly below their white counterparts in cognitive development, reading scores, and language assessment scores (Aratani, Wright, & Cooper, 2011). However, after demographic features were controlled, the achievement gap between the ethnic groups significantly disappeared, and the “racial disparities in reading scores found in preschool and kindergarten appear to be largely due to differences in SES and other demographic characteristics such as not having low birthweight and not receive public assistance” (Aratani, Wright, & Cooper, 2011, p. 9).

With the passage of legislation such as No Child Left Behind Act of 2001 and the Every Student Succeeds Act of 2015, schools have been held accountable for equitable student achievement outcomes on state and national assessment for subgroups, including minority and ethnic groups (Chatterji, 2006). Each year, state departments of education send every district and every school a report card that indicates student achievement scores with the breakdown of the super subgroups, which include minority groups. The expectation is that all students learn and are given equitable opportunities to succeed.

However, national report cards and statistics provide evidence that not all students are equipped with the prerequisite skills to succeed in adulthood.

- The percentage of minority students who graduate from post-secondary institutions is 18-20% lower than the percentage of non-minority students (NCES, 2016).
- The high school graduation rate for Caucasian students in 2014 was 87%, compared to African-American students at 73%, and Hispanic students at 76% (NCES, 2016).
- Unemployment rates in January 2017 were as follows: African-American 8.4%, Hispanic 5.8%, and White 4.3% (Bls.gov, 2017).
- The median hourly earnings in 2015 for Caucasian men was \$21, African-American men \$15, and Hispanic men \$14 (Patten and Patten, 2017).

These statistics give researchers a significant purpose to study the achievement gap between minority and non-minority students. Equipped with knowledge, the shift moves from research to the implementation of best practices among all educators. The achievement gap provides evidence that conventional strategies do not meet the needs of all students; it is now time for students to learn how to succeed (Tough, 2013).

### **Poverty and Achievement**

Nearly 31 million children in the United States live in low-income families, which represents approximately 43% of all children throughout the country (Jiang et al., 2007). Research suggests that families need an income about two times the federal poverty threshold in order to meet the basic needs of food and shelter (Cauthen & Fass, 2008).

This means that nearly half of all students who come to school each day for a quality education come to school without their basic needs met. According to Maslow (1943),

Undoubtedly, these physiological needs are the most prominent of all needs.

What this means specifically is, that in the human being who is missing everything in life in an extreme fashion, it is most likely that the major motivation would be the physiological needs rather than any others.

A person who is lacking food, safety, love, and esteem would most probably hunger for food more strongly than for anything else. (p. 373)

For a large portion of American children, their predominate desire when they walk through the school doors is not to how to read, how to write, or even play with their friends at recess; their greatest desire is to eat breakfast and lunch.

The challenges of poverty do not end as students walk through the doors of elementary, middle, or high schools. The statistics and conclusions regarding the effects of poverty and student achievement are significant. Cortiella and Horowitz (2014) stated that “more students with a learning disability are found in households living in poverty than in children from the general population” (p. 15). Hernandez (2011) conducted a longitudinal study of children starting in second grade through the completion of their eleventh-grade year, all of which lived below the federal threshold of poverty for more than half of their educational career. Three major findings were discovered as a result of this study:

1. One in six children who are not reading proficiently in third grade fail to graduate from high school on time, four times the rate for children with proficient third-grade reading skills.

2. Black and Hispanic children who are not reading proficient in third grade are about twice as likely as similar White children not to graduate from high school.
3. Children who have lived in poverty and are not reading proficiently in third grade are about three times more likely to dropout or fail to graduate from high school than those who have never been poor. (Hernandez, 2011, pp. 5-6)

A disturbing trend in the literature is the increasing amount of research conducted on homeless children. The reason behind the increase in research is the increasing number of children and families who are homeless. The National Center for Homeless Education reported in 2014 that the number of homeless individuals increased by 13% from 2011 to 2013; the number reached slightly more than 1.2 million people. The U.S. Department of Education (2004) defined homeless individuals as those:

who lack a fixed, regular, and adequate nighttime residence, including children and youth living in shelters, motels, or vehicles or at campgrounds; on the street; or in abandoned buildings or other inadequate situations or who are doubled up because of loss of housing, economic hardship, or similar reasons; as well as those waiting foster placement. (U.S. Code, Title 42, Chapter 119, Subchapter I, §11302)

Research in this area of study concluded that in addition to regular absences, frequent changes in schools, poor nutrition, and other health concerns, many of these students were at risk for academic and behavioral problems that resulted in high retention rates and low graduation rates (Masten, 2011; Masten, Sesma, Si-Asar, Lawrence, Miliotis, &

Dionne, 1997; McChesney, 1993). Legislation, namely the McKinney-Vento Homeless Assistance Act, along with best practices in education, have led to substantial improvements in the access and quality of education (Miller, 2011; Moats & Foorman, 2008; Walker-Dalhouse & Risko, 2008).

Poverty can severely limit the possibilities of success for children, however, many impoverished families and children have been able to overcome great difficulties (Secombe, 2002). It has been estimated that two-thirds of at risk students who suffer from some sort of trauma do not develop development problems in the future (Wolin & Wolin, 1993). Many researchers have concluded from their studies that one variable that has a huge impact on the children living in poverty and their resilience was the students' relationship with teachers and quality schools. Benard (2004) noted that "one of the most important and consistent findings in resilience research is the power of schools, especially of teachers, to turn a child's life from risk to resilience" (p. 65). Teachers are able to provide students in poverty with the attention, the care, and the basic needs that are many times lacking in the students' life. In addition, entire schools have made changes in the way that they meet the needs of impoverished students. According to Nicoll (2014) successful schooling for the students living in poverty requires the development of reforms based on resilience and growth mindsets and a resilience-focused systematic paradigm shift in the way that traditional academics skills are addressed.

In addition to federal programs, best practices in education, and teaching non-cognitive skills such as resiliency, research has been conducted to study the quality of childcare in the early years of development. The early years of childhood development are important years as children are acquiring prerequisite skills to literacy, therefore,



quality child care can make a significant difference (Reynolds, Ou, & Topitzes, 2004). Dearing, McCartney, and Taylor (2009) concluded that “higher quality early child care promotes the achievement of low-income children during middle childhood” (p. 1346).

Ratcliffe and McKernan (2010) provided evidence that children who experience poverty have worse adult outcomes in terms of education attainment and adult poverty status. Therefore, children who live in poverty are at risk for becoming adults living in poverty (Bireda & Moses, (2010). As a result of this evidence, researchers will continue to study the effects of poverty with the intention to provide educators with research-based interventions and strategies to improve literacy. The goal of educators is for students to improve their literacy skills to the level that poverty no longer controls their lives. Literacy empowers children to set goals for themselves and to make wise financial decisions that affect not only their lives, but for the generations to come.

## **Chapter 3**

### **Methods**

The purpose of this study was to examine the relationship between upper elementary students' self-reported levels of the non-cognitive construct of grit and their performance on the communication arts MAP test. The effect of gender, minority/non-minority status, and lunch pay status on the relationship between grit and achievement was also studied. In this chapter, the methodology used to conduct this research study is detailed, including a description of the research design, the selection of participants, measurement, and data collection procedures. The methods of data analysis and hypothesis testing are also described, followed by the limitations of the study, and a summary that concludes chapter 3.

#### **Research Design**

For this study, the researcher utilized a correlational research design to analyze the strength and the direction of the relationship between numerical variables. The dependent variable was student achievement scores on the communication arts MAP test. Independent variables included students' grit scores, gender, minority/non-minority status, and lunch pay status.

#### **Selection of Participants**

Lunenburg and Irby (2008) stated, "The target population is the group of interests to the research, the group to which you would like the results of the study to be generalizable" (p. 167). The population for this study was comprised of fifth and sixth grade students in District C. The sample of students included those fifth and sixth grade

students who were enrolled in the school district for the entire 2016-2017 school year, participated in the testing, and completed the survey.

### **Measurement**

For the purpose of this research, student achievement was measured by the communication arts MAP test for SY 2016-17. The MAP assessment is a standards-based test administered yearly to students grades 3-8, with the intent to measure specific skills defined for each grade by the state of Missouri (Missouri DESE, 2016b). The Communication Arts MAP assessment for fifth and sixth grade measured and assessed the following skills:

1. Strand: Reading
  - a. Content Category: Apply reading skills to literary texts
    - i. Key Ideas and Details
    - ii. Craft and Structure
    - iii. Integration of Knowledge and Ideas
  - b. Content Category: Apply reading skills to informational texts
    - i. Key Ideas and Details
    - ii. Craft and Structure
    - iii. Integration of Knowledge and Ideas
2. Strand: Writing
  - a. Content Category: Demonstrate the ability to produce and examine writing
    - i. Text Types and Purposes
    - ii. Production and Distribution
3. Strand: Speaking and Listening

4. Content Category: Demonstrate the ability to evaluate spoken material
  - i. Comprehension and Collaboration (pp. 27-28)

According to DESE, the Missouri Learning Standards help ensure students learn basic and higher-order skills, including real world problem solving and critical thinking skills that students need to achieve their goals. For all grade levels, the MAP Grade Level-Assessments in communication arts include multiple item types, including selected response items, short text items, technology-enhanced items, and a writing prompt (Missouri DESE, 2016a). Data Recognition Corporation, the MAP Grade-level Assessments testing vendor, uses student's correct responses to derive a MAP scale score (Missouri DESE, 2016a).

For state reporting purposes, the scale scores are measured by the total amount of correct responses given by the student in relation to the total amount of correct responses possible in each subject area test. The student's scale score is translated into one of the four MAP descriptors; below basic, basic, proficient, or advanced. Missouri DESE (2016) defines each descriptor and grade level expectation:

**Below Basic:** Students performing at the Below Basic level on the Missouri Assessment Program demonstrate a minimal command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills inconsistently and/or incorrectly in reading processes responding to literary and informational texts, and in writing. Students performing at the Below Basic level use few strategies to comprehend and interpret texts, demonstrate little understanding of literary forms, and apply few strategies for accessing information. (p. 5)

**Basic:** Students performing at the Basic level on the Missouri Assessment Program demonstrate a partial or uneven command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills inconsistently in reading processes responding to both literary and informational texts, and in writing. In addition to demonstrating, understanding, and applying the skills at the Below Basic level, students performing at the Basic level use some strategies to comprehend and interpret a variety of texts, demonstrate a partial understanding of literary forms, and inconsistently apply some strategies for accessing and summarizing information. They demonstrate an inconsistent ability to organize and/or develop writing and exhibit an inconsistent command the conventions of standard English. (p. 5)

**Proficient:** Students performing at the Proficient level on the Missouri Assessment Program demonstrate an adequate command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills consistently and competently in reading processes in responding to literary and informational text, and in writing. In addition to demonstrating, understanding, and applying the skills at the Basic level, students performing at the Proficient level use a range of strategies to comprehend and interpret a variety of texts, demonstrate an understanding of literary forms, and apply strategies for accessing and summarizing information. They demonstrate an adequate ability to organize and develop writing and exhibit a competent command of the conventions of standard English. (p. 5)

Advanced: Students performing at the Advanced level on the Missouri Assessment Program consistently demonstrate a thorough command of the skills and processes identified in the Missouri Learning Standards. They demonstrate these skills consistently and skillfully in reading processes in responding to literary and informational text, and in writing efficiently. In addition to demonstrating, understanding, and applying the skills at the Proficient level, students performing at the Advanced level use a wide range of strategies to comprehend and interpret a variety of texts, demonstrate a complete and thorough understanding of literary forms, and consistently apply a wide range of different strategies for accessing and summarizing information. They demonstrate an effective and thorough ability to organize and develop writing and exhibit an adequate command of the conventions of standard English. (p. 5)

For example, a fifth-grade student who receives a scale score of 500 would fall in the *proficient* descriptor. The scale score ranges for the communication arts MAP descriptors are shown in Table 4.

Table 4

*Communication Arts MAP Scale Score Ranges and Descriptors: SY 2016-2017*

Grade	Below Basic	Basic	Proficient	Advanced
3	230-415	416-446	447-501	502-730
4	240-435	436-472	473-525	526-740
5	250-448	449-487	488-540	541-780
6	260-467	468-498	499-549	550-790

*Note.* Adapted from *Guide to Interpreting Results*, by Missouri Department of Secondary and Elementary Education (2016a). Retrieved from <http://dese.mo.gov/college-career-readiness/assessment/grade-level>

The MAP test, which is evaluated periodically for reliability, was created by the Missouri Department of Secondary and Elementary Education in conjunction with DRC. One measurement used to evaluate reliability of the test is Cronbach's coefficient alpha. The coefficient alpha is an index of the consistency of performance over all test questions in a given form (Data Recognition Corporation [DRC], 2015). Cronbach's alpha reliability coefficients that are equal to or greater than 0.8 are considered acceptable for tests of moderate lengths (DRC, 2015). Table 5 provides evidence that the Cronbach's alpha coefficients for the 2015-16 MAP test are greater than 0.8, meeting the requirement for reliability.

Table 5

*Internal Consistency Reliability: Cronbach's Alpha Coefficients for the Communication*

*Arts MAP Assessment: SY 2015-16*

Grade	Cronbach's Alpha
3	.90
4	.90
5	.90
6	.88

*Note.* Adapted from *Guide to Interpreting Results*, by Missouri Department of Secondary and Elementary Education (2016a). Retrieved from <http://dese.mo.gov/college-career-readiness/assessment/grade-level>

In addition to test reliability, the Missouri DESE provides evidence of validity based on test content that was supported by the test specifications, including the test design, test blueprint, and alignment with state standards (DRC, 2015). Evidence of test validity was provided through the standard error of measurement. The standard error of measurement is an index of the random variability in test scores and may be used to

determine the range within which a student's true test score is likely to fall (DRC, 2015).

The standard error of measurement for the 2015-16 MAP test are presented in Table 6.

Table 6

*Standard Error of Measurement for the Communication Arts MAP Assessment:*

*SY 2015-16*

Grade	SEM
3	2.89
4	2.90
5	3.31
6	3.00

*Note.* Adapted from *Guide to Interpreting Results*, by Missouri Department of Secondary and Elementary Education (2016a). Retrieved from <http://dese.mo.gov/college-career-readiness/assessment/grade-level>

A second variable specified in research questions 1-4 was student self-reported resiliency. In order to measure student resiliency, the researcher administered the questionnaire, called the 8-item Grit Scale (G-S), Child Adapted Version (Duckworth & Quinn, 2009) to the participants in District C. The Child Adapted Version of the Short Grit scale was designed to provide further clarification and guidance for upper elementary and secondary students. The directions for the Child Adapted Version were shortened and simplified, and four of the question stems included vocabulary to assist students in their understanding of the question. A copy of the 8-item Grit Scale, Child Adapted Version, has been attached in Appendix A. A copy of the permission to use the Grit Scale for educational research purposes has been attached in Appendix B. The 8-item Grit Scale asks students to rate themselves in the areas determination, focus, sustainability, and purpose. A Likert-type scale, using the digits 1-5, is used to indicate



student responses. For items two, four, seven, and eight, the point values are: 5 = very much like me, 4 = mostly like me, 3 = somewhat like me, 2 = not much like me, and 1 = not like me at all. The items ask the students to rate themselves on their work habits and diligence. For instance, item seven required the students to rate themselves on whether or not they finish what they start. For items one, three, five, and six, the items are reverse scored and points are assigned as 1 = very much like me, 2 = mostly like me, 3 = somewhat like me, 4 = not much like me, and 5 = not like me at all. The reversed scored items focus on the student's ability or inability to stay focused and persevere in the accomplishment of their goals. For example, item eight required the students to reflect on whether or not they have difficulty maintaining their focus on projects that take more than a few months to complete. The student's final grit score is calculated by finding the mean score of the 8-item survey. According to Duckworth and Quinn (2009), the maximum score of 5 is considered gritty, and the lowest score of 1 is considered not gritty at all.

In order to validate the Short Grit Scale, Duckworth and Quinn (2009) conducted a series of cross-sectional and longitudinal studies. In a published research article, Duckworth and Quinn (2009) concluded that "collectively, the studies provide evidence for the predictive validity of the Grit-S questionnaire" (p. 172). In a second study, adults who scored higher on the scale progressed farther in education and made fewer career changes (p. 172). The results from a third study showed evidence that grit can be reliably assessed by self-reported assessments (Duckworth & Quinn, 2009). Referring to relationships and achievement, Duckworth and Quinn (2009) summarized the studies and results by stating that the "outcomes were objectively measured, which effectively rules

out the possibility of social desirability bias as an omitted third variable that accounts for these associations” (p. 173).

For this study, demographic measures of gender, minority/non-minority status, and lunch pay status were included as variables for research questions 2, 3, and 4. These demographic measures are stored at District C’s department of assessment. For RQ2, gender was determined as either male or female. For RQ3, minority/non-minority status was recorded as minority or non-minority. The final demographic measure for RQ4, lunch pay status, was recorded as either free/reduced pay or full pay.

### **Data Collection Procedures**

Before beginning data collection, the researcher requested the consent of District C through the written submission of a proposal to conduct research to the District Data Task Force. A copy of the written proposal and acceptance letter is included in Appendix C and Appendix D. A proposal to conduct this study was also submitted to, and approved by, the Institutional Review Board (IRB) committee of Baker University. A copy of the written proposal to the IRB committee is included in Appendix E and the IRB consent letter is included in Appendix F. Upon approval from both District C and Baker University, data collection began and surveys were sent to the elementary schools in District C. The principal of each elementary school received an email link to the survey through an online survey. The principal forwarded the link to each fifth and sixth grade teacher in the building. The survey included the questions from the 8-item Grit Scale, Child Adapted Version. Each fifth and sixth grade teacher administered the surveys to their students. Following the completion of each survey, the responses were stored within the survey database. The responses were downloaded from the database and were

placed in a spreadsheet for further analysis. To protect anonymity, the participants' state assigned MOSIS numbers were used instead of their names. The final spreadsheet consisted of the student's MOSIS number, grit score, MAP assessment score, and each student's gender, minority/non-minority status, and lunch pay status. The data were then used by the researcher to test each hypothesis.

### **Data Analysis and Hypothesis Testing**

Included in the section are research questions and hypotheses statements developed to guide this research. In addition, the corresponding data analysis has been included following each hypothesis.

**RQ1.** To what extent is there a relationship between fifth and sixth grade students' grit scores and students' MAP scores in communication arts?

**H1.** There is a statistically significant relationship between fifth and sixth grade students' grit scores and students' MAP scores in communication arts.

A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between students' grit scores and MAP scores in communication arts. A one sample *t* test was conducted to test for the statistical significance of the correlation coefficient. The level of significance was set at .05.

**RQ2.** To what extent is the relationship between fifth and sixth grade students' grit scores and students' MAP scores in communication arts affected by student gender?

**H2.** The relationship between fifth and sixth grade students' grit scores and students' MAP scores in communication arts is affected by student gender.

Prior to conducting the hypothesis test for RQ2, the data were disaggregated by gender. A Pearson product moment correlation coefficient was calculated to index the

strength and direction of the relationship between students' grit scores and MAP scores in communication arts for females. A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between students' grit scores and MAP scores in communication arts for males. A Fisher's  $z$  test was conducted to address RQ2. The two sample correlations were compared. The level of significance was set at .05.

**RQ3.** To what extent is the relationship between fifth and sixth grade students' grit scores and students' MAP scores in communication arts affected by student minority/non-minority status?

**H3.** The relationship between fifth and sixth grade students' grit scores and students' MAP scores in communication arts is affected by student minority/non-minority status.

Prior to conducting the hypothesis test for RQ3 the data were disaggregated by minority/non-minority status. A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between students' grit scores and MAP scores in communication arts for non-minority students. A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between students' grit scores and MAP scores in communication arts for minority students. A Fisher's  $z$  tests was conducted to address RQ3. The level of significance was set at .05.

**RQ4.** To what extent is the relationship between fifth and sixth grade students' grit scores and students' MAP scores in communication arts affected by student lunch pay status?

**H4.** The relationship between fifth and sixth grade students' grit scores and students' MAP scores in communication arts is affected by student lunch pay status.

Prior to conducting the hypothesis test for RQ4 the data were disaggregated by lunch pay status. A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between students' grit scores and MAP scores in communication arts for free/reduced pay students. A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between students' grit scores and MAP scores in communication arts for full pay students. A Fisher's  $z$  test was conducted to address RQ4. The two sample correlations were compared. The level of significance was set at .05.

### **Limitations**

Lunenburg and Irby (2008) defined limitations as “factors that may have an effect on the interpretation of the findings or on the generalizability of the results” (p. 133). The researcher does not control the limitations. Limitations of this study include the following:

1. Although the findings are important for the large, suburban district, any attempt to generalize the results to other districts in Missouri or the United States should be met with some scrutiny.
2. Many variables influence student performance on standardized tests, including some that schools cannot control, such as students' health the day of the test, their level of effort, or the amount of sleep students get the night before the test.

3. The responses on the student grit surveys were self-reports. Therefore, students may have elevated some aspects of the survey and at the same time may have under reported other survey items.
4. The level of student motivation during the communication arts MAP test and survey is unknown.

### **Summary**

This study was a quantitative analysis using a correlational research design to determine the relationship between student achievement scores on the communication arts assessments and self-reported grit scores, and the effects of gender, minority/non-minority status, and lunch pay status. The population for the study was all fifth and sixth grade students in District C. A purposive sample was taken from the population and was administer the 8-item Grit Scale (G-S). Student achievement data from the MAP communication arts assessment were connected to student grit scores. Pearson product correlation coefficients were calculated in order to determine the strength and direction of the relationships between the variables. Results of the quantitative data analysis for this study are presented in chapter 4.

## **Chapter 4**

### **Results**

The purpose of this study was to examine the relationship between fifth and sixth grade students' self-reported levels of resiliency, as measured by grit scores, and their performance on the communication arts MAP assessment. The second purpose of this study was to determine whether the relationship between fifth and sixth grade students' grit scores and student achievement, as measured by MAP, was affected by student gender, minority/non-minority status, or lunch pay status. Included in chapter 4 are the results of the quantitative analysis for each of the study's research questions. Descriptive statistics were used to describe the sample while Pearson product moment correlation coefficients were used to examine the relationship between student resiliency and performance. Fisher's  $z$  tests were used to determine if the relationship between resiliency and performance was affected by gender, minority/non-minority status, and lunch pay status.

#### **Descriptive Statistics**

Descriptive statistics are defined as the "mathematical procedures for organizing and summarizing numerical data" (Lunenberg & Irby, 2008, p. 63). The population for this study consisted of fifth and sixth grade students who attended District C. Of the 895 students who participated, 437 (49%) were females and 458 (51%) were males. Another variable that was studied was minority/non-minority status. Minority students consisted of 241 (27%) and non-minority students represented 654 (73%) of the total population. Lunch pay status was the final variable tested along with student grit score and achievement on the communication arts assessment. Lunch pay status in District C

consisted of 486 (54%) students who received free/reduced pay lunch pay status, and 409 (46%) who was classified as full pay students.

### **Hypothesis Testing**

The results of the hypothesis testing to address the four research questions are discussed in this section. Each research question was statistically analyzed. The four research questions along with hypotheses and statistical results are listed below.

**RQ1.** To what extent is there a relationship between fifth and sixth grade students' grit scores and students' MAP scores in communication arts?

**H1.** There is a statistically significant relationship between fifth and sixth grade students' grit scores and students' MAP scores in communication arts.

A Pearson product moment correlation coefficient were calculated to index the strength and direction of the relationship between student's grit scores and MAP scores in communication arts. A one sample *t* test was conducted to test for the statistical significance of the correlation coefficient. The level of significance was set at .05. The results of the calculation of the coefficient indicated a statistically significant and moderate positive relationship between students' grit scores and MAP scores,  $r = 0.293$ ,  $n = 895$ ,  $p = 0.000$ . H1, which stated that there is a statistically significant relationship between students' grit scores and students' MAP scores in communication arts, is supported.

**RQ2.** To what extent is the relationship between fifth and sixth grade students' grit scores and students' MAP scores in communication arts affected by student gender?

**H2.** The relationship between fifth and sixth grade students' grit scores and students' MAP scores in communication arts is affected by student gender.



Prior to conducting the hypothesis test for RQ2, the data were disaggregated by gender. A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between students' grit scores and MAP scores in communication arts for females. A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between student's grit scores and MAP scores in communication arts for males. A Fisher's  $z$  test was conducted to address RQ2. The two sample correlations were compared. The level of significance was set at .05. The results of the calculation of the coefficient for male students indicated a statistically significant and moderate positive relationship between male students' grit scores and MAP scores,  $r = 0.224$ ,  $n = 458$ ,  $p = 0.000$ . The results of the calculation of the coefficient for female students indicated a statistically significant and moderate positive relationship between female students' grit scores and MAP scores,  $r = .351$ ,  $n = 437$ ,  $p = 0.000$ . The results of the Fisher's  $z$  test provided evidence that the difference between the two correlations was statistically significant,  $z = 2.07$ ,  $p = 0.039$ .  $H_2$ , which stated that the relationship between students' grit scores and students' MAP scores in communication arts is affected by student gender, was supported. The relationship is stronger for female students than male students.

**RQ3.** To what extent is the relationship between fifth and sixth grade students' grit scores and students' MAP scores in communication arts affected by student minority/non-minority status?

**$H_3$ .** The relationship between fifth and sixth grade students' grit scores and students' MAP scores in communication arts is affected by student minority/non-minority status.

Prior to conducting the hypothesis test for RQ3 the data were disaggregated by minority/non-minority status. A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between students' grit scores and MAP scores in communication arts for minority students. A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between students' grit scores and MAP scores in communication arts for non-minority students. A Fisher's  $z$  test was conducted to address RQ3. The two sample correlations were compared. The level of significance was set at .05. The results of the calculation of the coefficient for minority students indicated a statistically significant and moderate positive relationship between minority students' grit scores and MAP scores,  $r = 0.209$ ,  $n = 241$ ,  $p = 0.001$ . The results of the calculation of the coefficient for non-minority students indicated a statistically significant and moderate positive relationship between non-minority students' grit scores and MAP scores,  $r = .312$ ,  $n = 654$ ,  $p = 0.000$ . The results of the Fisher's  $z$  test provided evidence that the difference between the two correlations was marginally significant,  $z = -1.46$ ,  $p = 0.144$ . H3, which stated that the relationship between students' grit scores and students' MAP scores in communication arts is affected by minority/non-minority status, was supported. The relationship is stronger for non-minority students than minority students.

**RQ4.** To what extent is the relationship between fifth and sixth grade students' grit scores and students' MAP scores in communication arts affected by student lunch pay status?

**H4.** The relationship between fifth and sixth grade students' grit scores and students' MAP scores in communication arts is affected by student lunch pay status.

Prior to conducting the hypothesis test for RQ4 the data were disaggregated by lunch pay status. A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between students' grit scores and MAP scores in communication arts for free/reduced pay students. A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between students' grit scores and MAP scores in communication arts for full pay students. A Fisher's  $z$  test was conducted to address RQ4. The two sample correlations were compared. The level of significance was set at .05. The results of the calculation of the coefficient for free/reduced pay students indicated a statistically significant and moderate positive relationship between free/reduced pay students' grit scores and MAP scores,  $r = 0.198$ ,  $n = 486$ ,  $p = 0.000$ . The results of the calculation of the coefficient for full pay students indicated a statistically significant and moderate positive relationship between full pay students' grit scores and MAP scores,  $r = .362$ ,  $n = 409$ ,  $p = 0.000$ . The results of the Fisher's  $z$  test provided evidence that the difference between the two correlations was statistically significant,  $z = -2.65$ ,  $p = 0.004$ . H4, which stated that the relationship between students' grit scores and students' MAP scores in communication arts is affected by student lunch pay status, was supported. The relationship is stronger for full pay students than free/reduced lunch pay students.

### **Summary**

The results of the study were presented in chapter 4. Prior to the description of hypothesis testing results for each of the four research questions, the chapter included a summarization of the descriptive statistics for the study sample. The results of the calculation of Pearson product correlation for research hypothesis one indicated a

statistically significant and moderate positive relationship between students' grit scores and MAP scores. The hypotheses test results for research question two indicated a statistically significant and moderate positive relationship between both male and female students' grit scores and MAP scores. The relationship is stronger for female students than male students. The results of the Fisher's  $z$  test provided evidence that the difference between the two correlations was statistically significant. Research question three test results indicated a marginally significant and moderate positive relationship between both minority and non-minority students' grit scores and MAP scores. The results of the Fisher's  $z$  test provided evidence that the difference between the two correlations was marginally significant with a stronger relationship for minority students than non-minority students. The results of the calculation of Pearson product correlation for research hypothesis four indicated a statistically significant and moderate positive relationship between free/reduced pay and full pay students' grit scores and MAP scores. The results of the Fisher's  $z$  test provided evidence that the difference between the two correlations was statistically significant with a stronger relationship for full pay students than compared to free/reduced lunch pay students.

Chapter five includes a study overview, the purpose statement and research questions, a review of the methodology, and major findings. Additional information in this chapter includes findings from the current study as related to the literature. Chapter five concludes with implications for action, recommendations for future research, and concluding remarks.

## Chapter 5

### Interpretation and Recommendations

Chapter 5 includes a summary of the study, an overview of the problem, the purpose statement and research questions, a review of the methodology, and major findings. The chapter also includes a discussion of the findings as related to the literature, followed by the conclusion. Embedded in the conclusion are implications for action, recommendations for future research, and concluding remarks.

#### Study Summary

The first section provides a brief summary of the current study. The summary contains an overview of the problem and the possible relationship between student grit and achievement in District C. The next section includes the purpose of the study followed by a summary that concludes with a review of the methodology and the study's major findings.

**Overview of the problem.** In 2011, the Missouri DESE launched their four-goal improvement plan for student achievement across the state. The first goal, relevant to this study, stated that “all Missouri students will graduate college and career ready” (Missouri DESE, 2017b, p.1). The second objective under this goal stated:

The percentage of students scoring at or above the proficient level on state assessments will increase each year to meet or exceed the annual ‘on track’ MSIP targets for all students and subgroups, placing the state on track to Top 10 performance by 2020 and the percentage of students scoring below basic will decrease by 1%. (Missouri DESE, 2017b, p. 1)

A review of historical student data over the last ten years indicated that student achievement had not met the benchmark assessment standards set by the State of Missouri's *Top 10 by 20 Plan* (Missouri DESE, 2017b). In 2016, the year of the current study, Missouri did not meet the goal as a top performing state in the area of student achievement. As a result, educators across the state started looking for new and innovative ideas to meet the needs of all students, including an increased focus on non-cognitive attributes. Educators at all levels have begun to turn their attention to the research conducted by those in the area of resiliency. Researchers such as Duckworth and Quinn (2009) concluded after extensive research that the non-cognitive construct of resiliency, or grit, is a significant factor in student achievement. A self-report questionnaire, called the Short Grit Scale (Grit-S), was developed by Duckworth and her colleagues to measure students' ability to persevere and develop long term goals for themselves. Based on the evidence gathered by these researchers and others in the field, educators believed that it was warranted to further investigate the impact that student resiliency had on student achievement in an elementary school setting.

**Purpose statement and research questions.** This study was guided by four research questions and four purposes. The first purpose of this study was to examine the relationship between fifth and sixth grade students' self-reported levels of resiliency, as measured by grit scores, and their performance on the communication arts MAP assessment. The second purpose of this study was to determine whether the relationship between fifth and sixth grade students' grit scores and student achievement, as measured by MAP, was affected by student gender. Another purpose of this study was to determine whether the relationship between fifth and sixth grade students' grit scores and

student achievement, as measured by MAP, was affected by student minority/non-minority status. The last purpose of this study was to determine whether the relationship between fifth and sixth grade students' grit scores and student achievement, as measured by MAP, was affected by student lunch pay status.

**Review of the methodology.** The study employed a quantitative correlational research design using an Grit Scale and state achievement test scores to address the research questions. Pearson product moment correlation coefficients and Fisher's  $z$  tests were calculated to determine the strength and direction of the relationship between the variables. The dependent variables were student achievement scores on the communication arts MAP test. Independent variables included students' grit scores, gender, minority/non-minority status, and lunch pay status. The sample for this study was comprised of fifth and sixth grade students in District C. The sample of students included only those fifth and sixth grade students who were enrolled in the school district for the entire 2016-2017 school year, participated in the testing, and completed the survey.

**Major findings.** Test results related to research questions revealed a positive relationship between students' self-reported grit scores and their achievement on the communication arts MAP assessment. Gender data was disaggregated, and further testing indicated that a statistically significant and moderate positive relationship between both male and female students' grit scores and MAP scores existed. The comparisons between the two correlations were statistically significant, and the relationship was stronger with females as compared to males.

Minority and non-minority status was also tested within the study. The correlation for both minority and non-minority students revealed a marginally significant and moderate positive relationship between students' grit scores and MAP scores. The results provided evidence that the difference between the two correlations was marginally significant with a stronger relationship for minority students than non-minority students.

The final variable tested in the study was lunch pay status. Similar to the other variables, a statistically significant and moderate positive relationship was found between free/reduced pay and full pay students' grit scores and MAP scores. The two correlations were statistically significant with a stronger relationship for full pay students than compared to free/reduced lunch pay students.

### **Findings Related to the Literature**

Few studies have evaluated the relationship between student resiliency and academic achievement; therefore, this study was designed to add to the body of research. The current study also addressed other factors such as gender, minority/non-minority status, and lunch pay status and their relationship to resiliency and achievement. The review of literature, compared to the results of the current study, provided evidence of similarities, differences, and the lack of research with certain variables.

A positive relationship was found between the non-cognitive attribute of resiliency and student achievement on state assessments in the current study. These findings are consistent with Duckworth and Quinn's (2009) conclusions drawn from research conducted with West Point Cadets and Scripps National Spelling Bee contestants. In both of these samples, participants who scored themselves highest on the Grit Scale were also the participants who succeed in their endeavors; the West Point



cadets completed their summer training and the students in the spelling bee remained in the competition longer than their competitors. Duckworth, Peterson, Matthews, and Kelly (2007) provided evidence that “gritty children work harder and longer than their less gritty peers and, as a consequence, perform better” (p. 1098). Similarly, in the current study, a statistically significant relationship was found between gritty students and achievement scores on the MAP communication arts assessment for fifth and sixth grade students in District C.

In the current study, gender data was disaggregated and a statistically significant relationship between both male and female students’ grit scores and MAP scores was found. In a study by Duckworth and Quinn (2009), the researchers determined that gritty students had higher GPAs and watched less television than less gritty students. However, the researchers concluded that there was no significant relationship between grit scores and gender (Duckworth & Quinn, 2009). In another study by Duckworth and Quinn (2009), the conclusion was made that “a higher level of grit suggests that grit may increase with life experience” however, “the Grit-S scores did not differ significantly by gender” (p. 169).

Minority/nonminority and lunch pay status were two other variables that were hypothesized and tested along with student resiliency and achievement. There is limited knowledge in these areas and further research is needed before significant conclusions can be made. Research is clear, however, that minority/non-minority and lunch pay status have a significant impact on student success, or the lack thereof. Urgency is present; the achievement gaps among subgroups of students is not closing at the rate to ensure that all students achievement to their fullest potential. “Research on grit is still in

its infancy, and much remains to be discovered about its underlying psychological mechanisms” (Duckworth & Gross, 2014, p. 321).

## **Conclusions**

This section contains conclusions drawn from the current study on the relationship between student’s grit scores and performance on the communication arts MAP assessment. Implications for action and recommendations for further research is included, as well as concluding remarks to finish the chapter.

**Implications for action.** The findings of this study included implications for actions by school districts of similar size and demographics as District C. Statistically significant relationships between elementary students’ self-reported grit scores and communication arts achievement scores were identified in this study. Meichenbaum (2017) stated that “Resilience is not a trait that a child is born with or automatically keeps once it is received. Resilience is a complex interactive process that entails characteristics of the child, family, school, and community factors” (p. 175). In addition to academic interventions for all students, school districts can also use resources available to teach and build resiliency in students at every level of the educational system. The results from this study indicate that time spent teaching non-cognitive attributes, including resiliency, has the potential to raise achievement scores in students throughout the school district.

This study provides district personnel with a body of knowledge that can be used to justify professional learning opportunities for elementary teachers, counselors, and school administrators in non-cognitive attributes. Many district leaders across the country believe that character education and the development of non-cognitive attributes are the keys to improving student achievement (Perkins-Gough, 2013). The role of

teachers, counselors, and administrators has evolved over years as the research demonstrates that in order for students to achieve at their potential, attributes that are not commonly assessed on achievement tests become more important (Perkins-Gough, 2013). Without professional development in non-cognitive attributes, teachers will not have the skills or knowledge to effectively implement these attributes in the classroom. Dufour and Mattos (2013) stated, “The key to improved student learning is to ensure more good teaching in more classrooms more of the time” (p. 38). Effective teaching will not occur unless professional development with teachers, counselors, and administrators exist.

**Recommendations for future research.** The purpose of this study was to determine whether there was a relationship between a student’s self-perceived amount of grit and their achievement on state assessments, with the variables of gender, minority/non-minority status, and social economic status included. The topic of resilience is becoming a popular area of research in many fields, including education. There are several recommendations for further research that would add to the body of knowledge and extend the current research.

The first recommendation to further the current study is the use of a qualitative or mixed method research design. The researcher could interview students to gauge a deeper understanding into the reasons why students chose to score themselves where they did on the grit scale. Question five of the grit scale states that “I often set a goal but later choose to pursue a difference one.” The researcher could follow up this statement by asking for further clarification and reasoning behind why the student chose to respond as

they did. The insight gained from a qualitative or mixed method research design could greatly increase educator's understanding of resilience and students.

The sample for the current study was fifth and sixth grade students in a suburban school district. The second recommendation for future study is to replicate this study with a sample of students from rural districts. The results of the study in a rural setting could be compared with the results found in the current study. The changes in the sample from a suburban to rural districts could reveal that student resilience is greatly affected by the changes in the school setting.

Another recommendation to further this study is to research resiliency programs and initiatives that are currently being implemented in school districts across the country. This research, combined with future research about effective resiliency programs, would provide school districts with the justification for resiliency education as well as effective teaching models to implement in the district.

The final recommendation to extend the study would be to research the possible impacts of trauma on student resiliency. Over half of the general population, including children, will experience some form of traumatic event throughout the course of their life (Courtois, 2002). Traumatic experiences can occur as a result of physical, emotional, social or sexual abuse, or neglect (Courtois & Gold, 2009). Replicating the study to include the presence of a traumatic experience as a variable may provide additional evidence to confirm the importance of student resiliency and achievement.

**Concluding remarks.** Duckworth (2016) attempted to determine what the best predictor of success in business, military, and in education. She concluded that in each domain there were certain characteristics that described the most successful people in

each of these fields. In business, prior experience was the best indicator of a successful and long-standing business person. For those in military who aspired to be selected in the most elite forces such as the Army Rangers or Navy Seals, exceptional physical fitness was the best predictor of success. In education, a supportive teacher “made it more likely that students would graduate” (p. 12). Duckworth (2016) came to a remarkable conclusion when she compared the characteristics of the elite in each of the domains. “Regardless of specific attributes and advantages that help someone succeed in each of these diverse domains of challenge, grit matters in all of them” (Duckworth, 2016, p. 12).

Grit, or resiliency, matters in education. Education is a complex, dynamic system composed of many stakeholders. Educators across the nation are confronted with the most daunting challenge in history as they are called to raise academics to the highest and most rigorous standards (National Governors Association, Chief Council of State School Officials, & Achieve, 2008). According to DuFour and Marzano (2013), “Teachers and administrators are expected to meet these unprecedented standards while serving an increasing number of students who historically have struggled to find success in traditional schools” (p. 5). This study provides further evidence that the non-cognitive attribute of resiliency can positively affect student performance, and therefore, conversations and actions about student resiliency might assist school districts in their effort to ensure that all children reach the highest academic standards.

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## Appendices

**Appendix A: 8-Item Grit Scale, Child Adaptive Version**

### 8- Item Grit Scale

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

1. New ideas and projects sometimes distract me from previous ones.\*
  - Very much like me
  - Mostly like me
  - Somewhat like me
  - Not much like me
  - Not like me at all
  
2. Setbacks (delays and obstacles) don't discourage me. I bounce back from disappointments faster than most people.
  - Very much like me
  - Mostly like me
  - Somewhat like me
  - Not much like me
  - Not like me at all
  
3. I have been obsessed with a certain idea or project for a short time but later lost interest.\*
  - Very much like me
  - Mostly like me
  - Somewhat like me
  - Not much like me
  - Not like me at all
  
4. I am a hard worker.
  - Very much like me
  - Mostly like me
  - Somewhat like me
  - Not much like me
  - Not like me at all
  
5. I often set a goal but later choose to pursue (follow) a different one. \*
  - Very much like me
  - Mostly like me
  - Somewhat like me
  - Not much like me
  - Not like me at all
  
6. I have difficulty maintaining (keeping) my focus on projects that take more than a few months to complete. \*
  - Very much like me
  - Mostly like me
  - Somewhat like me
  - Not much like me
  - Not like me at all



7. I finish whatever I begin.
- Very much like me
  - Mostly like me
  - Somewhat like me
  - Not much like me
  - Not like me at all
8. I am diligent (hard working and careful).
- Very much like me
  - Mostly like me
  - Somewhat like me
  - Not much like me
  - Not like me at all
- 

Scoring:

1. For questions 2, 4, 7 and 8 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 1, 3, 5 and 6 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 8. The maximum score on this scale is 5 (extremely gritty), and the lowest score on this scale is 1 (not at all gritty).

---

## **Appendix B: Permission to Use Grit Scale**

## Grit Scales

Researchers and educators are welcome to scales developed in Dr. Duckworth's lab for non-commercial purposes. These scales were originally designed to assess individual differences rather than subtle within-individual changes in behavior over time. Thus, we do not know whether they are valid indicators of pre- to post-change as a consequence of interventions. We also discourage the use of the scales in high stakes settings where faking is a concern (e.g., admissions or hiring decisions).

Grit scales are copyrighted and cannot be published or used for commercial purposes or wide public distribution. The scales themselves, whether in full or in part, are not permitted to be reproduced except in her own publications or on her website. All of Dr. Duckworth's scales can be viewed here:

<https://sites.sas.upenn.edu/duckworth/pages/research>

**Grit Scale** (17- items)

**12-item Grit Scale**

**Short Grit Scale** (8-items)

**8-item Grit Scale** (for children)

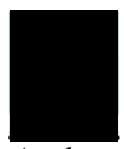
Duckworth, A.L., & Quinn, P.D. (2009). Development and validation of the Short Grit Scale (Grit- S). *Journal of Personality Assessment*, 91, 166-174.

<http://www.sas.upenn.edu/~duckwort/images/Duckworth%20and%20Quinn.pdf>

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

<http://www.sas.upenn.edu/~duckwort/images/Grit%20JPSP.pdf>

**Appendix C: Application to Conduct Research in District**



*Application to Conduct Research in the [Redacted] School District*

Name John Davison, III	Organization Baker University	Department	
Address [Redacted]	City [Redacted]	State MO	Zip Code [Redacted]
Phone Number [Redacted]	Fax Number N/A	E-mail [Redacted]	

I have read and understand the process of application to conduct research in the [Redacted] School District. I also verify that the information provided in this application is accurate to the best of my knowledge.

Signature \_\_\_\_\_  
Date: \_\_\_\_\_

Is this study part of your work for a degree?

Yes     No

Complete the following:

Ph.D.     Ed.D.

Professional

University or College Baker University

Advisor's Name Dr. Harold Frye

Advisor's Telephone Number [Redacted]

Are you currently employed by the [Redacted]?  \_\_\_\_\_

If yes, what is your current job assignment? [Redacted]

**Attach a concise, yet thorough, response to each of the items on the following page.**

## **1. Title and purpose of the study.**

Title: The Relationship Between Student Resiliency and Student Achievement in Upper Elementary Students

Purpose: The first purpose of this study is to examine the relationship between fifth and sixth grade students' self-reported levels of resiliency, as measured by grit scores, and their performance on the communication arts MAP assessment. The second purpose of this study is to determine whether the relationship between fifth and sixth grade students' grit scores and student achievement, as measured by MAP, is affected by student gender, ethnicity, or lunch pay status.

## **2. Specific data requests:**

Assessment Office: The level of achievement for 5<sup>th</sup> and 6<sup>th</sup> grade students in [REDACTED] on the 2017 Communication Arts MAP assessment. The researcher is also requesting the student responses to the survey that will be sent out to all 5<sup>th</sup> and 6<sup>th</sup> graders.

Data Management: The gender, ethnicity, and lunch pay status of the 5<sup>th</sup> and 6<sup>th</sup> grade students in [REDACTED] who took the 2017 Communication Arts MAP assessment. This information will not be connected to student names, but to their student numbers.

Human Resources: None

Other: None

## **3. Timeline.**

The collection of data will occur between April 2017 and July 2017.

## **4. Benefit to the [REDACTED] School District**

The results of this study could provide building and district administrators with potential conclusions and applications drawn from evidence provided by the results of statistical analysis on the relationship between student resiliency and student achievement. The information from this study can also be used by district officials in determining the significant areas of focus in the non-cognitive attributes of the school educational programs. The results from this study could also be used to advise professional development efforts for elementary teachers, counselors, and other staff members.

## 5. Research Design Summary

For this study, the researcher will utilize a correlational research design to analyze the strength and the direction of the relationship between numerical variables. The dependent variable is student achievement scores on the communication arts MAP test. Independent variables include students' grit scores, gender, ethnicity, and lunch pay status.

The population for this study is comprised of fifth and sixth grade students in the ██████████ School District. The sample of students will include only those fifth and sixth grade students who were enrolled in the school district for the entire 2016-2017 school year, participated in the testing, and completed the survey.

For the purpose of this research, student achievement is measured by the communication arts MAP test for the academic school year 2016-17. The principal of each elementary school will be sent an email link to the survey through Survey Monkey. The principal will then send the link to each 5<sup>th</sup> and 6<sup>th</sup> grade teacher in the building. The survey includes the questions from the 8-item Grit Scale, Child Adapted Version. Each 5<sup>th</sup> and 6<sup>th</sup> grade teacher will administer the survey to their students. Following the completion of the survey, the responses will be stored within the Survey Monkey database. The responses will be downloaded from the database and placed in a spreadsheet for further analysis. To protect anonymity, the participants' state assigned MOSIS numbers will be used instead of student names. The final spreadsheet will consist of the student's MOSIS number, grit score, MAP assessment score, and each student's gender, ethnicity, and lunch pay status. The data will then be used by the researcher to test each hypothesis.

RQ1. To what extent is there a relationship between fifth and sixth grade students' grit scores and students' MAP scores in communication arts?

RQ2. To what extent is the relationship between fifth and sixth grade students' grit scores and students' MAP scores in communication arts affected by student gender?

RQ3. To what extent is the relationship between fifth and sixth grade students' grit scores and students' MAP scores in communication arts affected by student ethnicity?

RQ4. To what extent is the relationship between fifth and sixth grade students' grit scores and students' MAP scores in communication arts affected by student lunch pay status?

## 6. Assurance of anonymity of ██████████ School District students and staff.

To protect anonymity, the participants' state assigned MOSIS numbers will be used instead of student names. In addition, the ██████████ School District will be referred to as "District C" throughout the research.

## 7. Risk of Research.

There are no risks involved in this study

**Appendix D: Consent to Conduct Research in District Letter**



## **Research Checklist and Approval**

██████████ School District

Please note- this is not the application

Date Submitted: March 9, 2017

Research Proposal Title: The Relationship Between Student Resiliency and Student Achievement In Upper Elementary Students

Principal Investigator(s): John Davison

### **Checklist**

- Completed "Application to Conduct Research in ██████████"
- Draft copy of "Informed consent" letter to study population/parents, if applicable
- Description of measurements and copies of any surveys
- Other, \_\_\_\_\_

Approval of this research is contingent on adherence to district procedures as outlined in the document entitled "Conducting Research in the ██████████ School District" and the information provided with the application. The district must be notified of any substantive changes to the information contained in the application. The district reserves the right to withdraw approval of research if the research is deemed to no longer be in the best interests of ██████████ students, staff, or the district.

Research Application:  Approved  Denied

### **Signatures**

██  
Data Task Force Member

██  
Data Task Force Member

██  
Data Manager

██  
Supervisor/Principal of Program or Building

Date of Consideration at ██████████ Data Task Force March 13, 2017

## **Appendix E. IRB Application**



SCHOOL OF EDUCATION  
GRADUATE DEPARTMENT

IRB PROTOCOL NUMBER \_\_\_\_\_  
(CRB USE ONLY)

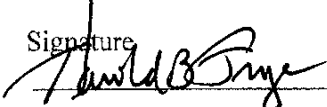
Date: March 11, 2017

IRB REPORT

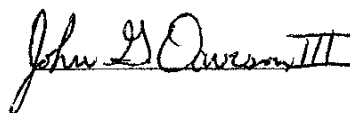
**Proposal for Research  
Submitted to the Baker University Institutional Review Board**

**I. Research Investigator(s)** (Students must list faculty sponsor first)

**Department(s)**      School of Education Graduate Department

- | Name                     | Signature   |                             |
|--------------------------|---|-----------------------------|
| 1. Dr. Harold Frye       |                                    | Major Advisor               |
| 2. Dr. Margaret Waterman | <u>Margaret Waterman</u> <small>John G. Davison III<br/>2100 South Ashland Court<br/>Saint Joseph, MO 64506</small> | Research Analyst            |
| 3.                       |   | University Committee Member |
| 4.                       |   | External Committee Member   |

Principal Investigator: John G. Davison III  
Phone: 913.426.3506  
Email: johndavison3434@gmail.com  
Mailing address: 1018 Ashland Court, Saint Joseph, MO 64506



Faculty sponsor: Dr. Harold Frye  
Phone: 913-344-1220  
Email: Harold.Frye@bakeru.edu

Expected Category of Review: \_\_\_Exempt \_\_\_X\_\_\_Expedited \_\_\_Full

**II: Protocol: (Type the title of your study)**

**The Relationship Between Student Resiliency and Student Achievement in  
Upper Elementary Students**

## Summary

### **In a sentence or two, please describe the background and purpose of the research.**

The study will take place in the [REDACTED] School District. The purpose of this study is to examine the relationship between 5th and 6th grade students' self-reported levels of resiliency, as measured by grit scores, and their performance on the MAP communication arts assessment. The second purpose of this study is to determine whether the relationship between 5<sup>th</sup> and 6<sup>th</sup> grade students' grit scores and student achievement, as measured by MAP, is affected by student gender, ethnicity, or lunch pay status.

### **Briefly describe each condition or manipulation to be included within the study.**

This study is a quantitative analysis using a correlational research design and does not involve comparison of control groups or treatment groups, therefore, there will be no conditions or manipulations included within the study.

### **What measures or observations will be taken in the study? If any questionnaire or other instruments are used, provide a brief description and attach a copy. Will the subjects encounter the risk of psychological, social, physical or legal risk? If so, please describe the nature of the risk and any measures designed to mitigate that risk.**

The researcher will distribute the Short Grit Scale to fifth and 6<sup>th</sup> grade students in the Saint Joseph School District and the researcher will also collect archival data.

- Student Grit Scores. Each 5<sup>th</sup> and 6<sup>th</sup> grade teacher in the district will distribute the Short Grit Scale to their students. The survey will be electronically utilized using Survey Monkey. The results of the surveys will be stored within the school district database and will be used by the researcher. The Short Grit Scale is attached.
- Student Demographic Data. The demographic data, including gender, ethnicity, and lunch pay status will be gathered from the [REDACTED] School District.
- Student Communication Arts MAP scores. Scores from the Missouri Assessment Program Communication Arts assessments will be used to measure student achievement. These scores are disrupted to the school district once the assessments have been completed and scored.

No subjects will encounter the risk of psychological, social, physical, or legal risk.

### **Will any stress to subjects be involved? If so, please describe.**

No subjects will encounter any stress.

**Will the subjects be deceived or misled in any way? If so, include an outline or script of the debriefing.**

Subjects will not be deceived or misled in any way.

**Will there be a request for information which subjects might consider to be personal or sensitive? If so, please include a description.**

Student demographic data will be downloaded from the [REDACTED] School District database and no student names will be included with the data provided to the researcher. The demographic data utilized in the study is the same information reported for core data to the state of Missouri. In order to protect anonymity, the students will use their student identification numbers instead of their names on the Grit Scale.

**Will the subjects be presented with materials which might be considered to be offensive, threatening, or degrading? If so, please describe.**

The subjects will not be presented with materials which might be considered to be offensive, threatening, or degrading.

**Approximately how much time will be demanded of each subject?**

The Grit Scale will take students approximately 10 minutes to complete.

**Who will be the subjects in this study? How will they be solicited or contacted? Provide an outline or script of the information which will be provided to subjects prior to their volunteering to participate. Include a copy of any written solicitation as well as an outline of any oral solicitation.**

The population for this study is comprised of 5<sup>th</sup> and 6<sup>th</sup> grade students in the [REDACTED] School District. The sample of students included only those 5<sup>th</sup> and 6<sup>th</sup> grade students who were enrolled in the school district for the entire 2016-2017 school year, participated in the MAP assessment testing, and completed the survey. A letter will be distributed to the students prior to the Grit Scale which will allow each student to choose not to complete the survey. The letter to parents and students is attached.

**What steps will be taken to ensure that each subject's participation is voluntary? What if any inducements will be offered to the subjects for their participation?**

A letter will be distributed to the students prior to the Grit Scale which will allow each student to choose not to complete the survey. Answers will be confidential and will be combined with the responses of the participants in summary form. Information reported will not include individual names or school districts. The letter to parents and students is attached.

There are no inducements to participate in this study.

**How will you insure that the subjects give their consent prior to participating? Will a written consent form be used? If so, include the form. If not, explain why not.**

The completion of the Grit Scale will indicate student consent to participate and permission to use the information by the researcher.

**Will any aspect of the data be made a part of any permanent record that can be identified with the subject? If so, please explain the necessity.**

There is no aspect of this data that will be made a part of any permanent record that can be identified with the subjects.

**Will the fact that a subject did or did not participate in a specific experiment or study be made part of any permanent record available to a supervisor, teacher or employer? If so, explain.**

The fact that a subject did or did not participate in a specific experiment or study will not be made part of any permanent recorded available to a supervisor, teacher, or employer.

**What steps will be taken to insure the confidentiality of the data? Where will it be stored? How long will it be stored? What will be done with it after the study is completed?**

The [REDACTED] School District assessment office will work with the researcher to collate student identification numbers with the student's demographic information, their MAP achievement scores, and the self-reported grit scores. The data as compiled for the purposes of this study will be stored in the [REDACTED] assessment office. The researcher, following the completion of the study, will dispose of documents created for the purpose of this research. The demographic and archival data from which information was taken will remain housed with the [REDACTED] assessment office and researcher as directed by the [REDACTED] district administration.

**If there are any risks involved in the study, are there any offsetting benefits that might accrue to either the subjects or society?**

No risks have been identified in this study. However, an offsetting benefit for the [REDACTED] School District may include insight into the possible relationship between student achievement and non-cognitive factors such as grit. This insight could also be used by district officials to assess non-cognitive attributes in educational programs and to advise officials for professional development.

**Will any data from files or archival data be used? If so, please describe.**

Data from the [REDACTED] School District database and student survey data will be used for this study.

**Appendix F: IRB Consent Letter**



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*Baker University Institutional Review Board*

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! March 23, 2017!

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Dear John Davison, III and Dr. Frye,!!!!!!!!!!!!!!!!!!!!!!

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The Baker University IRB has reviewed your research project application and approved this project under Expedited Status Review. As described, the project complies with all the requirements and policies established by the University for protection of human subjects in research. Unless renewed, approval lapses one year after approval date.

!

Please be aware of the following:

!

1. Any significant change in the research protocol as described should be reviewed by this Committee prior to altering the project.
2. Notify the IRB about any new investigators not named in original application.
3. When signed consent documents are required, the primary investigator must retain the signed consent documents of the research activity.
4. If this is a funded project, keep a copy of this approval letter with your proposal/grant file.
5. If the results of the research are used to prepare papers for publication or oral presentation at professional conferences, manuscripts or abstracts are requested for IRB as part of the project record.

!

Please inform this Committee or myself when this project is terminated or completed. As noted above, you must also provide IRB with an annual status report and receive approval for maintaining your status. If you have any questions, please contact me at [EMorris@BakerU.edu](mailto:EMorris@BakerU.edu) or 785.594.7881.

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Sincerely,

!

!

Erin Morris PhD

Chair, Baker University IRB

!

Baker University IRB Committee

! Joe Watson PhD

! Nate Poell MA

! Susan Rogers PhD

! Scott Crenshaw

!