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# A Study to Determine the Relationships Among Grit, Engagement, and Student Achievement

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# A Study to Determine the Relationships Among Grit, Engagement, and Student Achievement

by

Jill Dennison

December 9, 2020

A Dissertation submitted to the Education Faculty of Lindenwood University in partial fulfillment of the requirements for the degree of

Doctor of Education

School of Education

A Study to Determine the Relationships

Among Grit, Engagement, and

Student Achievement

by

Jill Dennison

This Dissertation has been approved as partial fulfillment

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| Kathy J. Grover<br>Dr. Kathy Grover, Dissertation Chair | December 9, 2020<br>Date |
| Dr. J Anderson, Committee Member | December 9, 2020<br>Date |
| Brady Quirk<br>Dr. Brady Quirk, Committee Member | December 9, 2020<br>Date |

Declaration of Originality

I do hereby declare and attest to the fact that this is an original study based solely upon my own scholarly work at Lindenwood University and that I have not submitted it for any other college or university course or degree.

Full Legal Name: Jill Dennison

Signature: Jill Dennison Date: 12/9/20

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## Abstract

In the absence of high quality and impact interventions, undesirable consequences of poverty will be seen to fruition. In this study, the Golden Circle business model (Sinek et al., 2017) served as the framework to understand how students' grit, engagement, and achievement are related in Title I elementary schools. The purpose of this study was to determine if there is a relationship between grit and engagement, engagement and student achievement, and finally grit and student achievement. The relationship between grit and engagement was measured by teacher and student perceptions, respectively. Student engagement and achievement were analyzed using student self-perceptions of the level of engagement and individual achievement results in math and reading. Finally, the relationship between grit and student achievement was measured by reading and mathematics academic achievement results and teachers' perceptions of students' educational engagement. Correlation provides insight into the behavior of pairs of variables (i.e., teachers' perceptions, students' perceptions, and academic achievement). Data collected and analyzed revealed no strong correlation between grit, engagement, and academic achievement. Moderate correlations were revealed between teachers' perceptions regarding their ability to change their students' ability to achieve in math. Additionally, moderate correlations were discovered between students' perceptions of their ability to affect their perseverance (grit) in reading.

## Table of Contents

## List of Tables

## List of Figures

# Chapter One: Introduction

Investment in children in the early grades can be a cost-effective process for defending against the long-term, undesirable consequences of poverty on academic achievement (Hattie & Anderman, 2013). Hattie and Anderman (2013) challenged educators when they stated, "Given the many influences that can have a positive effect on student achievement, the constant question every system, school, and teacher should ask is *how much* each influence impacts on achievement growth" (p. xix). In this study, the influence of the synergy of grit and engagement of students enrolled in Title I elementary schools in District A, where grit and engagement of adolescents from lower-income neighborhoods are measured, will be analyzed in relation to student academic achievement.

In this chapter, the background of the study is presented. The conceptual framework, followed by a declaration of the problem, the purpose of the study, the research questions, and the hypotheses are stated. Finally, the significance of the study, definition of key terms, and the limitations and assumptions in this study are described.

## Background of the Study

Title I, Part A (Title I) of the Elementary and Secondary Education Act (ESEA) was first established in 1965 and was amended and renamed the Every Student Succeeds Act (ESSA) in 2015 (U.S Department of Education [USDOE], 2017). The ESSA is a national education program through which financial assistance is provided to local educational agencies, usually local school districts, and schools with high percentages of economically underprivileged students to give all children an equal opportunity to learn and meet difficult state academic standards (USDOE, 2017). The ESSA was structured to

encourage innovation, flexibility, transparency, and accountability and to reduce encumbrance while preserving essential securities for all students (USDOE, 2017).

A pseudonym, District A, was selected to protect the anonymity of the District in this case study. District A, in the Midwest of the United States, is comprised of approximately 30 elementary schools which range in enrollment from roughly 200 to 400 students (District Communication, 2019). Schools are identified as either Title I or non-Title I status (District Communication, January 18, 2019). Title I school status is determined by the percentage of students, typically 70% or above, who are eligible for free or reduced-price meals (District Communication, January 18, 2019). Nineteen of the elementary schools in District A are qualified as Title I schools (District Communication, 2019).

The Title I schools in District A have performed significantly lower on average than the non-Title I schools in District A (District Communication, 2019). Eight of the 19 schools have been identified as Targeted Schools, (District Communication, 2019) performing in the lowest 10-15% of the Title I Schools in the region, as defined by the guidelines of the ESSA (USDOE, 2017). An additional two schools are identified as Comprehensive Schools, (District Communication, 2019) performing at the lowest 5% of the Title I Schools in the region on state assessments and attendance, as defined by the guidelines of the ESSA (USDOE, 2017).

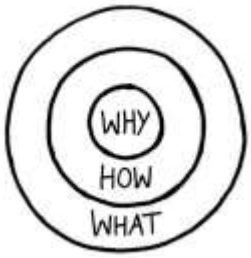
**Conceptual Framework**

In this study, the Golden Circle business model (Sinek et al., 2017) will serve as the framework to understand how students' grit, engagement, and achievement are related. The literature regarding Sinek's Golden Circle with other authors' opinions is

limited. However, the conceptual model is appropriate for this study. Using concentric circles as a model, Sinek (2009) created the Golden Circle to explain the characteristics of high functioning companies. For the purposes of this study, the core of the circle, the *why*, is aligned to student grit (Sinek et al., 2017). The inner ring of the Golden Circle, the *how*, parallels with the engagement of students, and the outer ring of the circle, the *what*, reflects student academic achievement (Sinek et al., 2017) (see Figure 1). Permission was granted to utilize the Golden Circle by Simon Sinek, Inc. (Appendix A).

**Figure 1**

*The Golden Circle*




*Note.* The Golden Circle depicts the why, how, and what as explained by Simon Sinek. Sinek, S. (2019, January 4). Simon Sinek.

The innermost circle of the Golden Circle is *why* a company or organization exists (Sinek, 2009). Sinek et al. (2017) finalized the explanation:

> When I say WHY, I don't mean to make money—that's a result. By WHY I mean what is your purpose, cause or belief. WHY does your company exist? Why do you get out of bed every morning? And WHY should anyone care? (p. 39)

This conviction is the *why* of what compels the members of an organization to do what they do (Sinek et al., 2017). Brooks and Seipel (2018) highlighted grit as a unique trait believed to be related to the overall achievement of successful students.

The middle circle of the Golden Circle is *how* the company does what they do (Sinek, 2009). Sinek (2009) continued, “Some companies and people know HOW they do WHAT they do” (p. 39). Hattie (2009) found across the grades, when instruction was challenging, relevant, and academically demanding, all students were found to have higher engagement, teachers talked less, and the greatest beneficiaries were at-risk students.

The outer circle of the Golden Circle represents *what* a company does (Sinek, 2009). As Sinek (2009) stated, “Every single company and organization on the planet knows WHAT they do” (p. 39). The Title I principal reported the connection that grit impacted student engagement which influenced student achievement (District Communication, March 11, 2020). The Title I principal continued that while there may be a correlation between grit, engagement, and academic achievement, these relationships may even be the causation for students who possess the capacity to be successful, which is student achievement (District Communication, March 11, 2020). Figure 2 illustrates the idea of the Golden Circle with the concepts of grit, engagement, and academic achievement.

**Figure 2**

*The Proposed Educational Golden Circle*


*Note.* Simon Sinek's The Golden Circle is reimagined with educational concepts. Sinek, S. (2019, January 4). Simon Sinek.

**Statement of the Problem**

Ten of the 19 Title I schools in District A are identified as low performing on state assessments in the areas of math and English language arts (District Communication, 2019). The other 9 Title I schools are performing lower on state assessments in the areas of math and English language arts on average than the non-Title I schools in District A (District Communication, 2019). Sousa and Armor (2016) reported an academic achievement gap exists between students in Title I schools and students in non-Title I schools. More specifically, Hattie (2009) found students in Title I schools score below students in non-Title I schools in reading and math. The problem to be addressed in this study is to determine whether student grit and student engagement are positively correlated to student academic achievement in District A, which could provide strategies for meeting the intention of Title I of the ESSA (USDOE, 2017) and narrowing the achievement gap.

## Purpose of the Study

The purpose of this study is to determine if there is a relationship between grit and student achievement, student achievement and engagement, and finally grit and engagement. The relationship between grit and student achievement was measured by reading and mathematics academic achievement results and teachers' perceptions of students' educational engagement. The relationship between grit and engagement was measured by teacher and student perceptions. Finally, student engagement and achievement were analyzed using student perceptions and their individual achievement results in math and reading.

### *Research Questions and Hypotheses*

The following research questions will guide this study:

1. What is the relationship of the perceptions of engagement of students as compared to teachers' perceptions of the grit of students enrolled in third through fifth grades in Title I elementary schools?

$H3_o$: There is no significant relationship between the perceptions of engagement of students and teachers' perceptions of the grit of students.

$H3_a$: There is a significant relationship between the perceptions of engagement of students and teachers' perceptions of the grit of students.

2. What is the relationship of academic achievement in the areas of mathematics and reading and the perceptions of engagement of students enrolled in third through fifth grades in Title I elementary schools?

$H1_o$: There is no significant relationship between academic achievement and students' perceptions of engagement as measured in:

a. Mathematics

b. Reading

$H1_a$: There is a significant relationship between academic achievement and students' perceptions of engagement as measured in:

a. Mathematics

b. Reading

3. What is the relationship of academic achievement and teachers' perceptions of the grit of students enrolled in third through fifth grades in Title I elementary schools?

$H2_o$: There is no significant relationship between academic achievement and teacher's perceptions of student grit as measured in:

a. Mathematics

b. Reading

$H2_a$: There is a significant relationship between academic achievement and teacher's perceptions of student grit as measured by:

a. Mathematics

b. Reading

**Significance of the Study**

The findings of this research may allow educationalists to determine the next steps to support student growth in the areas of grit and engagement. Educators could use the results of this study to build and implement programs to support student deficiencies in the social-emotional realm or level of engagement that in turn would narrow the student achievement gap. A better understanding of the link between grit, student

engagement, and academic achievement may validate the need to include systems and programs that foster grit and student engagement within the school system to increase student achievement.

The results of this study may also provide educators the knowledge to determine the appropriate entry interventions related to grit or engagement. The interventions may then increase grit, engagement, and academic achievement in third through fifth-grade students enrolled in District A's Title I elementary schools. Raun (2018) declared, "Some factors that contribute to generational poverty and cycles of failure are out of the control of educators, but the evidence base shows that there are factors within educators' control" (para. 3). Evidence-based approaches such as mindset, grit, emotional intelligence, and hardiness each contribute to complementary theories, which focus on success and achievement (Frydenberg, 2017). According to Mandelbaum (2018), "there is little research examining how adolescents' level of grit are affected by living in lower income neighborhoods" (p. 1).

## Definition of Key Terms

For the purposes of this study, the following terms are defined:

### *At-risk Student*

At-risk students are considered in danger of not graduating, being retained, or not meeting other education-related goals (Sumbera, 2017). Factors may include but are not limited to, socioeconomic status; academic success; conduct, mental, or physical problems; home environment; and school capacity to meet student needs (Sumbera, 2017).

### *Behavioral Engagement*

Behavioral engagement concerns questions regarding student conduct in class, student participation in school-related activities, and student interest in academic tasks (Cooper, 2014).

### *Cognitive Engagement*

Cognitive engagement is centered on the student's internal asset in the education development, which incorporates the internal mental qualities or non-visible characteristics of the student that support the effort in learning, understanding, and mastering the information or abilities promoted in academic work (Cooper, 2014).

### *Effect Size*

Effect size is a simple measure for quantifying the difference between two groups or the same group over time, on a common scale (Hattie & Anderman, 2013). Effect size is calculated by taking the difference in two mean scores and then dividing this figure by the average spread of student scores (Hattie, 2009).

### *Emotional Engagement*

Emotional engagement concerns the student's belief of having a place of worth to his or her teacher, classroom, or school. (Renninger & Bachrach, 2015).

### *Grit*

Grit is defined as passion and perseverance toward personal goals maintained despite setbacks and little success in the short-term (Duckworth et al., 2007).

### *i-Ready Diagnostic*

i-Ready Diagnostic was created in 2010 by Curriculum Associates, a business that designs research-based, assessments, and data management resources (i-Ready Central,

2017). The diagnostic is an online assessment tool for students in kindergarten through middle school (i-Ready Central, 2017).

### *Panorama*

Panorama Student Survey is an online tool used to gather feedback from students about their classroom experience (Take a tour of Panorama, 2018). The comprehensive survey covers 19 key topics from pedagogical effectiveness and school climate to student engagement and growth mindset (Panorama, 2019a, 2019b).

## Limitations and Assumptions

The focus of the study is on all learners in third through fifth grades who have a response to the culture and climate survey, as well as i-Ready math and reading results from the Title I schools in District A; therefore, the sample is a limitation, and the results of the analysis should not be considered absolute (Fraenkel et al., 2019). The following limitations and assumptions were identified:

### *Sample Demographics*

The sample size will be all third through fifth-grade students who have academic achievement data and perception data, which are the students' responses to the culture and climate survey and are enrolled in the district's Title I elementary schools. The second limitation is that student perception data regarding engagement were collected from all individuals within the same collection window; student responses could have been based solely on the perception of the experience they most recently endured. Teacher perceptions were collected from all teachers in grades Kindergarten through fifth grade, including specials and special education teachers.

### *Instrument*

The surveys were composed by Panorama (2019a, 2019b), a survey company.

The following assumptions were accepted:

1. The responses of the participants were offered honestly.
2. The responses of the participants were offered without bias.

## Summary

In this chapter, the design of the study was introduced. The background of the study and the conceptual framework were provided. The statement of the problem, the purpose of the study, and the research questions and hypotheses were presented. The significance of the study, definition of key terms, and the limitations and assumptions in this study were described.

In Chapter Two, a review of literature is presented. The conceptual framework is further explained. In addition, studies regarding grit and related brain research are summarized, and the connection between grit and academic achievement are discussed. Finally, research findings regarding student engagement, teacher engagement, and the perceptions of elementary students are provided.

## Chapter Two: Review of Literature

Duckworth et al. (2007) determined students must be highly engaged and have the grit to achieve academic success. There is a gap in the academic achievement of students attending Title I schools as compared to students enrolled in non-Title I schools (Sousa & Armor, 2016). The purpose of this study is to examine the relationship between grit, engagement, and academic achievement of students enrolled in Title I elementary schools. Lack of grit and engagement could be an underlying reason for the achievement gap of students in Title I schools as compared to students in non-Title I schools (Longaretti & Toe, 2017).

Increasing the academic performance of all students is beneficial to society (Organisation for Economic Co-operation and Development [OECD], 2019). As Burgess (2015) stated, "most people agree that education is the primary route out of poverty, but standardized test scores show too many students are failing in our schools" (para. 1). This project has provided additional insight into the possible root cause of the achievement gap. If the data support a positive correlation between higher engagement or grit level and academic achievement, then an entry point into interventions for at-risk students could be developed.

In this chapter, a review of literature related to the study is provided. First, information on the conceptual framework is expanded with brain research and the Golden Circle. Next, grit, engagement, and the academic achievement gap are discussed. The chapter closes with recent findings on teacher and student perceptions of engagement and the value of analyzing the perceptions of elementary students.

## Conceptual Framework

The concept of the Golden Circle, more than any other inspiration, transformed Sinek's (2009) view of the world and restored his passion for working. Sinek's (2019) drive was to "imagine a world in which the vast majority of us wake up inspired, feel safe at work and return home fulfilled at the end of the day" (para. 1). To inspire and assist individuals and companies to reach their goals, Sinek (2009) formulated the Golden Circle which includes a person's *Why, How,* and *What.* As Peter Docker stated in Forbes, reflecting upon times in one's life when one has been moved or inspired is the first step to finding one's personal why (Schawbel, 2017). In this study, the Golden Circle framework serves as a model of the relationships among student grit, student engagement, and student achievement.

Sinek et al. (2017) posited that people who do not know their *why* may feel as if they are not contributing to a great purpose or may be detached from their work. As Sinek et al. (2017) explained, "people and organizations that know their WHY enjoy greater, long-term success, command greater trust and loyalty among employees and customers and are more forward-thinking and innovative than their competition" (pp. viii-ix). In the Golden Circle, the *why* is the "purpose, cause or belief that drives every organization and every person's individual career" (Sinek, 2009, p. 13). A career person's *why* is not solely to make a profit, nor is a student's *why* only to earn a grade (Sinek et al., 2017). Von Culin et al. (2014) scrutinized the motivational correlation of grit, or the *why*, for long-term objectives and found grit was clearly associated with engagement and importance. According to Duckworth (2016), the level of grit a person has is dependent upon passion, which is a source of interest and purpose.

Some leaders in organizations know the processes required, the *how*, to create or produce the organizations' product (Sinek et al., 2017). An important feature of the learning process is student engagement (Güvenc, 2015). Güvenç (2015) reported that motivation is an artifact of engagement. The effect size for student engagement is 0.48, which is just over the measurement for a year of growth as related to student achievement (Hattie, 2009, p. 298.). Student engagement will be the conduit between grit and student achievement in this study, just as the *how* in the Golden Circle is the conduit of creating a product, the *what*, which is driven by the *why* of a high functioning enterprise or company.

Sinek et al. (2017) claimed there are few organizations or people who can clearly state *why* they create or produce *what* they do. However, every person and organization knows *what* they do or *what* they create (Sinek et al., 2017). Grit and student achievement, the *what* of education, have been shown to be positively and significantly correlated (Al-Mutawah & Fateel, 2018; Zimmerman & Brogan, 2015).

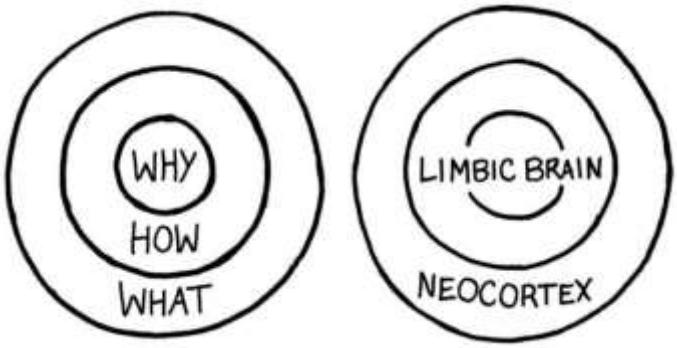
**The Brain and the Golden Circle**

Sinek (2009) explained the Golden Circle was not only a model for how leaders should lead. Rather, the Golden Circle was based upon brain research and meant to serve as more than a communications diagram (Sinek, 2009). Additionally, the executive function of the brain includes planning, reasoning, and behavior, all of which are vital components of communication (Ardila, 2018). The Golden Circle's three parts relate to the brain as follows: the *why* and *how* associate with the limbic brain and the *what* associates with the neocortex (Sinek, 2009).

The limbic system of the brain is responsible for feelings, the ability to make decisions, and behavior (Sinek, 2009). The Queensland Brain Institute (2020) explained the limbic part of the brain produces “behavioural and emotional responses, especially when it comes to behaviours we need for survival: feeding, reproduction and caring for our young, and fight or flight responses” (para 1). As described by the Tokyo Metropolitan Institute of Medical Science (2018), “the cerebral neocortex is responsible for higher brain functions, such as conscious thought and language, in humans” (para. 1).

**Figure 3**

*The Golden Circle and the Limbic Brain*




*Note.* The Golden Circle depicts the why, how, and what as explained by Simon Sinek. Sinek uses the model of the brain to support his claims of the Golden Circle's effectiveness. Sinek, S. (2019, January 4). Simon Sinek.

Not all neuroscientists agree with Sinek’s model (Middlebrook, 2015). May (2014), a biologist, stated, “there is very little empirical scientific support underlying Sinek's Golden Circle” (para. 1). Middlebrooke (2015) argued that neuroscientists do not understand the brain in such a simplistic manner as Sinek stated. May (2014) agreed that a body of research exists demonstrating the significance of emotion over firm rational self-interest in encouraging human behavior. May (2014) continued, “however, it is

another leap to claim that all emotional motivations driving the ‘whys’ of human action lead to desirable outcomes or even outcomes in line with individual self-interest” (para. 8).

**Grit**

Duckworth (2016) began learning about grit from a very young age. Duckworth (2016) spent years of her life listening to her father tell her and her siblings they were not geniuses. According to Duckworth (2016), her father thought not being a genius was a great disappointment to the family. Smith et al. (2016) stated:

> Not long ago, success in school meant success in life. We also believed that things like grit and determination were traits people were born with, not skills that could be developed over time. Over the past few decades, hard and soft sciences have produced an impressive body of evidence that teaches us two very new, very important things. First, that we can take our innate abilities and cultivate them, just like we build up muscle, dexterity, and language fluency. And secondly, that social and emotional skills matter just as much in determining life satisfaction and success as traditional intelligence. The use of the word "skills" here is intentional. These qualities are not only innate. They can be taught. And, they can be learned. (p. v)

As a case in point, Duckworth (2016) was awarded the MacArthur grant, also known as the *genius award,* in 2013.

Critics have acknowledged systemic issues such as the status of impoverishment and exclusionary measures are the causes of the lack of grit in low socio-economic populations (Bazelais et al., 2018). Tampio (2016) stated, “according to the grit narrative,

children in the United States are lazy, entitled and unprepared to compete in the global economy" (para. 1). Rather than discussing the need for systems to be created within schools to facilitate a growth mindset or engagement for students, opponents with fixed mindsets explain a student's predetermined status is to blame for poor student achievement (Bazelais et al., 2018). Therefore, due to the predetermined status, the efforts to increase achievement are futile (Bazelais et al., 2018).

Whether it is possible to enhance grit via interventions is not yet clear, although there is evidence that social and personal skills as well as resiliency are responsive to interventions (Paunesku et al., 2015). As noted by Tampio (2016):

> According to Duckworth, grit is the ability to overcome any obstacle in pursuit of a long-term project: "To be gritty is to hold fast to an interesting and purposeful goal. To be gritty is to invest, day after week after year, in challenging practice. To be gritty is to fall down seven times and rise eight." (para. 2)

Tampio (2016) argued promoting grit is not a productive or positive method of motivating individuals, often leading to ridiculous or mean behavior. According to Tampio (2016), Duckworth disagrees with schools grading on grit because the tools of measurement are unreliable.

To positively affect discrimination, a philosophy of grit may help minority individuals (Buskirk-Cohen & Plants, 2019). In the study conducted by Tefera et al. (2018),

> the narratives of Black and Latin students labeled with disabilities complicate the overly simplistic storyline of "grit" by demonstrating that simply "persevering," "working hard," or being "diligent" was insufficient to meet policy mandates,

> particularly given the type of individual learning support many students needed to advance their learning needs. (p. 4)

O'Neal et al. (2016) studied Latino college students who were the first in their families to attend higher education. Grit was found to be higher among Latino students than Caucasians (O'Neal et al., 2016). The higher the level of grit within these students the more positive the impact on overcoming stress and obstacles the students faced (O'Neal et al., 2016).

**Student Engagement**

The level of student engagement is a significant aspect concerning students' conduct (Güvenç, 2015). The level of engagement is a reliable indicator of student achievement and behavior (Güvenç, 2015). When students are aware of their power to get better at what they do, ownership and engagement are reinforced, and the grounds for subsequent improvement and sustainability are established (Rincón-Gallardo & Fullan, 2016). Students who are engaged during educational activities attain better academic achievement compared to less-engaged students and are less likely to drop out (Güvenç, 2015). Disengaged students face many risks, such as disturbing the class and dropping out (Güvenç, 2015).

Bryson (2014) identified five elements required to enable engagement, which include: a relationship between learner and teacher, relevant educational assignments that require student effort regarding time and rigor, collaboration among learners, an encouraging classroom, and culturally inspiring exercises. Motivation and engagement are directly related as one strives to reach a goal, which determines the behavior of a person (Güvenç, 2015). Students may be motivated by intrinsic or extrinsic rewards

(Güvenç, 2015). The learner engagement systems, outlined by Bryson (2014), give instructors direction to focus instructional endeavors and recommendations on engaging students in their education and supporting collaborative learning opportunities in school. According to Rincón-Gallardo and Fullan (2016), ownership and engagement are strengthened and determine the reason for successive improvements and maintainability when a collaborative group is aware of their ability. Highly structured classrooms more often foster student engagement and self-regulation (Güvenç, 2015). When students feel they have a say in their learning, interest increases while concerns about grades decrease (Güvenç, 2015).

Although intervention programs to increase engagement offer numerous high-quality plans, the number of choices makes it difficult for teachers to make decisions concentrated on the central goal (Fullen & Quinn, 2016b). Also, the focus on addressing the core subject areas has deemphasized the importance of the arts (Cavendish, 2017). Principals need to discover the bond that will amplify the coherence of the district and school goals at each level and subject area and build a course to achieve the goals (Fullen & Quinn, 2016b). As noted by Cavendish (2017), the new systems have had little to no impact on improving student achievement when educator buy-in is not fostered. Internal responsibility occurs when the group takes self and collective accountability for results and strengthens this practice by engaging in the external accountability structure (Fullen & Quinn, 2016a). Engagement may be the primary component for improving student achievement (Cavendish, 2017).

**The Brain, Grit, and Engagement**

Grit has also been determined to be a good non-cognitive supplemental forecaster of educational achievement (Duckworth et al., 2007). As stated by Mandelbaum (2018), "a deleterious life event encountered by school-age children can negatively affect cognitive abilities such as inhibitory control and attention shifting or flexibility, abilities related to grit" (p. 1). According to Von Culin et al. (2014), "since engagement overlaps with intrinsic motivation, meaning regulates people through self-identification and self-integration, and pleasure is typically an external goal, the more autonomous one's motivation is, the grittier this person might be" (p. 3).

Wang et al. (2017) examined the relationship between academic performance and the Grit-S Score based on brain activity by location. Wang et al. (2017) found the greater the Grit-S Score the lower the fractional amplitude of low-frequency fluctuations in the right dorsomedial prefrontal cortex of the brain, thus identifying a neural connection to grit. Through the findings of the study, Wang et al. (2017) provided a brain-based connection between grit and academic performance via the right dorsomedial prefrontal cortex (DMPFC). As found by Sinek (2009) and Takeuchi et al. (2019), the prefrontal cortex has a prime role in metacognitive functions which are vital to facilitate learning for both teachers and students.

DiMenichi and Richmond (2015), in a behavioral study, found that thinking about past failures can improve participants' grit scores. Therefore, the activity of the dorsomedial prefrontal cortex may impact grit when students reflect on past failures to approach similar situations in a different manner (DiMenichi & Richmond, 2015). The finding of a relationship between grit and impulsive activity suggests grit impacts self-

regulation, development, the pursuit of objectives, and reasoning concerning prior errors (Eickhoff et al., 2016).

**Academic Achievement Gap and Systems of Accountability**

Educators should avoid a constricted understanding of accountability as a one-dimensional method and try to explore local contexts that shape different accountability practices (Kim & Yun, 2019). As a supportive measure for educators:

> [The] ESSA provides greater flexibility to states to design state accountability systems that reflect ambitious academic standards, use a variety of indicators to measure college- and career-ready outcomes for all students, and can direct resources and support to struggling students and schools. (Bae, 2018, p. 3)

As Evans (2019) reported, federal accountability systems provide an avenue to establish innovative assessment systems, including for use in statewide accountability systems. Teachers are pleading for an accountability system that encourages continuous support and improvement rather than mere compliance and efforts to evade reprimand (Bae, 2018). According to Bae (2018), "Under ESSA, states are challenged to build new systems of accountability that highlight and measure the things that matter most for student success and provide the most useful data for school improvement" (p. 3). Evans (2019) stated, "The term 'innovative' is used to differentiate state assessment systems that do not rely solely on statewide annual achievement tests to determine student proficiency each year in the required grades and subjects" (p. 1). When deciding which school to attend, parents evaluate the success of a school system as communicated by the state and local accountability system. (Whitesell, 2015). Whitesell (2015) suggested the association between accountability and stakeholders' perceptions of their schools is vital

to understand since accountability systems are available for aiding parents and students with their choice when deciding what school to attend.

States are now allowed to investigate the effectiveness of accountability systems with alternative types of assessments such as performance-based competency and interim assessments to meet the federal requirements (Evans, 2019). Another perception of Whitesell (2015) was if the accountability system changes the thought of the parents and students, then the system in place does indeed provide information, which is useful. However, Whitesell (2015) continues to state if the evidence does not affect the perceptions of the parents and students, the system does not aid in making better decisions.

Educators should also be aware a variety of accountability methods are used in education since there is autonomy at the national and state levels (Kim & Yun, 2019). Mixed forms of accountability, those not solely relying on assessment results, are shown as the leading mode of accountability across the countries in the sample (Kim & Yun, 2019). A revised accountability system should be rooted in the redesign of schools as learning establishments dedicated to continuous improvement, where experimentation is encouraged and celebrated, while ongoing evaluation and self-reflection occur (Bae, 2018).

**Grit and Academic Achievement**

Over 56,000 public schools in the United States utilized Title I funding for 21 million elementary-aged children, according to a study in the past decade (Rivera Rodas, 2019, p. 5). According to Rivera Rodas (2019), “the percentage of students who are free and reduced [meal] eligible must meet a certain threshold, in order for a school to be

eligible to receive Title I funds" (p. 3). Eligibility for students to be classified in the free and reduced-meal program is determined through qualifying for a free lunch system or the student receiving civic assistance that has similar income thresholds such as food stamps (Rivera Rodas, 2019). The development of programs with equal access for students in both Title I and non-Title I schools is vital to student success (Weist & Amankonah, 2019).

As stated by Rivera Rodas (2019), Title I funds were not reaching high-poverty students so two provisions were made ensuring additional funds were used in Title I School. These two provisions include required supplemental, not supplanted, resources and comparability of resources across all schools within districts to be equal regardless of status (Rivera Rodas, 2019). Specifically, to supplement, not supplant and comparability, were added as the fundamentals to the Title I funds distribution (Rivera Rodas, 2019).

In a study determining the best mathematical practices, evaluations of performance by race/ethnicity, family social-economic status, school social-economic status, and community type were most discrepant between participants who attended a Title I school and those who did not attend a Title I school, not by demographic status alone (Weist & Amankonah, 2019). Title I supplies were meant to be additional resources for students above and beyond those also provided to non-Title schools (Rivera Rodas, 2019). This effort was to assure schools with high free and reduced lunch percentages were given additional resources above and beyond those procured with other funding (Rivera Rodas, 2019).

Knowledge of student grit levels may allow educators to recognize which students would benefit most from interventions that emphasize grit (Credé et al., 2016). Hodge et

al. (2018) concluded evidence exists that grit has a positive relationship with academics. While younger people were not deliberately included in the research performed by Hodge et al., the influence of age was substantial; but across available research literature, age-related results were mixed (Credé et al., 2016). The measurement of grit may be beneficial in schools where retention is problematic (Credé et al., 2016). Hodge et al. (2018) discovered findings that highlight the relevance of grit as a desired student trait which was related to positive engagement.

According to Brooks and Seipel (2018), "From an education perspective, success is often measured by the progression of an individual through the required stages of an academic program; the final result of which is the completion of a degree" (p. 22). Yuhun et al. (2018) reported students with more grit who were attending undergraduate university had higher grade point averages even when SAT scores were held constant. In existing studies of grit with over 1,500 participants, the outcomes revealed adults higher in age have more grit than younger adults (Credé et al., 2016, p. 13). Students with high SAT scores are predicted to complete college, but not all students matriculate (Brooks & Seipel, 2018). The level of grittiness could be the reason some adults are more prosperous than others, which in turn is the source of many learning and career-driven research projects, regardless of the SAT score one achieves (Brooks & Seipel, 2018).

Zmuda and Bradshaw professed, "Beyond the individual level, SEL programs may enhance school environmental supports (e.g., a climate of high expectations for academic performance, and safe and orderly classrooms), teacher practices, and student-teacher relationships, which in turn may translate into improved academic achievement" (as cited in Hattie, 2013, p. 174). Implementing a social and emotional program in the

school is expected to lay the groundwork for improved academic achievement, as reported by Zmuda and Bradshaw (Hattie, 2013).

The type of motivational incentive can impact grit through paths of both persistence and desire (Yuhun et al., 2018). External motivation may come from avoiding punishment or getting an award (Güvenç, 2015). Another possible extrinsic motivation is the escape of feeling guilty for not completing a task or pride for achieving it (Güvenç, 2015). The student has no other possibility than to complete the work (Güvenç, 2015). If a student likes completing a task, they are internally motivated which means the students complete the task for its own sake. Regardless of the origin of the activity, students complete the assignment by his or her personal choice (Güvenç, 2015). The third type of motivation is emotional which can impact the outcome of a student completing a task for a teacher (Güvenç, 2015). If students believe their teacher cares for them, they will more likely complete the work (Güvenç, 2015). The quality of teacher-student relationships is related to achievement, motivation and in turn, engagement (Güvenç, 2015).

Hodge et al. (2018) revealed a person with more grit is likely to have higher engagement, which may lead to greater academic productivity. Intrinsic motivation and engagement overlap which points to the more autonomous a person's motivation is, the grittier that person may be (Yuhun et al., 2018). Grit is known to be a favorable predictor of success, such as GPA and assessment scores (Buskirk-Cohen & Plants, 2019).

To further the understanding of the impact of grit in regards to specific traits related to students' commitment to education and their academic success, students were divided into four different categories based upon their self-reported commitment and academic performance (Buskirk-Cohen & Plants, 2019). In addition to the commitment

and academic performance categories, to determine the cause of completion or not, the students also self-reported grit and a sense of belonging (Buskirk-Cohen & Plants, 2019). There were no differences in grit within the groups of students (Buskirk-Cohen & Plants, 2019). Although a strong relationship was not found consistently across several studies, moderate increases in academic performances could be the difference between academic success and failure (Credé et al., 2017). Further studies are warranted to discover the predictability of grit before measures of grit become standards for academic success (Gray & Mannahan, 2019).

**Teacher and Student Perception of Engagement**

Teachers should select a variety of innovative teaching methods for effective learning and engagement, and internalize those methods (Gülbahar, 2017). As Güvenç (2015) suggested:

> The emotional dimension of engagement reflects positive emotions such as enthusiasm, interest, and enjoyment experienced during learning. Although the opposite of engagement is lack of engagement, which is defined as the absence of effort and determination, the term disaffection is used. (p. 648)

There is a disconnect between how students and teachers feel regarding the motivational impact of a teacher upon a student (Güvenç, 2015). As Güvenç (2015) suggested, teachers who support motivation in students have a positive effect, as reported by students. Although the individual teacher, when asked, feels unable to affect student motivation; the students disagree with the teacher's self-assessment (Güvenç, 2015).

Gathering student perceptions to measure classroom climate strongly predicts academic achievement (Bahar et al., 2018). Although, concern about surveying students

in upper elementary schools was shared by several districts across the United States (Luppescu, 2016). However, there is a lack of evidence to determine educational quality by collecting student perceptions (Bahar, 2016). To address this concern, Luppescu (2016) studied the validity of surveying younger students. Luppescu (2016) surveyed younger students, including students who had difficulty reading, students who could not describe how they felt about what was happening around them, and students who were less able to describe their feelings about school.

Luppescu (2016) agreed with Bahar et al. (2018) that studying perceptions from surveys is a metric used in educational settings and can be utilized to forecast academic achievement for students. Surveying can be an essential part of measuring the quality of instruction a student received, the quality of instruction is typically based on observational data along with achievement results, attendance, and class size (Bahar et al., 2016). Luppescu (2016) was stunned to determine the results used to evaluate the reliability of students in upper elementary were consistent with surveys administered to students in grades 6-12. As a result, Luppescu (2016) assured school leaders that survey results from younger students could be used to make informed decisions of school improvement processes.

**Efficacy and Student Achievement**

An individual's ability which influences task performance is self-efficacy (Nasir & Iqbal, 2019). Ross argued, "enhancing teachers' belief in their success plays a key role in school improvement" (Hattie, 2013, p. 266) When teachers believe they can be successful, they have higher levels of efficacy (Hattie, 2013). Motivation and behaviors are impacted by an individual's self-efficacy (Akturk & Ozturk, 2019). Teachers who

believe they can make a positive impact, who have efficacy, do make a positive impact on their students (Güvenç, 2015). Alternatively, teachers who do not have efficacy have a negative effect on learning (Güvenç, 2015).

As found by Lih and Ismail (2019) "Significant correlations found between teacher efficacy and students' achievement, which is an insight into how teachers' self-efficacy affects students' experiences in the classroom" (p. 210). Similarly, teacher efficacy is an important quality of a teacher which impacts student achievement (Hattie, 2013). Grades or test scores which measure what students know constitute academic achievement (Akturk & Ozturk, 2019). Teachers who believe in their competence will increase academic achievement and students' self-efficacy (Akturk & Ozturk, 2019). Ross suggested that highly efficacious teachers were more likely to focus on lower-achieving students (Hattie, 2013). Teachers can impact the self-efficacy of students (Akturk & Ozturk, 2019).

Student self-efficacy is a factor that impacts achievement (Akturk & Ozturk, 2019). Watt and Richardson agreed that student motivation affects student learning and achievement (as cited in Hattie, 2013). As stated by Pajares, "Student self-efficacy has a greater effect on student achievement than student ability and other motivational variables" (Hattie, 2013, p. 267). Nasir and Iqbal (2019) found that positive achievement may affect a student's future achievement and belief in self.

Student self-efficacy is also an indicator of high motivation and engagement (Akturk & Ozturk, 2019). Watt and Richardson believed behaviors of individuals are impacted by their motivation (as cited in Hattie, 2013). Non-cognitive or soft skills are other descriptions of a person's resilience, otherwise known as grit, which impacts the

level of engagement of a student (Fernandez-Martin et al., 2020). When students have high self-efficacy it positively impacts their educational career (Akturk & Ozturk, 2019). Students can learn motivation and engagement from teachers, which can directly influence their success in life (Gulbahar, 2017).

According to Gresham et al., there is a close relationship between social skills and academic performance (as cited in Hattie, 2013). Predicted achievement on eighth-grade assessment is more closely related to the students' third-grade social skills assessment than the students' third-grade academic achievement scores (Hattie 2013). Intentionally teaching social skills can be effective for all students and specifically for the most struggling students (Hattie, 2013).

Hattie (2013) recommended that school leaders should provide opportunities for teachers to learn from one another to develop collective efficacy in the school. Teacher professional learning focused on increasing teacher efficacy should be the center point of school improvement plans (Hattie, 2013). Non-academic factors may influence self-efficacy (Nasir & Iqbal, 2019). In an educational setting, teacher motivation impacts student motivation through the example of teachers' behavior (Hattie, 2013). Nasir and Iqbal (2019) found that further research was needed to investigate non-academic factors, such as the soft skills of resilience or grit. School leaders must provide opportunities for teachers to learn from one another while emphasizing collective efficacy in the school (Hattie, 2013).

Increasing teacher efficacy must be the center point of school improvement plans (Hattie, 2013). In an educational setting, teacher motivation impacts their students' motivation by how the teachers behave (Hattie, 2013). Non-academic factors may

influence self-efficacy (Nasir & Iqbal, 2019). Further research is needed to investigate non-academic factors, such as soft skills, which translate into student grit (Nasir & Iqbal, 2019).

**Student-Teacher Relationships, Grit and Student Achievement**

Positive connections between students and adults promote academic success (Hattie, 2013). Teacher qualities and educational practices with learners in the education environment are significant as they impact the students' ability to satisfy assessment requirements (Annamalai & Tan, 2015). Consequently, finding evidence-based recommendations for teacher engagement with students is necessary to provide how best to encourage teacher involvement (Annamalai & Tan, 2015).

Hattie (2013) found when teachers provided appropriate pressure and engaged their students, teachers communicated confidence in the students' ability to achieve. Ross suggested perceptions of those in a highly diverse classroom were that the teacher was more dominant and cooperative when compared to classrooms with less diversity among students (as cited in Hattie, 2013). Ross stated, "As language, ethnic, and socioeconomic status of students increasingly diverges from the background of many teachers, we can make special efforts to gain the knowledge about our students that allows for mutual respect and appropriate choice in instruction" (Hattie, 2013, pp. 222-223).

Teachers who were committed and engaged provided support to their most struggling students (Hattie, 2013). Alternatively, concerning grit, five of the 28 studies Fernandez-Martin et al. (2020) studied showed no statistical differences in grit as compared by variations of teacher efficacy. Teachers caring about their students in conjunction with high expectations were necessary ingredients to positive relationships

between students and teachers (Hattie, 2013). Although teachers are engaged in their work, Fernandez-Martin et al.'s (2020) review of grit studies revealed a limited number of interventions teachers could teach and provide to foster qualities related to grit which impact achievement.

**Social and Emotional Learning, Grit and Student Achievement**

According to Zmuda and Bradshaw, the idea that there is a link between social and emotional development and academic achievement being intrinsically connected is commonly accepted among educational researchers (as cited in Hattie, 2013). Intrinsic and extrinsic motivation concerning academic goals show predictions of grit levels (Fernandez-Martin et al., 2020). Positive relationships foster appropriate social skills among students (Hattie, 2013). These relationships can be grounded by parents or teachers (Hattie, 2013). Students' ability to be positively adaptive and flexible is linked to academic achievement (Hattie, 2013).

Teaching social and emotional skills is not a new concept, rather, it has been in the educational realm from the 1960s (Hattie, 2013). Social and emotional learning (SEL) programs as a preventable intervention is an approach taken to increase academic success (Hattie, 2013). The social and emotional curriculum is focused on five main competencies that are connected and not taught in isolation (Hattie, 2013). Zmuda and Bradshaw present the competencies as "interconnected, core competencies, self-awareness, self-management, social awareness, relationship skills, and responsible decision making" (Hattie, 2013, p. 173). Zmuda and Bradshaw expressed the need for more empirical research, which focuses on specific interventions when evaluating the impact on academic achievement (Hattie, 2013). Fernandez-Martin et al. (2020) agreed

more evaluations and high-quality research is needed to be completed which could lead to proven practices to increase the development of grit within individuals.

**Student Connectedness, Grit and Academic Achievement**

Wong et al. (2019) found a sense of belonging at school predicted higher educational expectations and achievement. Several research projects have resulted in modest correlations between school connectedness and achievement (Hattie, 2013). While research exists, there is a need for more direct questioning of students related to teachers including “teachers respect to students in this school” and “teachers think all students can learn” suggests McNeely (as cited in Hattie, 2013). McNeely stated the relationship between school connectedness and student achievement is an area that needs more research (as cited in Hattie, 2013).

The more students feel connected to school, the higher student engagement and academic achievement will be (Hattie, 2013). The best way to encourage grit is to have the students get involved in their school with something they are interested in and that benefits themselves and their classmates (Daniels, 2016). Such activity will create connections and bonds with the school and the other students (Daniels, 2016).

**Gender Influences, Grit and Student Achievement**

In the 1970s, discrepancies between male and female students were evident that males had more success in school than girls (Hattie, 2013). Feminist efforts in the 1980s to address the differences became more evident, especially in the areas of mathematics and science (Hattie, 2013). There is a tendency for girls to perform higher on assessments than males and a larger percentage of males drop out of high school than females (Hattie, 2013). In the 1990s the crisis turned to males in education (Hattie, 2013). The

gratification of independence from basic social and emotional needs, which impacts student achievement and grit, did not show any difference in terms of gender (Akbar & Ummet, 2017).

With regard to grit, 28 of the studies evaluated by Fernandez-Martin et al. (2020) were focused on sociodemographic variables. The results of some of the studies revealed differences between Caucasian, Hispanic, and Black students while other studies showed no differences (Fernandez-Martin et al, 2020). Students who had Spanish spoken at home had perceptions of their teachers to be more understanding than did their Asian and African American classmates (Hattie, 2013). African American males perceived their teachers as being less helpful and friendly (Hattie, 2013).

Women are inclined to have a higher level of grit than men (Fernandez-Martin et al., 2020). Although women may have a higher level of grit, the lack of gender differences overall concerning achievement does not explain the gender disparity in high-level math and science courses (Hattie, 2013). Grit can be linked to the outcomes of individuals as a whole and also when linked to demographic status (Fernandez-Martin et al., 2020). Girls are less likely to choose the more strenuous math and science classes, but when females complete these courses, they are more successful than their male counterparts (Hattie, 2013). Conversely, when science and math competitions are analyzed, males are more likely to win over females (Hattie, 2013). The success story of future implications of closing the gap has become more evident in middle and upper-class girls than that of girls in poverty (Hattie, 2013). The same is also true when evaluating the trends of males and social class (Hattie, 2013). The research is incomplete to be able

to explain the root or cause of gender gaps especially in the areas of math and science (Hattie, 2013).

In the fourth year of attending school, there is little to no difference in the abilities of males and females (Hattie, 2013). Although, older students have shown a higher level of grit (Fernandez-Martin et al., 2020). Conversely, many studies neglect to find a link between gender and age (Fernandez-Martin et al., 2020). The possibility of teachers and parents retaining a stereotypical view of gender roles may contribute to the difference in achievement (Hattie, 2013). Teachers must encourage their students to explore their interests rather than rely on outdated gender roles (Hattie, 2013). Teachers must maximize the potential in all of their students, regardless of gender (Hattie, 2013).

**Socioeconomic Status, Grit, and Student Achievement**

When fundamental skills of children are missing, students struggle throughout their school career (Hattie, 2013). Without appropriate interventions with low socioeconomic students, the cycle perpetuates into adulthood and onto the next generation (Hattie, 2013). Parents from low socioeconomic homes have difficulty providing the necessary tangible and intangible resources for their children (Hattie, 2013). The stress present in low socioeconomic homes has a negative impact on the family unit, which in turn provides less social and emotional health in the home (Hattie, 2013). Low socioeconomic families are limited to neighborhoods they can live in (Hattie, 2013). The neighborhoods that low socioeconomic families can afford lack in social organization and high-quality resources, such as schools, to support families (Hattie, 2013). Lessons for parents regarding grit attainment reveal no impact on student

achievement, but rather grit taught to students reveals an impact on the students' achievement (Fernandez-Martin et al., 2020).

**Summary**

Less advantaged students, those who attend Title I schools, are not as likely to come from families who can put resources into education and are as engaged with education as are their advantaged counterparts, which ultimately could limit the availability of obtaining secure employment (OECD, 2019). In Chapter Two, the review of existing literature was used to outline connections between grit, engagement, and achievement as related to the Golden Circle of *what*, *how*, and *why*. Duckworth (2016) explained desire and determination, otherwise known as grit, are much more significant to accomplishment than is intellect. Güvenç (2015) found that engagement ensures students are less likely to exhibit at-risk behaviors in the educational setting.

Chapter Three contains specifics of the methodology employed for this study, including the problem and purpose overview. Additionally, the research questions, hypotheses, and research design are outlined. Finally, the population and sample, the instruments used, data collection and analysis, and ethical considerations are included.

# Chapter Three: Methodology

Academic achievement gives direction to all instructive accountability plans and serves as the main outcome variable in most educational studies (Hattie & Anderman, 2013). Student engagement can be defined as how motivated a student is to learn in school, completion of work either within the classroom or at home, or the student's attitude toward the educational experiences they participate in every day (Hattie & Anderman, 2013). Grit, also described as yearning and willpower, is a significant factor regarding student achievement (Duckworth, 2016).

In this chapter, the overview of the study is revisited, the research design is established, components of the study are outlined including population and sample, instrumentation, data collection, and data analysis. In addition, ethical considerations are discussed. The goal of this research is to determine the significance of the relationships among grit, engagement, and achievement of students who attend a Title I school in which the majority of students live in poverty.

## Problem and Purpose Overview

Students at Title I designated schools traditionally score below students at non-Title I schools in reading and math (Hattie, 2009). A Title I principal from District A proclaimed students' lack of knowledge and parents' inability to create at home learning environments perpetuates the achievement gap throughout the school year and summer breaks (District Communication, March 10, 2020). The purpose of this study is to determine if increased student engagement and grit relate positively to increased achievement in order to know if implementing strategies to increase engagement and grit are worthwhile. Across the grades, when instruction was challenging, relevant, and

academically demanding, all students had higher engagement and teachers talked less—and the greatest beneficiaries were at-risk students (Hattie, 2009).

***Research Questions and Hypotheses***

The following research questions will guide this study:

1. What is the relationship of the perceptions of engagement of students as compared to teachers' perceptions of the grit of students enrolled in third through fifth grades in Title I elementary schools?

$H3_o$: There is no significant relationship between the perceptions of engagement of students and teachers' perceptions of the grit of students.

$H3_a$: There is a significant relationship between the perceptions of engagement of students and teachers' perceptions of the grit of students.

2. What is the relationship of academic achievement in the areas of mathematics and reading and the perceptions of engagement of students enrolled in third through fifth grades in Title I elementary schools?

$H1_o$: There is no significant relationship between academic achievement and students' perceptions of engagement as measured in:

a. Mathematics
b. Reading

$H1_a$: There is a significant relationship between academic achievement and students' perceptions of engagement as measured in:

a. Mathematics
b. Reading

2. What is the relationship of academic achievement and teachers' perceptions of the grit of students enrolled in third through fifth grades in Title I elementary schools?

$H2_o$: There is no significant relationship between academic achievement and teacher's perceptions of student grit as measured in:

a. Mathematics

b. Reading

$H2_a$: There is a significant relationship between academic achievement and teacher's perceptions of student grit as measured by:

a. Mathematics

b. Reading

3. What is the relationship of the perceptions of engagement of students as compared to teachers' perceptions of the grit of students enrolled in third through fifth grades in Title I elementary schools?

$H3_o$: There is no significant relationship between the perceptions of engagement of students and teachers' perceptions of the grit of students.

$H3_a$: There is a significant relationship between the perceptions of engagement of students and teachers' perceptions of the grit of students.

**Research Design**

In this study, students in grades three through five, who attend Title I schools in District A and have scale scores for both reading and mathematics as well as student engagement responses were included in the study. Perceptions from all teachers who

served in the Title I schools in District A regarding students' grit were also included in the study.

Chudgar and Luschei (2016) argued, "although many existing databases are under- or unutilized in quantitative international-comparative research, these resources present the opportunity for important, policy-relevant descriptive studies" (p. 2). Secondary data collected from the database of District A will be used for this study. The secondary data will include survey data and academic achievement data. Because the data have already been collected by District A, the study is limited to the data available from District A as part of the data collection.

Researchers attempt to determine the relationship between or within a set of variables through correlational research design (Fraenkel et al., 2019). According to Fraenkel et al. (2019), the group correlation is either a positive, negative, or no relationship based upon the correlation coefficient which is calculated. Specifically, the correlation among the level of engagement of students, teacher perceptions of grit within the school setting, and end-of-the-year i-Ready Diagnostic Assessment scores will be determined.

**Population and Sample**

The population of this research will include 1,800-2,200 students enrolled in grades three through five who are enrolled in the Title I Schools in District A who have both i-Ready Mathematics and Reading scale scores and engagement survey results. Also included in the population are all teachers who are assigned to Title I elementary schools in District A. Title I school status is determined by the percentage of students, typically 70% or above, who are eligible for free or reduced-price meals (District Communication,

January 18, 2019). The eligible students in this study had responses to the engagement survey and end-of-year i-Ready results for reading and mathematics assessments in grades three through five. The criteria for eligibility also included attending a Title I school in District A. The population also includes 550-580 teachers who teach grades kindergarten through fifth grade.

A purposive sample will be used in this study (Fraenkel et al., 2019). A purposive sample is a non-probability sample that is selected based on the characteristics of a population and the objective of the study (Crossman, 2020). A purposive sample was selected since the research is concentrated specifically on students and teachers in Title I schools in District A (Fraenkel et al., 2019).

**Instrumentation**

This study was based on an existing diagnostic instrument created by Curriculum Associates called i-Ready Adaptive Diagnostic (District Communication, April 20, 2018). According to i-Ready Central (2017), the i-Ready assessment was designed with several specific purposes in mind. i-Ready assessments establish a metric that can be used across the school year to accurately gauge student knowledge and monitor improvement over a period of time (i-Ready Central, 2017). i-Ready assessments also can accurately measure knowledge for different content standards within each specific subject area, to provide information on which skills students have mastered and in which they need more practice, and to link the diagnostic results to specific instructional advice found in i-Ready Instruction curricula (i-Ready Central, 2017).

### *Validity and Reliability*

According to Fraenkel et al. (2019), choosing tools created by experts is favored in research. The validity of the tool is ensuring the concept to be measured is being measured (Heale & Twycross, 2015). Reliability is how accurate the tool is when being used in multiple settings and getting the same results (Heale, & Twycross, 2015).

**Validity and Reliability of i-Ready.** The validity of the i-Ready instrument is based on the defensibility of the inferences a researcher can make from the data collected (Fraenkel et al., 2019). Three million students nationwide participate in the reliability study of the i-Ready products (i-Ready Central, 2017, p. 1). Upon completion of the i-Ready Adaptive Diagnostic, multiple scores are reported by i-Ready to provide a well-rounded view of each student's proficiency levels (i-Ready Central, 2017):

- Scale Scores – a common language across grades and schools. Scale scores put everything on a single continuum, so educators can compare across grade levels. The scores provide a metric, which indicates a student has mastered skills up to a certain point and still needs to work on skills that come after that point.
- Placement Levels – the practical day-to-day language that helps teachers determine what grade level of skills to focus on with a particular student. Placement levels indicate where students should be receiving instruction.
- Norm Scores – identify how students are performing relative to their peers nationwide. Based on a nationally representative sample of students, norm scores specify a student's ranking compared to other students in the same grade.
- Lexile® Measures – developed by MetaMetrics®, Lexile® measures are widely used as measures of text complexity and reading ability, allowing a direct

link between the level of reading materials and the student's ability to read those materials.

- Quantile® Measures – developed by MetaMetrics®, the Quantile® Framework for Mathematics is a unique resource for accurately estimating a student's ability to think mathematically and matching him/her with appropriate mathematical content. (i-Ready Central, 2017, p. 8)

Teachers are provided consistent, clear quantitative information on each student's capabilities regarding specific skills mastered and those that need to be highlighted for instruction (i-Ready Central, 2017).

In addition to i-Ready assessment data, this study will utilize the Panorama Culture and Climate survey which provides actionable perception data for both teachers and administrators (District communication, February 16, 2018). As published by Panorama,

> In August 2014, researchers at the Harvard Graduate School of Education and Panorama Education launched a first-of-its-kind collaboration to develop a valid and reliable survey tool to measure student perceptions of teaching and learning. Our goal was to develop a survey instrument that would be grounded in the most advanced survey methodology and make it freely accessible for classroom teachers. (Panorama Education, 2019a, Student Surveys, para. 1)

Culture and Climate survey measures perceptions of students in the following categories: valuing of school, school engagement, school-teacher-student relationships, and school safety (District Communication, February 16, 2018).

**Validity and Reliability of Panorama.** In the spring of 2015, Panorama Education launched the Panorama Student Survey to give principals and district leaders a tool to collect feedback from students (Panorama Education, n.d., Teacher Surveys). The categories, as defined by Panorama, which students are surveyed are:

- Valuing of School - How much students feel that school is interesting, important, and useful.
- School Engagement - How attentive and invested students are at school.
- School Teacher-Student Relationships - How strong the social connection is between teachers and students within and beyond the school.
- School Safety - Students' perceptions of their physical and psychological safety while at school. (Panorama Education, 2019a, Student Surveys, para. 2)

Teachers and leaders are encouraged to use the combination of the categories to determine practices within their building to support student learning (District communication, February 16, 2018).

In the spring of 2015, Panorama Education launched the Panorama Teacher Survey to give principals and school and district leaders a tool to collect feedback from teachers (Panorama Education, n.d., Teacher Surveys). The survey is designed to spark and support productive conversations between teachers and school leaders about professional learning, school communication, school climate, and other key topics (Panorama Education, n.d., Student Surveys). The Culture and Climate Survey is to measure the perceptions of teachers in the following categories:

The categories, as defined by Panorama, are:

- Grit - Perceptions of how well students are able to persevere through setbacks to achieve important long-term goals.
- Student Mindset - Perceptions of whether students have the potential to change those factors that are central to their performance in class.
- Faculty Growth Mindset - Perceptions of whether teaching can improve over time.
- Educating All Students - Faculty perceptions of their readiness to address issues of diversity.
- Teaching Efficacy - Faculty perceptions of their professional strengths and areas for growth.
- Feedback and Coaching - Perceptions of the amount and quality of feedback faculty and staff receive.
- School Climate - Perceptions of the overall social and learning climate of the school. (Panorama Education, n.d., Student Surveys).

Panorama survey assists educators with the use of data to support each student's needs and supports leaders (District communication, February 16, 2018).

**Data Collection**

Upon approval of the Lindenwood IRB (see Appendix B), the IRB approval from District A (see Appendix C) was sought. Once the District A IRB approved the study, the Assessment Coordinator compiled the i-Ready data in the Analytics office of District A based upon the file configuration requested (Appendix D). The Assessment Coordinator of the Analytics office of District A then paired by student the i-Ready assessment scale scores for both reading and math to student responses to the Panorama survey. The

teacher responses were reported by Title I school and then paired with the percentage of favorable responses from student perceptions within the same Title I. The data were collected, grouped by building, de-identified, coded, and emailed via secure email to the researcher (see Appendix C).

**Data Analysis**

To answer the three research questions, correlation statistical tests were conducted on data sets. Using the Data Analysis Add-In in Microsoft Excel, the measures of the correlation coefficient (*r*) were produced. Correlational research is a type of non-experimental research in which the researcher measures two variables and assesses the statistical relationship (i.e., the correlation) between them with little or no effort to control extraneous variables (Fraenkel et al., 2019). The coefficient is a decimal value between +1.00 and -1.00 (Fraenkel et al., 2019). The correlation coefficient (*r*) will be calculated to determine the strength of the relationship between the perceptions of students regarding engagement and assessment results, between academic achievement and teachers' perceptions of grit, and between students' perceptions of engagement and the teachers' perceptions of grit. The correlation coefficient (*r*) greater than or equal to 0.70 will be considered significant.

**Ethical Considerations**

All data and supporting documentation were locked in both physical and electronic forms. Electronic files were password-protected and saved on a secure network. Because a comparison of student-level data was required for this study, the Coordinator of Assessment encrypted the student names and numbers to de-identify scores to ensure student anonymity. The risk to participants was limited due to the data

used within the research were de-identified.

**Summary**

The objective of this correlational research was to examine the relationship between students' perception of engagement as related to academic achievement, teachers' perception of grit as related to academic achievement, and students' perception of engagement as related to teachers' perception of grit for students and teacher in Title I schools in District A (Fraenkel et al., 2019). A key factor in correlational studies is to ensure all participants have both factors being evaluated, such as i-Ready assessment results and responses to the culture and climate survey (Fraenkel et al., 2019).

In this chapter, the problem and purpose overview were presented, followed by the research questions and hypotheses. The research design was provided, as well as the population and sample descriptions. The instrumentation used for the study, data collection procedures, and data analysis were explained. Last, the ethical considerations to be employed, and a summary of the chapter were given.

# Chapter Four: Analysis of Data

The purpose of this study was to determine if there was a relationship between grit and student achievement, student achievement and engagement, and finally grit and engagement. The focus of the study was learners in third through fifth grades who had a response to the culture and climate survey, as well as i-Ready math and reading results from the Title I schools in District A. Student perception data, scale scores on Reading and Math i-Ready diagnostic assessments, and teacher perception data were collected to determine the relationship between the following: students' perceptions and teachers' perceptions, students' perceptions and academic achievement, and teachers' perceptions and academic achievement. A direct relationship between students' perceptions, teachers' perceptions, and academic achievement could allow scholastic leaders to implement programs to foster grit in students and to identify entry points for interventions for academics, and social and emotional programs which focus on perseverance to produce higher grit, higher engagement, and higher academic achievement.

## Data Collection

Student perception, teacher perception, and academic data were collected for this study by District A. Following Lindenwood University Institutional Review Board approval, as well as site approval of District A, a single file containing de-identified student information (demographics, perception data for both students and teachers, and academic data) was provided. The file contained data limited to students in grades kindergarten through fifth grade for the 2018–2019 school year. Additionally, the file only included students who were enrolled in the district's Title I kindergarten through fifth-grade buildings (19 buildings). The master file consisted of the following

components for the aforementioned school year:

- Student demographics with Perception data from the Climate and Culture Survey
- Student Achievement (i-Ready End-of-Year) File for Math and Reading
- Teacher perception data from the Climate and Culture Survey for all Title I teachers

Students were eligible for this study if data were gathered for all data points (responses for all perception questions and academic achievement scores for reading and math). Students lacking one or more data points were excluded from the study. The number of students in the kindergarten-fifth grades that were deemed eligible for this study was 2,074 for the 2018–2019 school year.

**Organization of the Chapter**

A summary of the data collected to describe the student population and attributes is presented in this chapter. A breakdown of the student demographics is presented by grade level for each school year 2019 (2018–2019). Table 1 reveals a view of the collected disaggregated data by grade level and shows a summary of eligible student counts, achievement in math and reading, and perception data.

**Table 1**

*Summary of Student Factors*

| Grade | Year | Student Count | Percep. Results (Q1) | Percep. Results (Q2) | % On Level Reading | % On Level Math |
|---|---|---|---|---|---|---|
| 3 | 2019 | 686 | 69.0% | 55.7% | 47.6% | 60.0% |
| 4 | 2019 | 706 | 68.3% | 56.4% | 41.8% | 55.6% |
| 5 | 2019 | 682 | 68.3% | 54.9% | 40.2% | 52.6% |
| Total | 2019 | 2,074 | 68.5% | 55.8% | 46.6% | 53.1% |

*Note.* School year 2018-2019 is represented by year 2019. *Q1* was "In your school, how excited are you to participate. *Q2* was "How focused are you on the activities in your school?" *%* is the average percentage of respondents selected the top two categories of the prompt. *% On* is the average percentage of students scoring on or above grade level as determined by the scale score from i-Ready.

Research questions one through three were answered to discover the nature of the relationships between the teachers' perceptions of students' grit and the students' perceptions of their engagement, the students' perceptions of their engagement and academic achievement, and the teachers' perceptions of students' grit and the students' perceptions of their engagement.

**Description of All Eligible Research Subjects**

Teachers' perceptions of students' grit, students' perceptions of their engagement, and achievement information for students in grades third through fifth grade were provided by District A for school 2018–2019 school year. Only students who were enrolled in the district's third-fifth grade Title I buildings were included. Also, buildings classroom teachers' perception grades kindergarten through fifth grade for the school

year 2018-2019 was provided. Students were excluded from the data sample if one or more data points (perceptions and/or achievement) were missing. Table 2 shows a summary of eligible students versus the total size of the sample population. As Table 2 depicts, out of the 2,548 students enrolled in District A's Title I school third-grade through fifth-grade students, 2,074 were eligible for this study based on the school year 2018–2019. Table 3 shows a summary of the eligible teachers versus the total size of the sample population. As Table 3 shows, out of the 847 teachers who serve kindergarten through fifth grade, 574 were eligible for this study based on the school year 2018–2019.

**Table 2**

*Summary of All Eligible Students by Grade Level*

| Grade | Year | Eligible | Ineligible | Total |
|---|---|---|---|---|
| 3 | 2019 | 686 | 67 | 753 |
| 4 | 2019 | 706 | 54 | 760 |
| 5 | 2019 | 682 | 43 | 725 |
| Total | 2019 | 2,074 | 164 | 2,238 |

*Note.* School year 2018-2019 is represented by year 2019.

**Table 3**

*Summary of All Eligible Teachers*

| Grade | Year | Eligible | Ineligible | Total |
|---|---|---|---|---|
| Total | 2019 | 574 | 273 | 847 |

*Note.* School year 2018–2019 is represented by year 2019.

**Research Question One**

What is the relationship of the perceptions of engagement of students as compared to teachers' perceptions of the grit of students enrolled in third through fifth grades in Title I elementary schools?

The first research question was focused on the areas of grit and engagement. Engagement was analyzed by focusing on two questions from the students' perceptions survey. The two questions from the students' survey analyzed were "In your school, how excited are you to participate?" and "How focused are you on the activities in your school?" The first question from the students' survey will be referred to as "excitement" and the second will be referred to as "focused."

The second part of this research question is grit. Grit was analyzed by focusing on two questions from the teachers' perceptions of questions related to students' grit. The two questions analyzed from the teachers' survey were "How possible is it for teachers to change how easily students give up?" and "If your students fail to reach an important goal, how likely are they to try again?" The first question from the teachers' survey will be referred to as "change" and the second will be referred to as "try again."

The relationship between engagement and grit was analyzed from four different approaches. Each approach contains one question from the students' perception survey and one question from the teachers' perception of students' grit. The subcategories analyzed were: excitement and try again, excitement and change, focused and try again, and focused and change.

### *Grit and Engagement: Excitement and Try Again*

To cross analyze the two questions from each set of questions, a series of correlations were conducted. When describing the co-directional movement of two variables, the correlation statistic is proper (Holmes et al., 2018). Since the question "Do your students have grit" was not asked based upon the variety of ways grit is defined, it important to look at these survey questions in a variety of ways to be able to look at the traits of both engagement and grit.

#### Excitement and Try again: All Grades.

The first research question was analyzed by conducting a correlation test with one survey question from the teachers' survey and one survey question from the students' survey. Two categories of excitement and try again were analyzed. The question from the students' survey analyzed in this section was "In your school, how excited are you to participate?" The question from the teachers' survey analyzed in this section was "If your students fail to reach an important goal, how likely are they to try again?"

The correlation coefficient in the aggregate when comparing excitement and try again for all grades third through fifth was $r = -0.30$. The negative correlation means as one variable is moving in a positive direction, the other is moving in a negative direction. There is a moderate relationship between the coefficients. Table 4 contains a breakdown of the relationship between students' perceptions of their excitement about school and classroom teachers' perceptions regarding students' grit by grade level.

**Table 4**

*Summary of Excitement and Try Again for All Students Grades Third through Fifth*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | - 0.33 |
| Free or Reduced | 0.02 |
| White | - 0.39 |
| Hispanic | - 0.03 |
| Black | 0.14 |
| Male | - 0.41 |
| Female | - 0.36 |
| Total | - 0.30 |

*Note:* The percentage of students who responded extremely excited or quite excited was the dependent variable in the correlation calculation. The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation.

**Excitement and Try again: Third grade.**

The first research question was also analyzed by conducting a correlation test with one survey question from the teachers' survey and one survey question from the students' survey disaggregated into specific grade levels. This section will cover the results from the third-grade correlation. Two categories of excitement and try again were analyzed. The question from the students' survey analyzed in this section was "In your school, how excited are you to participate?" The question from the teachers' survey analyzed in this section was "If your students fail to reach an important goal, how likely are they to try again?"

The correlation coefficient in the aggregate when comparing excitement and try again for third grade was $r$ = - 0.09. The negative correlation means as one variable is moving in a positive direction, the other is moving in the negative direction. There is a

very slight relationship between the coefficients. Table 5 contains a breakdown of students' perceptions of their excitement about school and classroom teachers' perceptions regarding students' grit by grade level.

**Table 5**

*Summary of Excitement and Try Again for Third Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.00 |
| Free or Reduced | - 0.13 |
| White | - 0.07 |
| Hispanic | 0.05 |
| Black | - 0.10 |
| Male | - 0.21 |
| Female | 0.05 |
| Total | - 0.09 |

*Note:* The percentage of students who responded extremely excited or quite excited was the dependent variable in the correlation calculation. The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation.

**Excitement and Try again: Fourth grade.**

The first research question was analyzed by conducting a correlation test with one survey question from the teachers' survey and one survey question from the students' survey disaggregated into specific grade levels. In this section, the results from the fourth-grade correlation are given. Two categories of excitement and try again were analyzed. The question from the students' survey analyzed in this section was "In your school, how excited are you to participate?" The question from the teachers' survey analyzed in this section was "If your students fail to reach an important goal, how likely are they to try again?"

The correlation coefficient in the aggregate when comparing excitement and try again for fourth grade was $r = 0.12$. The positive correlation means both variables were moving in the same direction. There is a slight relationship between the coefficients. Table 6 contains a breakdown of students' perceptions of their excitement about school and classroom teachers' perceptions regarding students' grit by grade level.

**Table 6**

*Summary of Excitement and Try Again for Fourth Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | - 0.04 |
| Free or Reduced | - 0.22 |
| White | 0.06 |
| Hispanic | 0.41 |
| Black | 0.16 |
| Male | 0.19 |
| Female | 0.04 |
| Total | 0.12 |

*Note:* The percentage of students who responded extremely excited or quite excited was the dependent variable in the correlation calculation. The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation.

**Excitement and Try again: Fifth grade**

The first research question was analyzed by conducting a correlation test with one survey question from the teachers' survey and one survey question from the students' survey disaggregated into specific grade levels. In this section, the results from the fifth-grade correlation are presented. Two categories of excitement and try again were analyzed. The question from the students' survey analyzed in this section was "In your school, how excited are you to participate?" The question from the teachers' survey

analyzed in this section was “If your students fail to reach an important goal, how likely are they to try again?”

The correlation coefficient in the aggregate when comparing excitement and try again for fifth grade was $r = -0.33$. The negative correlation means as one variable is moving in a positive direction, the other is moving in a negative direction. There is a moderate relationship between the coefficients. Table 7 contains a breakdown of students’ perceptions of their excitement about school and classroom teachers’ perceptions regarding students’ grit by grade level.

**Table 7**

*Summary of Excitement and Try Again for Fifth Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | - 0.04 |
| Free or Reduced | - 0.35 |
| White | - 0.43 |
| Hispanic | 0.25 |
| Black | 0.07 |
| Male | - 0.25 |
| Female | - 0.20 |
| Total | - 0.33 |

*Note:* The percentage of students who responded extremely excited or quite excited was the dependent variable in the correlation calculation. The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation.

***Grit and Engagement: Focused and Try Again***

To cross analyze the two questions from each set of questions, a series of correlations were conducted. When describing the co-directional movement of two variables, the correlation statistic is proper (Holmes, Illowsky, & Dean, 2018). Since the

question “Do your students have grit” was not asked based upon the variety of ways grit is defined, it important to look at these survey questions in a variety of ways to be able to look at the traits of both engagement and grit.

**Focused and Try again: All Grades.**

The first research question was analyzed by conducting a correlation test with one survey question from the teachers’ survey and one survey question from the students’ survey. Two categories of focused and try again were analyzed. The question from the students’ survey analyzed in this section was “How focused are you on the activities in your school?” The question from the teachers’ survey analyzed in this section was “If your students fail to reach an important goal, how likely are they to try again?”

The correlation coefficient in the aggregate when comparing focused and try again for all grades third through fifth was $r = -0.18$. The negative correlation means as one variable is moving in a positive direction, the other is moving in the negative direction. There is a slight relationship between the coefficients. Table 8 contains a breakdown of the relationship between students’ perceptions of their level of focus in school and classroom teachers’ perceptions regarding students’ grit by grade level.

**Table 8**

*Summary of Focused and Try Again for All Students Grades Third through Fifth*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | - 0.41 |
| Free or Reduced | - 0.02 |
| White | - 0.17 |
| Hispanic | 0.39 |
| Black | 0.07 |
| Male | - 0.24 |
| Female | 0.04 |
| Total | - 0.18 |

*Note:* The percentage of students who responded extremely focused or quite focused was the dependent variable in the correlation calculation. The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation.

**Focused and Try again: Third grade.**

The first research question was also analyzed by conducting a correlation test with one survey question from the teachers' survey and one survey question from the students' survey disaggregated into specific grade levels. This section will cover the results from the third-grade correlation. Two categories of focused and try again were analyzed. The question from the students' survey analyzed in this section was "In your school, how focused are you to participate?" The question from the teachers' survey analyzed in this section was "If your students fail to reach an important goal, how likely are they to try again?"

The correlation coefficient in the aggregate when comparing focused and try again for third grade was $r = - 0.27$. The negative correlation means as one variable is moving in a positive direction, the other is moving in the negative direction. There is a

moderate relationship between the coefficients. Table 9 contains a breakdown of students' perceptions of their level of focus in school and classroom teachers' perceptions regarding students' grit by grade level.

**Table 9**

*Summary of Focused and Try Again for Third Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.19 |
| Free or Reduced | - 0.41 |
| White | - 0.35 |
| Hispanic | 0.10 |
| Black | 0.29 |
| Male | - 0.48 |
| Female | - 0.03 |
| Total | - 0.27 |

*Note:* The percentage of students who responded extremely focused or quite focused was the dependent variable in the correlation calculation. The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation.

**Focused and Try again: Fourth grade.**

The first research question was analyzed by conducting a correlation test with one survey question from the teachers' survey and one survey question from the students' survey disaggregated into specific grade levels. In this section, the results from the fourth-grade correlation are given. Two categories of focused and try again were analyzed. The question from the students' survey analyzed in this section was "How focused are you on the activities in your school?" The question from the teachers' survey analyzed in this section was "If your students fail to reach an important goal, how likely are they to try again?"

The correlation coefficient in the aggregate when comparing focused and try again for fourth grade was $r = 0.33$. The positive correlation means both variables were moving in the same direction. There is a moderate relationship between the coefficients. Table 10 contains a breakdown of students' perceptions of their level of focus in school and classroom teachers' perceptions regarding students' grit by grade level.

**Table 10**

*Summary of Focused and Try Again for Fourth Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | - 0.16 |
| Free or Reduced | 0.43 |
| White | 0.13 |
| Hispanic | 0.24 |
| Black | 0.29 |
| Male | 0.11 |
| Female | 0.34 |
| Total | 0.33 |

*Note:* The percentage of students who responded extremely focused or quite focused was the dependent variable in the correlation calculation. The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation.

### Focused and Try again: Fifth grade

The first research question was analyzed by conducting a correlation test with one survey question from the teachers' survey and one survey question from the students' survey disaggregated into specific grade levels. In this section, the results from the fifth-grade correlation are presented. Two categories of focused and try again were analyzed. The question from the students' survey analyzed in this section was "How focused are you on the activities in your school?" The question from the teachers' survey analyzed in

this section was “If your students fail to reach an important goal, how likely are they to try again?”

The correlation coefficient in the aggregate when comparing focused and try again for fifth grade was $r = -0.59$. The negative correlation means as one variable is moving in a positive direction, the other is moving in the negative direction. There is a moderate relationship between the coefficients. Table 11 contains a breakdown of students’ perceptions of their level of focus in school and classroom teachers’ perceptions regarding students’ grit by grade level.

**Table 11**

*Summary of Focused and Try Again for Fifth Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | - 0.50 |
| Free or Reduced | - 0.57 |
| White | - 0.57 |
| Hispanic | - 0.05 |
| Black | 0.08 |
| Male | - 0.54 |
| Female | - 0.31 |
| Total | - 0.59 |

*Note:* The percentage of students who responded extremely focused or quite focused was the dependent variable in the correlation calculation. The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation.

***Grit and Engagement: Focused and Change***

To cross analyze the two questions from each set of questions, a series of correlations were conducted. When describing the co-directional movement of two variables, the correlation statistic is proper (Holmes, Illowsky, & Dean, 2018). Since the

question “Do your students have grit” was not asked based upon the variety of ways grit is defined, it important to look at these survey questions in a variety of ways to be able to look at the traits of both engagement and grit.

**Focused and Change: All Grades.**

The first research question was analyzed by conducting a correlation test with one survey question from the teachers’ survey and one survey question from the students’ survey. Two categories of focused and change were analyzed. The question from the students’ survey analyzed in this section was “How focused are you on the activities in your school?” The question from the teachers’ survey analyzed in this section was “How possible is it for teachers to change how easily they give up?”

The correlation coefficient in the aggregate when comparing focused and change for all grades third through fifth was $r = -0.17$. The negative correlation means as one variable is moving in a positive direction, the other is moving in the negative direction. There is a slight relationship between the coefficients. Table 12 contains a breakdown of the relationship between students’ perceptions of their level of focus in school and classroom teachers’ perceptions regarding students’ grit by grade level.

**Table 12**

*Summary of Focused and Change for All Students Grades Third through Fifth*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | - 0.30 |
| Free or Reduced | - 0.31 |
| White | 0.08 |
| Hispanic | - 0.17 |
| Black | 0.14 |
| Male | 0.12 |
| Female | 0.09 |
| Total | - 0.17 |

*Note:* The percentage of students who responded extremely focused or quite focused was the dependent variable in the correlation calculation. The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation.

**Focused and Change: Third grade.**

The first research question was also analyzed by conducting a correlation test with one survey question from the teachers' survey and one survey question from the students' survey disaggregated into specific grade levels. This section will cover the results from the third-grade correlation. Two categories of focused and change were analyzed. The question from the students' survey analyzed in this section was "In your school, how focused are you to participate?" The question from the teachers' survey analyzed in this section was "How possible is it for teachers to change how easily they give up?"

The correlation coefficient in the aggregate when comparing focused and change for third grade was $r$ = - 0.31. The negative correlation means as one variable is moving in a positive direction, the other is moving in the negative direction. There is a moderate relationship between the coefficients. Table 13 contains a breakdown of students'

perceptions of their level of focus in school and classroom teachers' perceptions regarding students' grit by grade level.

**Table 13**

*Summary of Focused and Change for Third Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | - 0.31 |
| Free or Reduced | 0.04 |
| White | - 0.12 |
| Hispanic | - 0.46 |
| Black | 0.29 |
| Male | - 0.16 |
| Female | 0.07 |
| Total | - 0.09 |

*Note:* The percentage of students who responded extremely focused or quite focused was the dependent variable in the correlation calculation. The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation.

**Focused and Change: Fourth grade.**

The first research question was analyzed by conducting a correlation test with one survey question from the teachers' survey and one survey question from the students' survey disaggregated into specific grade levels. In this section, the results from the fourth-grade correlation are given. Two categories of focused and change were analyzed. The question from the students' survey analyzed in this section was "How focused are you on the activities in your school?" The question from the teachers' survey analyzed in this section was "How possible is it for teachers to change how easily they give up?"

The correlation coefficient in the aggregate when comparing focused and change for fourth grade was $r = 0.12$. The positive correlation means both variables were moving

in the same direction. There is a slight relationship between the coefficients. Table 14 contains a breakdown of students' perceptions of their level of focus in school and classroom teachers' perceptions regarding students' grit by grade level.

**Table 14**

*Summary of Focused and Change for Fourth Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | - 0.48 |
| Free or Reduced | - 0.16 |
| White | - 0.05 |
| Hispanic | 0.12 |
| Black | - 0.19 |
| Male | - 0.06 |
| Female | - 0.17 |
| Total | 0.12 |

*Note:* The percentage of students who responded extremely focused or quite focused was the dependent variable in the correlation calculation. The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation.

### Focused and Change: Fifth grade

The first research question was analyzed by conducting a correlation test with one survey question from the teachers' survey and one survey question from the students' survey disaggregated into specific grade levels. In this section, the results from the fifth-grade correlation are presented. Two categories of focused and change were analyzed. The question from the students' survey analyzed in this section was "How focused are you on the activities in your school?" The question from the teachers' survey analyzed in this section was "How possible is it for teachers to change how easily they give up?"

The correlation coefficient in the aggregate when comparing focused and change for fifth grade was $r = 0.00$. There is no relationship between the two variables. Table 15 contains a breakdown of students' perceptions of their level of focus in school and classroom teachers' perceptions regarding students' grit by grade level.

**Table 15**

*Summary of Focused and Change for Fifth Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | - 0.34 |
| Free or Reduced | 0.03 |
| White | 0.20 |
| Hispanic | 0.05 |
| Black | - 0.02 |
| Male | 0.00 |
| Female | - 0.06 |
| Total | 0.00 |

*Note:* The percentage of students who responded extremely focused or quite focused was the dependent variable in the correlation calculation. The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation.

### *Grit and Engagement: Excitement and Change*

To cross analyze the two questions from each set of questions, a series of correlations were conducted. When describing the co-directional movement of two variables, the correlation statistic is proper (Holmes, Illowsky, & Dean, 2018). Since the question "Do your students have grit" was not asked based upon the variety of ways grit is defined, it important to look at these survey questions in a variety of ways to be able to look at the traits of both engagement and grit.

**Excitement and Change: All Grades.**

The first research question was analyzed by conducting a correlation test with one survey question from the teachers' survey and one survey question from the students' survey. Two categories of excitement and change were analyzed. The question from the students' survey analyzed in this section was "In your school, how excited are you to participate?" The question from the teachers' survey analyzed in this section was "How possible is it for teachers to change how easily they give up?"

The correlation coefficient in the aggregate when comparing excitement and change for all grades third through fifth was $r = 0.01$. The positive correlation means both variables are moving in the same direction. There is a very slight relationship between the coefficients. Table 16 contains a breakdown of the relationship between students' perceptions of their level of focus in school and classroom teachers' perceptions regarding students' grit by grade level.

**Table 16**

*Summary of Excitement and Change for All Students Grades Third through Fifth*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.17 |
| Free or Reduced | 0.05 |
| White | 0.19 |
| Hispanic | - 0.25 |
| Black | 0.22 |
| Male | 0.02 |
| Female | 0.10 |
| Total | 0.01 |

*Note:* The percentage of students who responded extremely excited or quite excited was the dependent variable in the correlation calculation. The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation.

**Excitement and Change: Third grade.**

The first research question was also analyzed by conducting a correlation test with one survey question from the teachers' survey and one survey question from the students' survey disaggregated into specific grade levels. This section will cover the results from the third-grade correlation. Two categories of excitement and change were analyzed. The question from the students' survey analyzed in this section was "In your school, how excited are you to participate?" The question from the teachers' survey analyzed in this section was "How possible is it for teachers to change how easily they give up?"

The correlation coefficient in the aggregate when comparing excitement and change for third grade was $r = 0.13$. The positive correlation means both variables are moving in the same direction. There is a slight relationship between the coefficients.

Table 17 contains a breakdown of students' perceptions of their level of focus in school and classroom teachers' perceptions regarding students' grit by grade level.

**Table 17**

*Summary of Excitement and Change for Third Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.21 |
| Free or Reduced | 0.03 |
| White | 0.41 |
| Hispanic | - 0.15 |
| Black | 0.12 |
| Male | 0.30 |
| Female | - 0.15 |
| Total | 0.13 |

*Note:* The percentage of students who responded extremely excited or quite excited was the dependent variable in the correlation calculation. The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation.

**Excitement and Change: Fourth grade.**

The first research question was analyzed by conducting a correlation test with one survey question from the teachers' survey and one survey question from the students' survey disaggregated into specific grade levels. In this section, the results from the fourth-grade correlation are given. Two categories of excitement and change were analyzed. The question from the student survey analyzed in this section was "In your school, how excited are you to participate?" The question from the teacher survey analyzed in this section was "How possible is it for teachers to change how easily they give up?"

The correlation coefficient in the aggregate when comparing excitement and change for fourth grade was $r = 0.08$. The positive correlation means both variables were moving in the same direction. There is a very slight relationship between the coefficients. Table 18 contains a breakdown of students' perceptions of their level of focus in school and classroom teachers' perceptions regarding students' grit by grade level.

**Table 18**

*Summary of Excitement and Change for Fourth Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.34 |
| Free or Reduced | - 0.04 |
| White | 0.01 |
| Hispanic | 0.34 |
| Black | 0.15 |
| Male | 0.16 |
| Female | 0.02 |
| Total | 0.08 |

*Note:* The percentage of students who responded extremely excited or quite excited was the dependent variable in the correlation calculation. The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation.

### Excitement and Change: Fifth grade

The first research question was analyzed by conducting a correlation test with one survey question from the teachers' survey and one survey question from the students' survey disaggregated into specific grade levels. In this section, the results from the fifth-grade correlation are presented. Two categories of excitement and change were analyzed. The question from the students' survey analyzed in this section was "In your school, how

excited are you to participate?" The question from the teachers' survey analyzed in this section was "How possible is it for teachers to change how easily they give up?"

The correlation coefficient in the aggregate when comparing excitement and change for fifth grade was $r = 0.37$. The positive correlation means both variables were moving in the same direction. There is a moderate relationship between the coefficients. Table 19 contains a breakdown of students' perceptions of their level of focus in school and classroom teachers' perceptions regarding students' grit by grade level.

**Table 19**

*Summary of Excitement and Change for Fifth Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | - 0.02 |
| Free or Reduced | 0.55 |
| White | 0.50 |
| Hispanic | 0.02 |
| Black | 0.21 |
| Male | 0.12 |
| Female | 0.52 |
| Total | 0.37 |

*Note:* The percentage of students who responded extremely excited or quite excited was the dependent variable in the correlation calculation. The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation.

**Research Question Two**

What is the relationship of academic achievement and the perceptions of engagement of students enrolled in third through fifth grade in Title I elementary schools?

The second research question was focused on the areas of engagement and achievement. Engagement was analyzed by focusing on two questions from the students' perceptions survey. The two questions from the students' survey analyzed were "In your school, how excited are you to participate?" and "How focused are you on the activities in your school?" The first question from the students' survey will be referred to as "excitement" and the second will be referred to as "focused." The second variable of this research question is academic achievement. Academic achievement was analyzed by focusing on the percentage of students on or above grade level in math and reading as assessed by the i-Ready diagnostic.

The relationship between engagement and achievement is analyzed by four different approaches. Each approach contains one question from the students' perception survey and the percentage of students on or above grade level in both math and reading. The subcategories analyzed were: excitement and math, excitement and reading, focused and math, and focused and reading.

### *Engagement and Achievement: Excitement and Math*

To analyze the engagement survey question and math achievement, a series of correlations were conducted. When describing the co-directional movement of two variables, the correlation statistic is proper (Holmes, Illowsky, & Dean, 2018). The aggregate was analyzed in addition to disaggregated data including gender, ethnicity, and lunch status.

#### *Engagement and Achievement: All grades.*

The second research question was analyzed by conducting a correlation test with one survey question from the students' survey and the percentage of students who

performed on or above grade level when assessed with the i-Ready math diagnostic. Two categories of excitement and math achievement were analyzed. The question from the students' survey analyzed in this section was "In your school, how excited are you to participate?" The second data set of the correlation was the percentage of students who performed on or above grade level on the math diagnostic assessment.

The correlation coefficient in the aggregate when comparing excitement and math achievement for all grades third through fifth was $r = 0.04$. The positive correlation means both variables were moving in the same direction. There is a very slight relationship between the coefficients. Table 20 contains a breakdown of the relationship between students' perceptions of their excitement about school and math achievement.

**Table 20**

*Summary of Excitement and Math for All Students Grades Third through Fifth*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.03 |
| Free or Reduced | 0.05 |
| White | 0.06 |
| Hispanic | 0.07 |
| Black | - 0.01 |
| Male | 0.05 |
| Female | 0.04 |
| Total | 0.04 |

*Note:* The percentage of students who responded extremely excited or quite excited was the dependent variable in the correlation calculation. The percentage of students who performed at or above grade level on the math diagnostic was the independent variable.

**Excitement and Math: Third grade.**

The second research question was also analyzed by conducting a correlation test with one survey question from the students' survey and the percentage of students who

performed on or above grade level on the math diagnostic assessment. This section will cover the results from the third-grade correlation. Two categories of excitement and math were analyzed. The question from the students' survey analyzed in this section was "In your school, how excited are you to participate?" The second data set of the correlation was the percentage of students who performed on or above grade level on the math diagnostic assessment.

The correlation coefficient in the aggregate when comparing excitement and math for third grade was $r = 0.11$. The positive correlation means both variables were moving in the same direction. There is a slight relationship between the coefficients. Table 21 contains a breakdown of students' perceptions of their excitement about school and the percentage of students who were assessed and performed on or above grade level on the math diagnostic.

**Table 21**

*Summary of Excitement and Math for Third Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.12 |
| Free or Reduced | 0.12 |
| White | 0.15 |
| Hispanic | 0.25 |
| Black | 0.04 |
| Male | 0.07 |
| Female | 0.17 |
| Total | 0.11 |

*Note:* The percentage of students who responded extremely excited or quite excited was the dependent variable in the correlation calculation. The percentage of students who performed at or above grade level on the math diagnostic was the independent variable.

**Excitement and Math: Fourth grade.**

The second research question was analyzed by conducting a correlation test with one survey question from the students' survey and the percentage of students who performed on or above grade level on the math diagnostic. In this section, the results from the fourth-grade correlation are given. Two categories of excitement and math were analyzed. The question from the students' survey analyzed in this section was "In your school, how excited are you to participate?" The second data set of the correlation was the percentage of students who performed on or above grade level on the math diagnostic assessment.

The correlation coefficient in the aggregate when comparing excitement and math for fourth grade was $r = 0.05$. The positive correlation means both variables were moving in the same direction. There is a very slight relationship between the coefficients. Table 22 contains a breakdown of students' perceptions of their excitement about school and the percentage of students who were assessed and performed on or above grade level on the math diagnostic.

**Table 22**

*Summary of Excitement and Math for Fourth Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | - 0.11 |
| Free or Reduced | 0.06 |
| White | 0.09 |
| Hispanic | 0.09 |
| Black | - 0.13 |
| Male | 0.00 |
| Female | 0.10 |
| Total | 0.05 |

*Note:* The percentage of students who responded extremely excited or quite excited was the dependent variable in the correlation calculation. The percentage of students who performed at or above grade level on the math diagnostic was the independent variable.

**Excitement and Math: Fifth grade**

The second research question was analyzed by conducting a correlation test with one survey question from the student' survey and the percentage of students who scored on or above grade level on math while assessed by the i-Ready diagnostic. In this section, the results from the fifth-grade correlation are presented. Two categories of excitement and math were analyzed. The question from the students' survey analyzed in this section was "In your school, how excited are you to participate?" The second data set of the correlation was the percentage of students who performed on or above grade level on the math diagnostic assessment.

The correlation coefficient in the aggregate when comparing excitement and math for fifth grade was $r = 0.02$. The positive correlation means both variables were moving in the same direction. There is a very slight relationship between the coefficients. Table

23 contains a breakdown of students' perceptions of their excitement about school and the percentage of students performing on or above grade level on the math assessment.

**Table 23**

*Summary of Excitement and Math for Fifth Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.02 |
| Free or Reduced | 0.04 |
| White | 0.03 |
| Hispanic | 0.08 |
| Black | - 0.08 |
| Male | 0.07 |
| Female | - 0.02 |
| Total | 0.02 |

*Note:* The percentage of students who responded extremely excited or quite excited was the dependent variable in the correlation calculation. The percentage of students who performed at or above grade level on the math diagnostic was the independent variable.

### *Engagement and Achievement: Excitement and Reading*

To analyze the engagement survey question and the reading achievement, a series of correlations were conducted. When describing the co-directional movement of two variables, the correlation statistic is proper (Holmes, Illowsky, & Dean, 2018). The aggregate was analyzed in addition to disaggregated data including gender, ethnicity, and lunch status.

#### Engagement and Achievement: All Grades.

The second research question was analyzed by conducting a correlation test with one survey question from the students' survey and the percentage of students who performed on or above grade level when assessed with the i-Ready reading diagnostic. Two categories of excitement and reading achievement were analyzed. The question from

the students' survey analyzed in this section was "In your school, how excited are you to participate?" The second data set of the correlation was the percentage of students who performed on or above grade level on the reading diagnostic assessment.

The correlation coefficient in the aggregate when comparing excitement and reading achievement for all grades third through fifth was $r = 0.03$. The positive correlation means both variables were moving in the same direction. There is a very slight relationship between the coefficients. Table 24 contains a breakdown of the relationship between students' perceptions of their excitement about school and reading achievement.

**Table 24**

*Summary of Excitement and Reading for All Students Grades Third through Fifth*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.00 |
| Free or Reduced | 0.04 |
| White | 0.04 |
| Hispanic | 0.03 |
| Black | - 0.07 |
| Male | 0.03 |
| Female | 0.02 |
| Total | 0.03 |

*Note:* The percentage of students who responded extremely excited or quite excited was the dependent variable in the correlation calculation. The percentage of students who performed at or above grade level on the reading diagnostic was the independent variable.

**Excitement and Reading: Third grade.**

The second research question was also analyzed by conducting a correlation test with one survey question from the students' survey and the percentage of students who performed on or above grade level on the reading diagnostic assessment. This section will

cover the results from the third-grade correlation. Two categories of excitement and reading were analyzed. The question from the students' survey analyzed in this section was "In your school, how excited are you to participate?" The second data set of the correlation was the percentage of students who performed on or above grade level on the reading diagnostic assessment.

The correlation coefficient in the aggregate when comparing excitement and reading for third grade was $r = 0.10$. The positive correlation means both variables were moving in the same direction. There is a slight relationship between the coefficients. Table 25 contains a breakdown of students' perceptions of their excitement about school and the percentage of students who were assessed and performed on or above grade level on the reading diagnostic.

**Table 25**

*Summary of Excitement and Reading for Third Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.06 |
| Free or Reduced | 0.12 |
| White | 0.06 |
| Hispanic | 0.22 |
| Black | 0.09 |
| Male | 0.04 |
| Female | 0.16 |
| Total | 0.11 |

*Note:* The percentage of students who responded extremely excited or quite excited was the dependent variable in the correlation calculation. The percentage of students who performed at or above grade level on the reading diagnostic was the independent variable.

**Excitement and Reading: Fourth grade.**

The first research question was analyzed by conducting a correlation test with one survey question from the students' survey and the percentage of students who performed on or above grade level on the reading diagnostic. In this section, the results from the fourth-grade correlation are given. Two categories of excitement and reading were analyzed. The question from the students' survey analyzed in this section was "In your school, how excited are you to participate?" The second data set of the correlation was the percentage of students who performed on or above grade level on the reading diagnostic assessment.

The correlation coefficient in the aggregate when comparing excitement and reading for fourth grade was $r = 0.03$. The positive correlation means both variables were moving in the same direction. There is a very slight relationship between the coefficients. Table 26 contains a breakdown of students' perceptions of their excitement about school and the percentage of students who were assessed and performed on or above grade level on the reading diagnostic.

**Table 26**

*Summary of Excitement and Reading for Fourth Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | - 0.04 |
| Free or Reduced | 0.02 |
| White | 0.05 |
| Hispanic | 0.05 |
| Black | - 0.07 |
| Male | 0.02 |
| Female | 0.02 |
| Total | 0.03 |

*Note:* The percentage of students who responded extremely excited or quite excited was the dependent variable in the correlation calculation. The percentage of students who performed at or above grade level on the reading diagnostic was the independent variable.

**Excitement and Reading: Fifth grade**

The first research question was analyzed by conducting a correlation test with one survey question from the student' survey and the percentage of students who scored on or above grade level on reading while assessed by the i-Ready diagnostic. In this section, the results from the fifth-grade correlation are presented. Two categories of excitement and reading were analyzed. The question from the students' survey analyzed in this section was "In your school, how excited are you to participate?" The second data set of the correlation was the percentage of students who performed on or above grade level on the reading diagnostic assessment.

The correlation coefficient in the aggregate when comparing excitement and reading for fifth grade was $r = 0.00$. There was no correlation between the two variables. Table 27 contains a breakdown of students' perceptions of their excitement about school

and the percentage of students performing on or above grade level on the reading assessment.

**Table 27**

*Summary of Excitement and Reading for Fifth Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | - 0.02 |
| Free or Reduced | 0.01 |
| White | 0.00 |
| Hispanic | - 0.06 |
| Black | - 0.17 |
| Male | 0.03 |
| Female | - 0.04 |
| Total | 0.02 |

*Note:* The percentage of students who responded extremely excited or quite excited was the dependent variable in the correlation calculation. The percentage of students who performed at or above grade level on the reading diagnostic was the independent variable.

### *Engagement and Achievement: Focused and Math*

To analyze the engagement survey question and math achievement, a series of correlations were conducted. When describing the co-directional movement of two variables, the correlation statistic is proper (Holmes, Illowsky, & Dean, 2018). The aggregate was analyzed in addition to disaggregated data including gender, ethnicity, and lunch status.

#### *Engagement and Achievement: All grades.*

The second research question was analyzed by conducting a correlation test with one survey question from the students' survey and the percentage of students who performed on or above grade level when assessed with the i-Ready math diagnostic. Two categories of focused and math achievement were analyzed. The question from the

students' survey analyzed in this section was "How focused are you on the activities in your school?" The second data set of the correlation was the percentage of students who performed on or above grade level on the math diagnostic assessment.

The correlation coefficient in the aggregate when comparing focused and math achievement for all grades third through fifth was $r = 0.09$. The positive correlation means both variables were moving in the same direction. There is a very slight relationship between the coefficients. Table 28 contains a breakdown of the relationship between students' perceptions of their ability to focus on school and math achievement.

**Table 28**

*Summary of Focused and Math for All Students Grades Third through Fifth*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.04 |
| Free or Reduced | 0.10 |
| White | 0.08 |
| Hispanic | 0.19 |
| Black | 0.10 |
| Male | 0.14 |
| Female | 0.04 |
| Total | 0.09 |

*Note:* The percentage of students who responded extremely focused or quite focused was the dependent variable in the correlation calculation. The percentage of students who performed at or above grade level on the math diagnostic was the independent variable.

**Focused and Math: Third grade.**

The second research question was also analyzed by conducting a correlation test with one survey question from the students' survey and the percentage of students who performed on or above grade level on the math diagnostic assessment. This section will cover the results from the third-grade correlation. Two categories of focused and math

were analyzed. The question from the students' survey analyzed in this section was "How focused are you on the activities in your school?" The second data set of the correlation was the percentage of students who performed on or above grade level on the math diagnostic assessment.

The correlation coefficient in the aggregate when comparing focused and math for third grade was $r = 0.10$. The positive correlation means both variables were moving in the same direction. There is a slight relationship between the coefficients. Table 29 contains a breakdown of students' perceptions of their ability to focus on school and the percentage of students who were assessed and performed on or above grade level on the math diagnostic.

**Table 29**

*Summary of Focused and Math for Third Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.06 |
| Free or Reduced | 0.11 |
| White | 0.05 |
| Hispanic | 0.29 |
| Black | 0.27 |
| Male | 0.13 |
| Female | 0.07 |
| Total | 0.10 |

*Note:* The percentage of students who responded extremely focused or quite focused was the dependent variable in the correlation calculation. The percentage of students who performed at or above grade level on the math diagnostic was the independent variable.

**Focused and Math: Fourth grade.**

The first research question was analyzed by conducting a correlation test with one survey question from the students' survey and the percentage of students who performed

on or above grade level on the math diagnostic. In this section, the results from the fourth-grade correlation are given. Two categories of focused and math were analyzed. The question from the students' survey analyzed in this section was "How focused are you on the activities in your school?" The second data set of the correlation was the percentage of students who performed on or above grade level on the math diagnostic assessment.

The correlation coefficient in the aggregate when comparing focused and math for fourth grade was $r = 0.12$. The positive correlation means both variables were moving in the same direction. There is a slight relationship between the coefficients. Table 30 contains a breakdown of students' perceptions of their focus on school and the percentage of students who were assessed and performed on or above grade level on the math diagnostic.

**Table 30**

*Summary of Focused and Math for Fourth Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.08 |
| Free or Reduced | 0.11 |
| White | 0.14 |
| Hispanic | 0.14 |
| Black | 0.01 |
| Male | 0.11 |
| Female | 0.13 |
| Total | 0.12 |

*Note:* The percentage of students who responded extremely focused or quite focused was the dependent variable in the correlation calculation. The percentage of students who performed at or above grade level on the math diagnostic was the independent variable.

### Focused and Math: Fifth grade

The second research question was analyzed by conducting a correlation test with one survey question from the students' survey and the percentage of students who scored on or above grade level on math while assessed by the i-Ready diagnostic. In this section, the results from the fifth-grade correlation are presented. Two categories of focused and math were analyzed. The question from the students' survey analyzed in this section was "How focused are you on the activities in your school?" The second data set of the correlation was the percentage of students who performed on grade or above level on the math diagnostic assessment.

The correlation coefficient in the aggregate when comparing focused and math for fifth grade was $r = 0.14$. The positive correlation means both variables were moving in the same direction. There is a slight relationship between the coefficients. Table 31 contains a breakdown of students' perceptions of their ability to focus on school and the percentage of students performing on or above grade level on the math assessment.

**Table 31**

*Summary of Focused and Math for Fifth Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.17 |
| Free or Reduced | 0.14 |
| White | 0.18 |
| Hispanic | 0.06 |
| Black | 0.08 |
| Male | 0.25 |
| Female | 0.02 |
| Total | 0.14 |

*Note:* The percentage of students who responded extremely focused or quite focused was the dependent variable in the correlation calculation. The percentage of students who performed at or above grade level on the math diagnostic was the independent variable.

### *Engagement and Achievement: Focused and Reading*

To analyze the engagement survey question and the reading achievement, a series of correlations were conducted. When describing the co-directional movement of two variables, the correlation statistic is proper (Holmes, Illowsky, & Dean, 2018). The aggregate was analyzed in addition to disaggregated data including gender, ethnicity, and lunch status.

#### *Engagement and Achievement: All grades.*

The second research question was analyzed by conducting a correlation test with one survey question from the students' survey and the percentage of students who performed on or above grade level when assessed with the i-Ready reading diagnostic. Two categories of focused and reading achievement were analyzed. The question from the students' survey analyzed in this section was "How focused are you on the activities

in your school?" The second data set of the correlation was the percentage of students who performed on or above grade level on the reading diagnostic assessment.

The correlation coefficient in the aggregate when comparing focused and reading achievement for all grades third through fifth was $r = 0.01$. The positive correlation means both variables were moving in the same direction. There is a very slight relationship between the coefficients. Table 32 contains a breakdown of the relationship between students' perceptions of their own ability to focus on school and reading achievement.

**Table 32**

*Summary of Focused and Reading for All Students Grades Third through Fifth*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.03 |
| Free or Reduced | 0.11 |
| White | 0.08 |
| Hispanic | 0.19 |
| Black | 0.10 |
| Male | 0.15 |
| Female | 0.03 |
| Total | 0.10 |

*Note:* The percentage of students who responded extremely focused or quite focused was the dependent variable in the correlation calculation. The percentage of students who performed at or above grade level on the reading diagnostic was the independent variable.

**Focused and Reading: Third grade.**

The second research question was also analyzed by conducting a correlation test with one survey question from the students' survey and the percentage of students who performed on or above grade level on the reading diagnostic assessment. This section will cover the results from the third-grade correlation. Two categories of focused and reading

were analyzed. The question from the students' survey analyzed in this section was "How focused are you on the activities in your school?" The second data set of the correlation was the percentage of students who performed on or above grade level on the reading diagnostic assessment.

The correlation coefficient in the aggregate when comparing focused and reading for third grade was $r = 0.10$. The positive correlation means both variables were moving in the same direction. There is a slight relationship between the coefficients. Table 33 contains a breakdown of students' perceptions of their ability to focus on school and the percentage of students who were assessed and performed on or above grade level on the reading diagnostic.

**Table 33**

*Summary of Focused and Reading for Third Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.05 |
| Free or Reduced | 0.10 |
| White | - 0.02 |
| Hispanic | 0.31 |
| Black | 0.15 |
| Male | 0.27 |
| Female | 0.04 |
| Total | 0.10 |

*Note:* The percentage of students who responded extremely focused or quite focused was the dependent variable in the correlation calculation. The percentage of students who performed at or above grade level on the reading diagnostic was the independent variable.

**Focused and Reading: Fourth grade.**

The second research question was analyzed by conducting a correlation test with one survey question from the students' survey and the percentage of students who

performed on or above grade level on the reading diagnostic. In this section, the results from the fourth-grade correlation are given. Two categories of focused and reading were analyzed. The question from the students' survey analyzed in this section was "How focused are you on the activities in your school?" The second data set of the correlation was the percentage of students who performed on or above grade level on the reading diagnostic assessment.

The correlation coefficient in the aggregate when comparing focused and reading for fourth grade was $r = 0.14$. The positive correlation means both variables were moving in the same direction. There is a slight relationship between the coefficients. Table 34 contains a breakdown of students' perceptions of their focus on school and the percentage of students who were assessed and performed on or above grade level on the reading diagnostic.

**Table 34**

*Summary of Focused and Reading for Fourth Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.09 |
| Free or Reduced | 0.13 |
| White | 0.14 |
| Hispanic | 0.14 |
| Black | 0.18 |
| Male | 0.14 |
| Female | 0.13 |
| Total | 0.14 |

*Note:* The percentage of students who responded extremely focused or quite focused was the dependent variable in the correlation calculation. The percentage of students who performed at or above grade level on the reading diagnostic was the independent variable.

### Focused and Reading: Fifth grade

The second research question was analyzed by conducting a correlation test with one survey question from the students' survey and the percentage of students who scored on or above grade level on reading while assessed by the i-Ready diagnostic. In this section, the results from the fifth-grade correlation are presented. Two categories of focused and reading were analyzed. The question from the students' survey analyzed in this section was "How focused are you on the activities in your school?" The second data set of the correlation was the percentage of students who performed on or above grade level on the reading diagnostic assessment.

The correlation coefficient in the aggregate when comparing focused and reading for fifth grade was $r = 0.13$. The positive correlation means both variables were moving in the same direction. There is a slight relationship between the coefficients. Table 35 contains a breakdown of students' perceptions of their ability to focus on school and the percentage of students performing on or above grade level on the reading assessment.

**Table 35**

*Summary of Focused and Reading for Fifth Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.12 |
| Free or Reduced | 0.15 |
| White | 0.17 |
| Hispanic | 0.10 |
| Black | -0.05 |
| Male | 0.24 |
| Female | 0.00 |
| Total | 0.13 |

*Note:* The percentage of students who responded extremely focused or quite focused was the dependent variable in the correlation calculation. The percentage of students who performed at or above grade level on the reading diagnostic was the independent variable.

**Research Question Three**

What is the relationship between academic achievement and teachers' perceptions of the grit of students enrolled in third through fifth grade in Title I elementary schools?

The third research question was focused on the areas of grit and achievement. The first part of this research question is grit. Grit was analyzed by focusing on two questions from the teachers' perception questions related to students' grit. The two questions analyzed from the teachers' survey were "How possible is it for teachers to change how easily they give up?" and "If your students fail to reach an important goal, how likely are they to try again?" The first question from the teachers' survey will be referred to as "change" and the second will be referred to as "try again." The second part of this research question is academic achievement. Academic achievement was analyzed by focusing on the percentage of students on or above grade level in math and reading as assessed by the i-Ready diagnostic.

The relationship between grit and achievement is analyzed by four different approaches. Each approach contains one question from the teachers' perception of students' grit and the percentage of students on or above grade level or above in math and reading as assessed by i-Ready diagnostic. The subcategories analyzed were: try again and math, change and math, try again and reading, and finally, change and reading.

### *Grit and Engagement: Try Again and Math*

To analyze the two questions from the set of questions from teachers and achievement data, a series of correlations were conducted. When describing the co-directional movement of two variables, the correlation statistic is proper (Holmes, Illowsky, & Dean, 2018). Since the question "Do your students have grit" was not asked based upon the variety of ways grit is defined, it important to look at these survey questions in a variety of ways to be able to look at the traits of both grit and achievement.

#### Try again and Math: All Grades.

The third research question was analyzed by conducting a correlation test with one survey question from the teachers' survey and the percentage of students on or above grade level or above as assessed by the i-Ready diagnostic. Two categories of try again and math were analyzed. The question from the teachers' survey analyzed in this section was "If your students fail to reach an important goal, how likely are they to try again?"

The correlation coefficient in the aggregate when comparing try again and math for all grades third through fifth was $r = 0.27$. The positive correlation means both variables were moving in the same direction. There is a slight relationship between the coefficients. Table 36 contains a breakdown of the relationship between classroom

teachers' perceptions regarding students' grit by grade level and the percentage of students performing on or above grade level on math from the i-Ready diagnostic.

**Table 36**

*Summary of Try Again and Math for All Students Grades Third through Fifth*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | - 0.27 |
| Free or Reduced | - 0.16 |
| White | 0.06 |
| Hispanic | - 0.58 |
| Black | - 0.03 |
| Male | 0.25 |
| Female | - 0.07 |
| Total | - 0.30 |

*Note:* The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation. The percentage of students achieving on or above grade level on the math i-Ready diagnostic was the dependent variable.

**Try again and Math: Third grade.**

The third research question was also analyzed by conducting a correlation test with one survey question from the teachers' survey and one survey question from the students' survey disaggregated into specific grade levels. This section will cover the results from the third-grade correlation. Two categories of try again and math were analyzed. The question from the teacher survey analyzed in this section was "If your students fail to reach an important goal, how likely are they to try again?"

The correlation coefficient in the aggregate when comparing try again and math for third grade was $r$ = - 0.09. The negative correlation means as one variable is moving in a positive direction, the other is moving in the negative direction. There is a moderate relationship between the coefficients. Table 37 contains a breakdown of the relationship

between classroom teachers' perceptions regarding students' grit by grade level and the percentage of students performing on or above grade level on math from the i-Ready diagnostic.

**Table 37**

*Summary of Try Again and Math for Third Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.23 |
| Free or Reduced | 0.19 |
| White | 0.24 |
| Hispanic | -0.11 |
| Black | -0.02 |
| Male | 0.07 |
| Female | 0.35 |
| Total | -0.12 |

*Note:* The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation. The percentage of students achieving on or above grade level on the math i-Ready diagnostic was the dependent variable.

**Try again and Math: Fourth grade.**

The first research question was analyzed by conducting a correlation test with one survey question from the teachers' survey and one survey question from the students' survey disaggregated into specific grade levels. In this section, the results from the fourth-grade correlation are given. Two categories of try again and math were analyzed. The question from the teacher survey analyzed in this section was "If your students fail to reach an important goal, how likely are they to try again?"

The correlation coefficient in the aggregate when comparing try again and math for fourth grade was $r = 0.20$. The positive correlation means both variables were moving in the same direction. There is a slight relationship between the coefficients. Table 38

contains a breakdown of the relationship between classroom teachers' perceptions regarding students' grit by grade level and the percentage of students performing on or above grade level on math from the i-Ready diagnostic.

**Table 38**

*Summary of Try Again and Math for Fourth Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.20 |
| Free or Reduced | 0.16 |
| White | -0.02 |
| Hispanic | -0.07 |
| Black | 0.17 |
| Male | 0.29 |
| Female | 0.04 |
| Total | 0.20 |

*Note:* The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation. The percentage of students achieving on or above grade level on the math i-Ready diagnostic was the dependent variable.

### Try again and Math: Fifth grade

The first research question was analyzed by conducting a correlation test with one survey question from the teachers' survey and one survey question from the students' survey disaggregated into specific grade levels. In this section, the results from the fifth-grade correlation are presented. Two categories of try again and math were analyzed. The question from the teacher survey analyzed in this section was "If your students fail to reach an important goal, how likely are they to try again?"

The correlation coefficient in the aggregate when comparing try again and math for fifth grade was $r = 0.30$. The positive correlation means both variables were moving in the same direction. There is a moderate relationship between the coefficients. Table 39

contains a breakdown of the relationship between classroom teachers' perceptions regarding students' grit by grade level and the percentage of students performing on or above grade level on math from the i-Ready diagnostic.

**Table 39**

*Summary of Try Again and Math for Fifth Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.42 |
| Free or Reduced | 0.18 |
| White | 0.38 |
| Hispanic | -0.22 |
| Black | 0.18 |
| Male | 0.09 |
| Female | 0.47 |
| Total | 0.30 |

*Note:* The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation. The percentage of students achieving on or above grade level on the math i-Ready diagnostic was the dependent variable.

### *Grit and Engagement: Try Again and Reading*

To analyze the two questions from the set of questions from teachers and achievement data, a series of correlations were conducted. When describing the co-directional movement of two variables, the correlation statistic is proper (Holmes, Illowsky, & Dean, 2018). Since the question "Do your students have grit" was not asked based upon the variety of ways grit is defined, it important to look at these survey questions in a variety of ways to be able to look at the traits of both grit and achievement.

#### Try again and Reading: All Grades.

The first research question was analyzed by conducting a correlation test with one survey question from the teachers' survey and the percentage of students on or above

grade level or above as assessed by the i-Ready diagnostic. Two categories of try again and reading were analyzed. The question from the teacher survey analyzed in this section was “If your students fail to reach an important goal, how likely are they to try again?”

The correlation coefficient in the aggregate when comparing try again and reading for all grades third through fifth was $r = 0.56$. The positive correlation means both variables were moving in the same direction. There is a moderate relationship between the coefficients. Table 40 contains a breakdown of the relationship between classroom teachers’ perceptions regarding students’ grit by grade level and the percentage of students performing on or above grade level on reading from the i-Ready diagnostic.

**Table 40**

*Summary of Try Again and Reading for All Students Grades Third through Fifth*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | -0.05 |
| Free or Reduced | 0.60 |
| White | 0.47 |
| Hispanic | 0.08 |
| Black | 0.14 |
| Male | 0.29 |
| Female | 0.73 |
| Total | 0.56 |

*Note:* The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation. The percentage of students achieving on or above grade level on the reading i-Ready diagnostic was the dependent variable.

**Try again and Reading: Third grade.**

The first research question was also analyzed by conducting a correlation test with one survey question from the teachers’ survey and one survey question from the students’ survey disaggregated into specific grade levels. This section will cover the results from

the third-grade correlation. Two categories of excitement and try again were analyzed. The question from the student survey analyzed in this section was “In your school, how excited are you to participate?” The question from the teacher survey analyzed in this section was “If your students fail to reach an important goal, how likely are they to try again?”

The correlation coefficient in the aggregate when comparing excitement and try again for third grade was $r = 0.42$. The positive correlation means both variables were moving in the same direction. There is a moderate relationship between the coefficients. Table 41 contains a breakdown of the relationship between classroom teachers’ perceptions regarding students’ grit by grade level and the percentage of students performing on or above grade level on reading from the i-Ready diagnostic.

**Table 41**

*Summary of Try Again and Reading for Third Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.26 |
| Free or Reduced | 0.53 |
| White | 0.32 |
| Hispanic | 0.00 |
| Black | 0.42 |
| Male | 0.37 |
| Female | 0.50 |
| Total | 0.42 |

*Note:* The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation. The percentage of students achieving on or above grade level on the reading i-Ready diagnostic was the dependent variable.

**Try again and Reading: Fourth grade.**

The first research question was analyzed by conducting a correlation test with one survey question from the teachers' survey and one survey question from the students' survey disaggregated into specific grade levels. In this section, the results from the fourth-grade correlation are given. Two categories of excitement and try again were analyzed. The question from the student survey analyzed in this section was "In your school, how excited are you to participate?" The question from the teacher survey analyzed in this section was "If your students fail to reach an important goal, how likely are they to try again?"

The correlation coefficient in the aggregate when comparing excitement and try again for fourth grade was $r = 0.61$. The positive correlation means both variables were moving in the same direction. There is a moderate relationship between the coefficients. Table 42 contains a breakdown of the relationship between classroom teachers' perceptions regarding students' grit by grade level and the percentage of students performing on or above grade level on reading from the i-Ready diagnostic.

**Table 42**

*Summary of Try Again and Reading for Fourth Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.37 |
| Free or Reduced | 0.55 |
| White | 0.64 |
| Hispanic | 0.14 |
| Black | 0.14 |
| Male | 0.55 |
| Female | 0.37 |
| Total | 0.61 |

*Note:* The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation. The percentage of students achieving on or above grade level on the reading i-Ready diagnostic was the dependent variable.

### Try again and Reading: Fifth grade

The first research question was analyzed by conducting a correlation test with one survey question from the teachers' survey and one survey question from the students' survey disaggregated into specific grade levels. In this section, the results from the fifth-grade correlation are presented. Two categories of excitement and try again were analyzed. The question from the student survey analyzed in this section was "In your school, how excited are you to participate?" The question from the teacher survey analyzed in this section was "If your students fail to reach an important goal, how likely are they to try again?"

The correlation coefficient in the aggregate when comparing excitement and try again for fifth grade was $r = 0.42$. The positive correlation means both variables were moving in the same direction. There is a moderate relationship between the coefficients. Table 43 contains a breakdown of the relationship between classroom teachers'

perceptions regarding students' grit by grade level and the percentage of students performing on or above grade level on reading from the i-Ready diagnostic.

**Table 43**

*Summary of Try Again and Reading for Fifth Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.26 |
| Free or Reduced | 0.29 |
| White | 0.48 |
| Hispanic | -0.30 |
| Black | -0.20 |
| Male | -0.18 |
| Female | 0.73 |
| Total | 0.42 |

*Note:* The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation. The percentage of students achieving on or above grade level on the reading i-Ready diagnostic was the dependent variable.

### *Grit and Engagement: Change and Math*

To analyze the two questions from the set of questions from teachers and achievement data, a series of correlations were conducted. When describing the co-directional movement of two variables, the correlation statistic is proper (Holmes, Illowsky, & Dean, 2018). Since the question "Do your students have grit" was not asked based upon the variety of ways grit is defined, it important to look at these survey questions in a variety of ways to be able to look at the traits of both grit and achievement.

#### Change and Math: All Grades.

The first research question was analyzed by conducting a correlation test with one survey question from the teachers' survey and the percentage of students on or above grade level or above as assessed by the i-Ready diagnostic. Two categories of change and

math were analyzed. The question from the teacher survey analyzed in this section was "How possible is it for teachers to change how easily they give up?"

The correlation coefficient in the aggregate when comparing change and math for all grades third through fifth was $r = 0.15$. The positive correlation means both variables were moving in the same direction. There is a slight relationship between the coefficients. Table 44 contains a breakdown of the relationship between classroom teachers' perceptions regarding students' grit by grade level and the percentage of students performing on or above grade level on math from the i-Ready diagnostic.

**Table 44**

*Summary of Change and Math for All Students Grades Third through Fifth*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.20 |
| Free or Reduced | 0.14 |
| White | 0.03 |
| Hispanic | 0.14 |
| Black | 0.12 |
| Male | 0.14 |
| Female | 0.17 |
| Total | 0.15 |

*Note:* The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation. The percentage of students achieving on or above grade level on the math i-Ready diagnostic was the dependent variable.

**Change and Math: Third grade.**

The first research question was also analyzed by conducting a correlation test with one survey question from the teachers' survey and one survey question from the students' survey disaggregated into specific grade levels. This section will cover the results from the third-grade correlation. Two categories of excitement and change were analyzed. The

question from the student survey analyzed in this section was “In your school, how excited are you to participate?” The question from the teacher survey analyzed in this section was “If your students fail to reach an important goal, how likely are they to change?”

The correlation coefficient in the aggregate when comparing excitement and change for third grade was $r = 0.25$. The positive correlation means both variables were moving in the same direction. There is a slight relationship between the coefficients. Table 45 contains a breakdown of the relationship between classroom teachers’ perceptions regarding students’ grit by grade level and the percentage of students performing on or above grade level on math from the i-Ready diagnostic.

**Table 45**

*Summary of Change and Math for Third Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | -0.08 |
| Free or Reduced | 0.26 |
| White | 0.00 |
| Hispanic | 0.06 |
| Black | 0.40 |
| Male | 0.10 |
| Female | 0.41 |
| Total | 0.25 |

*Note:* The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation. The percentage of students achieving on or above grade level on the math i-Ready diagnostic was the dependent variable.

**Change and Math: Fourth grade.**

The first research question was analyzed by conducting a correlation test with one survey question from the teachers’ survey and one survey question from the students’

survey disaggregated into specific grade levels. In this section, the results from the fourth-grade correlation are given. Two categories of excitement and change were analyzed. The question from the student survey analyzed in this section was “In your school, how excited are you to participate?” The question from the teacher survey analyzed in this section was “If your students fail to reach an important goal, how likely are they to change?”

The correlation coefficient in the aggregate when comparing excitement and change for fourth grade was $r = 0.22$. The positive correlation means both variables were moving in the same direction. There is a slight relationship between the coefficients. Table 46 contains a breakdown of the relationship between classroom teachers’ perceptions regarding students’ grit by grade level and the percentage of students performing on or above grade level on math from the i-Ready diagnostic.

**Table 46**

*Summary of Change and Math for Fourth Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.14 |
| Free or Reduced | 0.18 |
| White | 0.32 |
| Hispanic | -0.16 |
| Black | -0.13 |
| Male | 0.39 |
| Female | 0.00 |
| Total | 0.22 |

*Note:* The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation. The percentage of students achieving on or above grade level on the math i-Ready diagnostic was the dependent variable.

### Change and Math: Fifth grade

The first research question was analyzed by conducting a correlation test with one survey question from the teachers' survey and one survey question from the students' survey disaggregated into specific grade levels. In this section, the results from the fifth-grade correlation are presented. Two categories of excitement and change were analyzed. The question from the student survey analyzed in this section was "In your school, how excited are you to participate?" The question from the teacher survey analyzed in this section was "If your students fail to reach an important goal, how likely are they to change?"

The correlation coefficient in the aggregate when comparing excitement and change for fifth grade was $r = 0.30$. The positive correlation means both variables were moving in the same direction. There is a moderate relationship between the coefficients. Table 47 contains a breakdown of the relationship between classroom teachers' perceptions regarding students' grit by grade level and the percentage of students performing on or above grade level on math from the i-Ready diagnostic.

**Table 47**

*Summary of Change and Math for Fifth Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.32 |
| Free or Reduced | 0.18 |
| White | 0.34 |
| Hispanic | -0.37 |
| Black | 0.20 |
| Male | 0.12 |
| Female | 0.39 |
| Total | 0.30 |

*Note:* The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation. The percentage of students achieving on or above grade level on the math i-Ready diagnostic was the dependent variable.

### *Grit and Engagement: Change and Reading*

To analyze the two questions from the set of questions from teachers and achievement data, a series of correlations were conducted. When describing the co-directional movement of two variables, the correlation statistic is proper (Holmes, Illowsky, & Dean, 2018). Since the question "Do your students have grit" was not asked based upon the variety of ways grit is defined, it important to look at these survey questions in a variety of ways to be able to look at the traits of both grit and achievement.

#### Change and Reading: All Grades.

The first research question was analyzed by conducting a correlation test with one survey question from the teachers' survey and the percentage of students on or above grade level or above as assessed by the i-Ready diagnostic. Two categories of change and reading were analyzed. The question from the teacher survey analyzed in this section was "How possible is it for teachers to change how easily they give up?"

The correlation coefficient in the aggregate when comparing change and reading for all grades third through fifth was $r = 0.06$. The positive correlation means both variables were moving in the same direction. There is a very slight relationship between the coefficients. Table 48 contains a breakdown of the relationship between classroom teachers' perceptions regarding students' grit by grade level and the percentage of students performing on or above grade level on reading from the i-Ready diagnostic.

**Table 48**

*Summary of Change and Reading for All Students Grades Third through Fifth*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | -0.07 |
| Free or Reduced | 0.09 |
| White | -0.02 |
| Hispanic | 0.22 |
| Black | -0.03 |
| Male | -0.02 |
| Female | 0.24 |
| Total | 0.06 |

*Note:* The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation. The percentage of students achieving on or above grade level on the reading i-Ready diagnostic was the dependent variable.

**Change and Reading: Third grade.**

The first research question was also analyzed by conducting a correlation test with one survey question from the teachers' survey and one survey question from the students' survey disaggregated into specific grade levels. This section will cover the results from the third-grade correlation. Two categories of excitement and change were analyzed. The question from the student survey analyzed in this section was "In your school, how excited are you to participate?" The question from the teacher survey analyzed in this

section was “If your students fail to reach an important goal, how likely are they to change?”

The correlation coefficient in the aggregate when comparing excitement and change for third grade was $r = 0.25$. The positive correlation means both variables were moving in the same direction. There is a slight relationship between the coefficients. Table 49 contains a breakdown of the relationship between classroom teachers’ perceptions regarding students’ grit by grade level and the percentage of students performing on or above grade level on reading from the i-Ready diagnostic.

**Table 49**

*Summary of Change and Reading for Third Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.30 |
| Free or Reduced | 0.17 |
| White | 0.22 |
| Hispanic | 0.03 |
| Black | 0.09 |
| Male | 0.06 |
| Female | 0.14 |
| Total | 0.25 |

*Note:* The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation. The percentage of students achieving on or above grade level on the reading i-Ready diagnostic was the dependent variable.

**Change and Reading: Fourth grade.**

The first research question was analyzed by conducting a correlation test with one survey question from the teachers’ survey and one survey question from the students’ survey disaggregated into specific grade levels. In this section the results from the fourth-grade correlation are given. Two categories of excitement and change were analyzed. The

question from the student survey analyzed in this section was “In your school, how excited are you to participate?” The question from the teacher survey analyzed in this section was “If your students fail to reach an important goal, how likely are they to change?”

The correlation coefficient in the aggregate when comparing excitement and change for fourth grade was $r = 0.07$. The positive correlation means both variables were moving in the same direction. There is a very slight relationship between the coefficients. Table 50 contains a breakdown of the relationship between classroom teachers’ perceptions regarding students’ grit by grade level and the percentage of student performing on or above grade level on reading from the i-Ready diagnostic.

**Table 50**

*Summary of Change and Reading for Fourth Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | -0.02 |
| Free or Reduced | 0.09 |
| White | -0.05 |
| Hispanic | -0.12 |
| Black | 0.22 |
| Male | 0.02 |
| Female | 0.14 |
| Total | 0.07 |

*Note:* The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation. The percentage of students achieving on or above grade level on the reading i-Ready diagnostic was the dependent variable.

### Change and Reading: Fifth grade

The first research question was analyzed by conducting a correlation test with one survey question from the teachers’ survey and one survey question from the students’

survey disaggregated into specific grade levels. In this section, the results from the fifth-grade correlation are presented. Two categories of excitement and change were analyzed. The question from the student survey analyzed in this section was “In your school, how excited are you to participate?” The question from the teacher survey analyzed in this section was “If your students fail to reach an important goal, how likely are they to change?”

The correlation coefficient in the aggregate when comparing excitement and change for fifth grade was $r = 0.10$. The positive correlation means both variables were moving in the same direction. There is a moderate relationship between the coefficients. Table 51 contains a breakdown of the relationship between classroom teachers’ perceptions regarding students’ grit by grade level and the percentage of students performing on or above grade level on reading from the i-Ready diagnostic.

**Table 51**

*Summary of Change and Reading for Fifth Grade Students*

| Demographic Category | Correlation |
|---|---|
| Full Lunch | 0.02 |
| Free or Reduced | 0.03 |
| White | 0.05 |
| Hispanic | -0.25 |
| Black | -0.41 |
| Male | -0.06 |
| Female | 0.22 |
| Total | 0.10 |

*Note:* The percentage of teachers who responded extremely likely or quite likely was the independent variable in the correlation calculation. The percentage of students achieving on or above grade level on the reading i-Ready diagnostic was the dependent variable.

## Summary

Data from 2,074 students were analyzed from the school years 2018–2019. Results from the statistical analyses revealed no strong correlation when analyzing the total from the disaggregated grade-level data. Data was compared from student perceptions of their engagement and teachers' perceptions of students' grit, student perception of their engagement and student in achievement (in both math or reading), and teachers' perceptions of students' grit and student achievement (in both math and reading). Correlation permits the investigation of two variables' behavior (Holmes, Illowsky, & Dean, 2018).

In Chapter Five, a summary of results from the data analysis is provided. Also, the possibilities for alterations to this study are explored. Recommendations and utilization of this study are also made to optimize student success.

## Chapter Five: Summary and Conclusions

In this chapter, the main segments of the study are reviewed. The major elements are also connected to the problem addressed in Chapter One; which was that based on the lack of solid research in the field, there is a need to further understand the connection between student grit, engagement, and achievement (Fernandez-Martin et al., 2020). The research findings identified in Chapter Four are explicated and inferences are applied to current readings. To conclude, recommendations and suggestions for implications, best practices, and future studies are offered.

The purpose of this study was to determine if there was a relationship between grit and engagement, engagement and student achievement, and finally grit and achievement. The following information will explain the data points for each of the three research questions. For each survey prompt or academic achievement results, an abbreviate title has been determined to simplify the reporting of results. The correlations were analyzed in the same structure for each research question. The structure of how the data was analyzed is explained in the following paragraphs.

The teachers' perception data was held constant for all Kindergarten through fifth-grade teachers when analyzing grit and engagement and grit and achievement. Engagement and achievement were analyzed with student perception data and student achievement data. When the term "aggregate" is used, this refers to the total of all students within the category in relation to each research question. For example, within the first research question, *excitement and try again: all grades*, the correlation reported within the *excitement* and *try again* category in the aggregate was for all students in third through fifth grades. In another example within the first search question, *excitement and*

*try again: third grade,* the correlation reported of the excitement and try again categories in the aggregate was for all students in third grade.

When the term "disaggregate" is used, this refers to the subcategories of the students within the category in relation to each research question. The disaggregated categories include gender, male or female, lunch status, free and reduced or full pay, and ethnicity, white, black and Hispanic. For example, within the first research question, *excitement and try again: all grades*, the disaggregated correlations reported within the *excitement* and *try again* category were reported for male, female, free and reduced lunch, white, black and Hispanic. In another example within the first search question, *excitement and try again: third grade,* the disaggregated correlations reported within the excitement and try again category in the aggregate were separated for third graders in male, female, free and reduced lunch, white, black and Hispanic. This process was repeated in the same structure for each of the research questions.

## Findings

### *Research Question One*

*What is the relationship of the perceptions of engagement of students as compared to teachers' perceptions of the grit of students enrolled in third through fifth grades in Title I elementary schools?*

In the first research question, the relationship between grit and engagement was measured by teacher and student perceptions. The teachers responded to two different prompts regarding the grit of students. The first prompt was "How possible is it for teachers to change how easily they give up?" This prompt is labeled as "change." The *change* prompt gives insight into if the teachers believe teachers provide modification to

their students' ability to not give up. The second prompt was "If your students fail to reach an important goal, how likely are they to try again?" This prompt was labeled as "try again." The *try again* prompt gives insight into the ability of their students' ability to not give up, based upon the student themselves without intervention from the teacher.

Students responded to two different prompts that are used to measure engagement. The first prompt was "In your school, how excited are you to participate?" This prompt was labeled "excited." The second prompt was "How focused are you on the activities in your school?" This prompt was labeled as "focused." Both of these prompts explain modes of engagement of students within an educational setting.

Correlations were run for each of the pairings of prompts. A correlation was first run on *change* and *excited*, then *change* and *focused*. The first correlation determines if teachers can impact students to become more engaged in school. The second pairing was correlated by the responses to *try again* and *excited*, then *try again* and *focused.* The second correlation analyzes the students' ability to impact their engagement within the school.

As found by David and Wentzel, "when teachers respond to students in ways that are responsive to student's needs, emotionally warm, and provide for student autonomy, students tend to not only feel more motivated in the classroom but also achieve at higher rates" (as cited in Hattie, 2013, p. 221). To evaluate this statement, teacher perceptions of student grit and students' perceptions of their engagement were analyzed. After conducting a correlation analysis between perceptions of engagement of students as related to teachers' perceptions of student grit, it was found that no strong relationship existed between the *change* and *focus* when evaluating the data in the aggregate. After

disaggregating the data, patterns emerged from the categories of full pay lunch status whereas all of the relationships resulted in a moderate negative correlation except for *change* and *focused*. Having a positive correlation with the categories of *change* and *focused* means that teachers feel that they can change the focus of their students with full pay lunch status. Observing a negative correlation within the other three categories can be summarized to state teachers feel their full pay students will not try again when students fail. The correlation also implies teachers cannot change the students' excitement, which impacts engagement with their classwork. This outcome is supportive of Hattie's (2013) statement concerning teachers' beliefs of whether they can change a students' motivation.

When reviewing third grade, there was a difference between white students between *try again* and *focused* at -0.35 and *changed* and *focused* at 0.41. While observing a negative correlation with *try again* and *focused*, teachers feel students will not try again if the students are not engaged in the activities in the classroom. Alternatively, teachers feel they can change the engagement of students in their classes. In all categories of fourth-grade Hispanic students, a moderate relationship was found ranging from 0.12 to 0.41. Inferences from the results indicated the teachers feel they can change the engagement of their Hispanic students in their class.

The impact of the negative traits, which come with low socioeconomic status, are evident in the very early developmental phases (Hattie, 2013). Within the fifth-grade category, for free and reduced lunch status students, negative correlations were found at the *try again* and *focused* relationships as positive relationships result in the *changes* and *focused* relationships. This suggests that teachers have more impact on their students than does the intrinsic motivation of their students. The results of this study support the impact

of teachers closing the gap between social classes, as found by Hattie (2013). There are no other results that are substantial within this research question.

***Research Question Two***

*What is the relationship of academic achievement in the areas of mathematics and reading and the perceptions of engagement of students enrolled in third through fifth grades in Title I elementary schools?*

In the second research question, student engagement and achievement were analyzed by student perceptions and their individual achievement results in math and reading. The student responses to the engagement prompts were used along with i-Ready on or above grade level scale scores were analyzed. Students responded to two different prompts that were used to measure engagement. The first prompt was "In your school, how excited are you to participate?" This prompt was labeled "excited." The second prompt was "How focused are you on the activities in your school?" This prompt was labeled as "focused." Correlations were run for each of the pairings of prompts and percentage of students on or above grade level to run correlations. The correlation was first run on *excited* and *math*, then *excited* and *reading*. The second pairing was correlated by the responses to *focused* and *math*, then *focused* and *reading*.

Increased performance on assessments is not necessarily linked to being connected to school (Hattie, 2013). After conducting a correlation analysis between students' perceptions of their engagement and their academic performance on i-Ready reading and math, it was found that no strong relationship existed between the engagement and student achievement of all students in grades third through fifth in the aggregate. Only two areas within all of the disaggregated categories were noteworthy. In

third grade, Hispanic students' correlations were the highest in all four categories of questions with correlations ranging from 0.22 to 0.29. This slight correlation between students' excitement, as measured by focus and excitement in relation to achievement, implies Hispanic student engagement positively affects their achievement. The third-grade full pay lunch students had the highest correlation of 0.50 of any of the disaggregated categories within the area of *focused* and *reading*. A correlation of 0.50 third-grade full pay lunch students suggests their engagement positively impacts their student achievement. Within all of the other disaggregated categories, very slight to slight correlations were calculated. The results of this research support Hattie's (2013) claim that being engaged or connected to school does not have a correlation to assessment scores.

***Research Question Three***

*What is the relationship between academic achievement and teachers' perceptions of the grit of students enrolled in third through fifth grades in Title I elementary schools?*

In the third research question, the relationship between grit and student achievement was measured by reading and mathematics academic achievement results and teachers' perceptions of students' educational engagement. The student responses to the grit prompts were analyzed along with i-Ready on or above grade level scale scores to run correlations. The teachers responded to two different prompts regarding the grit of students. The first prompt was "How possible is it for teachers to change how easily they give up?" This prompt is known as "change." The *change* prompt gives insight into if the teachers believe teachers provide modification to their students' ability to not give up.

The second prompt was “If your students fail to reach an important goal, how likely are they to try again?” This prompt was labeled as “try again.” The *try again* prompt gives insight into the ability of their students' ability to not give up, based upon the student themselves without intervention from the teacher. Correlations were run for each of the pairings of prompts and percentage of students on or above grade level to run correlations. The correlation was first run on *change* and *math*, then *change* and *reading*. The second pairing was correlated by the responses to *try again* and *math*, then *try again* and *reading*. The finding of the third research question has been presented with each of the pairings of grit and student achievement, due to the abundance of correlations found within the grit and student achievement data sets.

**Change and Math Achievement.** After conducting a correlation test between classroom teachers’ perceptions of students’ grit, as measured by *change*, and student achievement in *math*, it was found that no strong relationship existed between *change* and *math* in the aggregate of all students in grades third through fifth. The teachers’ perceptions prompt “How possible is it for teachers to *change* how easily they give up?” related to math achievement scores resulted in 87.5% of the disaggregated correlations to be positive. Of the 87.5% of positive correlations, the majority of the categories had a slight to moderate correlation. The range of positive correlations was 0.04 to 0.41. These findings suggest that teachers feel that they have the ability to affect their students’ perseverance when students fail at completing math skills correctly.

**Try Again and Math Achievement.** After conducting a correlation test between classroom teachers’ perceptions of students’ grit, as measured by *try again*, and student achievement in math between the sections of *try again* and *math*, it was found that no

strong relationship existed between *try again* and *math* in the aggregate of all students grades third through fifth. The teachers' perceptions prompt of "If your students fail to reach an important goal, how likely are they to try again?" and math achievement scores resulted in 75.3% of the disaggregated correlations to be positive. Of the 75.3% of positive correlations, the majority of the categories have a slight to moderate correlation. The range of positive correlations was 0.02 to 0.25. This would suggest that teachers feel that students could *try again* on their own when they fail at completing *math* skills correctly.

**Change and Reading Achievement.** After conducting a correlation test between classroom teachers' perceptions of students' grit, as measured by *change*, and student achievement in *reading* it was found that no strong relationship existed between the two factors in the aggregate. The teachers' perceptions prompt "How possible is it for teachers to change how easily they give up?" and reading achievement results resulted in 68.8% of the disaggregated correlations to be positive. Of the 68.8% of positive correlations, the majority of the categories have a slight correlation. The range of positive correlations was 0.02 to 0.25. This would suggest that teachers feel that students could *try again*, but do not always *try again* when they fail at completing *reading* skills correctly.

**Try Again and Reading Achievement.** After conducting a correlation test between classroom teachers' perceptions of students' grit, as measured by *try again,* and student achievement in *reading,* it was found that no strong relationship existed between *try again* and *reading* in the aggregate. A moderate relationship does exist between the *try again* and *reading*. The teachers' perceptions prompt "If your students fail to reach an important goal, how likely are they to try again?" and reading achievement scores

resulted in 87.5% of the disaggregated correlations to be positive. Of the 87.5% of positive correlations, the majority of the categories have moderate correlations. The range of positive correlations were 0.08 to 0.73. The highest correlation outcomes were from females grades third through fifth at 0.73. Within the category of male correlation from third to fifth grades, the correlation was 0.29. This would suggest that teachers feel overall, students have the ability to try again when they fail at completing reading skills correctly.

**Conclusions**

The purpose of this study was to determine whether there is a relationship between grit, engagement, and achievement. The more connected teachers are with the learners in their class, the more engaged the learners will be in their school (Hattie, 2013). In addition to engagement, students will be more academically successful when there is a positive connection to their school and teachers. In contrast, the link between engagement and assessment is not strong (Hattie, 2013). The more students are involved in their school and connected to their teachers, the more grit students have (Daniels, 2016). Connectedness within students, which fosters grit, to their learning environment will increase their ability to achieve (Daniels, 2016). The outcomes of this study support Hattie's (2013) and Daniel's (2016) statements.

Ross stated teacher belief to change their students, or efficacy is a strong predictor of student achievement at the singular teacher level as well as the collective teacher level (as cited in Hattie, 2013). Highly efficacious teachers seek new and more influential skills that contribute to greater student achievement (Hattie, 2013). Fernandez-Martin et al. (2020) found there are few research projects regarding the predictability of

achievement due to research focusing on the outcome of achievement rather than the commencement or beginning of learning. As stated by David, academic outcomes including self-efficacy, achievement in math and language, and participation are positively correlated to student perceptions of supportive teachers (as cited in Hattie, 2013). The opposite remains true as well (Hattie, 2013). Non-supportive teachers have a detrimental impact on students including student efficacy and achievement (Hattie, 2013). The results of this research support revealed when teachers believe, or have efficacy, they can change the engagement of students in math, academic achievement is positively impacted.

Student self-efficacy, a precursor to grit, is also a predictor of student achievement (Nasir & Iqbal, 2019). Pekdemir found a significant relationship between student achievement in mathematics and a student's self-efficacy (as cited in Hattie, 2013). Focusing on low achieving students, as Ross explained, decreases the gap between successful and struggling students (as cited in Hattie, 2013). The findings presented within this study may be valuable in the future as leaders develop skills and feelings of efficacy within their teachers regarding the ability to change a students' academic pathways. Ultimately, results from the study indicated that classroom teachers could influence their students' ability to *try again* in the subject of *math*. Alternatively, the results revealed students have more influence over their ability to persevere in reading. By considering the outcomes of this study, leaders may derive an appreciation of the positive relationship that exists between classroom teachers' belief in students, or efficacy, regarding math achievement and students' belief in themselves within the content area of reading achievement.

Grit is a necessary factor to evaluate when looking at interventions in the educational realm (Fernandez-Martin et al., 2020). According to Ross, teachers with higher levels of efficacy choose higher goals for their students which fosters grit, are more likely to take responsibility for themselves, and push through struggles to meet their goals when faced with failure (as cited in Hattie, 2013). Higher success in highly efficacious teachers perpetuates the need for teachers to seek new solutions when faced with challenges (Hattie, 2013). Risks in teaching are more likely to happen when efficacy is high (Hattie, 2013). Students are less likely to be labeled as problems when participating in classrooms with highly efficacious teachers (Hattie, 2013).

The outcomes of this study revealed classroom teachers' perceptions of students' grit, as well as students' perception of their perseverance, could play a role in student achievement in both reading and math. The results do not support a strong relationship between engagement and student achievement, in math or reading. The outcomes did not result in strong relationships in all aggregate categories. However, there were several areas of higher correlation in the disaggregated categories. Several factors could have contributed to the absence of a strong relationship across all categories. More data directly related to grit, engagement, and achievement need to be collected to further study whether or not a significant relationship exists between males, females, students receiving free or reduced lunch, students paying full price for their meals, and white, black, and Hispanic students.

**Implications for Practice**

Teachers play a significant role in learner motivation, not only through modeling, direction, or expectations, but also in meeting students' need for relatedness, competence,

and independence, which translates into adulthood (Güvenç, 2015). The findings of this study showed moderate relationships between classroom teachers' perception of changing students' abilities and increased achievement in math. Additionally, the findings showed moderate relationships between students' ability to not give up and an increase in reading achievement. The results of this study supported the importance of teachers' perceptions of their students regarding their belief in their students. In the absence of the teacher efficacy, or belief in their ability to impact students, there appeared to be a lower academic achievement in students. Furthermore, the study results revealed the need for further study of the development of grit within students to impact academic achievement. According to Bandura, goal setting, motivational processes, control of negative feelings, and physical and social environments are impacted by teacher efficacy (as cited in Hattie, 2013).

The results of this study suggest a program that increases grit within students could have a positive impact on student achievement. Implementing a social and emotional program, which foster grit, in school is expected to lay the groundwork for improved academic achievement, as reported by Zmuda and Bradshaw (as cited in Hattie, 2013). Zmuda and Bradshaw professed, "Beyond the individual level, SEL programs may enhance school environmental supports (e.g., a climate of high expectations for academic performance, and safe and orderly classrooms), teacher practices, and student-teacher relationships, which in turn may translate into improved academic achievement" (as cited in Hattie, 2013, p. 174). The most positive impact of student achievement comes from well-planned social and emotional learning programs, which are implemented with fidelity (Hattie, 2013). As researched by Frydenberg (2017), remediation programs are

considered supportive as they help families to strengthen personal resources and provide protective factors against less than optimal social and physical circumstances and environments. While programs fostering grit in students proved to have a positive impact on achievement according to Fernandez-Martin et al. (2020), the research also concluded programs that bolster grit in adults, both teachers and parents, did not influence student grit.

Fernandez-Martin et al. (2020) proposed, “Grit predicts objective career success like career status and salary, retention in the workplace, or teaching effectiveness, but not subjective career success, like career or job satisfaction, task performance, or turnover intention” (p. 166). The purpose of school is to prepare students for the workforce (Gulbahar, 2017). Relationships that are positive between students and teachers build a feeling of academic success or later job satisfaction (Gulbahar, 2017). When teachers meet the psychological needs of students, motivation and engagement increase (Güvenç, 2015). Teachers have as much control over the engagement of their students as their students have on their engagement (Güvenç, 2015). When teachers develop relationships with students along with a consistent and supportive classroom environment, which takes much effort, there is a definite positive impact on learning (Güvenç, 2015). Especially in lower socioeconomic schools, educators must affect grit within students while they are in school since teaching grit to adults has little impact on student grit. (Fernandez-Martin et al, 2020).

Stable employment and being a productive member of society are desirable attributes of successful adulthood (Gulbahar, 2017). Work engagement is one of the components that have a positive effect on an employee’s accomplishments and efficiency

at work (Gulbahar, 2017). Thus, it is conceivable to state that work engagement in employees is an extremely vital aspect regarding the performance, motivation and efficiency of the employee (Gulbahar, 2017). Potentially, the decrease of enriching subjects reduces the engagement of students, which in turn decreases academic achievement and matriculation (Cavendish, 2017). The outcomes of this study revealed classroom teachers' perceptions, as well as students' perseverance, could play a role in student achievement in both reading and math. However, the outcomes did not result in strong relationships in all categories, there were areas of higher correlation in the disaggregated categories. Many factors could have contributed to the absence of a strong relationship across all categories. More data directly related to grit, engagement, and achievement, as well as efficacy are needed to be collected to further study whether or not a significant relationship exists between the variables.

## Recommendations for Future Research

According to Güvenç (2015), teachers play a significant role in learner motivation, which translates into adulthood not only through modeling, direction, or expectations, but also in meeting students' need for relatedness, competence, and independence. This study revealed additional questions that could be researched in the future. The recommendations for future research include restructuring the Educational Golden Circle, investigating a deeper understanding of the reasons the teachers selected their responses, expanding the survey prompts, extending the timeframe of the study, and extending the number of districts included in the study

### *Restructure the Educational Golden Circle*

Due to the relationship between efficacy, in both teachers and students, and grit,

reframing the circle to replace efficacy where grit is currently located may provide benefits to future research. This would provide a movement from grit in the "why" position to the "how". While the outcome is always increased student achievement, the "what" would remain the same. Due to the plethora of research currently available about the impact of efficacy on student achievement, reframing the Educational Golden Circle could be beneficial to determine what the entry point possibilities are when students are not achieving.

### *Extend the Research with Qualitative Data*

This research was confined to the use of quantitative data to determine the relationship between grit, engagement, and student achievement. Future investigators could build on the quantitative data set by collecting rationales for participants' selected survey responses. Having a deeper understanding of the reasons behind the selections to the prompts could add depth to the findings of the study. A more thorough data set could allow leaders to fine-tune policies to better support learner achievement. Qualitative studies could benefit the educational community by providing a deeper understanding of the relationships between the teachers' perceptions, students' perceptions, and achievement and further educators' ability to impact student achievement.

### *Expand the Survey Prompts*

After defining grit for the purpose of the study, educators could respond to prompts specifically asking if they perceived their students had grit in the academic areas of math and reading, separately. The open responses would allow for a more concise analysis than using preexisting data. Future research would benefit from having questions developed specifically for and aligned to the research questions.

### *Extend the Timeframe of the Study*

The timeframe for this study was limited to one year (2018-2019). While this timeframe served as a good starting point, the limitation to one year may not have been inclusive enough to determine strong relationships between grit, engagement, and student achievement. Three or four years of data would provide more extensive data for researchers to consider in the future.

### *Extend the Study beyond District A*

One of the limitations of this study was evaluating the singular district. Future studies may benefit by expanding the focus beyond District A into other districts in the same state. A broader sample could enable researchers to observe differences between elementary grade levels and disaggregated categories.

## Summary

As Yuhun et al. (2018) confirmed, over time research has shown a positive association between grit and academic achievement. Credé, Tynan, and Harms (2016) claimed, “Overall grit exhibits relations with academic performance and retention that are only modest and that do not compare favorably with other well-known predictors of academic performance such as cognitive ability, study habits and skills, and academic adjustment” (p. 30). As illustrated in one example, Yuhun et al. (2018) stated grittier high school students were found to be more likely to graduate from high school than the remaining students who attended the same school, even after controlling for assessment scores. Growth mindset, learning motivations, and grit are highly correlated (Yuhun et al., 2018). Hodge et al. (2018) found there was a positive correlation between grit, engagement, and academic achievement. Motivation is fostered by a growth mindset

which in turn allows people to exercise a higher sense of control of their academic outcomes (Yuhun et al., 2018).

In Chapter Two, a review of the literature connected the role of the teacher to positive relationships with students, teachers' belief in students' ability to persevere, and the impact of those efforts on student achievement (Hattie, 2013). The most positive impact of student achievement comes from well-planned, social and emotional learning programs, which are implemented with fidelity (Hattie, 2013). While programs for fostering grit in students prove to be impactful according to Fernandez-Martin et al. (2020), their research also concluded programs which bolster grit in adults, both teachers and parents, did not influence student grit. Chapter Three contained an overview of the structure of the study and the study's procedure. The study was conducted to observe the relationship between teachers' perceptions of students' grit, the students' perceptions of their engagement, and the impact on student achievement in both reading and math. In Chapter Four findings and solutions to the three research questions were emphasized.

State and local education administrations could utilize the findings of this study to determine if social-emotional learning programs, which nurture grit, would be beneficial to increase the success of the students in the educational systems. In addition, the results of this research could influence policy development in creating professional learning programs for teachers, which foster grit in students and additionally academic success. While multiple factors influence student achievement, the results of this study are important and leaders need to consider the influence educators have on increasing the grit of students. Efforts to increase grit are necessary to both support educators and students to increase student academic achievement.

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# Appendix A

## Permission to Use the Golden Circle Model

**Mikayla Steberl** (Simon Sinek Inc)
Jul 28, 2020, 3:52 PM EDT

Hi Jill,

First, thank you for your willingness to help spread Simon's message to inspire the world around you. We know that a movement only exists when people are inspired to move, to do something, to take up the cause as their own. The whole idea of this message is to share it with as many people as possible. We know it takes a lot of people and are grateful for those who champion the movement to inspire others.
To help ensure the message is being shared in alignment with our values, please take a moment to review the following simple guidelines regarding using Simon's work.

We do not object to your use of the Golden Circle as long as it is clear that you are sharing by your own choice and that your work is not affiliated with, or officially endorsed by, Simon. We do ask that you use one of our images of which I will provide you. I have attached a square no bleed version that can be used for print but please let me know if you require something different.

A few more friendly reminders:

Work should be appropriately attributed and not used to imply that Simon is endorsing or otherwise involved with the work. If you are looking to do something different or in addition to what has been requested, we would need to know more about your intended use. This would include using or adapting key concepts from Simon's work as the basis for a publication or using any other content that has yet to be discussed and/or approved. (Please send proof of instance before publication).

The materials and content may not be placed near logos or products and services where it would suggest or imply an affiliation with, or official endorsement by, Simon. We do not allow Simon's quotes, name, or image to be used for commercial gain.

All materials and content should be properly attributed to the book, source material, or Simon's website. if you are going to include a link, we prefer you using Simon's website as the source.

Some examples:

Excerpted from "Share the Golden Circle: Presenter Slides & Notes" (©2015 Simon Sinek, Inc.) www.simonsinek.com/Tools

Sinek, Simon. Find Your Why a Practical Guide to Discovering Purpose for You or Your Team. Portfolio/Penguin, 2017.

Sinek, Simon. Start with Why: How Great Leaders Inspire Everyone to Take Action. Portfolio/Penguin, 2013.

Sinek, Simon. Leaders Eat Last. Portfolio Penguin, 2017.

For more information on preparing a proper attribution and citation, please refer to http://www.easybib.com/

Thank you again for being a part of the movement to inspire and live in service to others. Please let me know if you have any questions or if I can be of any further assistance.

Inspire your world,

Mikayla

# Appendix B

Institutional Review Board Approval

Date: 10-29-2020

IRB #: IRB-21-23
Title: The Relationship among Grit, Engagement, and Student Achievement
Creation Date: 9-25-2020
End Date:
Status: Approved
Principal Investigator: Jill Palmer
Review Board: SC Institutional Review Board
Sponsor:

# Appendix C

Permission to Conduct Research-District

[redacted]

To: Jill Palmer

From: [redacted]

Date: July 1, 2019

Subject: Request to Conduct Research

Your request to conduct research proposal titled An Evaluation of Fostering Resiliency in At-Risk Students Measured by Engagement and Grit in Relation to Student Achievement submitted for consideration has been approved. Please understand this letter constitutes district approval, but the final decision for participation rests with the building principal. You will need to seek approval from the building principal before conducting your research and present this letter. Once you have building approval, then consent by the parents must be given for the students to participate in the study

Feel free to contact [redacted] if you have questions or need additional information.

[redacted]

## Appendix D

## Request for Data

Date:

AAA Team,

I am completing my dissertation through Lindenwood University and would like to request the following data for analysis. My proposal outlining each of the requested components is attached. Thank you for providing the data needed for this analysis outlined in the proposal. Please let me know if you have any questions.

Sincerely,

Jill Dennison

**Requested Data Components**

Data request for all Title I elementary schools:

Code each school randomly with School A, School B, and so on. Match responses for question one with the student IDs from i-Ready and the survey, then remove all identifying information and replace names with Student 1, Student 2, and so on. Provide the *N* for all students per school who have both i-Ready Reading and Math along with the perception question responses and demographic qualifiers including grade level, gender, race and socioeconomic status. Also, provide the *N* for all staff per school who answered all the questions.

1. What is the relationship of the perceptions of engagement of students enrolled in third through fifth grades in Title I elementary schools as compared to teachers' perceptions of those students' grit?

| | | | | |
|---|---|---|---|---|
| School A | % Answering Extremely or Quite excited In your school, how excited are you to participate? | % Answering Extremely or Quite excited How focused are you on the activities in your school? | % Answering Complete and Quite possible to How possible is it for teachers to change how easily they give up? | % Answering Extremely or Quite likely to If your students fail to reach an important goal, how likely are they to try again? |
| School B | % Answering Extremely or Quite excited In your school, how excited are you to participate? | % Answering Extremely or Quite excited How focused are you on the activities in your school? | % Answering Complete and Quite possible to How possible is it for teachers to change how easily they give up? | % Answering Extremely or Quite likely to If your students fail to reach an important goal, how likely are they to try again? |

2. What is the relationship of academic achievement and the perceptions of engagement of students enrolled in third through fifth grades in Title I elementary schools?

Data requested:

Code Title I school names with School A, School B, etc. in random order from A-P. Keep grade level and gender tied to each data point per student. Student must have both data points to be included within the analysis. Delete all other that only have one data point. Match the following data set per student:

- i-Ready Math Scale Score per student paired with the students answer to:

  In your school, how excited are you to participate?

- i-Ready Reading Scale Score per student paired with the students answer to:

  In your school, how excited are you to participate?

- i-Ready Math Scale Score per student paired with the students answer to:

  How focused are you on the activities in your school?

- i-Ready Reading Scale Score per student paired with the students answer to:

  How focused are you on the activities in your school?

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Student 1 | School A | Grade | Gender, Race, and FRL Status | Math Scale Score | Reading Scale Score | In your school, how excited are you to participate? | How focused are you on the activities in your school? |
| Student 2 | School B | Grade | Gender, Race, and FRL Status | Math Scale Score | Reading Scale Score | In your school, how excited are you to participate? | How focused are you on the activities in your school? |
| Student 3 | School D | Grade | Gender, Race, and FRL Status | Math Scale Score | Reading Scale Score | In your school, how excited are you to participate? | How focused are you on the activities in your school? |

3. What is the relationship of academic achievement and teachers' perceptions of the grit of students enrolled in third through fifth grades in Title I elementary schools?

- From the same coding as above, match the percentage of students on grade level from i-Ready Math as defined by standard view to the percent of teachers answering Completely possible to Quite possible to the following prompt:

  How possible is it for teachers to change how easily they give up?

- From the same coding as above, match the percentage of students on grade level from i-Ready Reading as defined by standard view to the percent of teachers answering Completely possible to Quite possible to the following prompt:

  How possible is it for teachers to change how easily they give up?

- From the same coding as above, match the percentage of students on grade level from i-Ready Math as defined by standard view to the percent of teachers answering Extremely likely to Quite likely to the following prompt:

  If you student fails to reach an important goal, how likely are they to try again?

- From the same coding as above, match the percentage of students on grade level from i-Ready Reading as defined by standard view to the percent of teachers answering.

- Extremely likely to Quite likely to the following prompt:

  If your students fail to reach an important goal, how likely are they to try again?

| | | | | |
|---|---|---|---|---|
| School A | Math % on Grade Level (Standard Level) for Gender, Race, and FRL Status | Reading % on Grade Level (Standard Level) for Gender, Race, and FRL Status | % Answering Complete and Quite possible to How possible is it for teachers to change how easily they give up? | % Answering Extremely or Quite likely to If your students fail to reach an important goal, how likely are they to try again? |
| School B | Math % on Grade Level (Standard Level) for Gender, Race, and FRL Status | Reading % on Grade Level (Standard Level) for Gender, Race, and FRL Status | % Answering Complete and Quite possible to How possible is it for teachers to change how easily they give up? | % Answering Extremely or Quite likely to If your students fail to reach an important goal, how likely are they to try again? |

## Vita

Jill Palmer is currently an elementary principal serving at Springfield Public Schools in Springfield, Missouri. She holds of Bachelor of Arts degree in Biology-Unified Science from Missouri State University in Springfield, Missouri. Also, she earned a Masters and Specialist of School Administration degree from William Woods University in St. Louis, Missouri.

Beginning in August of 2001, Jill served as a physics and biology teacher at Kickapoo High School in Springfield, Missouri. She served in that role for four years before transitioning to the District Curriculum Department and served as the Science Curriculum Coordinator for one year. She then served as the initial International Baccalaureate Coordinator for the Middle Years Programme and Assistant Principal at Pipkin Middle School in Springfield, Missouri. She then was promoted to Coordinator of Accountability in the Quality Improvement and Assessment department for the Springfield School District. While in this role, she coached teachers, principals, and district leaders about data use to make decisions and interventions for students. She served in that role for seven years before serving in the current Title I school. Jill joined Westport Elementary School in Springfield, Missouri in July of 2019. In her current position, she has the opportunity to develop data-literate teachers who will increase student achievement through personalized interventions.