

The Relationship Between Student Grit and Student Achievement

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Abstract

As academic performance standards for all students have remained high through rigorous requirements and accountability measures set forth by lawmakers through educational reforms, researchers and educators have focused on practices that offer interventions for students who are at-risk of academic failure (Worley, 2007). Increasingly, attention placed on academic standards is being balanced with attention to students' character and interventions that develop character, mindsets, or non-cognitive attributes as a means of increasing student success (Duckworth & Seligman, 2005; Seligman, 2011; Farrington, et al., 2012). The purpose of this quantitative study was to determine whether there was a relationship between 6th-8th grade students' grit scores and their academic achievement, as measured by the change in the TerraNova score from fall to spring and by students' grade point averages (GPA). The second purpose of the study was to determine whether the relationship between students' grit scores and their academic achievements was affected by student gender, race, and first language. The sample was comprised of 6th-8th grade students residing in Kansas City, Missouri, who attended Urban Community Charter School for the entire 2013-2014 school year. The results revealed that students' grit scores did not appear to be related to students' growth on the TerraNova or a students' GPA. Results also did not indicate that either relationship was affected by student gender. As data was disaggregated into four sub-samples, African-American, White, Hispanic/Latino, and Asian, the correlation for White students was positive and indicated a strong relationship between grit scores and academic achievement. Among the results, it was also found that the correlation between White students' grit scores and GPA was negative and indicated a strong inverse

relationship. Little or no relationship was found between students' grit scores and measures of achievement for African-American and Hispanic/Latino students. The findings of this study have implications for the students, teachers, and administrators at Urban Community Charter School and the results should inform discussions around the foundational beliefs on academic achievement and success by economically disadvantaged and racially diverse students. Additionally, the findings of this study strengthen the need for staff to be aware of and understand current research and educational trends related to the malleability and development of not only students' grit but also other non-cognitive skills.

Dedication

This work is dedicated to my loving family whose endless support and encouragement enabled me to complete this work. For my husband, Cameron, your love and willingness to be “in charge” while I work meant more to me than you can ever know. For “The Three M’s,” Macie, Maxwell, and Miles, you three are my light on the darkest of days. Your hugs and smiles were a welcome interruption during long hours of research and writing. For my parents, John and Patricia, your love, encouragement, and occasional push to keep moving have been unfailing in every season of my life. Words cannot adequately express the love and admiration I have for both of you.

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Chapter One

Introduction

Over the past few decades, African-American and Hispanic/Latino students have made real gains in academic achievement; yet, too many minority students and students living in poverty lag far behind white students (The Education Trust, 2014a; 2014b). Studies and reports each year identify factors that most often contribute to students' academic success, including but not limited to, middle to high socio-economic status, parental involvement, educational attainment of parents and extended family, two-parent household, and consistent student attendance (Makar, 2013; Thomas, 2013; Wells, 2013). Conversely, research studies identify and analyze opposing risk factors that contribute to academic failure, most notably poverty or low socioeconomic status, lack of parental involvement, limited English proficiency, race/ethnicity, and family mobility (Boyle, 2013; Brown, 2009; Conant, 2013; Garcia, 2013; Kuhns, 2013; Mansfield, 2011). Additionally, students attending unstable school districts, urban districts characterized by frequent turnover in district leadership, volatile school board relationships, poor teacher quality, and fiscal mismanagement (Cooper, Cibulka & Fusarelli, 2014; Good, 2008; McAdams, Wisdom, Glover & McClellan, 2003), are often labeled at-risk, and show persistent patterns of under-achievement (Chesebro et al., 1992; McMillan & Reed, 1994). Urban school districts are often defined and plagued by such risk factors. Examples of unstable and under-achieving, albeit failing, urban districts can be found in most every state across the country.

The State of Missouri recognized the unstableness and failings of its metropolitan school districts and in 1998 passed a charter school law. "Charters were one part of

legislation designed to end three decades of court-ordered desegregation in Kansas City and St. Louis...with the hope that charter schools might provide options to boost the existing public school systems” (University of Missouri, Office of Charter School Operations, 2012, para. 5). Both the Kansas City and St. Louis School Districts have been declared unaccredited and/or provisionally accredited by the state board of education over the past 15 years and have consecutive annual performance reports detailing their failures to meet the standards of accountability set by the state and federal governments (Hawley, 2011). Charter schools in Kansas City play an increasingly central role in education reform (Center for Research on Education Outcomes, 2009) and exist to counteract the effects of poverty and other factors that place students at risk of academic failure (NPR Staff, 2012).

As “public schools work to develop tools to diminish the achievement gap, identify students who are at-risk of academic failure, and provide interventions, researchers continue to investigate several indicators affecting academic achievement” (Worley, 2007, p. 7). Researcher Angela Duckworth stated the following in her application essay to the Ph.D. program at The University of Pennsylvania:

The problem, I think, is not only the schools but also the students themselves. Here’s why: learning is hard. True, learning is fun, exhilarating and gratifying- but it is also often daunting, exhausting and sometimes discouraging...To help chronically low-performing but intelligent students, educators and parents must first recognize that character is at least as important as intellect (as cited in Seligman, 2011, p. 103).

A critical literature review authored by Farrington et al. (2012) supported Duckworth's (2006) and Duckworth and Seligman's (2005) findings that "researchers are increasingly turning to noncognitive factors to explain differences in school performance by race/ethnicity and gender" (p. 7). Educators, unable to counter societal factors resulting from socioeconomic background, race/ethnicity and gender, may be well served to focus on developing strategies to ratchet up academic demands through more rigorous requirements, accountability measures, and high standards (Farrington, et. al., 2012), but also interventions that develop character, mindsets or non-cognitive attributes.

Background

Over half a century has passed since the desegregation of Little Rock, Arkansas, schools after the *Brown v. Board of Education* decision in May of 1954. The externally generated reforms of urban education attempted across this nation over the past 60 years "are extensive, their effects controversial, and the cumulative knowledge limited" (Mirón & St. John, 2003, p. 1). Despite hundreds of federal court orders, perpetual rewriting and reauthorizations of federal acts and laws, funding formulas, countless reform movements and presidential educational initiatives, many students still attend school in racial isolation and demographic trends suggest that isolation in public schools will increase, with schools becoming less and less diverse in years to come (Mirón & St. John, 2003).

Desegregation litigation interweaves with educational reform and policy. The urban district that serves as the setting for the current study reflects data that consistently shows this country's lack of progress on issues of social, economic, and racial justice for people of color (Ladson-Billings, 2006; Liu, 2004; Oakes and Lipton, 2004). The desegregation case *Missouri v. Jenkins* has been referred to as the most notorious of the

tortured efforts in this country to overcome state-sanctioned segregation (Dunn, 2008). Kansas City Metropolitan School District (KCMSD) first brought its case in 1977, when more than 60 percent of the district students were minority, by suing the state, suburban school districts, and the Department of Health, Education, and Welfare and other federal government agencies for its inability to desegregate majority black schools (Glazer, 2009). Following a seven-year discovery process and a six-month trial, the judge in the case found the state of Missouri and the school district liable for segregation. The judge, imposing higher taxes on the city and state, required the district build “magnet schools with elaborate facilities to attract suburban white children” (Glazer, 2009, para. 7) and decreed in admissions that there must be four whites for every six blacks in each magnet school. “Despite huge expenditure, integration was not much advanced” (Glazer, 2009, para. 7). Finally, in 1995, the Supreme Court ruled that the judge could not impose a program of magnet schools to attract white, suburban students and the state stopped making desegregation payments to the district in 1999. Twenty-six years after its initial filing, the case was dismissed in 2003 (Ciotti, 1998; Glazer, 2009; Joondeph, 1996).

Glazer (2009) noted, “The schools seemed as dysfunctional at the end as they had appeared at the beginning” (para. 9). School districts under tight federal supervision with solutions imposed by legal doctrine, as was the case in Kansas City, flies in direct contrast to other solutions for urban school reform. Dunn’s (2008) final word, “The court and the black community disagreed on what the problems were. Legal doctrine asserted the problem was racial isolation. The black community asserted it was substandard education” (p. 180). The community was left out of decision-making and implementation of the desegregation plan. Essentially, “the Kansas City plan assumed that inner-city

blacks couldn't learn unless they sat in classrooms with middle-class whites" (Ciotti, 1998, para. 100) and the district spent enormous amounts of money to attract suburban whites, dismantled schools as essential parts of neighborhoods, and ignored the needs of inner-city blacks. The lesson learned from the Kansas City desegregation experiment supports the black community's contention that poor student achievement was the problem and not integration (Ciotti, 1998).

In 1997 testimony before the judge in the case, University of Rochester economist Eric Hanushek stated, "KCMSD should have been looking at incentives to increase academic productivity, such as merit pay, charter school vouchers" (Ciotti, 1998, para. 98), but noted KCMSD was "institutionally biased against the notion of competition" (para. 98). Shortly after the Supreme Court struck down the legality of the funding for desegregation and suburban transportation, the KCMSD School Board abandoned the magnet program and returned to neighborhood schools, with a few exceptions (Curators of the University of Missouri, 2011). As the desegregation legislation and monies ended for KCMSD, the state of Missouri continued to pass new legislation aimed at urban school reform.

In 1998, Missouri became the 27th state to pass a charter school law as one part of legislation designed to end three decades of court-ordered desegregation in Kansas City and St. Louis (University of Missouri, Office of Charter School Operations, 2012). "The legislation was also passed with hope that charter schools might provide options to boost the existing public school systems, viewed during that time [1998] as failing by almost every standard" (University of Missouri, Office of Charter School Operations, 2012, para. 5). Historically, the District experienced a steep decline in academic achievement

starting in the 1970s continuing through the late 1980s, with flat or moderately declining scores into the late 1990s. The District lost its accreditation with the state of Missouri in 2000, regained provisional accreditation in 2002 only to lose it again in 2011. The District regained provisional accreditation in 2014 (Benson, n.d.; Kansas City Public Schools, 2015).

Charter legislation in Missouri differs from other states, as nationally 90 percent of charter schools are sponsored by the local school district, yet Missouri initially required that charter schools be sponsored by institutions of higher education (University of Missouri, Office of Charter School Operations, 2012). Given the failures of the Kansas City schools, and the discovery that under desegregation mandates “it was easier to meet the court’s 60/40 integration ratio by letting black students drop out than by convincing white students to move in” (Ciotti, 1998, para. 82), charter schools supported by universities would be free of district policies, the hyper-focus on integration, and envision an education for urban students largely underserved in traditional public schools (U. S. Department of Education, 2004). However, 2012 legislation passed into law allowing additional sponsors, including the school board of an accredited school district; a special administrative board of a metropolitan school district; a private four-year college or university or a two-year private vocational or technical school with their primary campus in Missouri; and, the Missouri Charter Public School Commission. Any allowable sponsors must apply to the Missouri State Board of Education for approval as such (Thaman, 2014).

Payne and Knowles (2009) discuss the increased role of charter schools in recent years and focus on the flexibility of charter schools, specifically in staffing, autonomy of

governance, and insulation from district policy, as reasons for their effectiveness. The authors state that “effective charter schools provide new schooling options for children and families who have had, historically, far too few” (p. 228). The U. S. Department of Education (2004) echoes the promise of charter schools in a report entitled, *Successful Charter Schools*. As was the case in Missouri, “proponents [charter schools] hope that this new mix of choice and accountability will not only provide students stronger learning programs than local alternatives, but will also stimulate improvement of the existing public school system” (p. 1). Charter schools formed within the bounds of both KCMSD and St. Louis City represent the philosophy as “a means to do an end-run around inflexible and incompetent bureaucracies to give some children a better education than they would otherwise have access to” (Payne & Knowles, 2009, p. 232).

In the fall of 2014, there were 37 Local Education Agencies (LEAs) operating in the state of Missouri, 20 of those charter schools were in Kansas City and 17 in St. Louis. Charters in Kansas City have a sponsorship with one of three different universities while charters in St. Louis maintain a sponsorship with one of six different institutions of higher education and one sponsorship with Saint Louis City Public Schools (Department of Elementary and Secondary Education, 2014g). The Missouri Department of Elementary and Secondary Education (DESE) Charter School Program Office oversees both charter sponsors and charter schools. With school enrollment at 19,943 charter school students in the state’s two urban districts (Department of Elementary and Secondary Education, 2014f) and the continual renewal process of sponsors and charters, it is a continual urban reform effort with varying academic successes.

Even before its initial opening as the public charter Urban-Edison Charter School in 1999, Urban Community Charter School can be traced back to 1854 when it opened as the Westport Main School, “the first public school in Westport and Kansas City” (Conner, ca. 1970s, p. 1). Beginning in the basement of the Westport Methodist church, the original building was raised in 1856 as the first tax-supported school in Kansas City (Conner, ca.1970s). The school was annexed by the Kansas City School District (KCSD) in 1899 and renamed the A.M. Allen School (Conner, ca. 1970s). Due to decreasing enrollment in the mid-1970s, the Allen School was closed in 1976. The school was not set up within the magnet school system during the years of court-ordered desegregation in KCMSD. After sitting dormant, the building was repurposed as “The Allen Community Center” and housed community service organizations along with the Kansas City Ballet Company. Then in 1999, 100 years after it had been annexed by KCSD and one year after the first charter laws were passed in Missouri, the building was purchased by Edison Schools, Incorporated and reopened as the public K-8 charter school Urban-Edison Charter School and was sponsored by a local university.

During the first two years after it reopened, Urban Community Charter School’s (then Urban-Edison Charter School) demographic makeup and academic achievements mirrored, if not fell below, that of the failing Kansas City Public Schools. A student population comprised of 97% African-American, 2% Hispanic, and 1% other, free and reduced lunch rates between 85%-96%, substandard state test scores and frequent turnover of students and staff in the initial two years did not distinguish the school from any other urban public or charter school in the state (Department of Elementary and Secondary Education, 2014a, 2014b, 2014d, 2014e). As a core group of staff continued

to build behind the leadership of the superintendent and principal, the school began to document academic growth and achievement. In the years since the inception of No Child Left Behind (2001) mandates and intensive achievement measures, Urban Community Charter School has met Adequate Yearly Progress (AYP) targets 12 of the past 14 years (in 2008 and 2011, targets were missed by less than 1%). Since 2008, Urban Community Charter School performance measures have exceeded state averages and average performance by students attending the KCSD (Department of Elementary and Secondary Education, 2014b, 2014c, 2014d, 2014e).

Demographic shifts over the years find the school with free/reduced lunch percentages at or exceeding that of the surrounding district and a large increase in Hispanic and English Language Learner populations. During the 2013-2014 school year, 93% of the 620 students qualified for the National School Lunch Program; 46% of the population was African-American, 52% Hispanic and 2% Other; and 25% of the students qualified as English Language Learners (Department of Elementary and Secondary Education, 2014a). During the 2013-2014 school year, the Missouri's Department of Elementary and Secondary Education classified Urban Community Charter School as a "School of Distinction in Performance" (Department of Elementary and Secondary Education, 2014b, 2014e). So, as the surrounding KCSD district fought to regain its state accreditation, this charter school has reestablished the original reputation of the A.M. Allen School as noted by historian Preston (ca. 1970s) in 1872 "the School was gaining regional reputation for educational excellence" (p. 10).

Urban Community Charter School's reputation for academic rigor is one of the draws for families applying to attend the school. While the school runs a wait-list for

entrance and often must utilize a lottery system for accepting students, Urban Community Charter School does not advertise for students or hold any student recruitment events.

The school relies on the word-of-mouth of current and former Urban Community Charter School students and their families to fill any vacant seats. Parents become acquainted with the school, as each family is required to volunteer a minimum of 10 hours per year and to attend Student-Led Conferences (SLCs) four times per year.

Other differences between the educational programs at Urban Community Charter School as compared to other public schools are the focus on character education and student self-discipline. From its inception as an Edison School, a group of charter schools governed by Edison Schools, Inc. of New York City, through establishing as its own Local Education Agency (LEA) in 2004, Urban Community Charter School has had as its foundation character core values, “Community Values: Teaching young people to discipline themselves with head, heart and hand” (Urban Community Charter School, 2013b, p. 6). The 12 Community Values are prominently displayed in the main hallway of the K-8 building and on the walls in each classroom. The Community Values are an integral part of each classroom’s Morning Meetings and emphasized by both teachers and students on a daily basis. During SLCs each quarter, in addition to sharing academic performance, students discuss with their families the importance of the Community Values and give self-ratings on how consistently they display or represent each value. Families work with their student(s) to write action-orientated goals around both academic performance and Community Values the student would most like to display. Seider, Gilbert, Novick, and Gomez (In Press) noted in their research on the role of character strengths in predicting achievement,

Over the past decade [2004-2014], a number of leading charter school networks have taken up character development as a key lever in promoting student success. This interest in character development has focused primarily upon cultivating students' performance character. Performance character consists of the qualities that allow individuals to regulate their thoughts and actions in ways that support achievement in a particular endeavor. (p. 1)

While character development is an important part of the school culture, Urban Community Charter School also adheres to a very strict Code of Conduct (Urban Community Charter School, 2013b, p. 8) and discipline policy. Urban Community Charter School can be characterized as a "No Excuses" school, "a term used to describe high-poverty, public schools featuring a strict disciplinary environment, extended time in school, college preparatory mission and an intensive focus on traditional reading and mathematics skills" (Seider et al., In Press, p. 2). Cultivating students' performance character strengths represents an important tool for achieving academic success at Urban Community Charter School.

Often families choose a charter school because they are dissatisfied with the status-quo of the low-performing traditional public school in their community (Holmes, n.d.). As noted by Seligman (2011), parents and guardians will assert that their child is intelligent, yet they are under-performing or failing at their current schools. Those families choosing to enroll their students at Urban Community Charter School are first introduced to the "No Excuse" policies, academically rigorous curriculum, and the school's focus on Community Values (Urban Community Charter School, 2013b, p. 6).

At the mandatory “New Parent Meeting,” the message given is in line with the definition of character Tough (2012) noted in his book, *How Children Succeed*:

For many of us, *character* refers to something innate and unchanging, a core set of attributes that define one’s very essence. Seligman and Peterson defined *character* in a different way: a set of abilities or strengths that are very much changeable- entirely malleable, in fact. They are skills you can learn; they are skills you can practice; and they are skills you can teach. (p. 59)

As a “School of Distinction in Performance” in the state of Missouri, Urban Community Charter School has consistently met the high-stakes performance standards in areas such as academic performance, academic growth, student attendance, and fiscal responsibilities (Department of Elementary and Secondary Education, 2014b, 2014e). So, while character education is rarely assessed or considered one of the basic elements of a contemporary high-stakes American education (Tough, 2012), at the core of Urban Community Charter School’s programming are the Community Values (Urban Community Charter School, 2013b, p. 6). “Underachievement among American youth is often blamed on inadequate teachers, boring textbooks, and large class sizes. We suggest another reason for students falling short of their intellectual potential: their failure to exercise self-discipline” (Duckworth & Seligman, 2005, p. 944). The policies and procedures (Urban Community Charter School, 2013b, p. 8), coupled with Community Values (Urban Community Charter School, 2013b, p. 6), enable the students of Urban Community Charter School to reach their intellectual potential.

Through her research, Duckworth (2006) went on to introduce a new construct, entitled “grit,” to account for achievement outcomes that were over and beyond that which could be explained by IQ.

Collectively, these findings suggest that the achievement of extremely difficult goals entails not only talent, but also the sustained and focused application of talent over time. Defined as perseverance and passion for long-term goals, grit differs from existing constructs in its emphasis on sustained effort and focused interest over time. (Duckworth, 2006, p. 71)

A report by the US Department of Education (Shechtman, DeBarger, Dornsife, Rosier, & Yarnall, 2013), states “it is the responsibility of the educational community to design learning environments that promote these factors so that students are prepared to meet 21st-century challenges” (p. v). Through policies, procedures and value-focused learning environment, Urban Community Charter School has worked to shift educational priorities for urban students to prepare them to be resilient, to exhibit grit and perseverance, as they face risk factors that could jeopardize their academic achievements.

Statement of the Problem

Duckworth (2006, 2015), Duckworth et al. (2007), Duckworth and Quinn (2009), Duckworth and Gross (2014), and Eskreis-Winkler et al. (2014) have illustrated through research results that grit may be as essential as IQ to high achievement. She and her colleagues have developed a self-report questionnaire called the Short Grit Scale (Grit-S) to measure individual trait-level perseverance and passion for long-term goals. Although Urban Community Charter School utilizes standardized measures to track student academic performance and achievement, no measures are administered to assess

students' character development or the Community Values (Urban Community Charter School, 2013b, p. 6) program. Concrete measures of non-cognitive skills, such as grit through the Grit-S, could provide additional data to support the continued academic success of students and the growth of the school.

This problem explored includes the possibility that grit, as a possibly malleable and teachable non-cognitive skill, is a factor that may increase success for Urban Community Charter School students. The possibility that a “relationship exists between what economists refer to as noncognitive skills, psychologists call personality traits, and what the rest think of as character” (Tough, 2012, p. xv), and middle school students' academic growth and success is the problem addressed in this study. Grit, a non-cognitive skill, is possibly the intangible that is present in this urban setting that enables students to succeed beyond statistical expectations. Urban students of color with limited English proficiency who reside in households that fall below the poverty line are indeed failing in the surrounding school district and other area charter schools. However, students in attendance at Urban Community Charter School continue to make academic growth and achieve success (Department of Elementary and Secondary Education, 2014b; 2014e; 2014h). As much as “learning is an interplay between cognitive and noncognitive factors” (Farrington et al., 2012, p. 2), insight into the relationships between academic success and non-cognitive skills could inform the character programming at Urban Community Charter School.

Urban Community Charter School's mission focuses on not only the here and now of student achievement to “create an academically rigorous, college-focused school, [but also life-long learning and] “skills needed to succeed academically and personally”

(Urban Community Charter School, 2013b, p. 8). Standardized measures used in high-stakes testing and state and federal reporting support the present academic curriculum at Urban Community Charter School. However, such standardized measures do not provide data that could be analyzed to look for relationships that may exist between character development and education programming with academic performance. Students' self-rating of non-cognitive skills, such as grit using the Grit-S, might provide relational data excluded from current standardized measures. Student data related to non-cognitive skills, such as grit, may provide support for the school-wide emphasis on character education. Particularly for a student population high in at-risk factors for school failure, non-cognitive traits which can be cultivated and are shown to possibly be malleable (Casillas et al., 2012; Dahbour, 2013; Duckworth & Gross, 2014; Goss, 2013; Krakovsky, 2007; Tough, 2011), such as grit, could be measured and given more prominence in the Community Values and character education programming as the relationship to high academic achievement is established.

Purpose Statement

The purpose of this study was to determine whether there is a relationship between 6-8th grade students' grit scores and their academic achievement, as measured by the change in the TerraNova score from fall to spring. The second purpose of the study was to determine whether the relationship between students' grit scores and their academic achievement, as measured by the change in the TerraNova score from fall to spring, is affected by student gender, race, and student first language. The third purpose of this study was to determine whether there is a relationship between students' grit scores and student achievement, as measured by student grade point average (GPA). The

final purpose of this study was to determine whether the relationship between students' grit scores and student achievement, as measured by GPA, is affected by student gender, race, and student first language.

Significance of the Study

The authors of a report from the U.S. Department of Education, Office of Educational Technology (2013), took a close look at a core set of non-cognitive factors essential to an individual's capacity to strive for and succeed at goals despite challenges and obstacles encountered throughout schooling and life. The authors asserted, "It is the responsibility of the educational community to design learning environments that promote these factors so that students are prepared to meet 21st-century challenges" (p. v). While specific conclusions and recommendations for research detailed in the report are later explored in chapter two, the current study contributes to the field and aligns with conclusion 5:

While there is a great deal of work in this area broadly, the importance of grit, tenacity, and perseverance in education is not necessarily widely known, and stakeholders at many levels may not understand the importance of investing resources in these priorities. In many settings, awareness-raising is necessary so that teachers, administrators, parents, and all other stakeholders in the educational community see these issues as important and become invested in supporting change. (p. xiv)

This researcher seeks to add to the body of scholarship detailing the relationship between achievement and character strengths. Seider, Gilbert, Novick, and Gomez (In Press) documented in their research, the prevalence of studies linking different forms of

academic perseverance (persistence, grit, self-discipline) to grade point averages from samples of university students (p. 8). According to those the researchers, Duckworth et al. (2007) “provide useful evidence of a relationship between achievement and perseverance among educated young adults who were primarily White and middle class, but cannot be easily generalized to younger and more diverse student populations” (p. 8). Much of the current and historical research (Duckworth, Peterson, Mathews & Kelly, 2007; Duckworth & Quinn, 2009; Ericsson, 2006; Ericsson, Krampe, & Tesch-Romer, 1993; Ericsson & Lehmann, 1996; Hogan & Weiss, 1974; Terman & Oden, 1947; Willingham, 1985; Wolfe & Johnson 1995; Winner 1997) has offered evidence of a relationship between academic perseverance and achievement among high-achieving youths and adults. Though Duckworth and Seligman (2005, 2006) did publish research with a more diverse population and reported self-discipline to be a significantly stronger predictor than IQ of students’ academic grades, the findings are still limited in generalizability because the students were attending a selective magnet school to which they were admitted on the basis of their achievement on standardized tests (Seider, In Press).

In contrast, the present research seeks to contribute to findings from a recent study, West et al. (2015), where self-report surveys on a broad set of non-cognitive skills from 8th grade students attending Boston public schools were positively correlated with test-score gains. The paradox presented in this recent study “is that schools in which students on average report higher levels of conscientiousness, self-control, and grit do not have higher average test-score gains than do other schools” (West et. al., 2015, p. 4). They found that charter middle schools in their study had “large and statistically

significant negative impacts on these non-cognitive skills” (p. 4). The charter schools in the West et al. (2015) study all subscribed to a “no excuses” approach to urban education and character development as a means to foster academic success. The current study contributes to the very recent body of research focused on “learning environments designed to promote grit, tenacity, and perseverance” (Shechtman et al., 2013, p. vii) and grit, in particular, as a concept worthy of wider recognition (Christensen & Knezek, 2014).

Delimitations

Lunenburg and Irby (2008) wrote that delimitations are “self-imposed boundaries set by the researcher on the purpose and scope of the study” (p. 134). The study was limited to one urban charter school, Urban Community Charter School, and the 6th through 8th grade students in attendance during the entire 2013-2014 school year. Student academic growth was configured using the difference between scale scores from individual students’ total score report from fall of 2013 to spring of 2014. The total score is a combination of performance on each reading, language and mathematics subtest of the TerraNova 3 Common Core, a norm-referenced nationally standardized achievement test for students in Kindergarten-12th grades. Grit was the only non-cognitive skill measured using a single survey, the 8-Item Grit Scale Child Adaptive Version 4, developed by Duckworth (2007). These delimitations may affect the ability to generalize the findings to student populations beyond Urban Community Charter School.

Assumptions

Lunenburg and Irby (2008) defined assumptions as the parameters around which the study was conducted, including the “nature, analysis, and interpretation of the data” (p. 135). This study was based on the following assumptions:

1. The Infinite Campus database for the school contained correct student information.
2. Student demographic data was downloaded from Infinite Campus and collected accurately.
3. Students performed as well as they could throughout all TerraNova testing sessions.
4. Students understood the questions on the Grit Scales and answered honestly to all survey questions.
5. Grit Scores were calculated correctly and reported accurately.

Research Questions

According to Creswell (2009), quantitative research questions derive from the broad, general purpose statement to more focused, specific questions. Research questions can inquire about the relationships among variables. The following research questions guided this study:

RQ1. To what extent is there a relationship between students’ grit scores and students’ growth on the TerraNova assessment?

RQ2. To what extent is the relationship between students’ grit scores and students’ growth on the TerraNova assessment affected by student gender?

RQ3. To what extent is the relationship between students' grit scores and students' growth on the TerraNova assessment affected by student race?

RQ4. To what extent is the relationship between students' grit scores and students' growth on the TerraNova assessment affected by student first language?

RQ5. To what extent is there a relationship between students' grit scores and students' GPA?

RQ6. To what extent is the relationship between students' grit scores and students' GPA affected by student gender?

RQ7. To what extent is the relationship between students' grit scores and students' GPA affected by student race?

RQ8. To what extent is the relationship between students' grit scores and students' GPA affected by student first language?

Definition of Terms

This section includes a list of terms where there is likelihood others outside the field of study will not know their meaning (Creswell, 2009). The following terms referenced in this study include:

African-American. African-American refers to the sub-group of Americans of African and especially of black African descent (Merriam-Webster, n.d.) In this study, the terms "African-American" and "Black" were used interchangeably to identify the population group having dark pigmentation of the skin (Merriam-Webster, n.d.) that are not of Hispanic origin (Department of Elementary and Secondary Education, 2016).

At-risk. At-risk refers to students whose household income qualifies for free or reduced lunch assistance under the National School Lunch Program (U. S. Department of Agriculture, Food and Nutrition Service, 2013) (see Appendix A).

Character education. The Community Values addressed in this study correlate with the U.S. Department of Education's (n.d.a) definition of character education:

Character education is a learning process that enables students and adults in a school community to understand, care about and act on core ethical values such as respect, justice, civic virtue and citizenship, and responsibility for self and others. Upon such core values, we form the attitudes and actions that are the hallmark of safe, healthy and informed communities that serve as the foundation of our society. (para. 5)

Charter schools. As defined by the National Education Association (n.d.), Charter schools are publicly funded elementary or secondary schools that have been freed from some of the rules, regulations, and statutes that apply to other public schools, in exchange for some type of accountability for producing certain results, which are set forth in each charter school's charter. (para. 1)

Grade point average (GPA). As defined by Merriam-Webster (n.d.), grade point average or GPA is “the average obtained by dividing the total number of grade points earned by the total number of credits attempted” (para. 1). Grade point averages at Urban Community Charter School are figured on a 4.0 scale.

Grit. “Grit clearly belongs to the Big Five Conscientiousness family, particularly overlapping with achievement motivation” (Duckworth & Eskreis-Winkler, 2013, para. 7). Grit is “perseverance and passion for long-term goals. Grit entails working

strenuously toward challenges, maintaining effort and interest over years despite failure, adversity, and plateaus in progress” (Duckworth, Peterson, Matthews & Kelly, 2007, p. 1087-1088).

First language. A “student first language” refers to those students whose families indicated on a district Home Language Survey (Urban Community Charter School, 2013a, p. 7) that their child’s first language is one other than English.

Hispanic/Latino. Hispanic/Latino refers to the sub-group of Americans of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin descent (Department of Elementary and Secondary Education, 2016). In this study, the terms may be used in conjunction or separately as a descriptor of the same group of persons.

Non-cognitive skills. “Non-cognitive skills are those attitudes, behaviours, and strategies which facilitate success in school and workplace, such as motivation, perseverance, and self-control. These factors are termed ‘non-cognitive’ as they are considered to be distinct from the cognitive and academic skills usually measured by tests or teacher assessments” (Gutman & Schoon, 2013, p. 4).

Race. “The term race refers to groups of people who have differences and similarities in biological traits deemed by society to be socially significant, meaning that people treat other people differently because of them” (“Race and Ethnicity Defined,” 2013, para. 1).

TerraNova assessment. The TerraNova, published by CTB/McGraw-Hill, is a series of standardized achievement tests. “A well designed standardized test provides an assessment of an individual's mastery of a domain of knowledge or skill” (*Standardized*

Test [Education] Law & Legal Definition, para. 1). In this study, the TerraNova Third Edition (3) Common Core Form 1 assessment, which includes multiple-choice, constructed-response, extended constructed-response, and performance tasks content aligned to the Common Core State Standards in reading, language, and mathematics, was utilized.

Overview of the Methodology

A quantitative research design was utilized to determine the relationship between students' (grades 6-8) grit scores and their growth in reading and mathematics on the TerraNova 3 Common Core assessment. A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between grit scores and TerraNova growth from fall of 2013 to spring of 2014. Relationships to all other independent variables were analyzed utilizing a Fisher's z test for a difference between two correlations. The population of this study included students grades 6-8 in attendance at Urban Community Charter School. The researcher used archival district data, including TerraNova 3 Common Core total scale scores from August 2013 and May 2014, along with GPA and student demographic data.

Organization of the Study

Chapter one included an introduction of the study, background information on Urban Community Charter School and the recently identified non-cognitive construct of grit and the statement of the problem. The purpose statement, significance, delimitations, and assumptions of the study were provided. The research questions and definitions of terms were identified. The final section of chapter one included a brief overview of the methodology of the study. Chapter two comprises a review of the literature that provides

an overview of the history and impact of major educational reform movements, the academic achievement of students, non-cognitive skills, and specifically the non-cognitive construct of grit. Chapter three provides the research design, population and sample, sampling procedures, instrumentation, measurement, validity and reliability, data collection procedures, data analysis and hypothesis testing, and concludes with the limitations of the study. Chapter four includes the descriptive statistics, hypothesis testing, and additional analyses when appropriate. Chapter five includes a study summary and focuses on the findings related to the literature, and conclusions including implications for action and recommendations for future research.

Chapter Two

Review of the Literature

The purpose of this study was to examine the extent to which a relationship exist between middle school (grades 6-8) students' level of grit and academic achievement, as measured by performance on the Terra Nova Assessment and student GPA. Possible effects on the relationship between grit and academic achievement by the variables of gender, race, and student first language were also explored. This chapter is divided into four major sections. Included in the opening of the review is a highlight of the history and impact of three major educational reforms movements. Second, an overview of the literature related to the academic achievement of students, with a focus on the achievement gap and indicators that place students at risk for academic failure including poverty, race, and English language learners, is reviewed. Third, a synthesis of research focused on non-cognitive skills, specifically perseverance, self-control, and resiliency, and their relationship to academic performance is presented. Lastly, the development of the non-cognitive construct of grit and related literature exploring individuals' level of grit and academic performance is investigated.

History and Impact of Three Major Reform Movements

From our country's inception, public education has played a vital role in American democratic society. Aside from preparing youth for productive work and lives, public education has also been expected to accomplish certain collective missions aimed at the promotion of the common good and citizenry (Center on Education Policy, 2007; Present, 2010). Over the past 60 years, Americans have implemented a vast array of approaches to improve our nation's schools and students' ability to succeed in life.

Landmark court cases, federal and state legislation, national reports, new programs, funding formulas, and national standards and assessment systems have all been undertaken by states and local school districts in the name of reform. “Of the many reforms undertaken, three major movements (equity-based reform, school choice, and standards-based reform) have had broad support and considerable impact” (Jennings, 2012, p. 2). Each reform movement is addressed in this section.

Equity-based reform. On May 17, 1954, the U.S. Supreme Court unanimously overturned the precedent set by *Plessy v. Ferguson* (1896) that “separate but equal” was constitutional and ruled that segregation violated the 14th Amendment’s equal protection clause. In the landmark case, *Brown v. Board of Education (Brown)*, the Court held that racially segregated schools were inherently unequal, thus ending federally sanctioned racial segregation in public schools (Engl, Permuth & Wonder, 2004; McBride, 2006; Simmons, 2014). The *Brown* decision initiated educational and social reform throughout the United States and was seen as a catalyst in launching the Civil Rights Movement (Congress of Racial Equality, 2014).

During the mid-1950s, 1960s, and 1970s, “the federal government enacted a variety of programs and policies to improve educational equity for minority children, poor children, children with disabilities, children with limited English proficiency, and women and girls” (Jennings, 2012, p. 2). The federal government and the courts stepped in because “local school districts and state governments were not providing these students with equality of opportunity” (Jennings, 2012, p. 2). Equality-based reforms, beginning with decisions handed down in *Brown* (1954) and *Brown II* (1955), were slow to enact change across the country. Having ordered states to integrate their schools “with all

deliberate speed” (Warren, 1955, para. 2) “the Supreme Court’s decision was ignored or deliberately violated in all of the southern states. In 1964, ten years after *Brown*, only an estimated 1.2% of black children in the eleven states of the old Confederacy attended public schools with white children” (Patterson, 2002, p. 9).

School integration, as an educational reform, reached an all-time high in 1988 when almost 45% of black students in the United States were attending majority-white schools. Between *Freeman v. Pitts* (1992) and *Missouri v. Jenkins* (1995), the Supreme Court sped the end of desegregation cases and set new goals that returned schools to local control, emphasizing that judicial remedies were intended to be limited in time and extent (Teaching Tolerance, 2004). As Patterson (2002) noted, we are in an era of resegregation of schools. “In 1996, the percentage of black kids in schools that are 90% or more black – which really means they’re black schools – was 35%, up from 33% in 1980” (p. 11). In a report from Harvard’s Civil Rights Project, authors Orfield and Yun (1999) concluded America’s schools were resegregating, finding U.S. schools were more segregated in 1999 than in 1970 when busing for desegregation began.

Current school resegregation, often the result of demographic movements and the migration of African-American and Hispanic/Latinos to urban communities, has scholars questioning the relevancy and continued impact of the *Brown* case (Edghill, 2013; Engl, Permuth & Wonder, 2004; Lopez & Burciaga, 2014; Patterson, 2002; Reed, 2002; Simmons, 2014; Wilkins, 2002). Simmons (2014) wrote, “Today, trying to integrate populations in urban districts where whites and middle-income students are rapidly decreasing in numbers doesn’t address the real problems of inadequate resources” (para. 5) because what *Brown* did not do, according to Reed (2002), “was create a better

educational system that conferred individual advantages on all school children. Integration in and of itself does not necessarily produce a better learning environment” (pp. 20-21).

Equity-based reforms also took shape in the late-1950s and 1960s as the Cold War stimulated comprehensive Federal education legislation. In response to the Soviet launch of Sputnik, Congress declared that America had fallen behind in the space race and passed the National Defense Education Act of 1958. Sputnik, the world’s first artificial satellite, instilled fear in many Americans that our cold-war enemy would soon be dropping bombs and spying on us from outer space (Cutuly, 2015; U.S. Department of Education, 2012). It was determined the nation’s children were weak in math and science and “the new soldier needed to carry a slide ruler instead of a gun” (Cutuly, 2015, para. 1). President Eisenhower (1958) stated this was an emergency undertaking meant to “strengthen our American system of education so that it can meet the broad and increasing demands imposed upon it by considerations of basic national security” (para. 1). Provisions of the legislation were in force from roughly 1959 to 1973 and outcomes from the National Defense Education Act (NDEA) suggested, “that comprehensive educational legislation can have a strong, positive effect” (Flattau, et. al., 2006, p. vii-1) on broad socioeconomic changes in the United States.

Specific student groups, particularly those considered at-risk for educational failure, were the focus of extensive educational legislation. “The Elementary and Secondary Education Act of 1965 (ESEA) instituted another tool for equity-based education reform – the use of separate, or categorical, aid programs to provide extra educational services for specific groups of students at risk for educational problems”

(Jennings, 2012, p. 2). As part of President Johnson's "War on Poverty," this legislation was the most important educational component and through a special source of funding, Title I, provided the single largest source of federal support for K-12 education. The law recognized the special educational needs of low-income families and the impact that concentrations of low-income families have on the local schools' ability to provide adequate educational programs (Elementary and Secondary School Act, 1965, section 201). As legislation developed under the principle of redress, all intentions were to set right or remedy barriers faced by low-income families in providing additional educational services for the poor that would help move them out of poverty (Halperin, 1979; Kessinger, 2011; Schugurensky, 2001). In addition to categorical aid, Spring (1993) wrote that the Elementary and Secondary Education Act had at least two other major consequences for legislative action in the politics of education. ESEA not only tied federal aid to national policy concerns, but it also linked aid to educational programs directly benefiting poor children. Also, there was a reliance on state departments of education to administer federal funds, which resulted in an expansion of state education departments and their involvement in educational decision-making.

Title I of ESEA was and remains the cornerstone of the Act, providing financial assistance to local educational agencies and schools with high numbers or percentages of children from low-income families. Federal funds are allocated through statutory formulas based primarily on census poverty estimates and the cost of education in each state (U. S. Department of Education, 2014). Over the years, Congress has amended, expanded and reauthorized ESEA nine times, adding programs and funding to help migrant children, neglected and delinquent youth, and second language learners among

others. The Act stimulated school improvements benefiting all students including enhanced math and science instruction, teacher professional development and safe and drug-free school programs (U. S. Department of Education, 2004a).

At \$8 billion, ESEA was the largest money authorization ever proposed for the nation's schools with \$1 billion for Title I alone (Halperin, 1979). Fast forward 41 years and the president's FY 2006 budget provided \$13.3 billion (U.S. Department of Education, 2005). The President's fiscal year 2015 budget proposals requested 21% of \$69 billion, or \$14.5 billion, in discretionary appropriations as marked for Title I funding. "The President's budget request reflects his strong belief that education is a vital investment in the nation's economic competitiveness, in its people, and in its communities" (U.S. Department of Education, n.d.b, para. 3).

The Equal Educational Opportunity Act of 1974 also heavily influenced equity-based reforms. In *Lau v. Nichols (Lau)*, the U.S. Supreme Court guaranteed children an opportunity to a meaningful education regardless of their language background (Bon, 2012; Jennings, 2012). "In this civil rights class action suit, the Court ruled that school districts receiving federal funds must act to correct students' linguistic deficits to ensure they receive an equal education" (Bon, 2012, para. 1). The decision was based on the Civil Rights Act of 1964, and *Lau* "remedies lay out how school districts can offer aid to students who do not speak English" (Jennings, 2012, p. 3). Title III, a federal program under ESEA, also provides aid for the education of English language learners.

Another major law, enacted in 1975, blended civil rights protections and categorical federal aid for the education of students with disabilities. Unlike ESEA and Title I, the Individuals with Disabilities Education Act (IDEA) incorporated "procedural

rights and the authority for parents to sue in court if their children did not receive services guaranteed under the law” (Jennings, 2012, p. 3). Another major difference found in IDEA for local schools districts is the obligation to pay for the range of services agreed to in a student’s individualized educational plan, regardless of the level of federal and state funds provided for the education of students with disabilities. IDEA guarantees access to a free, appropriate, public education in the least restrictive environment to every child with a disability. Reauthorization of IDEA in 1997 included an emphasis on access to the general education curriculum by students with disabilities, mandating equal access in a more inclusionary setting to the maximum extent possible (Wright & Wright, 2015).

As illustrated, the equity-based reforms begun in the mid-1950s, 1960s and 1970s began the use of categorical aid programs, programs backed up by legal protections, and educational guarantees regardless of whether districts receive additional funding (Jennings, 2012). As a result, discrimination against African-American and other students from minority backgrounds, as well as students with disabilities was outlawed. Students of varying abilities are educated in inclusionary settings, and while a trend exists toward resegregation of schools because of demographic shifts in urban areas, the equity programs highlighted have increased access to public education for children across the country.

School choice reform. The Center for Education Reform (2015) belief statement reads, “We believe that school choice means giving parents the power and opportunity to choose the school their child will attend. It means that the quality of a student’s education should not be dictated by their zip code” (para. 7). The premise of the school choice movement centers on a parent’s right to choose the school their child attends at

public expense (Jennings, 2012). Traditionally, children are assigned to a public school based on school district boundaries or according to where they live. Families with greater economic means already have school choice because they can move to an area with high-quality public schools or send their children to private schools. Proponents of the school choice reform movement believe that choice creates better educational opportunities for all, as low-income families are given the power of choice (The Center for Education Reform, 2015).

School choice can take a variety of forms, including voucher plans, private scholarship programs, charter schools, magnet schools, public school choice programs, and tuition tax credits and deductions. Regardless of the type of choice, supporters contend that parental choice brought market forces to bear on education and used the dynamics of consumer opportunity and competition to improve service quality (Editorial Projects in Education Research Center, 2004; Jennings, 2012; The Center for Education Reform, 2012). “It reasserts the rights of parents and the best interests of children over the convenience of the system, infuses accountability and quality into the system, and provides educational opportunity where none existed before” (The Center for Education Reform, 2012, para. 3).

Nationally, magnet schools make up the largest system of choice in the United States (Frankenberg, Siegel-Hawley & Wang, 2011) and have a record of promoting diversity and academic achievement (Bifulco, Cobb & Bell, 2008; Gamoran, 1996, Siegel-Hawley & Frankenberg, 2012). Today’s magnet schools, as part of the local public school system, have several key attributes, namely: may receive additional funding, maintain a distinctive curriculum or instructional approach, enroll a diverse

student body that crosses district attendance zones, and represent diversity as an explicit purpose (Chen, 2015; Siegal-Hawley & Frankenberg, 2012). Funding through The Magnet Schools Assistance Program (MSAP) of 1976 was a part of an amendment to the Emergency School Aid Act (ESAA) that played a role in the early expansion of magnet schools. Federal MSAP grants are awarded every three years, and 27 school districts were recipients of \$89.8 million in federal funding for the 2013-2016 cycle (U.S. Department of Education, 2013a). The National Center for Education Statistics shows an estimated 2.1 million students attended one of 2,722 public magnet schools during the 2010-2011 school year (Keaton, 2012).

Evaluation of student achievement in magnet schools presents mixed results (Institute on Metropolitan Opportunity, 2013). Studies often compare the achievement of magnet and non-magnet students without controls for initial differences in achievement (Poppell & Hague, 2001), and comparisons fail to inform about differences in educational value-added between the types of schools (Ballou, Goldring, & Liu, 2006). Other issues studies may fail to address or control are the confounded effects of parental and family residential decisions and characteristics that influence both where students go to school and how well they achieve. As stated by Ballou et al. (2006):

For example, if the students who seek admission to magnet schools have parents with above-average education and commitment to their children's education, then it is unclear how much of these students' subsequent success should be attributed to the quality of the magnet schools and how much to parental influences that would have contributed to higher achievement, regardless of the school attended.

(p. 2)

Such an example can be biased upward while in theory it could go either direction. “If parents seek magnet schools for children whose performance in regular public schools is slipping, the magnet school may appear to be ineffective if judged against regular schools serving students whose performance is exhibiting no decline” (Ballou et al. 2006, p. 3). Trends for magnet school demand lead to variations in evidence of academic achievement.

Gamoran (1996) conducted an early study that utilized national survey data compiled by the National Educational Longitudinal Study. Gamoran (1996) found that in public magnet schools that proliferated in urban areas during the late 1980s through mid-1990s achievement was higher in math, science, reading, and social studies than in comprehensive public schools. “In science, reading, and social studies, these gaps were statistically significant” (Gamoran, 1996, p. 44), and he concluded that the achievement benefits of magnet schools were substantial. Gamoran’s results were included in a review of empirical literature on student achievement in magnets published by the Institute on Metropolitan Opportunity (2013):

A significant number of empirical studies have concluded that students in magnet schools outperform their peers in traditional public schools in test scores. Studies have shown magnet schools to increase student achievement, student motivation and satisfaction with school, teacher motivations and morale, and parent satisfaction with the school. (p. 3)

Studies cited in the report from magnet schools in the San Diego Unified School District, the state of Connecticut, and in Fort Worth (Texas) Independent School District found students attending magnet schools, particularly at the high school level, achieving above

district norms (Abadzi & Dunkins, 1984; Betts, Rice, Zau, Tang, & Koedel, 2006; Cobb, Bifulco, & Bell, 2009; Institute on Metropolitan Opportunity, 2013).

On the contrary, studies that included controls for student demographics and prior achievement found no significant difference between magnet and non-magnet students' test scores (Ballou et al., 2006). Adcock and Phillips (2000) conducted an analysis of magnet schools in Prince George County, Maryland, and when controls for students' prior scores on a test of academic ability were in place, the average composite score of students in magnet schools on the Maryland School Performance Assessment Program was significantly lower than the average scores of students in non-magnet schools. The results from the magnet school program in the Kansas City Missouri School District in the 1980s and 1990s were dismal. Test scores did not rise, the black-white achievement gap did not diminish, and there was less student integration (Ciotti, 1998); the battle to turn around failing schools continues to be fought by the Kansas City School District in both its magnet and traditional neighborhood schools.

Charter schools are the other primary school choice option exercised in the state of Missouri, as well as across the United States. Charter schools are public schools with a performance contract or "charter" that details the school's mission, program, goals, students served, methods of assessment, and ways to measure success. The charter frees the school from many of the regulations created for traditional public schools while holding them accountable for academic and financial results (Barr, Sadovnik, & Visconti, 2006; Miami-Dade County Public Schools Research Services, 2010). "Charter schools are, in theory, autonomous" (Barr et al., 2006, p. 292). Schools determine their budgets, class and school sizes, staffing levels, internal organization, curriculum choices, and

school calendar. “In exchange for this added flexibility, charter schools are accountable for producing certain results and their charters are regularly reviewed, then renewed or revoked, by their authorizing agency” (Miami-Dade County Public Schools Research Services, 2010, pp. 1-2). Examples of organizations that can grant charters in Missouri include local school districts, state educational agencies, and institutions of higher education. As a public school, a charter is publically funded by tax dollars and must be open to all students in the school district. Students must participate in statewide testing programs and authorizing agencies, along with the state, are expected to hold schools accountable to the provisions of its charter.

Charter schools were launched in the 1990s with the first school opening in Minnesota in 1992 (Jennings, 2012). Currently, there are more than 6,700 public charter schools in 40 states and Washington, DC, enrolling about 2.9 million students (National Alliance for Public Charter Schools, 2015). Confined largely to urban areas with 47 percent of all charters located in cities, charter school growth has also been concentrated in a select number of states. Since 2005, more than half of new charter schools opened in six states: California, Florida, North Carolina, Arizona, Texas, and Wisconsin (National Alliance for Public Charter Schools, 2015).

While the public charter school movement continues to see schools open, the National Alliance for Public Charter Schools (2015) also reports there were more than 200 charter schools that ceased operation in the 2014-2015 school year, one of those occurring in the state of Missouri. As documented in a February 2015 report from the National Alliance for Public Charter Schools, schools closures are evidence that the charter school model is being upheld. Charter schools that are not meeting the needs of

their students and have low enrollment or financial concerns should be closed as an overall commitment to accountability. Research (Barr et al., 2006; Betts & Tang, 2008; CREDO, 2009; Lake & Gross, 2012; U.S. Department of Education, 2004b) quantifying the failures and need for closures, or success and expansion of charter schools in comparison to traditional public schools, remains under considerable debate.

Research Services of Miami-Dade County Public Schools, pinpoints the reasons it can be difficult to determine if charter school students perform better than students in traditional public schools: charter schools differ from state to state and from district to district; the student populations charter schools enroll differ from those of traditional public schools; data can be difficult to interpret because it is reported by advocates or opponents of charter schools and not independent evaluators. Another factor leading to difficulty when assessing the impact on student achievement in schools of choice is selection bias. “Selection bias arises because parents voluntarily choose to enroll their children in charter schools...the motivation for selecting charter schools makes these students different than students who remain in traditional public schools in ways that may impact student achievement” (Miami-Dade County Public Schools Research Services, 2010, p. 4). In fact, fluctuation in academic performance among charter schools can appear to be the norm, “not the exception, with some charter school students performing at much higher levels than traditional public school students and others performing at significantly lower levels” (Miami-Dade County Public Schools Research Services, 2010, p. 5).

The main goal of a study conducted by Gleason, Clark, Tuttle, Dwoyer, and Silverberg (2010) was to estimate charter school impacts on student achievement. This

large-scale randomized trial of the effectiveness of charter schools was funded by the Institute of Education Sciences. The authors attempted to control for selection bias as it compared outcomes of students who applied and were admitted to 36 different charter schools across 15 states with those students who applied to these schools but were not admitted. In addition, the authors conducted an analysis of charter schools' impacts on student effort in school, behavior and attitudes, and parental involvement and satisfaction. Two of the findings by Gleason et al. (2010) included:

- On average, study charter schools did not have a statistically significant impact on student achievement. However, the study charter schools' impacts on student achievement were inversely related to students' income levels, having a positive impact on scores among lower income students.
- Study charter schools positively affected parent and student satisfaction with and perceptions of school. According to the 11 measures of satisfaction and perceptions examined in the study, students and families enrolled in the study charter schools were more likely to rate their school as excellent. (p. 6)

Importantly, the researchers noted that although study charter schools “neither positively nor negatively affected most student outcomes on average, these averages mask variation across the schools in their impacts on students. The schools' impacts...varied widely” (Gleason et al., 2010, p. xxvi). They further documented that the study charter schools “serving the largest proportions of disadvantaged and lower achieving students had more positive and statistically significant impacts” (Gleason et al., 2010, p. xxvii). Such results support the view of charter schools as vehicles for urban education reform.

Three other studies evidenced charter schools' positive effect on students' academic performance utilizing controls for selection bias as they compared the performance of students selected through a lottery system to attend charters and the performance of those who were not selected to attend. Abdulkadiroglu et al. (2009) compared Boston middle and senior high charter and traditional public school students' performance on the Massachusetts Comprehensive Assessment System (MCAS). This study used student-level data and controlled for baseline demographic data, including gender, ethnicity, eligibility for free or reduced lunch, special education, and prior testing performance. The researchers found a large positive impact (.09 to .17 standard deviations in ELA and .18 to .54 standard deviations in math) on student achievement in all MCAS subjects in both middle school and high school (Abdulkadiroglu et al., 2009).

In a second study, Doobie and Fryer (2009) compared data from the Harlem Children's Zone Promise Academy Charter School for student outcomes at the sixth, seventh and eighth grades utilizing state English language arts and math tests. Students who attended the Promise Academy Charter School earned higher math test scores at all three grade levels than students who were not selected for enrollment. In ELA, no significant differences were found at the sixth or seventh grade level, but a positive effect (between one-quarter and one-third of a standard deviation) was found at the eighth grade level (Dobbie & Fryer, 2009).

In a third study, RAND Education researchers sought to determine the effects of charter high school attendance on educational performance in the state of Florida and the city of Chicago (Booker, Sass, Gill, & Zimmer, 2008). As in the two previous studies highlighted, researchers controlled for students' ethnicity, gender, family income,

disability status, and baseline test scores. “We find that charter high schools in both Florida and Chicago had substantial positive effects on high school completion and college attendance rates” (Booker et al., 2008, p. 5). Students who attended a charter middle school and went on to attend a charter high school were 7-15 percentage points more likely to earn a diploma than those in a traditional public high school. Additionally, Booker et al. (2008), found that 8-10% more of the students who attended a charter high school were more likely to attend college. Additionally, the researchers suggested that expanding school choice at the high school level could be a part of an effective policy to reduce dropout rates and promote college attendance.

However, continued overviews of literature related to academic impacts and achievement in charter schools remain mixed, and the results of studies indicate that charter school students do not consistently outperform students attending traditional public schools. Results presented in the study (Center for Research on Education Outcomes (CREDO), 2009) included data from students in grades 1-12 in attendance across 2,403 charter schools. CREDO at Stanford University led the study and examined changes in standardized reading and math test scores from one school year to the next. Effects on student performance were determined by comparing the test score changes of charter school students to those of matched students attending traditional schools. The authors found that charter schools were not advancing the learning gains of their students as much as traditional public schools (CREDO, 2009). As noted in the previous research included, the authors found substantial variability in charter school performance (What Works Clearinghouse, 2010). Additionally, RAND Education researchers concluded that students’ average gains while in attendance at charter schools in Florida, Ohio, Texas

(Zimmer et al., 2009), Philadelphia (Zimmer, Blanc, Gill, & Christman, 2008), and Los Angeles and San Diego Unified School Districts (Zimmer & Buddin, 2005), were statistically indistinguishable from the gains of traditional public school students.

The choice movement shows no signs of slowing down as charter schools continue to be the widest reaching school reform initiative in the United States (Raymond, 2014; Rebarber & Zgainer, 2014;), despite “evidence that its promise of producing better education has not been realized” (Jennings, 2012, p. 4).

Most researchers have concluded that there is a wide variation in charter school performance, with some charter schools performing at much higher levels than traditional public schools and others performing at significantly lower levels. To date, studies have not been able to determine why some charter schools are more effective than others. (Miami-Dade County Public Schools Research Services, 2010, p. 10)

As parents may be more satisfied with their choice of school, as a broad educational reform there needs to be more support and reporting guidelines for the kind of research that will allow more definitive answers versus the current variance in results (Jennings, 2012; Payne & Knowles, 2009).

Standards-based reform. “The original purpose of the standards-based movement was to identify what students should know and be able to do at specific grade levels and to measure whether they were mastering that content” (Jennings, 2012, p. 5). With the goal to establish objective metrics against which to measure student performance and teacher effectiveness through using standardized instructional materials and assessments, the standards-based reform movement and accountability has been a

primary driver of education in the United States for several decades (Hamilton, Stecher, & Yuan, 2012). As the movement has continued to 2015-16, it has taken on the additional purpose of applying consequences to schools and districts whose students did not meet set academic standards, becoming a system focused on test-driven accountability (Jennings, 2012).

Federal and state governments played an important role in shaping standards-based reforms. The measuring of educational outcomes had been growing across several states during the 1970s, but many researchers and historians view the publication of the report, *A Nation at Risk*, as a pivotal event (Hamilton et al., 2012). In 1981, the National Commission on Excellence in Education directed its eighteen members to examine the quality of education in the United States and to make a report within 18 months of its first meeting. That report, *A Nation at Risk*, opens with that very statement, “Our Nation is at risk” (National Commission on Excellence in Education, 1983, para. 1). The report continues with observations and indicators of “the risk”, such as: the decline in test scores and decline in enrollments in science and mathematical fields, an increase in remedial mathematical courses offered at 4-year colleges, complaints around high school graduates’ poor skills sets and lack of higher order intellectual skills by business leaders, and the overall poor performance by U.S. students on all measures of academic achievement as compared with European and Japanese counterparts. The National Commission on Excellence in Education (1983) also cited the unacceptable levels of functional illiteracy found among American children and adults.

To correct these deficiencies, the National Commission identified five areas of specific recommendations for movements by political and educational leaders for broad

reform and a push for excellence throughout education (Lunenburg, 1992).

Recommendations from the National Commission (1983) included strengthening high school graduation requirements to include “Five New Basics:” four years of English, three years of mathematics, three years of science, three years of social studies, and a half year of computer science. Also included was the strengthening of all college admission requirements, including two years of foreign language coursework in high school. The call for schools, colleges, and universities to adopt more rigorous and measurable standards and higher expectations for student academic performance was the second major recommendation. Specific recommendations called for the use of standardized tests of achievements and funds for districts to adopt rigorous, updated textbooks from publishers that have furnished evaluation data on the material’s effectiveness.

Lengthening the school day and school year was also recommended by the National Commission members. Final recommendations for reform focused on the preparation of and increased salaries for teachers and a call to citizens to provide the fiscal support and stability required to bring about the reforms proposed (National Commission on Excellence in Education, 1983).

The “rising tide of mediocrity” found by the National Commission served as a catalyst for a new era of education reform. “Confronted by economic recession at home and declining market share abroad, government and business leaders looked to public schools to assign blame and to seek solutions” (Adams, n.d., para. 5). The assumption of education reform in the mid-1980s was that improved quality of K-12 education would be the impetus for the nation’s economic growth. This era saw the publication of critiques of American high schools and more than two dozen influential reports on public

education between 1983 and the end of the twentieth century. Most reports decried the deficiencies of American schools, and a called for reforms of one kind or another (Adams, n.d.). As states adopted education reforms of varying magnitude, the nation's top political leaders also took action following the publication of *A Nation at Risk*. In 1989, President George H. W. Bush convened an education summit where the first ever national goals for public education were crafted (NY State Archives, n.d.a). Subsequent presidents have similarly sponsored national education summits producing a wide array of legislation, new programs, and reform bills undertaken by the federal government, individual states, and local school districts.

In the 1980s and early 1990s, states such as California, Kentucky, Maryland, Massachusetts, North Carolina, and Texas led the way in the development and implementation of standards-based assessments using state funds (Hamilton, Stecher, & Yuan, 2012). In 1994, Congress passed the Goals 2000: Educate America and Improve American's Schools Act (PL 103-227) to fund states' efforts to develop standards and assessments. As the governor of Arkansas, Bill Clinton had been a part of the education summit in 1989, and as President, his first educational legislative proposal and success was Goals 2000. The Act was influenced by recommendations from the National Council on Education Standards and Testing and legislated eight national goals, including six focused on school readiness and completion, student academic achievement, adult literacy, and safe and drug-free schools. One of the goals addressed teacher quality and another addressed parent responsibility (New York State Archives, n.d.b; North Central Regional Educational Laboratory, n.d.).

Congress appropriated \$105 million in the 1994 fiscal year for individual states that submitted applications describing the process by which the state would develop school improvement plans, including the development of set state standards and district-level implementation of standards-based reform. Not viewed as another discrete federal program, Goals 2000 required little regulation as compared to ESEA and supported systemic reform efforts many states had already begun (NY State Archives, n.d.b). It also differed from other federal programs as it “did not target a particular group of students or subject areas; rather, it supported a generic reform strategy that emphasized the development of state standards and the assessments needed to measure progress toward them” (New York State Archives, n.d.b., para. 3). However, Goals 2000 did signal the beginning of a process that would continue to span decades to come, the increased federalization and legislation of American educational policy (Heise, 1994).

In 1999, The National Education Goals Panel, a bipartisan and intergovernmental body of federal and state officials, was created to assess and report state and national progress toward achieving the eight national education goals. The National Education Goals Panel (1999) released a report encapsulating state and national progress toward those goals. Following the release of the report, disappointing results were summarized by Cooper (1999) in the *Washington Post*, “The nation has not met any of the eight educational goals for the year 2000...although measurable progress has been made toward the goals pertaining to preschoolers and student achievement in math and reading” (para. 1). The panel reported that the nation had declined in the case of teacher quality with the percentage of teachers holding a college degree in the main subject they taught (from 66 to 63%) and there was a significant increase in student use of illicit drugs

(24 to 37% in 10th grade) (National Education Goals Panel, 1999). At its inception, Goals 2000 was viewed as “comprehensive” and anticipated “far-reaching results that would significantly alter American educational policymaking” (Heise, 1994, p. 359), yet failed to achieve its primary goal of improved student academic achievement. Moreover, it instituted the shift and reallocation of educational policymaking roles from state governments and local boards as the customary responsibility holders, to the expansion of the federal government’s role (Heise, 1994).

At the close of the 20th century, and under the presidential leadership of George W. Bush, the 2001 proposal of the reauthorization of ESEA entitled No Child Left Behind Act (NCLB) sought to increase the intensity of Clinton’s Goals 2000 by mandating extensive grade-level testing, setting a deadline of 2014 for all students to perform at a proficient level in English language arts and math, and setting forth specific actions schools and districts had to take if they did not reach yearly goals set by each state for proficiency (Jennings, 2012). Enacted in 2002, NCLB was described at the cornerstone of the Bush Administration (U.S. Department of Education, 2012) as it expanded the federal government’s role and moved academic standards from the focal point of the standards-based movement and a means for raising quality instruction in schools, to a test-driven accountability system that imposed sanctions on schools unable to demonstrate year-over-year gains on annual tests in grades 3-8th in reading and mathematics (Jennings, 2012; Michelman, 2012). The premise of NCLB was to ensure that every child received a good education, with the definition of a good education equated with good scores on standardized tests (Zhao, 2009) and schools having met adequate yearly progress (AYP), the “yardstick by which the law requires states to

measure of every public school and school district is performing on the state's mandated tests" (Michelman, 2012, para. 2).

The No Child Left Behind (NCLB) Act affects virtually every program authorized under the Elementary and Secondary Education Act (ESEA)- ranging from Title I and efforts to improve teacher quality to initiatives for limited English proficient (LEP) students and safe and drug-free schools (U.S. Department of Education, 2002, p. 9).

As stated in the reference published by the U.S. Department of Education (2002), despite hundreds of programs and hundreds of billions of dollars invested since ESEA was enacted, American students still lagged behind fellow foreign students and the academic achievement gap in the United States between rich and poor, white and minority students, remains wide. A consensus spurred from national debate begun by *A Nation at Risk* (1983) guided the ideas behind the NCLB Act, namely that schools should be held accountable for results (U. S. Department of Education, 2012). The hallmark feature of this legislation was annual school report cards that provide comparative information on schools and delineate performance on standards by disaggregated groups. Schools that are making or are failing to make adequate yearly progress toward 100% proficiency by 2013-14 were identified in such reports. Also included are sanctions and rewards based on schools' AYP status (Dee & Jacob, 2009). Accountability for results was tied to federal education funds, with NCLB having appropriated \$56.17 billion at its inception 2002, at a height of \$138 billion in 2009 with the addition of a one-year stimulus from the American Recovery and Reinvestment Act, to approximately \$67.3 billion appropriated for fiscal year 2014 (Federal Education Budget Project, 2014; Harrington, 2011; U.S.

Department of Education, 2012). While educational funding under NCLB more than doubled, performance (AYP status) did not see comparable leaps in results (Harrington, 2011).

Volumes of articles, research studies, and yearly federal and state reports dedicated to exploring the impact of NCLB on student achievement have been published since 2002 (Dee & Jacob, 2009; Franklin, 2011; Kober, Chudowsky, & Chudowsky, 2008; Lyons, 2013; Maleyko, 2011; National Center for Education Statistics, 2014a; Pinkerton, Scott, Buell, & Kober, 2004; U.S. Department of Education, Office of Elementary and Secondary Education, 2014). While the philosophical intent of the reform was noble, often mixed and inconsistent results were reported. Often, researchers used achievement data on student test scores from the National Assessment of Educational Progress (NAEP) to determine the influence of NCLB instead of state or city-specific data. NAEP provides a “consistent measure of student achievement that is more nationally representative and that span periods both before and well after the implementation of NCLB” (Dee & Jacob, 2009, p. 3). Dee and Jacob (2009) reported statistically significant increases (effect size = 0.22 by 2007) in the mathematics achievement of 4th graders on the NAEP, with gains concentrated among white and Hispanic students. The authors also found moderate positive effects on 8th grade math achievement. However, in contrast, Dee and Jacob’s (2009) “results suggest that NCLB had no impact on reading achievement for 4th or 8th graders” (p. 37).

The Center on Education Policy (CEP), an independent nonprofit organization, begun in 1995 to advocate for public education and more effective public schools, initiated a series of annual reports and studies in 2002, running through 2015, on the

effects of NCLB (Lewis, 2012). The authors in a key finding from the CEP 2003 report cautioned that some states have more rigorous standards, assessments, and definitions of proficiency than others, affecting the percentages of students attaining proficiency and therefore, potentially penalizing states with higher expectations for student performance (Rentner et al., 2003). This early report foreshadowed inconsistent achievement results published by Maleyko (2011) whose study of four sample states suggested that the AYP standards in North Carolina were much more rigorous than the AYP standards in Texas. “Texas had the highest percentage of schools meeting AYP, yet the school level achievement on the Texas state accountability assessment provided for a very low correlation with NAEP proficiency status” (p. 306). Maleyko (2011) concluded that Michigan AYP standards were implemented with more rigor than Texas, but less so than North Carolina or California. Borkowski and Sneed (2006) believed this created conditions for grave harm where states have at times lowered standards or manipulated data to avoid sanctions or penalties. Rentner et al. (2003) had initially listed the overidentification of schools and districts needing improvement as a practical concern, even describing it as “inevitable” (p. 32).

In a CEP analysis of state test score trends through 2006-2007, researchers Kober et al. (2008) attempted to answer the question of whether student achievement had increased because of NCLB. Kober et al. (2008) discovered it was not possible to relate changes in student achievement directly to NCLB, but that the law has enabled all to learn much more about student achievement because of the expanse in student testing, accountability, and reporting of performance. Comparing state test score trends to NEAP performance levels, the authors concluded that reading and math achievement on state

tests had gone up in most states since 2002 with greater gains in the elementary and middle grades than at the high school level. Trends in reading and math achievement on the NAEP from 2002 to 2007 generally “moved in a positive direction, although gains on NAEP tended to be smaller than those on state tests” (Kober et al., p. 2). Notably, the researchers described in the summary of findings that achievement gaps on state tests have narrowed since 2002 much more often than they have widened (p. 65).

Rentner et al. (2003) noted, in an additional Center on Education Policy report after the Act’s first year, support could erode if the U.S. Department of Education applied the detailed requirements too rigidly and may find waivers of specific requirements necessary to accomplish the law’s broader goals. Fast forward to the Blueprint for Reform of the Elementary and Secondary Education Act, an act which has become a series of waivers with many requirements for standards and assessments. Waivers have been granted to 43 states and the District of Columbia in exchange for implementing education reforms backed by the Obama administration (Bidwell, 2014). NCLB, due for reauthorization since 2007, began to include waivers in 2011 after education professionals continued to criticize the law for “unintentionally incentivizing states to set lower academic standards to meet its requirements” (Bidwell, 2013). Waivers, flexibility within the law, require states to develop comprehensive plans to “improve educational outcomes for all students, close achievement gaps, and improve the quality of teaching” (The White House, n.d., para. 5). States must adopt a strong plan to implement college-and-career-ready standards and accountability systems that recognize and reward high-performing schools as well as those that are making gains. In 2011, the first year waivers were granted, “the percentage of public schools not making AYP varied greatly by state,

from about 7% in Wyoming to about 91% in Florida...with nearly half of the nation's public schools, 48%, not making AYP in 2011" (Usher, 2012, p. 2).

Two years prior, in 2009, the standards-based reform movement saw the development and subsequent launch of the Common Core State Standards (CCSS). Created by Gates-funded consultants for the National Governors Association Center for Best Practices (NGA Center), these national standards have begun to play an integral role in the No Child Left Behind waivers (Strauss, 2013). The Common Core State Standards (CCSS), which focus on English language arts and mathematics in grades K-8 and college and career readiness in grades 9-12, provide clear and consistent learning goals based on rigorous content and higher-order thinking skills (Common Core State Standards Initiative, 2015). "Encouraged by the federal Race to the Top initiative, 45 states had by 2011 quietly adopted benchmarks...set by the Common Core State Standards Initiative (CCCSI)" (Henderson, Peterson, & West, 2015, para. 10). However, public debate has begun in many states, and the "Common Core is now at the core of a heated national controversy" (Crawford, 2014, para. 16). With assessments in development and portions implemented in 2013 in some states, the Common Core was seen as adding to the narrative of failure (Rethinking Schools, 2013) created under the decade plus of NCLB. The editors at Rethinking Schools (2013) referred to NCLB as a test and punish approach to standards-based education reform and speculate as the "Common Core's college and career ready performance level becomes the standard for high school graduation, it will push more kids out of high school than it will prepare for college" (para. 14). Opponents to the Common Core State Standards, such as Rethinking Schools, the Heritage Foundation, FreedomWorks, and the NEA, decry the

bureaucracies, political agendas and commercial interests tied to the success of the CCSS as it hinges on the failures of schools (Williams, 2014).

Conversely, the NEA was also listed as a supporter on the Common Core State Standards Initiative (2015a) website with a link to comments made in 2010 by NEA President Dennis Van Roekel. Notably, the majority of the statements of support linked to CCSSI's website are dated 2010. On the NEA website, neaToday, Long (2013) authored an article listing the six ways the Common Core is good for students. A panel of educators from the 46 states that had adopted the CCSS at that time, came to a consensus in identifying ways the standards are good for education; for example, CCSS put creativity back into the classroom because they are standards and not a prescribed curriculum, broad standards require students to explore topics more deeply and apply knowledge to everyday life, and Common Core increases rigor and helps to get more students college and career ready (Long, 2013). At the American Society of News Editors annual Convention in 2013, U.S. Secretary of Education, Arne Duncan, stated that Common Core standards "mark a sea-change in education. Not only do they set the bar high, but they also give teachers the space and opportunity to go deep, emphasizing problem-solving, analysis, and critical thinking" (U.S. Department of Education, 2013b, para. 45). Duncan (U.S. Department of Education, 2013b) emphasized the point that Common Core was not a federal project, but rather state-led work incentivized by Race to the Top funds.

Again, Common Core was described as more rigorous than any previous state standards as they emphasize analytical and critical thinking skills in math and English (Caldwell, 2015). The underlying premises being that higher standards will result in

higher levels of student performance, a truth not yet realized as the United States continues to score behind other nations, such as Finland, Singapore, and South Korea, on international tests (Cavanagh, 2010). National Assessment of Educational Progress (NAEP) data analyzed in comparison to two indexes of CCSS implementation examined in the Brown Center Report on American Education (Loveless, 2015), found an improved scale score amounting to 0.04 standard deviations on the 4th grade ELA NAEP scale. Loveless (2015) noted a threshold of 0.20 *SD* is often seen as the minimum size for a test score change to be regarded as noticeable, so although positive, the effects are quite small. While improvements were encouraging to CCSS supporters, the findings of Loveless' (2015) study are merely statistical associations and cannot be used to make causal claims. Much as news organizations have publicized, Loveless (2015) warned in the Brown Center Report of the politics of Common Core and the dynamic element it adds to implementation in the coming years. As federal and state governments and public opinion continue to shape standards-based reform, it appears to be an educational movement that is here to stay.

November of 2015, the newest proposed version of ESEA, dubbed the Every Student Succeeds Act (ESSA), was officially released. The reauthorization, as described by Klein (2015) begins with states still submitting accountability plans to the Education Department beginning in the 2017-18 school year, yet there is no more expectation that states get all students to proficiency as under NCLB Classic. States can pick their goals to address proficiency on tests (tests in reading and math grades 3-8 and once in high school), English-language proficiency, and graduation rates. Goals have to set an expectation that all groups that are furthest behind close gaps in achievement, and under

ESSA states can set aside up to 7% of Title I funds for school turnaround. “States must adopt challenging academic standards, just like under NCLB, but the U.S. Secretary of Education is expressly prohibited from forcing or even encouraging states to pick a particular set of standards, including Common Core” (Klein, 2015, para. 31). As few would argue that standards have broadly raised the current quality of American schools (Jennings, 2012), the following section will explore the academic achievements of students from a focus on the achievement gap and indicators that place students at risk for academic failure.

Academic Achievements of Students

While government programs have directed resources to schools for decades to help ensure all children have equal access to a quality education, gaps in achievement have remained for decades. “The *achievement gap* is one of the most talked-about issues in U.S. education” (Ladson-Billings, 2006, p. 3). The term refers to the disparity in academic performance between groups of students and shows up in grades, standardized test scores, advanced placement, enrollment in honors courses, drop-out rates, and college completion rates, among other measures of success (Editorial Projects in Education Research, 2011; Ladson-Billings, 2006). According to the National Governors’ Association (2005), the achievement gap is a matter of race and class, as across the U.S. “a gap in academic achievement persists between minority and disadvantaged students and their white counterparts” (para. 3). The achievement gap is most often used to describe the troubling performance gaps between African-American and Hispanic students and their white peers, and the similar discrepancies found between students from low, socio-economic families and those who are not. Federal education

accountability measures have also increased awareness of gaps in performance based on sex and English-language proficiency (Editorial Projects in Education Research, 2011). The Nation's Report Card™ has documented U.S. students' performance on NAEP assessments since the early 1970's, and serves as the government's barometer on the persistence of gaps in standardized test scores for the past 40 years.

Achievement gap and race. There is a gap in academic achievement, as evidenced by achievement on national and state standardized tests, between African-American and Hispanic/Latino students and their white peers (The Education Trust, 2014a, 2014b). As “an integral part of our nation's evaluation of the condition and progress of education” (National Center for Education Statistics, 2013, p. Inside front cover), NAEP assessments are conducted both at the national and state levels. When gauging achievement gaps as a matter of race, considerable changes in the demographic makeup of American students in recent decades should be considered. “Notably, Hispanic students now account for a larger proportion of students, and White students account for a lower proportion, than in the 1970s” (National Center for Education Statistics, 2013, p. 4). In 1978, the percentage distribution of 13-year-old students in NAEP included 80% who identified themselves as White, 13% Black, and 6% Hispanic. Comparatively in 2015, 52% of 13-year-old students identified as White, 15% Black, and 24% Hispanic (National Center for Education Statistics, 2015a). While NAEP results show that, over time, Black and Hispanic students have improved performance in reading and mathematics, both subgroups trailed their White peers on 2015 assessments by an average of more than 24 test-score points in reading and 18 or more test-score points in mathematics (Editorial Projects in Education Research, 2011; National Center for

Education Statistics, 2015b, 2015c, 2015d, 2015e). Despite massive reform efforts in the U.S. to close the gaps, this difference in NAEP performance equates to about two grade levels and is more pronounced at the high school level in reading where African-American 12th grade students and white 8th grade students performed at the same achievement level (Braun, Chapman, & Vezzu, 2010).

Achievement gaps on NAEP assessments between Black and Hispanic students and their White peers in the state of Missouri in many ways mirror national reports. Black-White performance gaps remain at a constant 24-point difference or more in both reading and mathematics across all grade levels. In 2015, Hispanic students' average scores in reading showed a 12- to 20-point differential from White students in the state; however, there was an 11- to 15-point gap in the scores in mathematics (National Center for Education Statistics, 2015b, 2015c, 2015d, 2015e).

Similar disparities between minority students and their white peers is evidenced both at school entry in vocabulary and cognitive development prior to and in preschool years (Farkas & Beron, 2004; Fuller et al., 2009; Hibel, 2009; Lee & Burkham, 2002; Jencks & Phillips, 1998) and in high school graduation rates and college success statistics (Editorial Projects in Education Research, 2011; National Center for Education Statistics, 2014b; Swanson, 2008; The Education Trust, 2014a, 2014b; Zhao, 2009). When controlling for family income and parental education levels, Jencks and Phillips (1998) found a black-white gap of approximately one-year's vocabulary knowledge among three to six-year-olds. Similar vocabulary development discrepancies were reported by Fuller et al. (2009) among Mexican-American and other children of Hispanic backgrounds and non-Hispanic white children by 24 months of age. Research utilizing data from the

Children of the National Longitudinal Survey of Youth (CNLSY) and the Early Childhood Longitudinal Study, Kindergarten Class of 1998-99 (ECLS-K) demonstrated racial inequalities in oral vocabulary and cognitive ability scores (Farkas & Beron, 2004; Lee & Burkham, 2002). Authors Lee and Burkham (2002) found that Black and Hispanic children scored approximately 20% below non-Hispanic white children on cognitive tests at school entry. Early literacy skills, such as vocabulary development, were frequently implicated as a precursor to subsequent academic success with minority children at a particular risk as discrepancies in language ability persist into adolescence (Farkas & Beron, 2004).

Though the U.S. Department of Education reported the national high school graduation rate for 2013 was 81.4%, an all-time high, far too many African-American and Latino students leave high school without a diploma (The Education Trust, 2014a, 2014b). With 69% and 73% graduation rates respectively, the nation's racial minorities have seen huge gains in high school graduation and college enrollment rates. Yet, questions remain around students' preparedness for higher education as few African-Americans or Latinos who took the ACT met any of the college-readiness benchmarks, just 1 in 20 African-American graduates met all four benchmarks and 1 in 7 Latinos, compared with 1 in 3 white graduates (ACT, 2013; The Education Trust, 2014a, 2014b). A study of high school graduation rates (Swanson, 2008) found that in the nation's 50 largest urban areas, where most minority students reside, only about 52% of students completed high school with a diploma. That rate was well below the national graduation rate, "and even falls short of the average for urban districts across the country (60 percent)" (Swanson, 2008, p. 8). Zhou (2009) contended such gaps in graduation rates

and preparation have damaging effects on education experiences and access to college and put minorities at a disadvantage for securing high-income jobs in the future. Also in direct contrast to U.S. Department of Education reports, Orfield, Losen, Wald & Swanson (2004) called into question the National Center for Education Statistics (NCES) formula used by most states in reporting dropout/graduation rates as it “relies heavily on underestimated dropout data, and significantly overestimates graduation rates” (p. 8) and, therefore, obscured both the magnitude and racial dimension of dropout/graduation rates. Orfield et al. (2004) also contended that failure to adhere to a rigorous graduation rate accountability system “casts serious doubt on whether there is the political will to educate all children to high standards” (p. 13) and state the drop-out/push-out problem for minority school children is likely to grow more severe.

Though minority students have evidenced gradual improvements, groups of children who are vulnerable to educational difficulties most often experience multiple risk factors simultaneously (Rouse, 2007). Minority students are more likely to experience family poverty and attend schools with high concentration of poverty (Borman & Rachuba, 2001; Duncan, Brooks-Gunn, & Klebanov, 1994; Rouse, 2007). A striking feature identified by Reardon (2011) using NAEP data compared achievement trends in the black-white gap and income gap among cohorts born in the 1940s to the 1950s and cohorts born in 1990s and 2000s.

For cohorts born in the 1940s to the 1960s, the black-white achievement gap was substantially larger than the 90/10 income achievement gap, particularly in reading. For cohorts born in the 1970s and later, however, the opposite is true. Among children born in the last two decades (those cohorts currently in school),

the 90/10 income gap at kindergarten entry was two to three times larger than the black-white gap at the same time. (Reardon, 2011, p. 12)

The relationship between a family's position in the income distribution and their children's academic achievement has grown substantially stronger in recent decades.

Achievement gap and poverty. While the socioeconomic status of a child's parents has always been one of the strongest predictors of the child's academic achievement, the relationship between family socioeconomic characteristics and academic achievement has changed since the 1960s (Reardon, 2011). "The achievement gap between children from high- and low- income families is roughly 30 to 40 percent larger among children born in 2001 than among those born twenty-five years earlier" (Reardon, 2011, p. 1). According to Reardon (2011) the income achievement gap, defined in his research as the income difference between a child from a family at the 90th percentile of the family income distribution and a child from a family at the 10th percentile, was now nearly twice as large as the black-white achievement gap. As the gap between children in high- and low-income families has widened, so has the achievement gap between children in high- and low-income families.

While poverty has been expressed as an economic state, the argument regarding the negative and unpredictable impact of poverty on the physical growth, emotional development, and overall health of children is as much related to the environment of poverty as it is with the finances of poverty (Neuman, 2008). Jensen (2009) describes how poverty hurts children, families, and communities. Furthermore, Jensen (2009) details how chronic exposure to poverty can have detrimental influence and cause changes to the brain. Children raised in poverty are faced daily with overwhelming

challenges and their brains have adapted to suboptimal conditions in ways that undermine good school performance (Jensen, 2009).

Education is portrayed as a means to better one's opportunities in life. "The American mythology continues to insist that education is the path to the middle class for those struggling to escape the grip of poverty" (Hudley, 2013, para 2). With nearly 20% of children in the United States living in poverty, the percentage represents one of the highest rates of poverty in the developed world (Neuman, 2008). However, the education that poor, urban students in public schools receive is demonstrably insufficient to make them competitive with their more advantaged, middle and upper-income peers (Hudley, 2013). Academic success in school is consistently influenced by family income and according to the U.S. Department of Education (2014a), in all academic subject areas; students of all ages and grades from wealthy homes outperform students living in low-income homes.

All schools face obstacles as they work to provide successful academic opportunities for students. "Concentrated poverty is often noted as the biggest challenge facing urban schools" (McKinney, Flenner, Frazier, & Abrams, 2006, para. 8). The effects of family poverty are intensified when there is a high concentration of low-income families in the neighborhood, as identified by Simons, Simons, Conger, and Brody (2004) as "collective socialization," depressed attitudes and motivation may be accepted as normative, thereby reducing urban children's expectations and success in school. Olson and Jerald (1998) reported that "concentrated school poverty is consistently related to lower performance on every educational outcome measured" (p. 14).

In this era of accountability, high-stakes standardized testing is seen as the primary methodology for determining academic achievement. As recent as 2013, students eligible for free/reduced lunch price in Missouri had an average score 24 points lower on both reading and mathematics NAEP assessments than those not eligible, a gap that has persisted for more than 20 years and mirrors gaps across the nation (National Center for Education Statistics, 2015f, 2015g, 2015h, 2015i). Evidence of high academic performance in high poverty schools exists despite reform efforts that have produced little improvement in America's schools.

The term 90/90/90 originally coined by Douglas B. Reeves in 1995 referred to schools with the following characteristics: "90% or more of the students were eligible for free and reduced lunch, 90% or more of the students were members of ethnic minority groups, and 90% or more of the students met the district or state academic standards in reading or another area" (Reeves, 2000). The research was conducted in Milwaukee, Wisconsin, and included four years of test data (1995 through 1998) with students in a variety of school settings in districts that maintained careful records of actual instructional practices and strategies (Reeves, 2003). The research on 90/90/90 Schools found five common characteristics common to the high achievement schools, including:

- A focus on academic achievement;
- Clear curriculum choices;
- Frequent assessment of student progress and multiple opportunities for improvement;
- An emphasis on nonfiction writing;
- Collaborative scoring of student work (Reeves, 2003, p. 3).

Additionally, Reeves (2003) described specifics related to each of the five characteristics and highlighted the notion that the schools were achieving success without using specific proprietary programs, but rather used consistent practices in instruction and assessment with support from local teachers.

Norfolk Public Schools in Virginia had two 90/90/90 Schools and in 2002-2003 Reeves (2003) examined the accountability reports and conducted site visits and interviews. Reeves (2003) found the Norfolk accountability system “provided insight into measurable indicators that were linked to the largest gains in student achievement” (p. 9) and nine characteristics “that distinguished the schools with the greatest academic gains” (p. 9). Schools that experienced gains of 20% or more in academic achievement in language arts, mathematics, science, and social studies, first, devoted time for teacher collaboration. Second, the high-poverty schools provided significantly more frequent feedback to students beyond the report card, and third, made dramatic changes in the schedule. Teachers in the successful schools engaged in action research and mid-course selections and the principals made decisive moves in teacher assignments. Sixth and seventh, the schools included an intensive focus on constructive data analysis and consistently used common assessments. Schools employed the resources of every adult in the system, and professional development was distributed among all; and ninth, there was cross-disciplinary integration with the involvement of the subjects, such as music, art, and physical education, in deliberate strategies to promote academic achievement (Reeves, 2003).

In a separate study, Kannapel and Clements (2005) looked closely at the practices of a small number of schools across Kentucky that were also an exception to the pattern

of low income/low performance. The schools selected for the study had 50 percent or more of students on free/reduced lunch, high accountability index with evidence of progress on the state test over time, and an achievement gap of fewer than 15 points between low- and middle-income students. The researchers (Kannapel & Clements, 2005) compared the audits of high-performing, high-poverty schools to those of low-performing, high-poverty schools, and found the high-performing schools scored significantly higher on: “review and alignment of curriculum; individual student assessment and instruction tailored to individual student needs; caring, nurturing environment of high expectations for students; ongoing professional development for staff that was connected to student achievement data; and, efficient use of resources and instructional time” (p. 3). Additionally, the common characteristics identified in the study by Kannapel and Clements (2005) mirrored those described by Reeves (2003). Namely, the strong focus on academics, instruction, and student learning using regular assessments of individual student progress and the changes in instruction to meet the students’ needs was also found in successful schools by Kannapel and Clements (2005). The researchers also attributed the high morale and overall success of the school to the “careful and intentional manner in which teachers were recruited, hired, and assigned” (p. 3).

In a contrasting view, Berliner (2013) argued in research formatted in an analytic essay, that school reforms have failed, and America’s educational problems are outside of the school. Berliner (2013) asserts disparities in the achievement gap between poor and wealthy students will not be solved through improvements to teachers, curriculum, testing programs, or administration alone. The researcher/author suggested educational

problems are primarily a result of income inequality and “targeted economic and social policies have more potential to improve the nation’s schools” (Berliner, 2013, p. 1).

Noted in the essay, the “current menu of reforms simply may not help education improve as long as we refuse to notice that public education is working fine for many of America’s families” (p. 16) and the common characteristic of families for whom it is failing is poverty.

Berliner (2013) intertwined policies for improving education and social policies to address income equality in his recommendations. First, jobs that pay a fair or living wage rather than a minimum wage would help to ensure workers could support themselves and their families. Additionally, he argued, “Our nation also needs higher taxes” (Berliner, 2013, p. 17) as the U.S. has an extremely low tax rate compared to other OECD countries, despite distortions to the contrary in the media. Highly profitable companies in the U.S. also pay less in taxes, limiting tax revenue for civic supports. School policies recommended by the author included: high-quality, public preschool programs, provisions for summer educational opportunities that are both academic and cultural for poor youth, and programs to provide tutoring rather than policies that require grade retention for students performing below grade level (Berliner, 2013). Wrap-around services for youth in schools that service poor families, and adult programs that make the school a part of the overall community resources rather than a remote building were a part of the author’s overall argument. Berliner (2013) asserts it is evident that America cannot simply test its way out of educational problems.

Achievement gap and English language learners. “Although there is no single definition of English language learners, the U.S. Department of Education defines this

group as students served in programs of language assistance, such as English as a second language, high-intensity language training, and bilingual education” (Murphey, 2014, p. 2). The U.S. Department of Education provides additional federal funding to assist states and local education agencies under Title III: the English Language Acquisition, Language Enhancement, and Academic Achievement Act and mandates separate reporting of achievement data for this subgroup. ELLs are falling behind their English-literate peers despite \$723.4 million in funding (U.S. Department of Education, 2015) for programs in 2014.

“More than one in ten preK-12 students in the U.S. are English Language Learners (ELLs), yet a sizeable achievement gap exists between those more than 5.3 million ELL students and their English proficient peers” (Grantmakers for Education, 2010, p. 1). According to the 2013 National Assessment of Education Progress (NAEP), the average scores for English Learners (ELs) on both the reading and mathematics assessments in grades 4, 8, and 12 were significantly lower than the average scores for non-ELs (National Clearinghouse for English Language Acquisition, 2015a). At the eighth grade level, 70% of ELs scored at the below basic level in reading on the NAEP assessments as compared to 20% of the non-ELs participants. Mathematics proficiency levels are similar with 69% of ELs at the eighth grade level scoring below basic on NAEP assessments and 24% of non-ELs at the below basic level (National Clearinghouse for English Language Acquisition, 2015a). These numbers reflect the need to improve educational outcomes for ELL students, especially as the most rapidly growing subgroup in our nation’s schools comprising 9% of all students (National Clearinghouse for English Language Acquisition, 2015b).

Performances by the 27,071 ELs students on state assessments in SY2013-14 in Missouri mirror the national achievement gaps. On state reading/language arts assessments, 25% of ELs scored proficient or above as compared to 53% of all students across the state. In mathematics, 34% of ELs scored proficient or above as compared to 52% of all students performing at those levels (National Clearinghouse for English Language Acquisition, 2015c). In contrast, data on monitored former-ELs, students who received ELL services in the past but have since tested out of the program, reflects performance on state assessments comparable to non-ELs. In reading/language arts, 54% of monitored former-ELs and 53% of all students scored proficient or above in SY2013-14 and in mathematics, 60% of monitored former-ELs as compared to 52% of all students scored at a level of proficient or above (National Clearinghouse for English Language Acquisition, 2015c). Standardized achievement tests “used for assessment and accountability purposes may not provide reliable and valid outcomes for ELLs” (Abedi, 2010, p. 4) and research recommendations for conceptual scoring and performance assessments will be discussed.

Murphey (2014) recommended conceptual scoring as one approach for assessing ELLs “using measures that are valid in terms of their sensitivity to culture and to the amount of exposure to English these students have had” (Murphey, 2014, p. 2). In conceptual scoring, comparable test items are developed in both English and a student’s home language and credit is given to correct responses independent from the language of the response. Bilingual children benefit from conceptual scoring, especially when tested in Spanish (Bedore, Peña, García, & Cortez, 2005) and is practiced with linguistically diverse preschoolers and to reduce the inappropriate, overidentification of language

disorders (Wang, Castilleja, Sepulveda, & Daniel, 2011). The current study did not contain measures with conceptual scoring options.

Performance assessments offer opportunities for students to present a more comprehensive picture of what they know and are able to do (Abedi, 2010) and can lead to a better understanding of student performance. In performance assessment settings, tasks are instructional, allow for active engagement of both ELL and non-ELL students, and improve academic achievement. Wang, Niemi, and Wang (2007) indicated that performance assessment outcomes are not sensitive to elements of students' background status and ethnicity. While not a variable in the present study, the state of Missouri has piloted performance assessment items on the state's yearly assessments at the 5th grade level.

A variable that affects ELLs' academic learning is the quality of instruction they receive (Short & Echevarria, 2004/2005). As a part of a seven-year research project, Short and Echevarria (1999) and Echevarria, Vogt, and Short (2004) developed a model of sheltered instruction for effectively delivering lessons to ensure ELLs' academic success. The Sheltered Instruction Observation Protocol (SIOP) Model (Echevarria, Vogt, & Short, 2004; Short & Echevarria, 1999) "is a lesson-planning and delivery approach composed of 30 instructional strategies" (Short & Echevarria, 2004/2005, p. 10). Educators use this model with the regular core curriculum and modify their instruction to make the content understandable for ELLs while promoting academic English language growth. Research by Jones, Sloss, and Wallace (2014) and Guzman (2015) both evidenced results of the positive impact of implementing the SIOP model into everyday classroom instruction.

Jones et al., (2014) purpose was to determine research-based best practices and models of instruction that would increase the academic achievement and growth of the ELL population in a pre-K through eighth grade district. The district sought to decrease the achievement gap between ELL and non-ELL students, which was at nearly 50% in 2011. The researchers, Jones et al., 2014, “studied literature for research-based best practices that effectively impacted ELLs, the perceptions of best practices...teacher lesson plans for implementation of best practices, and the best practices being implemented in the school districts surrounding” (p. 11) the district that demonstrated significant growth. Final recommendations from the results of the study included a strategic plan for a district-wide adoption and implementation of the SIOP model (Jones et al., 2014).

Guzman (2015) specifically focused on ELLs at the third grade level and analyzed performance results following the first-year implementation of the SIOP model. Impacts on reading scores, English language proficiency scores, and college and career readiness scores were compared between students who did have instruction in the SIOP model and those who did not. As evidenced in the comparison of assessment results, “third grade ELLs did make a significant improvement after the implementation of SIOP” (Guzman, 2015, p. 49) and demonstrated statistically significant gains in language acquisition and reading skills. Evidence from both studies supports instructional models that could successfully reduce the achievement gap between ELL and non-ELL students.

Non-cognitive Skills of Perseverance, Self-control, and Resiliency

Following is a synthesis of research focused on non-cognitive skills, specifically perseverance and resiliency, and their relationship to academic performance is

presented. “IQ tests and achievement tests do not adequately capture *non-cognitive skills*- personality traits, goals, character, motivation and preferences...For many outcomes, their predictive power rivals or exceeds that of cognitive skills” (Kautz, Heckman, Diris, ter Weel, & Borghans, 2014, p. 2). While achievement tests predict only a small fraction of the variance in later-life success, for example at most 17% of later life earnings can be correlated to adolescent achievement test scores with measurement error accounting for at most 30% of the remaining variability (Heckman & Kautz, 2012; Kautz et al., 2014). Non-cognitive skills valued in the labor market and society, such as perseverance, grit, conscientiousness, self-control, trust, attentiveness, self-esteem, and resilience had been largely ignored in evaluations of students and schools (Kautz et al., 2014). However, research and constructed measures of these skills provide evidence that they predict outcomes above and beyond scores on achievement tests to meaningful life outcomes (Almlund, Duckworth, Heckman, & Kautz, 2011; Borghans, Duckworth, Heckman, & ter Weel, 2008; Gutman & Schoon, 2013; Kautz et al, 2014; Kautz & Zanoni, 2014; Tooley & Bornfreund, 2014; Tough, 2012).

Perseverance and engagement. Engagement and perseverance involve how students behave, feel, and think regarding their commitment to academic tasks (Fredricks, Blumenfeld, & Paris, 2004). “Perseverance is a widely used concept within research which involves steadfastness on mastering a skill or completing a task... Two manifestations of perseverance: engagement and grit” (Gutman & Schoon, 2013) will be focused on, with grit expanded upon later in this review. Research studies have used the terms perseverance and engagement interchangeably, with more studies focused on engagement because of the ability to measure behaviors related to engagement. In their

meta-analysis of forty-four research articles related to school engagement, Fredricks et al. (2004) divided existing research into three major engagement categories: behavioral, emotional, and cognitive. Engagement will be presented as a multidimensional construct and integrated concept for this review.

Studies utilize a range of scales and methods to measure the construct of engagement, including student surveys, measures of teacher's perceptions of engagement, observer reports, and other measures of "observable characteristics related to engagement rather than engagement as a psychological construct" (Frontier, 2007, p. 32). There is strong support for significant correlations between school engagement and positive academic outcomes, including achievement, school retention, and emotional well-being (Gutman & Schoon, 2013). Shernoff, Csikszentmihalyi, Schneider, and Shernoff (2003) conducted a longitudinal study of 526 high school students to quantify the conditions under which students reported being engaged. Using the experience-sample method, students were asked to report levels of concentration, interest, and enjoyment during classroom activities. The researchers reported that students spent an average of one-third of the time passively attending to information and half of the day completing independent work. Overall, "activities that are academically intense and foster positive emotions stand the best chance of engaging students" (Shernoff et al., 2003, p. 173). Seider, Gilbert, Novick, and Gomez (2013) identified in their research performance character strengths, such as perseverance and persistence, as being correlated to students' academic achievement. In a study that included a diverse sample of nearly 500 urban adolescents, Seider et al. (2013) found that "urban middle school students' academic perseverance was a highly significant predictor of their cumulative grade point average" (p. 27). Their

reported results, as with Shernoff et al., (2003), suggested urban educators need to be committed to cultivating students' performance strengths, such as perseverance, to develop necessary academic skills. Others have speculated that changes in classroom context can increase students' academic perseverance (engagement) and, in doing so, increase students' grade point average (Farrington et al., 2012).

Li and Lerner (2011) used longitudinal data from the 4-H Study of Positive Youth Development across grades 5 to 8 to determine whether links existed between trajectories of school engagement and grades, depression, substance use, and delinquency. School engagement was associated with the prevention of antisocial behaviors, such as delinquency and school dropout. Johnson, McGue, and Iacono (2006) found that school engagement was directly associated with positive changes in academic achievement during adolescence. Sbrocco's (2009) study of academic engagement by eighth-grade students sought to determine whether a relationship existed between academic engagement and student academic achievement. Sbrocco (2009) stated, "It is clear from the data that, indeed, a relationship does exist, and that this relationship is positive and significant" (p. 149). The strongest relationship evidenced in this study, and similar research conducted by Frontier (2007), was between behavioral engagement and a student's grade point average. Additionally, Li and Lerner (2011) found school engagement to promote successful career development over and above cognitive ability.

"Conversely, disengagement shows a negative and significant relationship with academic achievement" (Sbrocco, 2009, p. 149) and disengaged students are more likely to score lower on indicators of achievement. Previously found was that students' problems with behavioral engagement in the first grade were associated with lower

achievement four years later, and correlated to an eventual drop out of high school (Alexander, Entwisle, & Horsey, 1997). While dated, Alexander et al. (1997) reported results that took a “life-course perspective on dropout, viewing it as the culmination of a long-term process of academic disengagement” (p. 87), a conclusion echoed in contemporary research as well.

Self-control. According to Duckworth and Kern (2011), more than 3% of all publications are indexed in the PsycINFO database by the keywords self-control. Related terms include self-discipline, delay of gratification, self-regulation, and impulse control (Gutman & Schoon, 2013). Definitions may vary widely, but “self-control is generally defined as the ability to forgo short-term temptations, appetites, and impulses in order to prioritize a higher pursuit” (Gutman & Schoon, 2013, p. 20). Gottfredson and Hirschi (1990) suggested that self-control is malleable during the first 10-12 years of life, but after that point may only improve with age as socialization continues to occur and is largely unresponsive to external interventions.

“Most often, self-control is measured using questionnaires completed by the participant or a close informant, e.g., parent” (Gutman & Schoon, 2013, p. 20). The Self-Control Scale (Tangney, Baumeister, & Boone, 2004) is a reflective measure of self-control as a dynamic concept, rather than a fixed trait. As a popular scale used in social science research (Hasford & Bradley, 2011), it contains items about acting “without thinking through all the alternatives,” “resisting temptation,” and “concentrating” which give the notion “that an individual has the ability to override or change one’s inner responses, as well as interrupt undesired behavioural tendencies” (Gutman & Schoon, 2013, p. 20). Measures of self-control are used to explore the correlational relationship

between self-control and achievement or outcomes, with many finding that self-control is a significant predictor of attainment (Casillas et al., 2012; Duckworth & Seligman, 2006; Duckworth, Tsukayama, & May, 2010; Mischel, Ebbesen, & Zeiss, 1972; Mischel, Shoda, & Peake, 1988; Moffitt et al., 2010).

In the 1960s, Mischel began conducting a series of psychological studies, often referred to as “the marshmallow experiment,” testing the importance of self-control (delayed gratification) for academic achievement. Mischel, Ebbesen, and Zeiss (1972) left children at the Stanford University preschool alone with one marshmallow after being told they could have two marshmallows if they waited to eat the one until the experimenter returned. The researchers left the room for up to 15 minutes. Footage of the children waiting alone showed some eating the marshmallow right away, while others created external and internal distractions for themselves. “They made up quiet songs, hid their heads in their arms, pounded the floor with their feet...and so on” (p. 215). In the discussion, Mischel et al. (1972) stated that even a preschool child can wait “most stoically if he expects that he really will get the deferred larger outcome “ (p. 217), but they must shift attention elsewhere and occupy themselves internally with cognitive distractions. Thus effective delay, or increased instances of self-control, “probably depends on suppressive and avoidance mechanisms that reduce frustration” (p. 215), and points to the effectiveness of interventions for improving self-control.

Years later, the researchers (Mischel, Shoda, & Peake, 1988; Mischel, Shoda, & Rodriguez, 1989; Shoda, Mischel, & Peake, 1990) conducted follow-up studies and tracked each preschool child’s progress in cognitive and academic competence and ability to cope with frustration and stress in adolescence. Parents of the children who

were able to wait longer at age four or five “rated them as more academically and socially competent, verbally fluent, rational, attentive, planful and able to deal well with frustration and stress” (Mischel et al., 1988, p. 687) as adolescents. Additionally, “pre-school delay time correlated positively with SAT” (Shoda et al., 1990) scores, but with guarded results as Shoda et al. (1990) gave caution before generalizing from the study because of the smallness of the sample.

However, research from Moffitt et al. (2011) confirms the findings from the Stanford marshmallow study. Researchers led by Moffitt followed 1,037 children in New Zealand from birth to age 32. Moffitt et al.’s (2011) observational and correlational designed study measured children’s self-control through behavior ratings from parents, teachers and the children themselves, as well as from research staff who worked with the children. Among four hypotheses, the researchers tested “whether children’s self-control predicted later health, wealth, and crime” (p. 2694). By adulthood, children in the highest self-control group were significantly less likely to have multiple health problems or to have addictions to multiple substances as compared with kids in the lowest self-control group. Those in the low self-control group had significantly lower incomes and were more likely to have a criminal record than those in the high self-control group. Notably, “Dunedin study children with greater self-control were more likely to have been brought up in socioeconomically advantaged families and had higher IQs” (p. 2694), so tests were done independent of their social class and IQs. Moffitt et al. (2011) concluded that because it was possible to disentangle the effects of self-control from IQ and social class, self-control could then be a clear target for improvement intervention.

Interventions have focused on improving self-control to reduce problem behaviors, particularly before adolescence. In a meta-analysis, Piquero, Jennings, and Farrington (2010) examined studies that investigated the effect of self-control improvement programs for children up to age 10 on improving self-control, and/or reducing delinquency and problem behaviors. Piquero et al. (2010) found that self-control improvement programs are effective for improving self-control with a variety of school-based strategies including teaching mindfulness or meditation techniques, cognitive behavioral and coping strategies (i.e., thinking aloud), and social-problem solving training (i.e., videotape training, role playing). With effect sizes both positive and significant across the 34 studies analyzed, it could be suggested that self-control improvement programs can be successful.

Resiliency. Resilience can be thought of as “bouncing back” after a series of setbacks; however, resilience is more accurately defined as a set of qualities that foster a process of successful adaptation, or coping skills, and transformation despite great risk factors, incredible hardships, and overwhelming obstacles (Benard, 1997; Sagor, 1996). Resilience is positive adaptation despite the presence of risk, which may include poverty, parental bereavement, parental mental illness, and/or abuse (Masten, 2009, 2011). As a developmental process rather than an attribute or personality trait that some possess and others do not, resilience is demonstrated when individuals succeed despite significant risks. Individuals “may be considered resilient in one area, but have lower levels in another area of adaptation” (Gutman & Schoon, 2013, p. 27). For example, students with multiple high-risk factors who are academically successful and resilient may experience emotional problems or depression.

“One viable measure of student and school success is high school graduation” (Johns, 2005, p. 31). At-risk students show persistent patterns of under-achievement and social maladjustment in school, leading to their failure to finish high school. Thus, many research studies focused on measurements of school and academic success examine the notion of resilience and the characteristics, protective factors, and coping skills that enable students to succeed despite risks of failure (Borman & Overman, 2004; Johns, 2005; McMillan & Reed, 1994; Perez et al., 2009; Samel, Sondergeld, Fischer, & Patterson, 2011; Yirenkyi, 2003).

An early and comprehensive resiliency study, initiated in 1955, was conducted by Werner and Smith (1992) on the island of Kauai. The study included 698 high-risk infants and continued over a span of 40 years. Werner and Smith (1992) concluded that resilient children had at least one caring adult in their lives who contributed to their ability to develop protective factors. Key protective factors predicting resilience were “affectional ties within the family that provided emotional support in times of stress” (p. 80).

Yirenkyi (2003) studied resiliency as the ability to thrive, mature, and increase competence in the face of adverse circumstances among minority high school students. Research identifies “essential elements required for the development of resilience” (p. 15) when exposed to risk factors was the presence of protective factors. Protective factors enable students to deal with the effects of risk factors, whether those protectors are individual, familial, or societal. Borman and Overman (2004) identified the individual characteristics of resilient children as including high self-esteem, high self-efficacy, autonomy, being actively engaged in school, and having strong interpersonal skills.

McMillan and Reed (1994) described protective factors and elements of resiliency individual attributes as including high intrinsic motivation and internal locus of control, the ability to set clear, realistic goals, along with the opportunity to establish a close bond with at least one caregiver and school staff who have taken a personal interest in them.

Samel et al. (2011) followed an urban cohort of students from 7th grade through the senior year of high school. “Key events, structures, and relationships supported the development of resilience...and revealed multiple paths to graduation” (p. 96). The researchers documented that negative student choices could be overcome through strong interventions, specifically those that dealt with attendance, discipline, teacher expectations, and credit requirements for graduation. The researchers concluded, “Teacher and school support matters in helping students persist” (p. 116). Teachers’ expectations for high school and college graduation, coupled with explicit connections between what was learned in school and what students would need to know about life outside of school, enabled students to overcome the lack of support from a parent/guardian. “When schools focus on teacher and student rapport, classroom climate, and strengthened instructional skills” (p. 116), then teachers can provide protective factors and help students develop resiliency.

Resilience and coping are both connected to how individuals respond to stress (Gutman & Schoon, 2013). Resilience follows the exercise of coping skills (Compas et al., 2001) and “as a result, coping is malleable and the use of more successful coping strategies can be taught to individuals” (Gutman & Schoon, 2013, p. 27). Resilience is promoted through interventions that aim to reduce risk factors and to put in place protective factors that buffer against the risks. The positive psychology movement has

generated a distinction between interventions such as coping strategies, and positive emotions such as optimism and gratitude. Seligman (2006) and his colleagues at the University of Pennsylvania have been the main proponents and publishers of research that promotes the teaching of “learned optimism” to children. This area of research has continued to garner attention as a way to help individuals, particularly children and adolescents, develop better metacognitive and anti-depressive skills as they manage difficulties in life. A greater understanding regarding the relationship among non-cognitive skills, such as resiliency, and positive emotions has continued to be a focus of the positive psychology movement.

Non-cognitive Construct of Grit

The development of the non-cognitive construct of grit and related literature exploring individuals’ level of grit, its relation performance in a variety of life settings, possible malleabilities, and opposing evidence is investigated in the following subsections. Gritty individuals personify the universal and age-old truth that success is the result of hard work and persistence. Grit is the trait visualized in Aesop’s fable of the tortoise and the hare, “the metaphor of achievement as a race...the oft-told story... preaches the value of plodding on, no matter how slow or uneven our progress, toward goals that at times seem impossibly far away (Duckworth & Eskreis-Winkler, 2013, para. 2). Over the past decade, and especially in the past few years, educators and psychologists have produced evidence for an alternate way of thinking about non-cognitive factors, such as grit, that contribute to success (Tough, 2013).

Trait-level grit defined. While intelligence can be considered the best-documented predictor of achievement (Gottfredson, 1997) in all professional domains,

intellectual talent does not always translate into achievement (Terman & Oden, 1947) and “less is known about other individual differences that predict success” (Duckworth, Peterson, Mathews & Kelly, 2007, p. 1087). The results of Duckworth’s (2006), Duckworth et al.’s (2007), Duckworth and Quinn’s (2009), and Eskreis-Winkler et al.’s (2014) research has suggested that grit may be as essential as IQ to high achievement, possibly making it the individual difference that might predict success beyond intelligence. “We define grit as perseverance and passion for specific, high goals, sustained over years. Thus the gritty individual works strenuously toward long-term challenges, maintaining both interest and effort despite distractions, boredom, setbacks, and even failures” (Duckworth, 2006, p. 73). Grit, as a non-cognitive trait, was originally introduced by Duckworth (2006) has also been defined by Shechtman et al. (2013) as, “Perseverance to accomplish long-term or high-order goals in the face of challenges and setbacks, engaging the student’s psychological resources, such as their academic mindsets, effortful control, and strategies and tactics” (p. vii).

Duckworth and colleagues at the University of Pennsylvania’s Duckworth Lab focus on both grit and self-control. While these two traits are related and can predict achievement, as Galton (1892) suggested, the ability to pursue challenging aims over months and years is different from the capacity to resist momentary temptations. “Although both self-control and grit entail aligning actions with intentions, they operate in different ways and over different timescales (Duckworth, 2015, para. 2), as the correlation between these two traits is not perfect (Duckworth & Gross, 2014). Both traits are facets of Big Five conscientiousness and contribute to the quality and quantity of effort individuals invest in their goals (Duckworth, 2015).

The Big Five are five broad factors, or dimensions, of personality traits. Srivastava (2015) describes the Big Five personality framework as a “coordinate system that maps which traits go together in people’s descriptions or ratings of one another” (para. 6). Within the five broad factors, “Grit clearly belongs to the Big Five Conscientiousness family, particularly overlapping with achievement motivation” (Duckworth & Eskreis-Winkler, 2013, para. 7). However, it differs from the achievement aspects of conscientiousness with an emphasis on long-term rather than short-term stamina (Duckworth et al., 2007). Grit is “perseverance and passion for long-term goals. Grit entails working strenuously toward challenges, maintaining effort and interest over years despite failure, adversity, and plateaus in progress” (Duckworth, Peterson, Matthews & Kelly, 2007, p. 1087-1088). Individuals who rank themselves high in grit “deliberately set for themselves extremely long-term objectives and do not swerve from them- even in the absence of positive feedback” (Duckworth et al., 2007, p. 1089). The researchers reasoned that grit may be as essential as IQ to high achievement, and more than self-control or conscientiousness, may set apart exceptional individuals (Duckworth et al., 2007).

Method of measurement. Duckworth et al. (2007) described the development of the Grit Scale. To test their hypotheses, the researchers sought “a brief, stand-alone measure of grit that met four criteria” (p. 1089). Namely, evidence of psychometric soundness, face validity for adolescents and adults pursuing goals in a variety of domains (e.g., not just work or school), low likelihood of ceiling effects in high-achieving populations, and most important, a precise fit with the construct of grit. (p. 1089)

As Duckworth et al. (2007) reviewed several published self-report measures, they failed to find any that met all four of their criteria. Hence, they developed and validated a self-report questionnaire called the Grit Scale. A two-factor structure for the original 12-item self-report measure of grit (Grit-O) was identified with “the theory of grit as a compound trait comprising stamina in dimensions of interest and effort” (Duckworth & Quinn, 2009, p.166). Room for improvement was suggested as they did not examine whether either factor predicted outcomes better than did the other, so Duckworth & Quinn (2009) undertook the investigation to validate a more efficient measure of grit.

Across six studies, Duckworth & Quinn (2009) summarized that “individual differences in grit accounted for significant incremental variance in success outcomes over and beyond that explained by IQ, to which it was not positively related” (Duckworth et al. 2007, p. 1098). In Study 1, the researchers identified items for the Short Grit Scale (Grit-S) with the best overall predictive validity. The Short Grit Scale (Grit-S) retained “the 2 -factor structure of the original Grit Scale (Grit-O) with 4 fewer items and improved psychometric properties” (Duckworth & Quinn, 2009, p. 166). A confirmatory factor analysis was used to test the two-factor structure of the Grit-S in Study 2, while Study 3 validated an informant version of the Grit-S and established consensual validity. Test-retest stability was measured in Study 4, and further tests of the predictive validity of the Grit-S were conducted in Studies 5 and 6 in two novel samples of West Point cadets and National Spelling Bee finalists (Duckworth & Quinn, 2009). Duckworth and Quinn (2009) surmised the Grit-S to be a more efficient measure of grit with superior psychometric properties, comparable predictive validity, and fewer items relative to the Grit-O.

Evidence of research, malleability, and opposing views. Grit has been correlated with positive outcomes in some studies by Duckworth and colleagues. As first exemplified by Duckworth (2006), grit was hypothesized to predict success over and beyond self-discipline and IQ in challenging settings. Five studies were presented in that publication (Duckworth, 2006) and expanded upon in a subsequent article (Duckworth et al., 2007) overall “grit predicted educational attainment among adults, GPA among undergraduates and adolescents, retention GPA at West Point, and ranking in the National Spelling Bee” (Duckworth, 2006, p. 71). Study 1 involved a large sample of adults aged 25 years or older and as predicted, more educated adults were higher in grit than were less educated adults of equal age (Duckworth et al., 2007). The researchers interpreted the “observed association between grit and education as evidence that sticking with long-range goals over time makes possible completion of high levels of education” (Duckworth et al., 2007, p. 1092). A second study with participants aged 25 years or older related grit to the Big Five traits of conscientiousness, agreeableness, extraversion, and openness to experience. The researchers also reported that individuals who were a standard deviation higher in grit than average were 35% less likely to be frequent career changers (Duckworth et al., 2007).

“Study 3 tested whether grit was associated with cumulative GPA among undergraduates at an elite university” (Duckworth et al., 2007, p. 1093). University of Pennsylvania students majoring in psychology were the participants in the study of undergraduates in which the researchers found grit scores associated with higher GPAs, “a relationship that was even stronger when SAT scores were held constant” (Duckworth et al., 2007, p. 1093). “Paradoxically, the students with higher grit scores tended to have

higher GPAs but lower SAT scores than their less gritty peers. This finding suggests that what students lack in tested achievement they can make up for in grit” (Gutman & Schoon, 2013, p. 18). Additionally, study results are consistent with the suggestion by Moutafi, Furnham, and Paltiel (2005) that among relatively intelligent individuals, those who are less bright than their peers compensate by working harder and with more determination.

The major purpose of Study 4 by Duckworth (2006) was to examine whether grit predicted retention in a challenging environment, the United States Military Academy (West Point). “Grit predicted completion of the rigorous summer training program better than any other predictor” (Duckworth, 2006, p. 96). While in contrast, grit was not the best predictor of cumulative first-year academic and military GPA as self-discipline was a slightly superior predictor. Duckworth (2006) surmised that such findings supported Galton’s (1892) contention that there is a qualitative difference between easy and hard goals, and speculated that grit may be more important to sticking to goals when there is an option to drop out, while self-discipline may be more essential in a relatively structured setting where tasks are manageable, such as the classroom.

As part of Duckworth’s (2006) publication, Study 5 was set to test a hypothesis about the mechanism of grit. Duckworth (2006) was curious about the importance of grit to exceptional extracurricular accomplishment and conducted a longitudinal investigation involving finalists in the Scripps National Spelling Bee. Overall, Duckworth et al. (2007) suggested, “that gritty children work harder and longer than their less gritty peers and, as a consequence, perform better” (p. 1098). Grit predicted advancement to higher rounds in the competition, performance in the final round, and gritty finalists outperformed their

less gritty peers at least in part because they studied longer. “Specifically, weekend hours of practice mediated the relationship between grit and final round” (Duckworth et al., 2007, p. 1097). Thus, the study’s results supported Duckworth’s (2006) assertion that grit is a powerful predictor of achievements that demand sustained effort and focused interest over time.

Grit, as a personality trait predictive of success over and above intelligence (Duckworth et al., 2007; Duckworth & Seligman, 2005; Moffitt et al., 2011), and self-control “are often used interchangeably by laypeople and scientists alike” (Duckworth & Gross, 2014), yet while they are related they remain separable determinants of success with overlap in key psychological processes. Researchers Duckworth & Gross (2014) employed a hierarchical goal framework to highlight the similarities and differences and give an integrative framework for understanding the requirements for success. In that “highly effortful, focused practice is a necessary means to improving skill, then it may be that grit predicts high achievement by inclining individuals to both show up and work very hard, continuously, toward a highly-valued goal for years” (Duckworth & Gross, 2014, p. 7). While the capacity to exercise self-control is essential to everyday success, grit is associated with lifetime attainment goals (Duckworth & Quinn, 2009; Duckworth et al., 2007), educational and professional success (Duckworth, Kirby, Tsukayama, Berstein, & Ericsson, 2011; Duckworth, Quinn, & Seligman, 2009; Duckworth, Quinn, & Tsukayama, 2012; Eskreis-Winkler, Shulman, Beal, & Duckworth, 2014; Robertson-Kraft & Duckworth, 2014; West et al., 2015; Yeager et al., 2014;), and additional positive life outcomes (Duckworth & Gross, 2014; Eskreis-Winkler, Gross, & Duckworth, In Press; Von Culin, Tsukayama, & Duckworth, 2014).

Researchers Eskreis-Winkler et al. (2014) examined the association between grit and other individual difference variables, and retention in four life domains: the military, workplace sales, high school, and marriage. Using longitudinal designs, the researchers assessed the extent to which grit and other variables prospectively predicted program completion among soldiers in Army Special Operations Forces (ARSOF) course selection, job retention among sales representatives, and on-time graduation among juniors in the Chicago public high schools. A fourth cross-sectional study assessed the association between grit, Big Five personality traits, and marital status. In each study, it was estimated that variance in retention would be explained by grit.

Participants in the first study were members of four consecutive cohorts admitted to ARSOF selection courses. Grit was assessed with the eight-item Short Grit Scale. Fifty-eight percent of the candidates successfully completed the courses, with analysis showing that grit was not correlated with either general intelligence or physical fitness of successful participants. “Because grit was independent of both general intelligence and physical fitness, it was not surprising that in full model controlling for general intelligence, physical fitness, age and years of schooling, the effect of grit remained significant” (Eskreis-Winkler et al., 2014, p. 3). While the army’s traditional predictors of retention have been general intelligence and physical fitness, overall the results indicated that gritty individuals were most likely to complete the 24-day ARSOF selection course successfully.

A second study included in the investigation by Eskreis-Winkler et al. (2014) examined retention in sales jobs, an area prior studies have found retention to be predicted by Big Five traits and age. The predictive validity of grit for retention in sales

was measured along with personality traits while controlling for age. Results found among personality variables that only grit predicted retention and when controlling for conscientiousness and all demographic variables, the effect of grit remained significant. “Candidates one standard deviation higher in grit had 40% higher odds of workplace retention” (Eskreis-Winkler et al., 2014, p. 4).

Another life context examined by Eskreis-Winkler et al. (2014) was high school graduation and whether students’ grit, measured junior year, was a predictor of high school completion. Participants were high school juniors in 98 Chicago Public Schools in an analysis that controlled for established demographic, situational, and individual difference variables. The results of the study indicated grit to be strongly correlated with both academic conscientiousness and school motivation. Additionally, high school graduation was predicted by grit and in a binary logistic regression model that controlled for all measured individual difference variables and situational variables, as well as standardized achievement test scores and demographic covariates, “grit remained a significant predictor of graduation. Students one standard deviation higher in grit their junior year had 21% higher odds of graduating from high school on time” (Eskreis-Winkler et al., 2014, p. 6). Again, overall results indicated that gritty individuals were more likely to be successful, and the effect of grit on retention held even when controlling for other variables.

In a fourth study included in their investigation on the grit effect, Eskreis-Winkler et al. (2014) examined the association between grit and the likelihood of remaining married. Participants completed the eight-item Short Grit Scale and the Big Five Inventory, as researchers were interested in also analyzing the overall association

between grit, personality traits, marital status, and gender. Eskreis-Winkler et al. (2014) reported grit to be strongly associated with Big Five conscientiousness and moderately with the other Big Five subscales. The grit scores of males were not significantly different from the grit scores of females. In contrast to other studies, “grit was not a significant predictor of retention in the bivariate model, it is unsurprising that in the full model, grit was not associated with marital status” (Eskreis-Winkler et al., 2014, p. 8). However, in a test to determine whether the relationship between grit and remaining married varied by gender, the researchers found a significant interaction between gender and grit. “Grit was associated with 17% increased odds of remaining married among men, but was not associated with greater odds of remaining married among women (Eskreis-Winkler et al., 2014, p. 8). The effect of grit on marital status among men held when controlling for other variables.

In general, the four studies conducted by Eskreis-Winkler et al. (2014) demonstrated the correlational nature between grit and retention within educational and professional success and positive life outcomes. Robertson-Kraft & Duckworth (2014) also examined the correlation between grit and effectiveness and retention among novice teachers. Within the hiring process, districts do not typically collect information on personal qualities, yet the researchers used biographical data on grit to explain variance in teachers’ effectiveness and retention. With two longitudinal samples of novice teachers assigned to low-income districts, Robertson-Kraft & Duckworth (2014) reported:

teachers in their first and second year in the classroom who had demonstrated higher levels of grit in their pursuits prior to entering teaching were more likely to

remain in the classroom for the school year and, among those who stayed, to make academic gains with their students. (p. 17)

As the researchers concluded, it would seem “logical that grit would positively impact teacher performance and persistence” (Robertson-Kraft & Duckworth, 2014, p. 22). A conclusion consistent with an earlier study by Duckworth, Quinn and Seligman (2009) that reported first and second-year Teach For America teachers one standard deviation higher in grit were 31% more likely to outperform their less gritty peers (as measured by the academic gains of students). Results from both studies suggest that grit may be a proximal contributor to teacher effectiveness (Duckworth et al., 2009).

Additional studies have also positively correlated grit with positive affect, happiness, and life satisfaction (Singh & Jha, 2008; Von Culin, Tsukayama, & Duckworth, 2014) in adult participants. With happiness described as a multi-faceted construct comprised of pleasure, engagement, and meaning, Von Culin et al. (2014) hypothesized “grittier individuals would pursue happiness primarily through engagement and meaning rather than through pleasure” (p. 3). The researchers also expected the effort facet of grit to be most strongly associated with the pursuit of engagement. Across two different participant groups, with Study 1 having included 15,874 adults and Study 2 including 317 adults, Von Culin et al. (2014) found “grittier individuals were more likely than less gritty individuals to seek happiness through engagement, with medium-sized effects in both samples” (p. 5). Small to medium associations were found between grit and the pursuit of meaning and, notably, those who seek pleasure in life were less gritty than were their peers. Von Culin et al. (2014) surmised an orientation toward engagement might promote grit whereas an orientation toward pleasure may impede grit,

findings which echoed Singh and Jha's (2008) earlier research that found significant correlations of grit with happiness, positive affect, and life satisfaction.

Grit and other non-cognitive skills are positively correlated with the attendance, behavior, and test-score gains of students as well (West et al., 2015). In this study, West et al. (2015) measured non-cognitive skills along various dimensions and probed levels of conscientiousness, self-control, grit, and growth mindset in 1,368 8th grade students attending Boston public schools. West et al. (2015) stated specifically in examining the relationship between the non-cognitive measures and residualized test-score gains.....confirms that each of the four (conscientiousness, self-control, grit, growth mindset) non-cognitive measures is positively correlated with test-score gains in both math and ELA; all but one (self-control) of these correlations are statistically significant. (p. 14)

However, West et al. (2015) met with paradoxical results as the same non-cognitive measures were unrelated to test-score gains at the overall school level. The researchers provided suggestive evidence that the school-level results were driven by reference bias and did raise a question about the practice of assessing non-cognitive skills based on instruments that rely on student self-reports.

While the studies presented have examined the association between grit, grades, and academic performance, an additional study has found positive correlations between grit and the use of learning strategies (Duckworth, Kirby, Tsukayama, Berstein, & Ericsson, 2011). In a longitudinal study, Duckworth et al. (2011) use the expert performance framework to understand how children improve in academic skill. "Specifically, the authors examined the effectiveness and subjective experience of three

preparation activities widely recommended to improve spelling skill” (Duckworth et al., 2011, p. 174). Deliberate practice, defined as memorizing and studying words while alone, better predicted performance in the Scripps National Spelling Bee than other methods of study. While deliberate practice was rated the most effortful and least enjoyable type of preparation activity, grittier spellers were found to have performed better “suggesting that perseverance and passion for long-term goals enables spellers to persist with practice activities that are less intrinsically rewarding- but more effective- than other types of preparation” (Duckworth et al., 2011, p. 174). The opportunity for deliberate practice of academic skills has the potential to increase performance, as Duckworth’s et al. (2011) suggests, “teachers should distinguish between more and less effective academic preparation activities” (p. 179). As a cautionary note, the researchers also suggest that less gritty students, as those less likely to sustain long periods of deliberate practice, might also benefit from learning self-regulatory strategies.

Authors Gutman and Schoon (2013) noted in a literature review “there are no experimental studies investigating whether it is possible to improve one’s grittiness” (p. 19) and, subsequently, “there are no experimental studies which have improved grit and then examined the effect of this increased grittiness on subsequent outcomes” (p. 19). However, grit, as a concept designed to be consistent across both time and context and as an inherent personality trait, is not immutable (Duckworth, 2015). “While there is enough stability to traits to sensibly describe one individual as grittier than another, it is also true that children and adults change their habitual patterns of interacting with the world as they accumulate additional life experience” (Duckworth, 2015, para. 19). According to Duckworth (2015), her lab has begun to address the foundational question,

“What inclines an individual to be gritty?” (para. 10), as they utilize an expectancy-value framework to identify developmental antecedents and mechanisms to both grit and self-control. The expectancy-value lens views goal commitment to be a function of perceived benefits, costs, and the likelihood of realization. As Duckworth (2015) and her students investigate each of these potential antecedents to grit, support is found in the association with success marker of deliberate practice (Duckworth et al., 2010) and Dweck’s (2006) research and concept of a growth mindset. As stated by Duckworth & Eskreis-Winkler (2013),

At present, we are investigating the link between grit and growth mindset, which is conceptually related to optimistic explanatory style but more specifically refers to the implicit belief that intelligence is malleable rather than fixed. In as yet unpublished cross-sectional studies of school-age children, we have found moderate, positive associates between grit and growth mindset, suggesting that growth mindset, like optimistic explanatory style, may contribute to the tendency to sustain effort toward and commitment to goals. (para. 13)

Duckworth & Eskreis-Winkler (2013) continued to acknowledge the accumulated body of correlational and experimental evidence by Dweck as a promising direction for future research in “directly measuring the impact of directing attention to specific, changeable aspects of performance on trait-level grit” (para. 13).

Duckworth (2015) and her students have undertaken research in the area of intentional change, “the correction of maladaptive, incorrect beliefs about skill development and achievement” (para. 20). The intervention work Duckworth (2015) is engaging in with classroom teachers focuses on teaching students about the sort of

practice experts do to improve. The future directions of Duckworth's (2015) research on grit also included online and interactive lessons on the misattribution of achievement to talent because the hours of hard practice is often hidden from others and the emotions of confusion and frustration are typical and essential to learning.

Eskreis-Winkler (2015), a researcher with the Duckworth Lab at the University of Pennsylvania, hypothesized that wise interventions could motivate non-experts to engage in deliberate practice and improve their achievement. As one of the identified antecedents to deliberate practice, grit had previously been examined in expert, high achieving populations as examined in a study of National Spelling Bee finalists (Duckworth et al., 2011). Across four longitudinal, randomized-controlled field experiments, Eskreis-Winkler (2015, unpublished dissertation) found

among lower-achievers, wise deliberate practice interventions improved math performance for fifth and sixth graders (Study 1), end-of-semester grades for undergraduates (Study 2), end-of-quarter grades for sixth graders (Study 3), and trended towards having the same effect on end-of-quarter grades for seventh graders (Study 4). (p. 2)

Collectively, the results of a novel grit-building intervention suggest it is a malleable construct, which can be encouraged via intervention (Eskreis-Winkler, 2015).

Eskreis-Winkler (2015) developed a novel, objective task measure of deliberate practice as it was assumed average middle school students would not be able to distinguish reliably between deliberate practice and less effective forms of practice. The preliminary study also "established the importance of deliberate practice to middle school achievement and uncovered associations between expectancy-value beliefs...and

deliberate practice” (p. 18). In Study 1, a brief, wise intervention was developed and administered to fifth and sixth graders, and approximately one week later, Eskreis-Winkler (2015) evaluated whether the intervention improved math achievement. The results of the analysis “revealed the effect of treatment was significantly positive among lower-performing students... and significantly negative among high-performing students” (p. 23). The researcher believed this was due to the lack of challenge presented by the math content for high-performers, and the intervention appears to have discouraged them from working on problems that were too easy for them. Similar results were reported when a similar intervention was administered to undergraduates in Study 2 with GPA as an achievement measure, findings that may suggest directions for future research.

In Studies 3 and 4, the researcher examined the psychological and behavioral processes the intervention activated. The intervention in both studies was expanded and included lessons on how deep interests develop and how they might promote achievement. In Study 3, beliefs and behaviors of sixth grade participants were assessed one month later. The intervention delivered improved practice-specific expectancies and values, deliberate practice behavior, and fourth quarter achievement (GPA) among lower-performing students (Eskreis-Winkler, 2015). Study 4 aimed to replicate the findings of Study 3, but with seventh grade participants and a follow-up of four months. While a “similar pattern of results emerged” (p. 40) with the strongest effects confined to the lowest-performing students in a one-week follow-up, the effects were not evident four months later.

Eskreis-Winkler (2015) concluded grit is a construct that can be built upon “from brief, motivational, deliberate practice interventions” (p. 47) and wrote of the importance of interventions anchored in psychological theory. Researchers Alan, Boneva, and Ertac (2015) also published a paper detailing results from a large-scale randomized educational intervention similar in nature to Eskreis-Winkler (2015).

Alan et al.’s (2015) study also aimed to enhance grit in the classroom environment. Having conducted the study in elementary schools in Istanbul, Alan et al. (2015) provided evidence that grit “is malleable in the childhood period and can be fostered through targeted education in the classroom environment” (p. 3). Materials used for intervention included animated videos, mini case studies, and classroom activities that highlighted four domains based on psychological theory: i) the plasticity of the human brain, ii) the role of effort in enhancing skills and achieving goals, iii) the importance of constructive interpretation of failure, and iv) the importance of goal setting. Additionally, the program aimed “to change the students’ beliefs about the importance of effort partly by changing the mindset of the teachers and the nature of the classroom environment” (pp. 3-4).

Results reported in the study included positive effects of the interventions regarding behavior and outcomes. In a follow-up exactly one week later, the researchers found treated students were more likely to opt for difficult high-reward tasks when offered a choice of an easier alternative, and when they received negative feedback in the difficult task, students in the treatment group were more likely than those in the control group to persevere and attempt the difficult task again (Alan et al., 2015). The findings also suggested that treated students would be more likely to engage in ability

accumulation exercises across the weeks and results of the questionnaires hinted at more positive “beliefs about the malleability of ability and the productivity of effort” (Alan et al., 2015, p. 5). This first intervention provided causal evidence grit could be improved in the short-term through targeted education (Alan et al., 2015).

When considering opposing evidence to the research on grit, it is important to be able to separate the research from the narratives on grit permeating through educational literature and publications. Headden and McKay (2015) highlighted the backlash from critics “while there may be a clear connection between grit and achievement at, say, military school, the correlation is far less apparent in creative work” (p. 14). Sparks (2014) reported on unpublished research studies led by Grohman. In two separate analyses of college undergraduates, Grohman compared students’ ratings on grit with academic and extracurricular records, including achievement in visual art, writing, performance art, and scientific ingenuity. Results found that neither grit nor the related factors of consistency and perseverance predicted a student’s success in creative achievement. Headden and McKay (2015) cite Grohman’s presentation to the American Psychological Association as stating “grit taps into highly effective learning in a very structured environment, but not necessarily in someone who thrives on different interests” (p. 14). In the debate on the importance of talent and practice, grit may not do much to boost creative achievements as it does academic (Sparks, 2014).

Ivcevic and Brackett (2014a) examined the validity of grit, conscientiousness, and emotion regulation ability (ERA) as predictors of school outcomes. The three constructs, along with indicators of school success obtained from school records, were measured in a sample of private high school students. “Regression analyses showed that after

controlling for other Big Five traits, all school outcomes were significantly predicted by conscientiousness and ERA, but not grit” (p. 29). Ivcevic and Brackett (2014a) note in their discussion that as schools work to increase student success and search for programs aimed to enhance traits which may foster success, their results point “educators to the importance of the broad trait of conscientiousness instead of the lower-level trait of grit” (p. 33).

In an additional study, Ivcevic and Brackett (2015) “addressed two questions about the relationship between emotion regulation ability and creativity” (p. 482). The researchers explored under what circumstances emotion regulation ability is associated with creativity and the mechanism by which it might influence artistic interests. Results showed the relationship between emotion regulation ability and creativity as “mediated by passion for one’s interests and persistence in the face of obstacles” (p. 484), yet the researchers make a direct contrast between the findings and any connection that might be made to grit. As the study included teacher’s ratings of students’ level of passion and persistence in creative works, Ivcevic and Brackett (2015) stated specifically, “The combination of passion and persistence as assessed by teacher ratings in the present study is reminiscent, but distinct from research on grit” (p. 485). The discussion continued, “Grit is not defined in terms of emotional intensity of engagement” (p. 485) and only encompasses one’s stamina for interests. The case was made that the passion and engagement correlated with creativity is conceptually different from grit. The aforementioned unpublished research from Grohman (Sparks, 2014) and Ivcevic and Brackett (2014b) each demonstrated nonsignificant correlations between grit and creativity.

More broadly, some critical scholars purport the emphasis on grit as a determinant of success “essentially blames the students for shortcomings that are more appropriately the responsibility of schools and society” (Headden & McCay, 2015, p. 14). In a presentation on how student culture and learning are connected, Howard (2015) cautioned that advocates of grit make a fundamental error in interests in interventions tied to the concepts of grit and perseverance. According to Howard (2015), grit research and its educational application are dependent on attribution theory (Weiner, 1980, 1986) and “overestimate the power of the person and underestimate the power of the situation” (Howard, 2015, slide 4). Interventions and methods for fostering non-cognitive traits, such as grit and perseverance, do not account for many students’ exposures to trauma and the profound impact trauma has on cognitive development and academic outcomes (Howard, 2015; Sultan, 2015). Howard (2015) in a presentation to the Education Writers Association questioned instruments and surveys used to measure grit, as factors of trauma are not taken into account and suggest poor students and students of color do not have as high a degree of grit as middle-class and white peers. The transformative effects of interventions related to grit may not apply to disadvantaged students, a caution echoed by education researcher Socol (2013, 2014), education writer Kohn (2014), and economists Mullainathan & Shafir (2013).

In a literature review, Gutman & Schoon (2013) purpose the lack of causal evidence linking grit to positive outcomes and little evidence of grit’s stability as a character trait across multiple time points in a person’s life limit the ability to generalize grit to broader populations. The authors caution the targeting of grit as a possible factor for interventions is not backed by adequate experimental evidence aside from success by

“exceptional individuals” (Gutman & Schoon, 2013, p. 19) and is counterintuitive to evidence that students’ persistence at tasks changes over time and is influenced by situational context. The included opponents and critics of grit have each suggested emphasis has been misplaced on a lower-level personality trait that values specialization over wider experiences.

Summary

In summary, this review highlighted the history and impact of three major educational reforms movements. An overview of the literature related to the academic achievement of students, with a focus on the achievement gap and indicators that place students at risk for academic failure including poverty, race, and English language learners, was also reviewed. Additionally, a synthesis of research focused on non-cognitive skills, specifically perseverance, self-control, and resiliency, and their relationship to academic performance was presented. Lastly, the development of the non-cognitive construct of grit and related literature exploring individuals’ level of grit and academic performance was investigated. Chapter 3 will cover in detail the methodology used to conduct this research study.

Chapter Three

Methods

The purpose of this study was to examine relationships between middle school students' self-reported levels of the non-cognitive construct of grit and their growth on standardized achievement tests. The relationship between their self-reported level of grit and their GPA was also examined. The effects gender, ethnicity, and student first language on the relationships between grit, growth on standardized achievement tests, and GPA were also explored. In this chapter, the methodology used to conduct this research study is detailed, including a description of the research design, population and sampling procedures. The instrumentation, measurement, validity and reliability, data collection procedures, and methods of data analysis are also described. Limitations of the study are outlined, and a summary concludes chapter three.

Research Design

The design of this study was quantitative and correlational. According to Creswell (2009), a quantitative research design best addresses the problem by identifying the factors or variables that influence an outcome. The TerraNova total score combines three student performance scores, standardized achievement in reading, language, and mathematics. The first dependent variable was the difference in TerraNova total scores from fall to spring reported as growth in overall standardized achievement. Overall GPA was the second dependent variable in the study. Independent variables include students' Grit Scores, self-reported gender, ethnicity/race, and student first language.

Population and Sample

Lunenburg and Irby (2008) stated, “The target population is the group of interest to the research, the group to which you would like the results of the study to be generalizable” (p. 167). The population for this study was comprised of 6-8th grade students residing in Kansas City, Missouri. The sample included only those attending Urban Community Charter School for the entire 2013-2014 school year.

Sampling Procedures

Purposive sampling is used when the sample is chosen “based on the researcher’s experience or knowledge of the group sampled” (Lunenburg & Irby, 2008, p. 175). Students in this study’s sample had to have participated in both TerraNova testing windows (August 2013 and May 2014). Students who transferred either in or out of the school during the 2013-2014 school year were excluded from participation in the study. Criteria for students’ selection for inclusion in the sample also required that they had answered all survey questions on the 8-item Grit Scale.

Instrumentation

The first instrument used was the TerraNova Third Edition (3) Common Core Form 1: a normative assessment, national achievement test aligned to the Common Core State Standards (CCSS) in reading, language, and mathematics for students in grades 3-8 (CTB/McGraw-Hill, 2008a). The assessment is delivered in a paper and pencil format with each subject area divided into strictly timed sessions for a total testing time of 3 hours, 50 minutes. In each subject area, students are required to answer selected response (SR) or multiple-choice, constructed response (CR), and extended constructed response items. The SR or multiple-choice items present the students with a question followed by

four response options. A CR item requires a student to provide the correct single-response answer while extended constructed response items may have more than one approach to providing the correct answer and often require a student to explain their thinking. Following completion of the test, student booklets are shipped to CTB/McGraw-Hill where they are both machine and hand scored (CTB/McGraw-Hill, 2008a).

The TerraNova Third Edition (3) Common Core Form 1 was administered to students in grades 6-8 in the study sample in August of 2013. The same assessment was administered to the study sample in May of 2014. CTB/McGraw-Hill uses students' correct answers to derive norm-referenced scores in reading, language, and mathematics. "Norm referenced scores describe individual student performance relative to the performance of a large, nationally representative group of students" (CTB/McGraw-Hill, 2008a, p. 16). Among the norm-referenced scores is a scale score, which is reported as a national percentile, a normal curve equivalent, stanines, a grade equivalent, and an object mastery scores for each subject area. For this research, student performance was reported from individual's total score. The total score is an average of the individuals' reading, language, and mathematics scale scores.

Duckworth (2007) developed the second instrument utilized in this study, the 8-Item Grit Scale Child Adaptive 4 (see Appendix B). Using a 5-point Likert-type scale, respondents rate the 8 statements in the survey as either: "5 = *Very much like me*; 4 = *Mostly like me*; 3 = *Somewhat like me*; 2 = *Not much like me*; or, 1 = *Not like me at all*" (Duckworth, 2007). There is a two-factor structure to the survey items in which Consistency of Interest and Perseverance of Effort (John & Srivastava, 1999), facets of

the Big Five personality traits, are strongly intercorrelated (Duckworth & Quinn, 2009, p. 172). Questions 1, 3, 5, and 6 ask about the consistency of interest over time (e.g., “New ideas and projects sometimes distract me from previous ones,” “I often set a goal but later choose to pursue (follow) a different one”). While questions 2, 4, 7, and 8 tap into the ability to sustain (perseverance) effort (“Setbacks (delays and obstacles) don’t discourage me. I bounce back from disappointments faster than most people,” “I am a hard worker”) (Duckworth, 2007). Individuals self-rate and score the eight items using a Likert-type scale with assigned point values.

The third instrument used in the current study was individual student GPAs. Student grade point averages at Urban Community Charter School are figured on a standard 4.0 scale. Teachers’ electronic grade books are maintained within the school’s student information and data system, Infinite Campus. The information system houses individual teachers’ electronic grade books, reports final course grades, and configures overall GPA using a simple calculation formula- dividing the total grade point values by the number of courses completed.

Measurement. The difference between an individual student’s TerraNova total score, the average of the scale scores for reading, language, and mathematics, from testing performance in August of 2013 and May of 2014 was calculated to determine overall growth on the TerraNova assessment for the study participants. This measure of growth guided the inquiry into the relationship between the variables in research question numbers 1-4. A second variable measured for research questions 1-4 was student self-reported Grit scores, reported on a scale of 1-5. The Grit survey followed reverse coding to score responses to four of the eight questions. For questions 2, 4, 7, and 8, the point

values follow 5 = very much like me, 4 = mostly like me, 3 = somewhat like me, 2 = not much like me, and 1 = not like me at all. For questions 1, 3, 5, and 6, the values are reversed, and points are assigned as 1 = very much like me, 2 = mostly like me, 3 = somewhat like me, 4 = not much like me, and 5 = not like me at all. Final grit scores are calculated by adding up all the points and dividing by 8. “The maximum score on this scale is 5 (extremely gritty), and the lowest score on this scale is 1 (not at all gritty)” (Duckworth, 2007, p.2).

For research questions 5-8, overall grade point average (GPA) as calculated by Infinite Campus for all study participants for the 2013-2014 school year were reported. A simple formula was used to compute grade point averages as an A is awarded 4 points, a B = 3 points, a C = 2 points, a D = 1 point, and F = 0 points. The points are added together and divided by the number of classes taken, resulting in a final GPA. Self-reported Grit scores were again a second variable measured for these research questions.

Demographic measures were also included as variables in research questions 2, 3, 4, 6, 7, and 8. For questions 2 and 6, student gender (male, female) was determined as it had been recorded in Urban Community Charter School’s student information system. Race, also recorded within the student information system Infinite Campus, was recorded as African-American, Hispanic/Latino, White, or Asian for research questions 3 and 7. Research questions 4 and 8 included a variable for student first language. This demographic measure was reported from each participant’s Home Language Survey (Urban Community Charter School, 2013a). Parents and/or guardians self-report their student’s first language. In this study, the measure was reported as “English” or if they reported a first language other than English, it was recorded as “non-English.”

Validity and reliability. CTB/McGraw-Hill provides comprehensive documentation of the TerraNova tests' validity and reliability. A technical report of more than 600 pages (CTB/McGraw-Hill, 2001), a teacher's guide (CTB/McGraw-Hill, 2012) and report options that include "linking studies coupled with state-specific performance reporting (CTB/McGraw-Hill, 2008a, p. 13) each detail validity and reliability measures for the battery of TerraNova assessments. The internal consistency reliability coefficients in the technical report (CTB/McGraw-Hill, 2001) ranged from .77 to .90 for the sub-tests. Linking studies provide predictive validity coefficients ranging from adequate (.67) to strong (.82) for overall predictive accuracy of the assessment as compared to state assessments in the Mid-Atlantic Region (Brown & Coughlin, 2007). As noted by Brown and Coughlin (2007),

The technical report exhaustively details the extensive test development, standardization, and validation procedures undertaken to ensure a credible, reliable, and valid assessment instrument. The teacher's guide details the assessment development procedure and provides information on assessment content, usage, and score interpretation for teachers. A linking study provided clear and convincing evidence of predictive validity for...predicting student performance. (p. 11)

A paper presented at the National Council on Measurement in Education in May of 2010, by Shu of CTB/McGraw-Hill and Schwarz of ETS, reported reliability for tests containing mixed item formats, such as that of the TerraNova, Third Edition. The approach they proposed was to "estimate reliability coefficients that assume either essentially tau-equivalent or congeneric test parts using IRT scaling models associated

with SR [selected response] and CR [constructed response] item formats” (p. 3). Linking studies (CTB/McGraw-Hill, 2001; 2002) provide predictive validity coefficients ranging from adequate (.67) to strong (.82) for overall predictive accuracy of the assessment as compared to state assessments in the Mid-Atlantic Region (Brown & Coughlin, 2007). Brown and Coughlin (2007) and other reports (CTB/McGraw-Hill, 2008b; Ferrara, Huff & Lopez, 2010; Kim, Barton, & Choi, 2010; Schneider, Hugg, Egan, Tully & Ferrara, 2010) quantify CTB/McGraw-Hill’s (2008a) assertions that “TerraNova tests have set the bar for the highest standards in research, item reliability and validity, and technical quality” (p. 24) and predict future performance on state No Child Left Behind (NCLB) tests.

While CTB has developed academic assessments for over 80 years, the Grit Scale (Grit-S) measures a much newer non-cognitive construct. Duckworth and Quinn (2009) undertook an investigation across six separate studies to validate an efficient measure of grit. In the article, Duckworth and Quinn (2009) “present[ed] evidence for the Grit-S’s internal consistency, test-retest stability, consensual validity with informant-report versions, and predictive validity” (p. 166). In Study 4, Duckworth and Quinn (2009) tested the ability of the Grit-S to predict school grades (GPA) in a population of high-achieving middle and high school students. Their research demonstrated that “among adolescents, the Grit-S longitudinally predicted GPA” (p. 166). Evidence was found that Grit-S was relatively stable over time with the correlation between scores on a 1-year test-retest at $r = .68$, $p < .001$ and “showed good internal consistency at both the 2006 and 2007 assessments, $\alpha = .82$ and $.84$, respectively” (p. 170). Additionally,

confirmatory factor analyses supported a two-factor structure of the self-report version of Grit-S in which Consistency of Interest and Perseverance of Effort each loaded on grit as a second order latent factor. Both factors showed adequate internal consistency and were strongly intercorrelated, $r = .59, p < .001$. (p. 172)

Duckworth and Quinn recommended the Grit-S, the 8-item scale only for children utilized in the present study, as an economical measure of perseverance and passion for long-term goals (p. 174).

Data Collection Procedures

Before beginning data collection, the researcher requested the consent of the Urban Community Charter School through the verbal submission of a proposal to conduct research to the Superintendent, Middle School Principal, and Testing Coordinator. In the meeting, all three administrators verbally approved the data collection process for the study and asked the students remain anonymous. An Institutional Review Board (IRB) request was submitted to Baker University (see Appendix C) and permission to conduct the study was received on June 15, 2015 (see Appendix D). Data collection began upon approval.

Upon request, the Registrar and Test Administrator from Urban Community Charter School worked in tandem to assign random numbers to each 6th through 8th grade participant in the study and collate their demographic, achievement, and grit score data accordingly. Data on students' race, gender, and 2013-2014 GPA, were downloaded from Infinite Campus, Urban Community Charter School's student information system, and entered into an Excel spreadsheet. The Registrar consulted each subject's school application for a "Home Language Survey," where families self-identify their students'

first language, and entered it into the data set in Excel. The Test Administrator entered each subject's total scores on the TerraNova Third Edition Common Core Form 1 from the August 2013 and the May 2014 test dates into the dataset and computed the individual achievement growth. The Test Administrator requested the individual Grit Surveys from the middle school homeroom teachers. The Test Administrator and Registrar worked in tandem to score the Grit Surveys while the other double-checked that inverse scoring was followed and then the data was added to the Excel spreadsheet. When the Excel spreadsheet was obtained, no subject names or individually identifiable aspects of the subjects were included. All data were uploaded into the IBM® SPSS ® Statistics Faculty Pack 23 for Windows by the researcher.

Data Analysis and Hypothesis Testing

Included in the section are research questions and hypotheses statements developed to guide this study. Additionally, the corresponding data analysis follows each hypothesis.

RQ1. To what extent is there a relationship between students' grit scores and students' growth on the TerraNova assessment?

HI. There is a statistically significant relationship between students' grit scores and students' growth on the TerraNova assessment.

A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between the variables in RQ1. A one-sample *t* test was conducted to test for the statistical significance of the correlation coefficient of the relationship between students' grit and students' growth on the TerraNova assessment. The level of significance was set at .05.

RQ2. To what extent is the relationship between students' grit scores and students' growth on the TerraNova assessment affected by student gender?

H2. The relationship between students' grit scores and students' growth on the TerraNova assessment is affected by student gender.

Before conducting the RQ2 hypothesis test using the Fisher's z test for two correlations to test H2, the data was disaggregated by gender. A correlation coefficient was calculated for male students to assess the strength and direction of the relationship. A second correlation coefficient was calculated for female students to assess the strength and direction of that relationship. The two sample correlations were compared. The level of significance was set at .05.

RQ3. To what extent is the relationship between students' grit scores and students' growth on the TerraNova assessment affected by student race?

H3. The relationship between students' grit scores and students' growth on the TerraNova Assessment is affected by student race.

Six Fisher's z tests were conducted to test H3. Before conducting the tests, data was disaggregated into four sub-samples by race: White, African-American, Hispanic/Latino, and Asian. A correlation coefficient was calculated for each sub-sample to index the strength and direction of the relationship between students' grit and students' growth on the TerraNova assessment. The level of significance was set at .05.

RQ4. To what extent is the relationship between students' grit scores and students' growth on the TerraNova assessment affected by student first language?

H4. The relationship between students' grit scores and students' growth on the TerraNova assessment is affected by student first language.

A Fisher's z test was conducted to test H4. Before conducting the test, the data was disaggregated by student first language. A correlation coefficient was calculated for each sub-sample to index the direction and relationship between the variables. The two sample correlations were compared. The level of significance was set at .05.

RQ5. To what extent is there a relationship between students' grit scores and students' GPA?

H5. There is a statistically significant relationship between students' grit scores and students' GPA.

A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship in RQ5. A one-sample t test was conducted to test for the statistical significance of the correlation coefficient. The level of significance was set at .05.

RQ6. To what extent is the relationship between students' grit scores and students' GPA affected by student gender?

H6. The relationship between students' grit scores and students' GPA is affected by student gender.

Before conducting the Fisher's z test for two correlations to test H6, the data was disaggregated by gender. A correlation coefficient was calculated for male students to assess the strength and direction of the relationships between students' grit scores, student GPA, and gender. A second correlation coefficient was calculated for female students to assess the strength and direction of the relationship between students' grit scores, students' GPA, and gender. The two sample correlations were compared. The level of significance was set at .05.

RQ7. To what extent is the relationship between students' grit scores and students' GPA affected by student race?

H7. The relationship between students' grit scores and students' GPA is affected by student race.

Six Fisher's z tests were conducted to test H7. Data was disaggregated into four sub-samples by race: White, African-American, Hispanic/Latino, and Asian. A correlation coefficient was calculated for each sub-sample to index the strength and the direction of the relationship between students' grit scores and students' growth on the TerraNova assessment. The level of significance was set at .05.

RQ8. To what extent is the relationship between students' grit scores and students' GPA affected by student first language?

H8. The relationship between students' grit scores and students' GPA is affected by student first language.

A Fisher's z test was conducted to test H8. Before conducting the test, the data was disaggregated by student first language. A correlation coefficient was calculated for each sub-sample to index the direction and relationship between the variables. The two sample correlations were compared. The level of significance was set at .05.

Limitations

Lunenburg and Irby (2008) described limitations as those things of which the researcher has no control. This researcher identified the following limitations to this study:

1. As gender and race were both variables in the study, neither demographic was represented in proportions reflective of KCMSD or the country as a whole;

therefore, results may not be generalizable beyond the specific population from which the sample was taken.

2. Home Language Surveys were completed by the parents/guardians of the student sample. As a self-report, some may have provided responses that were inaccurate. Study results were reported as either English or non-English and may not be generalizable to specific languages or dialects.
3. Students' completion of the Grit Scales was a self-report, and some may have provided replies that did not fully reflect an honest response. Examples include respondents answering positively to items in anticipation of future achievement, overly negative or overly positive responses to the personal nature of the questions, and possible misunderstandings of certain words or phrases.
4. There is no universal standard for calculating grade point average (GPA), and methods vary by institution. A simple calculation formula is followed at Urban Community Charter School. On a 4.0 scale, GPA is configured by dividing the total grade point values, where an A = 4 points, B = 3 points, C = 2 points, and a D = 1, by the number of courses completed. Institutions that calculate GPA weighted by credit hours for courses or other methods may not find results of the study generalizable.

Summary

Chapter three presented information and provided an overview of the quantitative research study. The research design was explained, population and sample, along with sampling procedures, were introduced. The TerraNova 3 Common Core Form 1 and 8-Item Grit Scale Child Adaptive 4 were explained in detail. The chapter included an

outline of data analysis and hypothesis testing, followed by the limitations identified in the study. Chapter four includes the results of the hypothesis testing and additional analyses.

Chapter Four

Results

The purpose of this quantitative study was to determine whether there was a relationship between 6-8th grade students' grit scores and their academic achievement, as measured by the change in the TerraNova score from fall to spring, and if that relationship was influenced by student gender, race, and student first language. Another purpose of this study was to determine whether there was a relationship between students' grit scores and student achievement, as measured by student grade point average (GPA), and if that relationship was influenced by student gender, race, and student first language. Included in this chapter is a presentation of the results of the quantitative data analysis used to address the eight research questions. Descriptive statistics were used to describe the sample while Pearson product moment correlation coefficient and Fisher's z tests were used to test the hypotheses. The IBM® SPSS® Statistics Faculty Pack 23 for Windows was used for data analyses.

Descriptive Statistics

Lunenburg and Irby (2008) defined descriptive statistics as the “mathematical procedures for organizing and summarizing numerical data” (p. 63). The population for this study was comprised of 6-8th grade students residing in Kansas City, Missouri. The sample included those attending Urban Community Charter School for the entire 2013-2014 school year. Of the 183 total participants, 61 were in the 6th grade, 64 in the 7th grade, and 58 were in the 8th grade. The sample included 102 females (55.7%) and 81 males (44.3%). Eighty-two students (44.8%) spoke English as their first language, and

101 students (55.2%) did not speak English as their first language. Table 1 shows descriptive statistics for the racial makeup of the student population.

Table 1

Student Race

Race	Frequency	Percentage
African-American	72	39.344
White	6	3.279
Hispanic/Latino	100	54.645
Asian	5	2.732
Total	183	100.000

Hypothesis Testing

The results of the hypothesis testing to address the eight research questions presented in the study are discussed in this section. Each research question is followed by a hypothesis. The method used to test each hypothesis is described along with the results.

RQ1. To what extent is there a relationship between students' grit scores and students' growth on the TerraNova assessment?

H1. There is a statistically significant relationship between students' grit scores and students' growth on the TerraNova assessment.

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

correlation coefficient ($r = -.046$) provided evidence for a very weak negative relationship between students' grit scores and students' growth on assessments. The results of the one sample t test indicated the correlation was not statistically significant, $df = 136$, $p = .596$. There is no relationship between the two variables.

RQ2. To what extent is the relationship between students' grit scores and students' growth on the TerraNova assessment affected by student gender?

H2. The relationship between students' grit scores and students' growth on the TerraNova assessment is affected by student gender.

Before conducting the Fisher's z test for two correlations to test H2, the data was disaggregated by gender. A correlation coefficient was calculated for male students to assess the strength and direction of the relationship between students' grit scores and students' growth on assessments ($r = -.064$, $p = .625$, $df = 59$). Although this correlation was negative, it indicated little or no relationship between the two variables. A correlation was calculated for female students to assess the strength and direction of the relationship between students' grit scores and students' growth on assessments ($r = .004$, $p = .970$, $df = 75$). Although this correlation was positive, it indicated little or no relationship between the two variables. The two sample correlations were compared. The level of significance was set at .05. The results of the Fisher's z test indicated no statistically significant difference between the two values, $z = -.39$, $p = .696$. The correlation for males was not different from the correlation for females.

RQ3. To what extent is the relationship between students' grit scores and students' growth on the TerraNova assessment affected by student race?

H3. The relationship between students' grit scores and students' growth on the TerraNova Assessment is affected by student race.

Before conducting the six Fisher's z tests for two correlations to test H3, the data was disaggregated into four sub-samples by race: African-American, White, Hispanic/Latino, and Asian. A correlation was calculated for African-American students to assess the strength and direction of the relationship between students' grit scores and students' growth on assessments ($r = -.049, p = .734, df = 50$). Although this correlation was negative, it indicated little or no relationship between the two variables. A correlation was calculated for White students to assess the strength and direction of the relationship between students' grit scores and students' growth on assessments ($r = .743, p = .153, df = 3$). This correlation was positive and indicated a strong relationship between the two variables. The sample correlations for African-American students and White students were compared. The level of significance was set at .05. The results of the Fisher's z test indicated a marginally significant difference between the two values, $z = -1.39, p = .165$. The correlation for African-American students was weaker than the correlation for White students.

A correlation was calculated for Hispanic/Latino students to assess the strength and direction of the relationship between students' grit scores and students' growth on assessments ($r = -.068, p = .550, df = 80$). Although this correlation was negative, it indicated little or no relationship between the two variables. The sample correlations for Hispanic/Latino students and African-American students were compared. The level of significance was set at .05. The results of the Fisher's z test indicated there was not a statistically significant difference between the two values, $z = .1, p = .920$. The

correlation for Hispanic/Latino students was not different from the correlation for African-American students. The sample correlations for Hispanic/Latino students and White students were compared. The level of significance was set at .05. The results of the Fisher's z test indicated a marginally significant difference between the two values, $z = 1.43, p = .153$. The correlation for Hispanic/Latino students was weaker than the correlation for White students.

A correlation was calculated for Asian students to assess the strength and direction of the relationship between students' grit scores and students' growth on assessments ($r = -.115, p = .927, df = 3$). Although this correlation was negative, it indicated little or no relationship between the two variables. The difference between the correlations between the Asian sub-sample and the African-American, White, or Hispanic/Latino sub-samples could not be evaluated because of the small size of the Asian sub-sample.

RQ4. To what extent is the relationship between students' grit scores and students' growth on the TerraNova assessment affected by student first language?

H4. The relationship between students' grit scores and students' growth on the TerraNova assessment is affected by student first language.

Before conducting the Fisher's z test for two correlations to test H4, the data was disaggregated by student first language. A correlation was calculated for students whose first language is English to assess the strength and direction of the relationship between students' grit scores and students' growth on assessments ($r = -.091, p = .425, df = 79$). Although this correlation was negative, it indicated little or no relationship between the two variables. A correlation was calculated for students whose first language is not

English to assess the strength and direction of the relationship between students' grit scores and students' growth on assessments ($r = .017, p = .901, df = 59$). Although this correlation was positive, it indicated little or no relationship between the two variables. The two sample correlations were compared. The level of significance was set at .05. The results of the Fisher's z test indicated no statistically significant difference between the two values, $z = -.61, p = .542$. The correlation for students whose first language is English was not different from the correlation for students whose first language is not English.

RQ5. To what extent is there a relationship between students' grit scores and students' GPA?

H5. There is a statistically significant relationship between students' grit scores and students' GPA.

A Pearson product moment correlation coefficient was calculated to index the strength and direction of the relationship between students' grit scores and GPA. A one-sample t test was conducted to test for the statistical significance of the correlation coefficient. The level of significance was set at .05. The correlation coefficient ($r = .036$) provided evidence for a very weak positive relationship between students' grit scores and GPA. The results of the one sample t test indicated the correlation was not statistically significant, $df = 139, p = .673$. There is no relationship between the two variables.

RQ6. To what extent is the relationship between students' grit scores and students' GPA affected by student gender?

H6. The relationship between students' grit scores and students' GPA is affected by student gender.

Before conducting the Fisher's z test for two correlations to test H6, the data was disaggregated by gender. A correlation was calculated for male students to assess the strength and direction of the relationship between students' grit scores and GPA ($r = -.003, p = .981, df = 62$). Although this correlation was negative, it indicated little or no relationship between the two variables. A correlation was calculated for female students to assess the strength and direction of the relationship between students' grit scores and GPA ($r = .076, p = .513, df = 77$). Although this correlation was positive, it indicated little or no relationship between the two variables. The two sample correlations were compared. The level of significance was set at .05. The results of the Fisher's z test indicated no statistically significant difference between the two values, $z = -.61, p = .653$. The correlation for males was not different from the correlation for females.

RQ7. To what extent is the relationship between students' grit scores and students' GPA affected by student race?

H7. The relationship between students' grit scores and students' GPA is affected by student race.

Before conducting the Fisher's z test for two correlations to test H7, the data was disaggregated into four sub-samples by race: African-American, White, Hispanic/Latino, and Asian. A correlation was calculated for African-American students to assess the strength and direction of the relationship between students' grit scores and GPA ($r = -.008, p = .957, df = 51$). This correlation was negative, and it indicated little or no relationship between the two variables. A correlation was calculated for White students

to assess the strength and direction of the relationship between students' grit scores and GPA ($r = -.862, p = .060, df = 5$). This correlation was negative and indicated a strong inverse relationship between the two variables. The sample correlations for African-American students and White students were compared. The level of significance was set at .05. The results of the Fisher's z test indicated a marginally significant difference between the two values, $z = 1.82, p = .069$. The correlation for African-American students was weaker than the correlation for White students.

A correlation was calculated for Hispanic/Latino students to assess the strength and direction of the relationship between students' grit scores and GPA ($r = .157, p = .163, df = 80$). Although this correlation was positive, it indicated little or no relationship between the two variables. The sample correlations for Hispanic/Latino students and African-American students were compared. The level of significance was set at .05. The results of the Fisher's z test indicated there was not a statistically significant difference between the two values, $z = -.90, p = .369$. The correlation for Hispanic/Latino students was not different from the correlation for African-American students. The sample correlations for Hispanic/Latino students and White students were compared. The level of significance was set at .05. The results of the Fisher's z test indicated a statistically significant difference between the two values, $z = -2.04, p = .041$. The correlation for Hispanic/Latino students was weaker than the correlation for White students.

A correlation was calculated for Asian students to assess the strength and direction of the relationship between students' grit scores and GPA ($r = .397, p = .740, df = 3$). This correlation was positive, and it indicated a moderately strong relationship between the two variables. The difference between the correlations between the Asian

sub-sample and African-Americans, Whites or Hispanic/Latino sub-samples could not be evaluated because of the small size of the Asian sub-sample.

RQ8. To what extent is the relationship between students' grit scores and students' GPA affected by student first language?

H8. The relationship between students' grit scores and students' GPA is affected by student first language.

Before conducting the Fisher's z test for two correlations to test H8, the data was disaggregated by student first language. A correlation was calculated for students whose first language was English to assess the strength and direction of the relationship between students' grit scores and GPA ($r = .204, p = .176, df = 79$). Although this correlation was positive, it indicated little or no relationship between the two variables. A correlation was calculated for students whose first language was not English to assess the strength and direction of the relationship between students' grit scores and GPA ($r = -.177, p = .176, df = 60$). Although this correlation was negative, it indicated little or no relationship between the two variables. The two sample correlations were compared. The level of significance was set at .05. The results of the Fisher's z test indicated a statistically significant difference between the two values, $z = 2.2, p = .028$. The correlation for students whose first language is English was different from the correlation for students whose first language is not English. For students whose first language is English the correlation was positive and for students whose first language is not English the correlation was negative.

Summary

The results of the study were presented in chapter four. Following the summarization of the descriptive statistics for the study sample, chapter four provided a description of the hypothesis testing results for each of the eight research questions. The results of the calculation of Pearson product moment correlation coefficients for hypotheses one and five were not statistically significant, and no relationship was found between the variables. The hypotheses test results for research questions two and six also provided evidence of little or no relationship as it relates to gender. The results of the analyses related to hypotheses three and seven indicated the relationships were affected by race. Students' grit scores and growth on assessments or GPA was not affected by identification with the African-American or Hispanic/Latino race. The correlation for White students was strong and indicated a relationship between the variables. The small sample size limited comparisons that involved the Asian sub-sample. The results of the Fisher's z tests used to test for differences between correlations for questions four and eight indicated or provided evidence the relationship between students' grit and growth on assessments was not affected by a students' first language; however, the correlation for students whose first language was English was different from the correlation for students whose first language was not English when the difference in the relationship between students' grit and GPA was assessed.

Chapter five includes the study summary including an overview of the problem, the purpose of the study, research questions, review of methodology, and major findings. Additionally, the findings related to the literature follow the study summary. The chapter

closes with, implications for action, recommendations for future research, and concluding remarks.

Chapter Five

Interpretation and Recommendations

The purpose of this study was to determine whether there was a relationship between 6-8th grade students' grit scores and their achievement, as measured by the change in the TerraNova score from fall to spring and overall GPA. An additional purpose was to determine if the relationships were affected by student gender, race, and first language. Chapter five contains a summary of the study including an overview of the problem, purpose statement and research questions, and a review of the methodology. The major findings of the study and how these findings are related to the literature are discussed. Finally, the chapter closes with implications for action, recommendations for further research, and concluding remarks.

Study Summary

The first section provides a brief summary of the current study. The summary contains an overview of the problem and explores the possibility that grit was a factor that increased success for Urban Community Charter School students. The next section includes the purpose of the study and the research questions. The summary concludes with a review of the methodology and the study's major findings.

Overview of the problem. Duckworth (2006, 2015), Duckworth et al. (2007), Duckworth & Quinn (2009), Duckworth & Gross (2014), and Eskreis-Winkler et al. (2014) have suggested through research results that grit may be as essential as IQ to high achievement, and she and her colleagues have developed a self-report questionnaire called the Short Grit Scale (Grit-S) to measure individual trait-level perseverance and passion for long-term goals. Although Urban Community Charter School utilizes

standardized measures to track student academic performance and achievement, no measures are administered to assess students' character development or the Community Values (Urban Community Charter School, 2013b, p. 6) program. Concrete measures of non-cognitive skills, such as grit through the Grit-S, could provide additional data to support the continued academic success of students and growth of the school. This study explores the possibility that grit, as a possibly malleable and teachable non-cognitive skill, is a factor that may increase success for Urban Community Charter School students.

Purpose statement and research questions. Eight research questions guided this study. The purpose of this study was to determine whether there was a relationship between 6-8th grade students' grit scores and their academic and student achievement, as measured by the change in the TerraNova score from fall to spring and overall GPA. This study also sought to determine if the relationships were affected by student gender, race, and student first language.

Review of the methodology. The design of this study was quantitative and correlational. The population for this study included 6-8th grade students in attendance for the entire 2013-2014 school year at Urban Community Charter School in Kansas City, Missouri. The sample included students who had completed the TerraNova Third Edition (3) Common Core Form 1 in August of 2013 and May of 2014 and answered all survey questions on the 8-item Grit Scale. Pearson product moment correlation coefficients and Fisher's z tests were calculated to determine the strength and direction of the relationship between the variables.

Major findings. Results related to the research questions revealed that students' grit scores did not appear to be related to students' growth on a standardized achievement

test. The relationship between students' grit scores and students' growth on assessments was negative, but very weak. Data was disaggregated by gender and results did not support a relationship between gender and students' grit scores and students' growth on assessments. The correlation for males was a weak negative and a weak positive for females. When the two sample correlations were compared, the correlation for males was not different from the correlation for females.

Race was also addressed as a variable that possibly affects the relationship between students' grit scores and students' growth on assessments. As data was disaggregated into four sub-samples, the correlation for African-American students indicated little or no relationship between the two variables. The correlation for White students was positive and indicated a strong relationship between the two variables. The correlation calculated for Hispanic/Latino students indicated little or no relationship between the students' grit scores and the students' growth on assessments. Overall, both the correlations for African-American students and the correlation for Hispanic/Latino students were weaker than the correlation for White students. The fourth sub-sample results provided evidence of little or no relationship between Asian students' grit scores and the students' growth on assessments. Differences in the correlations for the Asian sub-sample and the other three sub-samples could not be evaluated because of the small size of the Asian sub-sample.

Student first language was another variable included in the research questions for this study. Results indicated there was little or no relationship between the students whose first language was English and students whose first language was not English.

The correlation for students whose first language is English was not different from the correlation for students whose first language was not English.

Results also revealed that students' grit scores did not appear to be related to students' GPA. The correlation provided evidence of a very weak positive between grit scores and students' GPAs, yet it was not statistically significant. A hypothesis that addressed student gender as a variable that affected the relationship between students' grit scores and GPA also was not supported. The correlation for males was not different from the correlation for females.

The relationship between students' grit scores and students' GPA was hypothesized to be affected by student race. As data was disaggregated into four sub-samples, the correlation for African-American indicated little or no relationship between the variables. The correlation for White students was negative and indicated a strong inverse relationship between students' grit scores and GPA. For Hispanic/Latino students, the correlation was positive but indicated little or no relationship between the variables. Differences between the correlations for African-American and White students and Hispanic/Latino and White students both were marginally significant. The correlation for African-American and Hispanic/Latino students was weaker than the correlations for White students. The Asian sub-sample results indicated a moderately strong relationship between Asian students' grit scores and GPA.

The relationship between students' grit scores and students' growth on assessments, as well as the relationship between students' grit scores and GPA, were hypothesized to be affected by student first language. The relationship between students' grit scores and students' growth on assessments was not affected by student first

language. The relationship between students' grit scores and students' GPA was different for students whose first language is English and students whose first language is not English. For students whose first language is English, the relationship was positive and for students whose first language is not English the relationship was negative and weak.

Findings Related to the Literature

When connecting the findings of the current study with those in the literature and reviewed in chapter two, some similarities and differences were identified. The current study was designed to add to the body of scholarship detailing the relationship between achievement and character strengths, particularly the non-cognitive trait of grit. A discussion of the results guided by the research questions is compared.

Duckworth's (2006) initial research hypothesized grit to predict success over and beyond self-discipline and IQ in challenging settings. Five studies presented in that publication (Duckworth, 2006) and expanded upon in a subsequent article (Duckworth et al., 2007) concluded overall "grit predicted educational attainment among adults, GPA among undergraduates and adolescents, retention GPA at West Point, and ranking in the National Spelling Bee" (Duckworth, 2006, p. 71). The current study specifically sought to add to Duckworth's (2006), Duckworth et al. (2007), Duckworth & Quinn (2009), Eskreis-Winkler et al. (2014), and colleagues' West et al. (2015) results on the relationship between grit and achievement, and began by hypothesizing a relationship between urban middle school students' grit scores and two measures of academic achievement: students' growth on standardized assessments and students' GPA. The findings for the overall sample in the current study indicated little to no relationship

between these variables, a direct contrast to Duckworth et al.'s (2007) results among undergraduates at an elite university where "grit scores were associated with higher GPAs" (p. 1093). The results of the current study are also in contrast to West et al. (2015) evidence that measures of non-cognitive skills, including grit, "are positively correlated with achievement gains on standardized tests among a large and diverse sample of 8th grade students" (p. 24).

However, a paradox emerged when West et al. (2015) reported results at the school level, as the positive correlation between grit and test-score gains was not evident. Students in attendance at charter schools in the study made unusually large test score gains, yet reported lower average levels of grit than other district schools. "Longitudinal data from two of the charter schools indicate[d] marked declines" (p. 25) in non-cognitive skills over time. The background of Urban Community Charter School presented in chapter one, and the absence of a relationship between grit and achievement reported in chapter four are in support of West et al.'s (2015) explanation of paradoxical findings as a reflection of reference bias. "More specifically, students attending academically and behaviorally demanding charter schools may redefine upward their notion of what it means to demonstrate...grit - and thus rate themselves more critically" (p. 25).

While the correlations between students' grit scores and students' growth on assessments was a very weak negative and not statistically significant and the correlation between students' grit scores and GPA was a very weak positive and not statistically significant, a connection can be made to Duckworth et al.'s (2007) findings. Undergraduates surveyed by Duckworth et al. (2007) with higher grit scores tended to have higher GPAs, but lower SAT scores. Again, although the results of the current

study did not reach a level of statistical significance, there were weak correlations that reflect such findings that “suggest that what students lack in tested achievement they can make up for in grit” (Gutman & Schoon, 2013, p. 18).

The results of the current study did not support the hypotheses that stated gender would affect the relationships between students’ grit scores and the two measures of achievement. There was little to no relationship between the variables, which is consistent with Duckworth & Quinn’s (2009) findings across two separate studies that found “Grit-S scores did not differ significantly by gender” (p. 169) or “between genders” (p. 170).

When the current study sample was broken up by race into four sub-samples, African-American, White, Hispanic/Latino, and Asian, only the results for the White students was in agreement with Duckworth’s (2006), Duckworth et al. (2007), Duckworth & Quinn (2009), Eskreis-Winkler et al. (2014), and West et al.’s (2015) results, which overall found grit to be predictive of academic achievement. While the participants in the majority of the reported research are predominately white, middle-to-upper class, and high achievers, the demographic make-up of the sampled students from the public schools in Boston in the West et al. (2015) study most closely matched the diversity of the sample in the current study. West et al. (2015) had also found grit to be positively correlated with achievement gains on standardized tests among the large sample, and while the results were not disaggregated by race within that study, it is assumed the results for the African-American and Hispanic/Latino students in the current study were therefore in contrast with the West et al. (2015) findings.

The results of the African-American and Hispanic/Latino sub-samples found some agreement with opposing evidence to the research on grit. Critical scholars purport the emphasis on grit as a determinant of success and suggest poor students and students of color do not have as high a degree of grit as middle-class and white peers (Howard, 2015). Education researcher Socol (2013, 2014) and education writer Kohn (2014) caution the effects of grit may not apply to disadvantaged students and the targeting of grit as a possible factor related to success is only evidenced by “exceptional individuals” (Gutman & Schoon, 2013, p. 19).

The current study also broke up the overall sample into two sub-samples by student first language. The findings as they relate to student first language could not be directly compared to Duckworth’s (2006), Duckworth et al. (2007), Duckworth & Quinn (2009), Eskreis-Winkler et al. (2014), or West et al.’s (2015) results as they did not disaggregate results by this demographic. Few studies have attempted to establish a relationship between students’ whose first language is English, or whose first language is not English, and the students’ grit score and measures of achievement.

Conclusions

This section provides conclusions drawn from the current study on the relationship between student’s grit scores and two different measures of academic achievement. Implications for action and recommendation for further research are included. Concluding remarks complete this section.

Implications for action. The findings of this study have implications for the students, teachers, and administrators at Urban Community Charter School. The results of this study should assist school leaders in making informed decisions about the

Community Values and current character education programming at the school. The results of the study should also inform discussions by stakeholders at all levels around the foundational beliefs on academic achievement and success by economically disadvantaged and racially diverse students.

The present study has implications for school leaders, counselors, and teachers interested in providing interventions that develop character, mindsets, and/or non-cognitive attributes in students. First, this study offers insight into the relationship, or lack of relationship, between a single non-cognitive skill, grit, and achievement. School leaders should consider conducting a strategic analysis of each of the non-cognitive skills identified in the Community Values along with the character education programming at the school. Administrators, instructional coaches, curriculum leaders, and counselors could look closely at the current Community Values in comparison with curricular resources, lesson planning, and classroom activities and practices currently in place at the school. Observations, walkthroughs, instructional rounds, and ongoing dialogue with staff and students may give insight that would enable school leaders and decision makers to determine the direction of changes in the Community Values, current curricular resources, and practices.

Furthermore, all staff must be aware of and understand current research and educational trends related to the malleability and development of not only students' grit but also other non-cognitive skills. A needs assessment could be completed to guide the development of a school-wide professional development plan focused on social and emotional learning (SEL) and character education. Through professional development opportunities, book studies, and classroom-level action research projects, all staff could

focus on implementing strategies that encourage and develop the non-cognitive skills in students that foster personal and academic growth.

Further suggestions include the design of a school vision related to SEL and character education. The current school mission focuses on student achievement and life-long learning and the development of “skills needed to succeed academically and personally” (Urban Community Charter School, 2013b, p. 8). The Title I School Improvement Plan could be updated to include goals developed as a result of the strategic analysis of curricular resources and practices, as well as the staff needs assessment, and would define the schools’ commitment to students’ personal development and SEL. Strategies to achieve such goals would include specific standards and benchmarks supported through curricular resources and professional development.

Recommendations for future research. The purpose of this study was to determine whether there was a relationship between 6-8th grade students’ grit scores and their academic achievement, as measured by standardized assessments and GPA. The study also sought to determine whether the relationships were affected by student gender, race, and student first language. The research on trait-level grit and its relationship to academic achievement is a developing field, and there are limited studies investigating the relationship in economically and racially diverse populations. There are several recommendations for future research that would improve and extend this current study.

A first recommendation is a replication of this study with GPA calculated from only academic subject areas. Duckworth (2006), Duckworth & Quinn (2009), and West et al. (2015) calculated GPA as the average of final grades in academic subjects while the current study figured GPA from final grades of all courses in which the students were

enrolled. This replication may create a more accurate picture of students' academic performance.

A second recommendation would be to add research questions related to each of the 8-items self-reported within the Grit-S along with qualitative data around the individual responses to the grit survey. The participants in the current study were 6-8th grade students, and at best, middle school students can be referred to as a "walking contradiction" (Vawter, 2009, p. 1), one minute recycling items as a way to ease global warming only to leave the cafeteria a mess. While educators can advance the cognitive function of the brain, the emotional brain develops differently and in adolescence does not necessarily advance with intelligence (Vawter, 2009). Adding a qualitative component to complement the data collected using the Grit-S could allow students to express why they may have, for example, rated themselves as both a hard worker (very much like me = 5), yet also saw themselves as having difficulty maintaining focus (very much like me = 1). A qualitative look inside the middle school brain as it relates to grit may provide an agreement to Duckworth & Eskreis-Walker's (2013) analyses that found grit increased monotonically throughout adulthood.

A third recommendation also includes a replication of this study, but in a public school rather than a charter school setting. As stated previously in this chapter, the participants in the current study attend an academically and behaviorally demanding charter school, which may have resulted in the similar paradoxical results found by West et al. (2015). Replicating the study with middle school participants from the surrounding urban district may provide additional evidence to confirm or contrast the current study's findings.

A fourth recommendation would include a longitudinal study that would follow the current study's participants through their high school years. The longitudinal study could replicate the eight research questions of the original study and add questions that might compare the stability of students' grit scores over time. A researcher could also hypothesize that there would be a relationship between students' growth on standardized tests across multiple years and students' grit scores as compared to a single years' time because of the definition of grit includes perseverance "sustained over years" (Duckworth, 2006, p. 73).

Concluding remarks. Educators, unable to counter societal factors resulting from socioeconomic background, race/ethnicity and gender, may be well served to focus on developing strategies to ratchet up academic demands through more rigorous requirements, accountability measures, and high standards (Farrington, et. al., 2012), but also interventions that develop character, mindsets or non-cognitive attributes. The results of the current study did not conclusively indicate that a relationship between students' grit scores and two measures of academic performance were positively correlated in middle school students. However, there is a core set of non-cognitive factors essential to an individual's capacity to strive for and succeed at goals despite challenges and obstacles encountered throughout schooling and life. "It is the responsibility of the educational community to design learning environments that promote these factors so that students are prepared to meet 21st-century challenges" (U.S. Department of Education, Office of Educational Technology, 2013, p. v).

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Appendices

Appendix A: Qualifications for Free and Reduced Lunch

Table A1

Household Size and Income Level to Qualify for Free or Reduced Lunch Status

2013

Household Size	Annual Income for Reduced Cost Meals	Annual Income for Free Meals
1	\$21,257	\$14,937
2	\$28,694	\$20,163
3	\$36,131	\$25,389
4	\$43,568	\$30,615
5	\$51,005	\$35,841
6	\$58,442	\$41,067
7	\$65,879	\$46,293
8	\$73,316	\$51,519
Each Additional Member	+\$7,437	+\$5,226

Note. Adapted from “Federal Register,” by the U.S. Department of Agriculture, 2013, p. 17630.

Appendix B: 8-Item Grit Scale

8- Item Grit Scale

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

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

2. Setbacks (delays and obstacles) don't discourage me. I bounce back from disappointments faster than most people.
 - Very much like me
 - Mostly like me
 - Somewhat like me
 - Not much like me
 - Not like me at all

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

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

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

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

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

Scoring:

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

2. For questions 1, 3, 5 and 6 assign the following points:
 - 1 = Very much like me
 - 2 = Mostly like me
 - 3 = Somewhat like me
 - 4 = Not much like me
 - 5 = Not like me at all

Add up all the points and divide by 8. The maximum score on this scale is 5 (extremely gritty), and the lowest score on this scale is 1 (not at all gritty).

Duckworth, A.L., & Quinn, P.D. (2009). Development and validation of the Short Grit Scale (GritS). *Journal of Personality Assessment*, 91, 166-174.
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Duckworth, A.L., Peterson, C., Matthews, M.D., & Kelly, D.R. (2007). Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology*, 9, 1087-1101.
<http://www.sas.upenn.edu/~duckwort/images/Grit%20JPSP.pdf>

Appendix C: IRB



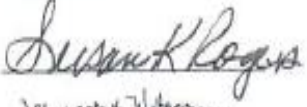
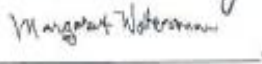
SCHOOL OF EDUCATION
GRADUATE DEPARTMENT

Date: _____
IRB PROTOCOL NUMBER _____
(IRB USE ONLY)

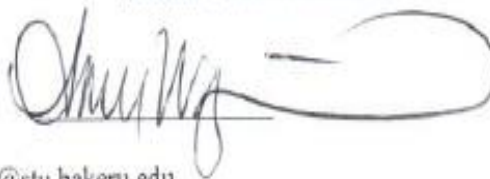
IRB REQUEST
Proposal for Research
Submitted to the Baker University Institutional Review Board

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

Department(s) School of Education Graduate Department

Name	Signature	
1. Dr. Susan Rogers		Major Advisor
2. Margaret Waterman		Research Analyst
3. Dr. Harold Frye		University Committee Member
4. Dr. Phyllis Chase		External Committee Member

Principal Investigator: Amy S. Washington
Phone: (816)456-1669
Email: ahusker@sbcglobal.net, amyswashington@stu.bakeru.edu
Mailing address: 12708 E 64th Court, Kansas City, MO 64133



Faculty sponsor: Dr. Susan Rogers
Phone: (Office: 913-344-1226) (Cell: 785-230-2801)
Email: srogers@bakeru.edu

Expected Category of Review: Exempt Expedited Full

II: Protocol: The Relationship between Student Grit and Student Achievement

Summary

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

The study will take place at the Urban Community Charter School, a K-12 charter school that shares attendance boundaries with the Kansas City (Missouri) Public School District. A “School of Distinction in Performance,” (Department of Elementary and Secondary Education, 2014b, 2014e) Urban Community Charter School’s demographics mirror those of the surrounding urban district while its students’ academic performance data continues to exceed the measured performance of the students attending KCPS district schools. The purpose of this study is to determine whether there is a relationship between students’ (grades 6-8) grit scores and their academic achievement growth. The second purpose of the study is to determine whether the relationship between students’ grit scores and their growth academic achievement growth is affected by student gender, race, and student first language. The third purpose of this study is to determine whether there is a relationship between students’ (grades 6-8) grit scores and their grade point average (GPA). The final purpose of this study is to determine whether the relationship between students’ grit scores and GPA is affected by student gender, race, and student first language.

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

This study is relationship research and does not involve comparison of control groups or treatment groups, therefore, there will be no conditions or manipulations included within the study.

What measures or observations will be taken in the study? If any questionnaire or other instruments are used, provide a brief description and attach a copy.

The school has already collected all data and the study will be utilizing the archival data.

- Student Demographic Data: The demographic data, including gender, ethnicity, and grade level will be gathered from Infinite Campus, the student information database utilized by the school.
- Student GPA: The GPA for each subject will be taken from Infinite Campus, the student information database utilized by the school.
- Student Grit Scores: Each middle school homeroom teacher has compiled the Grit Score for their homeroom students. Students have access and are aware of their own scores. Teachers maintain Grit Score as anecdotal files and/or spreadsheets as a part of the college and career readiness programming at the school. The 8-Item Grit Scale is attached.
- Student academic achievement growth as measured by the Total Score on the TerraNova Third Edition Common Core Form 1: The Test Administrator for Urban Community Charter School maintains all files related to standardized testing. Classroom teachers distribute individual scores to students and their families during conferences. Binders with score reports for the entire school

population are secured in the Test Administrator's office and are available for review on an as-needed basis.

Will the subjects encounter the risk of psychological, social, physical or legal risk? If so, please describe the nature of the risk and any measures designed to mitigate that risk.

All data utilized in this study is archival data; therefore, no subjects will encounter the risk of psychological, social, physical, or legal risk.

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

All information for use in this study will be form archival data; therefore, subjects will not be subjected to stress.

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

Subjects will not be deceived or misled in any way.

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

Student demographic data will be downloaded from Infinite Campus, Urban Community Charter School's student information system. The demographic data utilized in the study is the same information reported for core data to the state of Missouri. Additionally, all applicants to the school complete a "Home Language Survey" where families self-identify their students' first language. These surveys are a part of the students' educational file at the school and serve as initial identifiers for students whom may be eligible for second language services. Archival data will be used in the study and no student names will be included with the data provided to the researcher.

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

Subjects will not be presented with materials that might be considered to be offensive, threatening, or degrading.

Approximately how much time will be demanded of each subject?

No additional time will be demanded of each subject because the researcher will use archived data.

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

The population for this study was comprised of 6-8th grade students residing in Kansas City, Missouri. The sample included only those attending Urban Community Charter School for the entire 2013-2014 school year. Archival data will be accessed; therefore, no solicitation will be used.

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

The data is archival data. Subjects will not need to consent to participate. No inducements will be offered.

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

The data is archival data. Subjects will no need to consent to participate.

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

No, subjects will not be identifiable through any aspect of the data.

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

Archival data will be used. No record will be made available to anyone related to this study.

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

The Registrar and Test Administrator from Urban Community Charter School will work in tandem to assign random numbers to each subject in the study and collate their demographic, achievement and grit score data accordingly. The data as compiled for the purposes of this study will be stored in the Test Administrator's office. The Test Administrator following the completion of the study will dispose of documents created for the purpose of this research. The demographic and archival data from which information was taken will remain housed with the Registrar and Test Administrator as directed by the administration of Urban Community Charter School.

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

No risks have been identified in this study. However, an offsetting benefit for Urban Community Charter School may include insight into the possible relationship between cognitive and non-cognitive factors, such as Grit. Such insight could enhance the character programming and college and career readiness lessons at the school.

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

All data utilized will be archival data.

Appendix D: IRB Approval Letter



Baker University Institutional Review Board

June 15, 2015

Dear Amy Washington and Dr. Rogers,

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

Please be aware of the following:

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

Please inform this Committee or myself when this project is terminated or completed. As noted above, you must also provide IRB with an annual status report and receive approval for maintaining your status. If you have any questions, please contact me at CTodden@BakerU.edu or 785.594.8440.

Sincerely,

Chris Todden EdD
Chair, Baker University IRB

Baker University IRB Committee
Verneda Edwards PhD
Sara Crump PhD
Erin Morris PhD
Scott Crenshaw