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# Middle Grade Academic Achievement and Socioeconomic Status on North Carolina State Report Cards, 2012 - 2013

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# Middle Grade Academic Achievement and Socioeconomic Status on North Carolina State Report Cards, 2012 - 2013

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ABSTRACT

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In the era of accountability in our nation's public schools, high-stakes standardized testing is the primary methodology for determining academic achievement; results from end-of-grade standardized testing are published annually in state and national report cards that are used as an instrument for determining school and teacher quality. What standardized tests do not take into consideration, however, are external environmental factors that have an impact on academic achievement; this research project focuses upon the effects of socioeconomic status on academic achievement on the middle grade student in North Carolina in 2012 and 2013. These years were chosen to comparatively analyze student achievement during the transition from the North Carolina Standard Course of Study to the Common Core curriculum. Only public schools configured in grades 6-8 that operate on a traditional school calendar were considered for this study. One way analyses of variance and paired samples *t* tests were performed to determine whether significant differences exist between student achievement in each grade level, academic year, and tested subject area (mathematics and reading) based on various levels of socioeconomic status levels within the school. Socioeconomic status levels were determined by the percentage of student population within the middle school that received free or reduced cost lunch during that school year. Significant differences existed between every socioeconomic level, subject area, and grade level, and significant differences also existed between each academic year as well as the number of economically disadvantaged students passing both the reading and mathematics assessments in each academic year. Schools with higher poverty levels

scored significantly lower on both subject areas in both academic years than their wealthier counterparts. Test scores were also significantly lower in 2013 than in 2012, and fewer economically disadvantaged students passed both reading and mathematics in 2013 than in 2012. Further research is suggested to determine whether the trend of higher poverty schools performing significantly lower on standardized assessments than wealthier schools will continue with the ongoing implementation of the Common Core curriculum.

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# CHAPTER 1

# INTRODUCTION

*"Not everything that counts can be counted, and not everything that can be counted counts."*
*Albert Einstein*

In a time of increased accountability measures and volatility of educational policy, public and legislative bodies have become increasingly focused on student achievement as reported in statewide standardized test scores. During my time in North Carolina, I have experienced the tremendous pressure exerted by governing bodies and public expectations regarding standardized test scores both as a student and as a tenured public school educator. Having all students take the same standardized test is like saying that we have "standardized" children and that we all expect them to learn in the same ways and exhibit this learning in the same way--through these standardized assessments. What these "one-size-fits-all" assessments fail to take into consideration, however, are the varied backgrounds of our students. Many factors play an important part in a student's academic success, like ethnicity, special needs, or environmental factors; in this study, I focused on students' socioeconomic status and how this affects student achievement (socioeconomic status will be referred to in this study as SES).

The accountability movement began with the publication of *A Nation at Risk: The Imperative for Educational Reform* by the Reagan administration in 1983; this report portrayed the American educational system as a failing entity and proposed that its only way to redemption was through stricter accountability measures (i.e., increased standardized testing) ("Is the Use," n.d; Walberg, 2003). Why do legislators and the general public care about standardized test

scores? Because numbers are the easy data to analyze and because "educational attainment is well recognized as a powerful predictor of experiences in later life," policymakers and the public assume that standardized testing data provide accurate reflections of student (Brooks-Gunn & Duncan, 1997, p. 61).

However, as the push for increased accountability through standardized assessment gained momentum it left many students falling through the cracks; standardized tests do not take the varying experiences of our students into consideration when it comes to test results, and as a result, achievement gaps became the norm for many subgroups but most noticeably for our economically disadvantaged children. Additionally, the recent downturn in our nation's economy has only resulted in a greater income gap between our schools' wealthy and disadvantaged children: "…the Great Recession wreaked havoc among working-class families' employment. This has led to greater residential segregation and homogenously poor neighborhoods, leading to a higher concentration of poor students in certain schools" (Neuman, 2013, p. 18). The time frame that our nation experienced the Great Recession coincided with No Child Left Behind's deadline of having all children test as proficient in math and reading (according to standardized tests) by 2014; our nation did not meet this benchmark during a time of economic hardship for our students' families. Because of this coincidence, my interest has been piqued in determining what, if any, relationship exists between socioeconomic status and student achievement as determined by standardized assessments.

Because of the context surrounding socioeconomic status and student achievement, in this study, I reviewed mathematics and reading achievement data in the middle grades (grades 6-8) from the 2011-2012 and 2012-2013 academic years in North Carolina; I compared these standardized achievement data with socioeconomic status at the following levels: 1%-40% of

students on free or reduced cost lunch, 41%-60% of students on free or reduced cost lunch, 61%-80% of students on free or reduced cost lunch, and 81%-100% of students on free or reduced cost lunch; I have combined levels 1%-20% and 21%-40% (the highest socioeconomic levels) because the population size is too small in the 1%-20% category and therefore inadequate to be a representative sample. Analysis of these data is important in considering how socioeconomic status may affect the achievement scores of young adolescents. While many studies and meta-analyses have been performed over the years to determine whether a relationship exists between socioeconomic status and student achievement, a study has not yet been performed comparing socioeconomic status and student achievement with the new national Common Core curriculum; for this reason, it is a worthwhile venture to compare these test scores and students' socioeconomic status (Sirin, 2005; White, 1982; White, Reynolds, Thomas, & Gitzlaff, 1993).

## Statement of the Problem

The purpose of this study was to determine whether a significant difference exists in academic achievement when compared by socioeconomic levels in the North Carolina middle grades learner as measured by reading and mathematics standardized tests. This study was an analysis of data from the 2 most recent testing years as North Carolina's curriculum and testing instruments dramatically changed from 2012 to 2013 with the implementation of the Common Core curriculum, thus changing from an old curriculum to the new curriculum.

## Research Questions

### Research Question 1

Is there a significant difference between reading proficiency levels when compared by socioeconomic status levels for sixth grade students on the 2012 and 2013 state report cards?

Research Question 2

Is there a significant difference between mathematics proficiency levels when compared by socioeconomic status level for sixth grade students on the 2012 and 2013 state report cards?

Research Question 3

Is there a significant difference between reading proficiency levels when compared by socioeconomic status level for seventh grade students on the 2012 and 2013 state report cards?

Research Question 4

Is there a significant difference between mathematics proficiency levels when compared by socioeconomic status level for seventh grade students on the 2012 and 2013 state report cards?

Research Question 5

Is there a significant difference between reading proficiency levels when compared by socioeconomic status level for eighth grade students on the 2012 and 2013 state report cards?

Research Question 6

Is there a significant difference between mathematics proficiency levels when compared by socioeconomic status level for eighth grade students on the 2012 and 2013 state report cards?

Research Question 7

Is there a significant difference between 2012 and 2013 academic achievement scores on mathematics standardized tests for middle grades students?

Research Question 8

Is there a significant difference between 2012 and 2013 academic achievement scores on reading standardized tests for middle grades students?

Research Question 9

Is there a significant difference between students' proficiency levels in both reading and mathematics standardized tests when compared by the schools' economic levels in 2012 and 2013 for middle grades students?

## Significance of the Study

Because of the high-stakes nature of current standardized tests, it is imperative that educators and policymakers become more aware of other issues outside of the walls of the school building that may impact test scores for students. Additionally, because of the "wholesale" nature of educational change that has occurred in North Carolina in the past few years (with the implementation of the Common Core curriculum, new assessments, new teacher evaluation instruments, etc.), it is crucial that the focus is not taken off students as these new changes can possibly serve as distractors.

## Definition of Terms

Education is a field in which there is a large quantity of specified jargon. Below are definitions for some of the critical terms for this study.

Adequate Yearly Progress (AYP): Adequate yearly progress is an accountability system that combines the percent of students tested with the percent proficiency and is meant to show a school's (and students') growth over time, according to yearly standardized assessments. It also includes a system of rewards and consequences for schools that meet or fail to meet AYP standards (U.S. Department of Education, 2002).

High-Stakes Test*:* A high-stakes test is any test designed to make important decisions concerning students or other stakeholders, most commonly for the purposes of accountability and AYP (see

below); these tests often come with rewards or sanctions for schools based upon students' scores ("High-Stakes Test," 2013).

Income Achievement Gap*:* Also called the "opportunity gap" between poor and wealthy children, the income achievement gap is known as 'the disparity in academic performance between groups of students...[and] shows up in grades, standardized-test scores, course selection, dropout rates, and college-completion rates, among other success measures . It is most often used to describe the troubling performance gaps...at the lower end of the performance scale...and the similar academic disparity between students from low-income families and those who are better off ("Achievement Gap," 2004).

Socioeconomic Status (SES): In this study socioeconomic status is defined as whether or not a student qualifies for free or reduced lunch cost based on the student's parental income, as defined by Title I federal guidelines (U.S. Department of Education, 2004).

Student Achievement: For the purposes of this study student achievement is defined by North Carolina's middle schools' standardized test scores (using the state scale of 1-4, with scores of 3 and 4 being defined as "proficient" and grades 1-2 being defined as "not proficient") on the NC READY assessments in 2013 and 2014.

Title I: Part of the Elementary and Secondary Education Act, Title I is a federal government program that provides grant monies to high poverty public schools as an attempt to decrease the achievement gap between high income and high poverty students as well as students with limited English proficiency and minority students (U.S. Department of Education, 2004).

## Delimitations and Limitations

For this study data were collected and analyzed from every school that concurrently houses grades 6-8 in North Carolina that also reported standardized achievement data on reading

and mathematics as well as SES level of their school to the North Carolina Department of Public Instruction for the 2012-2013 and 2013-2014 academic years. These data were collected from North Carolina report cards from these years from the North Carolina Department of Public Instruction website. In order for schools to be reported on report cards, the school must have been operated for at least the previous 3 years as well as have reported complete information to the state of North Carolina.

Schools that were ineligible to report information for the 2012-2013 and 2013-2014 school years were not included in this study. Additionally, private and charter schools were not included in this study, nor were schools with only one or two grade levels (i.e., schools organized as a 7-8 school or a sixth grade only school) considered for this study. I only used the population of middle schools that were configured as grades 6-8 during the school years in question to decrease variation among differently configured schools (like K-8 schools or 5-8 schools).

## Summary

This chapter introduces the topic of study as well as its significance to current educational policy. It addressed the research questions, as well as the null hypotheses, while also defining study-specific terms and limitations and delimitations.

This study is organized into five chapters:

Chapter 1 contains the introduction, statement of the problem, purpose of the study, research questions, definitions, limitations and delimitations, and overview of the study. Chapter 2 presents a related literature review of existing research surrounding the topic. Chapter 3 illustrates the methods and procedures for the study. Chapter 4 contains the statistical analysis of the study. Chapter 5 includes the statistical findings, conclusions, and recommendations of the study, as well as an overall summary of the study.

# CHAPTER 2

# REVIEW OF THE LITERATURE

## Standardized Testing in Public Schools

Contrary to popular belief, standardized tests have been in existence in America since the mid-1800s ("Is the Use of Standardized Tests Improving Education in America?," n.d.). The Elementary and Secondary Education Act (ESEA) of 1965 was the first major federal law meant to disburse large financial contributions into the education system through standardized testing, and test scores became the norm for determining the success of an ESEA program (Popham, 2001). However, popularity in standardized testing rose dramatically after the publication *of A Nation at Risk: The Imperative for Educational Reform* by the Reagan administration in 1983; this report portrayed the American educational system as a failing entity and proposed that its only way to redemption was through stricter accountability measures (i.e., increased standardized testing).

While standardized tests typically begin around third grade in most public schools, others begin testing children as young as 6 years old to standardized exams (Kohn, 2000). While standardized assessments can be used to identify areas of strengths and weaknesses within a school, there is a great deal of debate surrounding whether standardized assessments have a legitimate place in today's public schools.

Currently, the two main types of standardized testing that exists within our educational system are norm-referenced and criterion-referenced tests. Criterion-referenced tests are based upon a pass or fail system and are designed to prove that the student is proficient based upon a certain set of criteria ("Criterion- and Standard-Referenced Tests," 2007). Norm-referenced tests are set upon a normal distribution curve in order to compare student scores to one another.

Originally, academic achievement tests were intended to be criterion-referenced tests, but over time, they have evolved into norm-referenced tests where students ultimately compete to outperform one another. Unfortunately, because of this evolution, regardless of student content knowledge, some students will inevitably fall in the lower tail of the distribution curve, giving them the appearance of "failing."

Advantages

There are several important positive aspects to assessing students using standardized testing formats. In general, standardized tests are perceived as inclusive and nondiscriminatory because everyone has to take them regardless of race, gender, or ability; however, they have been criticized for cultural, racial, and socioeconomic bias (Goode, 2001). These tests can provide an indication of students' ability on a variety of topics while identifying areas of strengths and weaknesses, and they can also be a useful tool for assessing the schools themselves (Brown & Hattie, 2012). Additionally, standardized assessments can provide students with an individualized report of where they stand academically and can serve as a benchmark while providing the opportunity for self-reflection and motivation for self-improvement. Phelps (2011), who completed a 100-year peer-reviewed analysis of testing research, discovered that 93% of studies have found student testing has a constructive outcome on student achievement. Perhaps because of the emphasis on the importance of testing scores through educational policy and the increasing importance of standardized assessments like the SAT and ACT for obtaining college entrance, families are more likely to invest additional time and resources into their children's education to improve scores on these tests (Reardon, 2011).

Moreover, because a great deal of time and fiscal resources have been invested into the development of reliable assessments, generally the quality of standardized assessments is

relatively high; the questions are usually field tested, revised, and well-written, answers are correct, and the questions are aligned with state curriculum through various quality assurance processes that ensure reliability and validity (Brown & Hattie, 2012). Furthermore, these assessments provide an objective perspective of student achievement in individual subject areas, which provides helpful information for teachers, administrators, students, and parents. Lastly, advocates of standardized assessments argue that these tests make certain that schools and faculty members are held accountable to taxpayers for their instruction and that many parents and teachers approve of these tests (Elliot & Agiesta, 2013).

Disadvantages

Concerns regarding standardized testing include placing too much emphasis upon scores, student testing anxiety, "teaching to the test," skewed test results, cheating concerns, and socioeconomic and cultural bias (Brown & Hattie, 2012; Olson, 1999). Because these tests are considered "high-stakes," poor student performance can lead to negative consequences for students and teachers alike. To protect both the test-takers and test administrators, teachers and school administrators also need an emotionally safe environment to effectively use a testing instrument without fear of punitive action (Brown & Hattie, 2012). Even current president Barack Obama has been quoted as saying, "Too often what we have been doing is using these tests to punish students or to, in some cases, punish schools" (Werner, 2011). Sadly, as a result of stakes of these tests being so high, test anxiety is now a common ailment amongst students across the nation; the Stanford-9 standardized exam, for example, even comes with instructions as to what actions the test administrator must to take if a student vomits on a test booklet, according to the 2002 edition of the *Sacramento Bee* (Ohanian, 2002). Stories like this add to the public sentiment that these tests are inflicting serious harm to children today, both

academically and emotionally, and these assessments do not result in improved cognition (Horn, 2003; Popham, 2001). Kohn argued that the more important these tests become "in terms of being the basis for promoting or retaining students, for funding or closing down schools--the more that anxiety is likely to rise and *the less valid the scores become*" and that it ultimately "drives good teachers and principals out of the profession" by making them "defensive and competitive;" because of the focus on tested subjects as a result of these examinations, curriculum has been drastically narrowed as subjects like art and social studies have fallen by the wayside as principals avoid being labeled as leaders of a "failing school" (Kohn, 2000, para. 11). As schools lose arts and humanities classes to the pressures of regulated, high-stakes tests, schools run the risk of ignoring--and possibly losing--skills like creativity and innovation in our students (Renzulli, 2013; Zagursky, 2011). Additionally, the possibility of receiving sanctions for poor test scores is an expression of collective punishment implemented by state and federal education groups; unfortunately, states like Texas, North Carolina, and Virginia where these collective sanctions for poor test scores are among the most severe have been used as models for other states to replicate on a national level (Kohn, 2000; Tienken & Zhao, 2010).

As well as creating resentment and anxiety for our students, teachers, and administrators, standardized testing also brings with it a tremendous financial cost. In 2008 alone public schools spent nearly $1.1 billion on standardized assessments (Vu, 2008). In the last 5 decades Americans have spent an estimated three trillion dollars on educational reform that has revolved around these exams (Renzulli, 2013). On top of federal and state monies spent on hiring firms to create these assessments, these educational companies generate an astounding revenue stream not only writing the exams but also by producing and selling teaching materials to help boost student scores on their own tests. In 1999 revenue estimates were at $250 million dollars

annually, but these revenues have steadily climbed as the accountability movement has gained steam (Kohn, 2000). Regrettably, because standardized tests are used to determine where government monies should be spent, more funds are poured into creating these assessments when they could be spent on research-based methods of improving student outcomes (Ujifusa, 2012).

Despite the avalanche of funds provided for standardized testing, there exists a great deal of evidence that standardized tests do not, in fact, improve student learning or achievement. In fact, according to the National Assessment of Educational Progress (NAEP) American children are performing worse *after* the implementation of No Child Left Behind accountability measures (Guisbond, 2012). It is also interesting to note that states that did not initially require high-stakes testing had more students earning levels of proficiency on NAEP examinations than did states that implemented mandatory standardized testing (Baker, 2012). Furthermore, opponents of standardized testing argue that regulated exams lack objectivity and that "...measurable outcomes may be the least significant results of learning" (Kohn, 2000, para. 6). Kohn reported that because of the multiple-choice format of these tests, the process by which students answer a question is completely disregarded and does not give students any credit for understanding important concepts, even if the incorrect answer is only a result of a minor error. Likewise, because multiple-choice items are the types of questions used, the types of knowledge being assessed is typically superficial. According to Kohn (2000) there is a statistical association between high scores on standardized tests and relatively superficial cognition. These studies also found that only 3% of mathematics questions in standardized tests required critical, higher level knowledge and that in reading tests reflective interpretation of the passages is discouraged in favor of simple recall questions. Furthermore, because these tests are designed to formulate results as a bell curve, Kohn argues that there will always be students in the bottom distribution

of scores, which can be misleading. Finally, the actual results from tests can be imprecise and even inaccurate. Because all test results have error statistically, results can be erroneous by as many as 50 scale score points (Tienken, 2008, 2009; Tienken & Zhao 2010).

Perhaps most important is not what is being assessed but rather what is *not* being assessed, as what we measure is both invalid and misleading because student achievement depends on multiple factors that cannot be readily assessed, like ability, behavior, and socioeconomic status (Brooks-Gunn & Duncan, 1997; Wiggins, 2012). Because these examinations are designed to assess what is easily measured, they are inherently incapable of assessing what cannot be measured. These tests cannot ascertain "initiative, creativity, imagination, conceptual thinking, curiosity, effort, irony, judgment, commitment, nuance, good will, ethical reflection, or a host of other valuable dispositions and attributes" (Kohn, 2000, para. 45). This supports one of Albert Einstein's most famous assertions: "Not everything that counts can be counted, and not everything that can be counted counts" (n.d.).

While helpful features exist within standardized tests, there are just as many negative consequences. Currently most standardized tests provide merely a proficiency level along with a percentile ranking of how each student does when compared with others within one's state or the nation. Opponents of standardized testing, however, argue that test-makers must strive to improve tests so the tests can provide richer diagnostic information that can help inform future instruction rather than simply reporting a percentage of items missed (Brown & Hattie, 2012). Furthermore, testing data can paint an inaccurate picture regarding America's schools. U.S. Secretary of Education Arne Duncan warned in 2011 that unless specific changes are made to the Elementary and Secondary Education Act that as many as 82% of America's public schools could be labeled as failing (as cited in McNeil, 2011). Based on this labeling system and its

misplaced emphasis on high-stakes test results, it would appear to the untrained eye as though America's educational system is broken despite great things that happen in the classroom outside of standardized assessments. James Pellegrino of University of Illinois at Chicago coauthored a policy statement by the Gordon Commission on the Future of Assessment in Education urging

> a fundamental shift in thinking about the purposes of assessment. Many of us believe we need to rethink some of this – it's not that we don't need to use assessments to monitor how well students are learning, but most of that should be targeted at the classroom level for supporting the teaching and learning process and not be so much a part of a high-stakes accountability system (Lu, 2014, para. 31-32).

Wiggins also asserted that while concrete benchmarks are crucial to examine student performance, they must be authentic and meaningful rather than the superficial examinations that are currently in place (1991).

## Socioeconomic Status and Student Achievement

In educational and psychological research socioeconomic status typically refers to the amount of income an individual or family receives on an annual basis; however, this definition can differ according to the context in which socioeconomic status is referred. One of the earliest definitions of socioeconomic status in educational research is by Chapin (1928), who called it "the position that an individual or family occupies with reference to the prevailing average of standards of cultural possessions, effective income, material possessions, and participation in group activity in the community" (White, 1982, p. 462). More commonly, and more recently, socioeconomic status is viewed through multiple lenses like family income, parental educational level and employment, and social standing ("Education and Socioeconomic Status," n.d.; White, 1982). Poverty can also reference a lack of time, important relationships and models, proper

nutrition, health, and sleep in addition to monetary resources (Pawloski, 2014). With reference to this study, socioeconomic status is viewed as a lens through which one views student achievement. There is a plethora of research that supports what is referred to as the "opportunity gap" or "achievement gap" between poor and wealthy children, which is known as

> …the disparity in academic performance between groups of students...shows up in grades, standardized-test scores, course selection, dropout rates, and college-completion rates, among other success measures. It is most often used to describe the troubling performance gaps...at the lower end of the performance scale...and the similar academic disparity between students from low-income families and those who are better off ("Achievement Gap," 2004, para. 1)

It is this achievement gap that serves as the motivation for this study.

Academic Effects of Poverty

Correlational studies show a strong relationship between high poverty and poor academic performance (Sirin, 2005; White, 1982; White et al., 1993). This correlation begins at the beginning of a child's academic career, and even before, in some cases. Pawloski stated that poverty is more influential to academic performance than even gestational exposure to cocaine (2014). Because poverty is empirically linked to delayed language acquisition and knowledge attainment in young children, it is crucial to provide interventions to high poverty students as soon as they enter school; however, these interventions do not provide support structures in the child's home, which has a tremendous impact on a child's learning (Neuman, 2013). Additionally, a child's environment is said to effect 66% of a child's academic performance, while genetics only effects 34% of academic functioning (Pawloski, 2014). Upon entrance to kindergarten, researchers concluded that the lowest SES students scored more than a standard

deviation below the highest SES students in math and reading. More importantly, perhaps, it is noted that these differences do not decline throughout students' academic careers, which is an indication that the issue is most likely *not* school quality (Dills, 2006; Reardon, 2011). In another study by Noble, McCandliss, and Farah in 2007, 150 healthy first grade students who were socioeconomically diverse were studied, and the researchers found that socioeconomic status accounted for more than 30% of the variance in a child's language system with a smaller (but still significant) variance in other cognitive systems, indicating a disadvantage cognitively for economically disadvantaged children (Jensen, 2009). Examining the other end of the spectrum in school age, SAT scores, increase "in perfect tandem with $20,000-dollar family income amounts" (Wiggins, 2012, para.5). In public test score data, academic achievement falls as poverty levels rise in a school, which seems to indicate that a high-poverty school could become a likely candidate for academic failure (Oliver, 2009).

In every state in the nation the economically disadvantaged subgroup never outperforms other nonlabeled students regardless of the grade level or subject area, supporting that the variable with the strongest correlation to academic achievement is socioeconomic status. Correlations between SES and student achievement frequently range from .100 to .800 (Tienken, 2010; White, 1982). In a meta-analysis of research regarding economic status and achievement Sirin (2005) found that the correlation between these two variables increased throughout the levels of schooling, climaxing in the middle school, and plateauing at the high school level. Caro, McDonald, and Willms (2009) found similar findings to Sirin's research. They found that the SES gap does not change dramatically until the beginning of grade 7 until grade 10, which emphasizes the importance of quality instruction at the middle grades level. This is also an important factor for why additional study on student achievement and SES at the middle level is

crucial as "the [cognitive] effects of wealth [are] indirect and must accrue over time" (Willingham, 2012, p. 34). These data also support the cumulative advantage theory, which posits that differences associated with one's socioeconomic status and educational achievement increase as time progresses through one's academic career (Caro et al., 2009).

Sirin's (2005) analysis reported a mean correlation of .299, which was a decrease from earlier studies; however, he notes that this decrease is most likely due to changes in research on SES, academic achievement, and society as a whole (Sirin, 2005).Other research supports this assertion; some reports indicate that children in poverty consistently score six to nine points lower on regulated examinations than their wealthier counterparts, between 6 and 13 points on standardized IQ tests (which is enough of a deviation to make the difference between a child being placed within a regular education or a special education classroom), and only 1.1% of low-income schools are cited as top performers within one's state (Payne, 1996; Potter, 2013). The same study showed that low-income students score lower on measures of cognition, health, school achievement, and emotional well-being than wealthier students.

It therefore stands to reason that the highest poverty schools are often the lowest performing on standardized achievement tests, which can create a perpetual cycle of low expectations ("Achievement Gap," 2004; Jensen, 2009). Using the 2010 Florida Comprehensive Assessment Test, or FCAT, as an example, two thirds of high SES students passed the examination while two thirds of low SES students failed (Baker, 2010). Another example, this time using the Virginia Standards of Learning, mirrored these results through the appearance of an inverse relationship between the percentage of students receiving free or reduced rate lunches and the adjusted pass rates on these tests, which shows a direct relationship between students' SES and achievement. With evidence like this, it seems as though standardized test results only

tell the general public about the other factors in play when it comes to these exams, and standardized tests do not seem to be a valid measure of school effectiveness and only show the ignorance of those who place these scores in a position of importance (Kohn, 2000). As a result, researchers assert that high-stakes testing

> has several disadvantages including placing low SES schools in jeopardy of losing their accreditation, damaging the reputation of outstanding teachers, harming the self-image of those persons in communities with lower SES, and publicizing the looming threat of state takeover or privatization. [Researchers] believe the United States should establish legislation that takes the low SES diversity into account because while the test promotes accountability, it does not promote understanding or collegiality among teachers and administrators....They also state that students from homes or neighborhoods of low SES tend to have less varied cultural or academic experiences, less support (financial, academic, technological) and encouragement from home, and less early childhood preparation than their counterparts from middle-or upper-class backgrounds.... [and] research suggests that students with less economic support from home tend to achieve at or below grade level. (Baker, 2010, p. 194-195)

The federal government has attempted many interventions over the decades to address this achievement gap, the most recent of which was No Child Left Behind in 2001. Initially, Food Stamps, Title I, and Head start were initiated in the 1960s to address the issue of poverty and academic success in children (Dills, 2006). Despite massive amounts of money issued to Title I schools to address the disparity in achievement, a large gap still exists, and furthermore, a 2004 study found that within 3 years of Title I funding, the extra funding is offset by local spending, rendering it ineffective for its intended purpose (Baker, 2010; Dills, 2006). Part of the

purpose of NCLB was to force the disaggregation of testing data to identify existing gaps between subgroups and general student population ("Achievement Gap," 2004). A recent study notes that in the last 60 years our nation has moved to one where income level is a more deterministic measure of academic success than race. The study found that the gap between high SES and low SES students has grown more than 40% since the 1960s and is now more than twice the gap between Caucasian and African American students (Tavernise, 2012). A possible explanation for this dramatic increase in the achievement gap could be due to varied quality in public schools over the past few decades, although it is worth noting that gaps did decrease overall during the school year and widened during the summer academic break (Caro et al., 2009).

While there was some decrease in the achievement gap in the initial implementation of No Child Left Behind, the decrease stagnated by the end of the program's first decade ("Achievement Gap," 2004). Accountability measures were put into place to ensure a decline in these gaps, resulting in a goal of 100% of students being labeled as proficient by 2014. A 2008 study forecast nearly every school in California to fail these accountability measures. The study cited that the reason for this projected failure would be due to the poor results from limited English proficiency students and high poverty students ("Is the Use," n.d.). Unfortunately, NAEP data also supports this prediction; the National Association for Educational Progress reported in 2005 that nearly 50% of all immigrant, minority, and high poverty children would not graduate from high school and that in the nation's largest cities, more than 30% of the lowest-income students land in the lowest percentile rankings on standardized assessments in reading and mathematics (Renzulli, 2013). Additionally, with the Great Recession, there is a high

probability that the recession may have widened the income achievement gap because income declined more severely for those with less income (Tavernise, 2012).

A possible cause for the dramatic differences between high poverty and low poverty schools could be because of the various factors affecting high poverty schools. Often, low socioeconomic classrooms are led by inexperienced teachers with less education and experience, and frequently these classrooms are privy to less equipment and instructional materials coupled with a higher proportion of students with low academic skills (Baker, 2010). Although it is unlikely that it is intentional, teachers of high poverty students are cited as emphasizing more basic computation than sophisticated algorithms, concepts, and procedures in mathematics and reading while using less instructional time than classrooms in wealthier schools (Willingham, 2012). This could be because many teacher preparation programs are considered a "one size fits all" approach to teaching practices, which does not adequately prepare teachers for what challenges they will face in a high poverty school setting (Pawloski, 2014). Additionally, schools in high poverty areas are typically understaffed and under-resourced, which impedes student achievement. This can lead to increased at-risk behavior and dropout rates, which creates a perpetual feedback loop of underachievement, lack of success, and generational poverty (Aikens & Barbrin, 2008, as cited in "Education and Socioeconomic Status," n.d.). It is imperative to have high quality teachers in all schools, but especially in high poverty schools because, according to research, 1 year with an effective teacher yields an additional $50,000 of lifetime earnings per student, and 9 out of 10 students that move upward out of poverty state that it is because of an important student-teacher relationship they had as children. Moreover, from an instructional stance, a highly effective teacher can teach in 6 months what a less effective teacher requires 2 years (or more) to teach (Pawloski, 2014).

Causes

Growing up in poverty puts children at an academic disadvantage for their childhood—even before they are born—and involve risk factors of "emotional and social challenges, acute and chronic stressors, cognitive lags, and health and safety issues" (Jensen, 2009, para. 6). Low income mothers tend to have less access to quality prenatal care that leaves their unborn children at a greater risk for nutritional deficiencies. This can lead to cognitive lags and low birth weight that can lead to chronic health issues, ultimately resulting in increased absences and lower academic achievement due to these absences (Willingham, 2012). Children in poverty have less access than their wealthier counterparts to educational enrichment prior to entry in public schools as well as decreased language development, resulting in smaller vocabularies and lower language skills ("Achievement Gap," 2011). Wiggins (2012) also argued that because of the various health and cognitive risk factors associated with low SES, it is an environmental factor that can determine future levels of student. Because of this wealthier families spend nearly seven times more on their child's educational enrichment than low-income families, and only 36% of low-income parents read to their kindergarten-age children each day, compared with 62% of upper-income parents, resulting in 400 more hours in literacy activities than low-income students by the time they enter kindergarten (Jensen, 2009; Neuman, 2012; Tavernise, 2012). Family socioeconomic status not only affects the child's academic opportunities through enrichment activities, but it also influences the amount of social capital a child has in school, which also indirectly affects educational success (Sirin, 2005). This can lead to two different models of child development: the family investment model and the stress model. The family investment model states that wealthier parents have more human, social, and financial capital and can therefore invest more in their children's education, whereas the stress model asserts that low-

income students are affected by long-term stress that ultimately lessens parenting efficacy and negatively affects cognitive functioning in the child. It is important to note that both of these models are not mutually exclusive (Willingham, 2012). Furthermore, low SES children tend to have the same types of cognitive disorders, the most common being stress, attention deficit hyperactivity disorder, learning delays, attachment issues, and dyslexia (Pawloski, 2014).

In the United States today more than 15.5 million children are poverty-stricken according to the definition of poverty as a family of four living on less than $22,000 annually, which translates to one in five American children ("Achievement Gap," 2011; Brooks-Gunn & Duncan, 1997). Poverty has reached epidemic proportions in this country, especially in terms of students under the age of 18 living in poverty (Tienken, 2010). Income inequality is at an all-time high in this nation, particularly due to the recent recession, and it is still increasing. Now, wealthy families earn 11 times more than a family in poverty, social mobility is more difficult, and the workforce is now polarized into a highly-skilled and high-wage sector and a low-skill, low-wage division (Reardon, 2013). Unfortunately, there is a strong association between family income and the child's educational level. For children in poverty a $10,000 increase in annual family income (up to age 5) equates with nearly an entire year increase in completed education (Brooks-Gunn & Duncan, 1997). Unfortunately, there is sufficient empirical evidence to support the assertion that "...schools bring little influence to bear on a child's achievement that is independent of his background and general social context," which forces one to ponder exactly how much influence teachers have on actual test scores (Colemen et al, 1966, as cited in White, 1982, p. 461). A 2014 study by Polikoff and Porter evaluated standardized test scores of teachers who were considered high-quality based on student surveys and principal observations. In their quantitative analysis they found little to no correlation between excellent teaching and student

test scores. Furthermore, this study determined that teachers only account for a maximum of 14% variance in student test scores, supporting the stance that environmental factors far outweigh teacher input when it comes to standardized test scores. Because of this recent study some educational associations, like the Houston Federation of Teachers, have filed federal lawsuits against using standardized assessments as evaluative instruments for teachers, arguing that this violates educators' rights.

There is a well-known adage among educators that one "can't beat the family" when it comes to students. While this is a cynical view of a teacher's role when it comes to student success, there are many research-based reasons why this maxim has withstood the test of time. It is noted that a student's home environment is a substantial factor when it comes to knowledge acquisition and learning development in children, as children from low SES homes are statistically twice as likely to have learning-related difficulties in schools than children from more affluent homes (Brooks-Gunn & Duncan, 1997; Morgan, Farkas, Hillemeier, & Maczuga, 2009). This correlation became well-established with the 1966 Coleman Report, which found that family background accounted for the largest variation in student achievement. Students who live in poverty are faced with many more environmental and emotional stressors and instability than those from middle- and upper-class neighborhoods, which typically results in chronic ailments like depression as well as harmfully effecting cognitive functioning as a result of chronic stressors. This has a direct link to negative educational outcomes (Jensen, 2009; Mistry, Benner, Tan, & Kim, 2009; Willingham, 2012). Furthermore, children in low income neighborhoods frequently experience safety worries that also overshadow educational concerns (Pratt, Tallis, & Eysenck, as cited in Jensen, 2009). Because a child's upbringing is entirely out of one's control, children in high poverty settings are often confronted with upsetting, stressful

situations with which wealthier children are never faced. As a result, a child's brain is forced to adapt to unfavorable conditions that often undercut academic performance.

Because of these difficulties low SES children are more likely to become uninterested in school that results in learned helplessness among high poverty students. This can begin as early as first grade in some students (Jensen, 2009). Low income parents are also less involved in their child's schooling than more affluent parents, and low SES students also tend to befriend students who are themselves disengaged in the educational process. Studies indicate that a disengaged student and family is less likely to experience academic success, and this could be as a result of less social capital for lower-income families (Sirin, 2005; Willingham, 2012). Furthermore, those identifying as being considered "lower class" tend to have feelings of not "belonging" in school and tend to enroll in lower level courses. As a result these students have higher rates of dropping out or enrolling in vocational courses rather than college classes (Caro et al., 2009; Langhout, Drake, & Rosselli, as cited in "Education and Socioeconomic Status," n.d.).

From the stance of an educator children in poverty typically exhibit language delays and difficulties with mathematical processing. Language delays are related to a child's preschool literacy environment such as the number of books read to the child, trips to libraries and the vocabulary used and verbal responses from the parent to the child. Low-income parents are less likely to be able to afford resources like children's books or tutoring (Aikens & Barbarin, 2008; Orr, 2003). Because of a lack of language skills children from poorer families are more likely to acquire new reading and phonological skills slowly, leading to reading difficulties (Aikens & Barbarin, 2008). As a result of these language delays, knowledge gaps tend to grow as children age, resulting in the well-documented achievement gap. The result of this disparity "...leads to

the social stratification of information capital that occurs among those who live in affluent and poor communities" (Neuman, 2013, p. 18). When it comes to math, the other highly tested subject, children in poverty are less likely to be proficient with basic algorithms like addition and subtraction as well as difficulties with word problems as they combine basic math tasks along with language (in which children in poverty already have demonstrated difficulties) (Coley, 2002). Because of these inconsistencies and delayed knowledge acquisition leading to the achievement gap, it ultimately results in this staggering statistic:

> Students from low-SES schools entered high school 3.3 grade levels behind students from higher SES schools. In addition, students from the low-SES groups learned less over 4 years than children from higher SES groups, graduating 4.3 grade levels behind those of higher SE groups. (Palardy, 2008, para. 15)

Criticisms

Although the relationship between socioeconomic status and student achievement has been established through research, the causes of this relationship are often highly contested and debated (Reardon, 2011). Despite the many studies that support the assertion that socioeconomic status is linked to academic achievement, since White's initial meta-analysis of the research in 1982, which found that socioeconomic status is only weakly linked to academic achievement ($r = .22$), results of new research have been inconsistent, ranging from a strong relation to no correlation, depending on the unit of analysis (Sirin, 2005; White, 1982). More recent studies have shown a medium association between socioeconomic status and student achievement when using the student as the unit analysis but a large association when the school is the unit of analysis. When using an aggregated unit of analysis, like a school, the average effect size

doubled in magnitude, but inherently it is statistically problematic to make generalizations at the student level from aggregated data (Sirin, 2005).

Furthermore, how the researcher measures socioeconomic status (parent income level, parent occupation, student free/reduced lunch eligibility, etc.) as well as other defining characteristics (such as the student age, ethnicity, and geographic location) also affects the effect size between socioeconomic status and achievement (Sirin, 2005). For example in Sirin's research when socioeconomic status was defined using neighborhood characteristics the correlation between socioeconomic status and achievement was only .25, whereas when it was defined using home resources as an indicator of economic status of a student's family the correlation nearly doubled to .47. Some studies use Title I labels (students who are eligible for free or reduced lunch programs) as an indicator of economic status. When compared through an independent samples t test for reading and mathematics, significant differences were noted between Title I and non-Title I schools (Heier, 2011). Using eligibility for free or reduced lunch as an indicator of socioeconomic status is also not without its pitfalls. The process of determining this eligibility is not foolproof, and some parents choose not to apply for the program (especially as their children age), thus skewing studies surrounding SES and achievement scores (McLoyd, as cited in Sirin, 2005).

It is also hypothesized that because research has shown that the link between SES and academic achievement declines as students age that either schools act as an "equalizer" or that the at-risk students drop out of school when the opportunity presents itself. Research is inconclusive on this matter (White, 1982). Other critics point out that additional factors like motivation and resilience are also a strong predictor of academic achievement (when compared to socioeconomic status), and furthermore, SES is only an indirect factor. As such, theoretically,

it should not have a larger impact on student achievement than direct factors like quality of instruction or rigor of the curriculum (Caldwell & Gunther, as cited by Baker, 2010; Wiggins, 2012).

## State and National Report Cards

School, district, state, and national report cards were created to share testing data due to of current accountability laws. The purpose of creating state report cards is not only to publicize testing data on various levels, but it is also meant to act as an impetus to improve public education by providing the public with information that will hopefully translate to school improvement and increased parent involvement (Olson, 1999). Some states' departments of education create report cards on their own, and other states, like North Carolina in 2001 (when the state first began creating report cards), welcomed stakeholder input from administrators, parents, teachers, and policymakers when creating the first report card format ("North Carolina Report Cards: Frequently Asked Questions," n.d.). Report cards' formats vary from state to state and typically include student outcomes like standardized test scores, attendance, and dropout rates. Report cards are generally one of the highlights of a state's accountability system that is largely driven by federal accountability systems put in place by Title I (Olson, 1999; "Title I," 2004). Title I, Part A states that in addition to publishing testing data on an annual basis on report cards, schools must also disaggregate data and provide a 2-year data trend to show the achievement of the following subgroups: racial and ethnic groups, students with disabilities, limited English proficient, economically disadvantaged, migration status, and gender (*Report Cards: Title I, Part A, Non-Regulatory Guidance,* 2003).

In addition to these data, many states assign an overall rating based mostly on standardized test data (Olson, 1999). These reports take a great deal of number crunching to

prepare and, as a result, become very costly (up to $8,000 per school). Despite the vast amount of data that are compiled and synthesized to create these report cards, state report cards are unlikely to include important data regarding levels of parent involvement, quality indicators of a school's teachers, and school climate data. These data have empirical links to improvements in student test scores but nonetheless are neglected from most report cards.

Likewise, some states also include a ranking system for districts within the state. For the current academic year of 2013-2014 in North Carolina, for example, schools will receive a grade of A-F for the first time. Still the department of public instruction does assert that report cards are not the most useful ranking tool because of the inherent structural differences between schools ("North Carolina Report Cards: Frequently Asked Questions," n.d.). Ultimately, when newspapers publish test scores and rank schools, the public perception is that school rankings reflect the quality of teaching and therefore teaching faculty within the school (Popham, 2001).

Moreover, the national accountability movement, driven in part by federal education programs like Title I, has led to the creation of a national report card published by the National Assessment of Education Progress (NAEP). Historically, NAEP national assessments began in 1969 to collect information on students' academic knowledge nationally in order to make comparisons on national, international, state, and local levels to make evaluations regarding the state of the nation's educational system ("About the Nation's Report Card," n.d.). NAEP is a project of the National Center for Education Statistics (NCES) within the Institute of Education Sciences of the U.S. Department of Education, and the Commissioner of Education Statistics implements the NAEP project. The National Assessment Governing Board supervises and creates governing policies for NAEP. Comparisons are drawn between student academic levels and each individual state's annual measureable objectives (AMOs) and adequate yearly progress

(AYP) along with school identifying factors (such as a school identified for needing improvement etc.), and this information is later shared through the state education department website and announced through other public media outlets (*State and Local Report Cards: Title I, Part A of the Elementary and Secondary Education Act of 1965, as Amended*, 2013). While a great deal of student achievement data is gathered, along with disaggregated data for subgroups, no identifying student information is ever shared. Student confidentiality is of utmost importance in both state and national report cards ("About the Nation's Report Card," n.d.).

Although NAEP assessments have been in place for quite some time, it is only fairly recently that they started publishing national report cards. In 2001, with the reauthorization of the Elementary and Secondary Education Act, states that receive Title I funding are now required to take NAEP reading and math assessments for grades 4 and 8 every 2 years to comply with the Title I accountability system. These scores are then compiled into the national report card ("About State NAEP," 2012). Although initially NAEP scores showed a decrease in achievement gaps in the 1990s, according to the national report card, the achievement gap is most recently showing a widening trend. Arne Duncan, U.S. Secretary of Education, noted in 2011 that "while student achievement is up since 2009 in both grades in mathematics and in 8th grade reading, it's clear that achievement is not accelerating fast enough for our nation's children to compete in the knowledge economy of the 21st Century" (Duncan, as cited by Strauss, 2011, para. 21). Some argue, however, that NAEP testing data are more in line with the Common Core standards; typically, NAEP proficiency levels were much lower than state end of grade standardized assessment scores, but after the implementation of Common Core standards, in math, there was only a 1% discrepancy between Common Core math proficiency with eighth graders (who

scored at 36 %) and NAEP math proficiency with North Carolina eighth graders (who scored at 37% proficiency) (Hood, 2013).

Often, because of the negative connotations surrounding poor NAEP test scores, as well as state and national report cards, individual state education departments "spin" their results to say that they have made significant gains, when in fact these gains are not statistically significant. In California when the state department released that their fourth graders' reading scores and their eighth graders math scores improved, neither improvement was statistically significant according to NAEP's standards (Ujifusa, 2013). Because states feel the need to place a positive spin on their report cards, this perpetuates the idea of competition between states' educational testing outcomes, and a national report card also extends the competition to an international scale, placing more emphasis on standardized testing and accountability on a national and state level.

Despite the emphasis on NAEP scores for national report cards, it is interesting to note that NAEP progress slowed after the implementation of No Child Left Behind. Although the purpose of NCLB was to close the achievement gap, NAEP test scores showed more growth before NCLB (Strauss, 2011). Although a tremendous amount of federal and state dollars were spent on the creation of new high-stakes test to support NCLB accountability systems, Strauss argues that "with nearly 22 percent of the nation's children living in poverty, and with school reformers insisting that the effects of living in poverty can be overcome by schools without actually dealing with those effects — sickness, hunger, no early education, etc. — the gap will remain. It's not rocket science" (para.15). Ultimately, while state and national report cards can provide a window into the world of public school data and student achievement, it is only a tiny,

jaded glimpse and cannot illuminate the complicated issues that surround student achievement and standardized high-stakes assessments.

## Title I

To address the widening income achievement gap between socioeconomically disadvantaged children and their wealthier counterparts the federal government created the Title I program. Title I is a federal education program whose purpose is to ensure that all children have an equitable opportunity to obtain a high-quality education and reach proficiency on standardized state assessments (U.S. Department of Education, 2004). Title I was originally established in 1965 as part of Lyndon Johnson's "war on poverty" and was meant to close the achievement gap between disadvantaged students and wealthy students as well as minority and nonminority students ("5 Facts About Title I," n.d.; U.S. Department of Education, 2004). Additionally, it was meant to boost achievement for poorly performing students in high-poverty schools (whether these students are high poverty themselves, limited English proficiency, or students with disabilities), and it was meant to be an equalizer of sorts by ensuring high-quality education and academic assessments through a strict accountability system and rigorous curriculum (U.S. Department of Education, 2004). While targeting high-poverty students was its original intent, Title I shifted its focus from remedial education in 1994 during the reauthorization of the Elementary and Secondary Education Act to education of all disadvantaged students. Additionally, Title I funds can be used for a variety of programs within the Title I school through funding instructional programs, school counseling, and improving parent involvement ("Title I-Helping Disadvantaged Children Meet High Standards," n.d.). This federally funded program currently serves more than 21 million children nationwide from prekindergarten through 12$^{th}$ grade, and Title I students are found in almost every school district

in the nation ("5 Facts About Title I," n.d.; *U.S. Department of Education*, 2011). Title I is the largest federally funded No Child Left Behind program. In 2013 more than $13 billion was earmarked for Title I funds on a national level ("No Child Left Behind Funding," 2013).

According to Title I documents, a school can only be identified as Title I if 40% or more of its student population are from low-income families and qualify for free or reduced cost lunch according to Title I guidelines (to be considered a "schoolwide program"). As of 2014 for a family of four the income limit for receiving free lunch is an annual salary of $30,615; the income limit for receiving a reduced lunch cost (for a family of four) is $43,568 for the 2013-2014 school year ("Definitions," n.d.; *U.S. Department of Education*, 2011; "Income Eligibility Guidelines," 2013). The funding from Title I is intended to be used for instructional purposes to help low-income and low-achieving students experience greater academic success, and this is measured through state standardized assessments, which ultimately determine whether the school meets adequate yearly progress (AYP) for both the entire school population and its subgroups ("Definitions," n.d.; *U.S. Department of Education*, 2011).

If Title I schools fail to meet AYP for 2 or more consecutive academic years, the school must be designated as a school that "needs improvement" and faces certain sanctions such as providing public school choice for families within the school, supplemental educational services (like tutoring, for instance), and possible school restructuring ("Definitions," n.d.). In a study by Deke, Dragoset, Bogen, Gill, and Sekino, however, these supplemental services did not show significant improvement in reading or mathematics scores in the Title I student, and when provided with public school choice, in a study performed by RAND education, there was no measurable achievement gain after a child changed schools (Deke et al, 2010; Zimmer et al, 2007). Federal consequences increase on a yearly basis for each additional year that the school

fails to meet AYP for up to 7 years. After 7 years of failing to meet adequate yearly progress, the district may either be forced to replace all the teachers within the school or turn the school over to the state department of education or a private educational management company ("Title I," 2004). In order to meet AYP, part A of Title I guidelines states that schools must:

- have academic standards for all public elementary and secondary school students;
- test students in English and math every year between grades 3 and 8 and once in high school;
- report on student achievement by average school performance as well as by the performance of specified subgroups;
- ensure that all students are academically proficient by the spring of 2014; and
- hold districts and schools accountable for demonstrating adequate yearly progress in student achievement. ("Title I," 2004)

In North Carolina the majority of students served with Title I services are in first through sixth grade (65% of students) (*North Carolina Department of Public Instruction*, n.d.).

Evidence regarding the success of Title I programs is contradictory. By some accounts the program is successful at closing achievement gaps, but by others a significant gap still remains between advantaged and disadvantaged students in high poverty schools. According to a document by the U.S. Department of Education, Title I has been recognized for closing the achievement gap in basic skills between minority and nonminority students by nearly 30% from 1970 to the mid-1980s (*U.S. Department of Education,* 1994, as cited by "Title I," 2004). In the same document the National Assessment of Title I (NATI) cited gains in reading and math performance in Title I schools but also noted a considerable achievement discrepancy between students in the highest poverty and wealthiest public schools ("Title I," 2004). In a 2011 study

the researchers have found that since 2002, 79% (or more, depending on the grade and subject combination) of Title I schools have made academic achievement gains (according to percent of students who test as proficient or tests' mean scores) (Kober, McMurrer, Silva, & Rentner, 2011). This study also showed that gaps between Title I and non-Title I schools have narrowed more than they widened since 2002 (with some exceptions in fourth grade) and that gaps narrowed more quickly at Title I schools. Despite this evidence, however, Weinstein pointed out that no studies have been able to conclusively prove a cause and effect relationship between student success and Title I funds (2009).

Alternately, studies exist that call into question the efficacy and equity of Title I funding for high poverty schools. One study argues that Title I funding is inequitable due to its formula to determine eligibility in terms of Title I students in a district: either by counting the percentage of Title I eligible students in a district or by counting the total number of Title I eligible students in a district, the latter of which would favor large school districts at the expense of smaller ones with higher poverty rates (because Title I is a fixed amount of funding to be shared). Based on this information, North Carolina is ranked 50$^{th}$ with 19.4% of students eligible for Title I funds, but each pupil only receiving $1,261 from Title I funds, as opposed to Wyoming, ranked first with only 11.6% of it students being eligible for Title I funds, but each pupil receiving $3,149 from funds, nearly 3 times the amount of North Carolina students with fewer eligible students ("Title I Funding Revision Must Be a Priority for Real Education Reform," 2010). Findings from Weinstein, Stiefel, Schwartz, and Chalico (2009) indicate that Title I funding may perhaps average standardized achievement scores in schools. These effects increase with the length of Title I eligibility. Other studies indicate mixed reviews of Title I efficacy. In a meta-analysis reviewing 17 federal summaries of Title I program evaluations, Borman and Agostino (1997)

discovered that Title I was an overall effective program during the first 2 decades of its implementation, especially in mathematics gains. However, because students fail to retain much of the curriculum over the summer, it is suggested that schools use Title I funds to provide curricular programs over the summer to promote knowledge retention.

While the empirical evidence regarding the effects of Title I funding on student achievement is mixed, it is important to note both the successes and the failures of this program while keeping in mind that causality between achievement and federal funding has not been established. It is also important to bear in mind that Title I students are unlikely to become successful academically without intentional efforts to address not only their academic needs but their economic necessities as well (Kober et al, 2011).

## Common Core Standards

After the implementation of No Child Left Behind, state standards (and standardized assessments aligned to these standards) became the norm to meet accountability measures of this legislation. However, there was a common argument that states could not compare data to one another because each state's expectations was different from one another; hence came the impetus for the Common Core standards, which is a national set of standards that are meant to be used as a curricular framework for all states who adopted them (45 states, the District of Columbia, four U.S. Territories, and the Department of Defense Education have adopted these standards) ("In the States," 2012).

### *Background*

In 2009 the National Governors Association, the Council of Chief State School Officers, and the organization "Achieve," all led by the organization "Student Achievement Partners" and the head of the College Board Organization, David Coleman, wrote these standards. While there

were few educators in this group, there were many testing representatives present (Ravitch, as cited in Strauss, 2014). Because the U.S. Department of Education is legally banned from controlling any curriculum in local public schools, it was prohibited from subsidizing the creation of these standards. As a result, the Gates Foundation has funded the cause with nearly $200 million to jump start the implementation of these standards. It is important to note that these standards are considered a starting point and will continue to be revised as new research arises, and students cannot currently opt out of this curriculum if they live in a state that has adopted the standards ("NC Common Core Explained: Frequently Asked Questions," n.d.)

Advantages

Wiggins (1991) asserted that a school has standards when it communicates high expectations for all its learners, and many proponents of the Common Core standards argue that this curriculum does just that. Those in favor of this curriculum believe that, if implemented correctly, it moves our nation's schools beyond superficial "test preparation" curriculum and gives teachers the opportunity for deep, meaningful learning through fewer and more rigorous standards, helping our nation become more globally competitive (Conley, 2011; Wagner, 2013). Furthermore sharing a national curriculum will help states by providing the same benchmarks for each state and will eliminate issues of gaps appearing for students if they are moved from a state mid-year ("The Standards," 2010). It will also allow for the sharing of ideas and resources on a national level while still allowing for local flexibility and interpretation of the standards (Phillips & Wong, 2010).

These standards are also proving to be popular at the collegiate level. Michael Maher, an assistant dean for professional education and accreditation at North Carolina State University, asserted that the Common Core standards are an improvement over previously implemented

standards, that he argued lacked depth (as cited in Wagner, 2013). Furthermore, a committee of collegiate researchers completed a comparative study of the new Common Core standards and previously held state standards. These researchers found that when compared to previous standards the Common Core standards were higher quality, giving an overall grade of B- for the English Language Arts standards and an A- to the math standards (Carmichael, Martino, Porter-Magee, & Wilson, 2010). Representatives of the College-Ready for Work for the Bill and Melinda Gates Foundation (which also funds the two consortiums that are creating Common Core standardized assessments) also believe that these standards will help create college-ready high school graduates that would translate to no further remediation needs in college (Phillips & Wong, 2010).

Several professional education associations also support these new curricular standards, the most noteworthy being the nonprofit organization of the Association for Supervision and Curriculum Development (ASCD). This association, founded in 1943, is a membership-based group of educational professionals and experts, and it was one of the final educational organizations to formally endorse the Common Core standards. The ASCD only endorsed these standards after a thorough yearlong review of the standards development and implementation of this curriculum, and it stressed the importance of teacher and administrator input into these standards, along with continuous professional development, to make these standards a success. In order to help facilitate the sharing of ideas, resources, and professional development, the ASCD has created a Common Core resource page that provides a timeline of standards implementation along with online professional development and other resources. The association realizes that without this crucial support and resource development that these standards could fail before the implementation is fully realized (Carter, n.d.).

Disadvantages

Perhaps it is because of improper support and lack of appropriate professional development that opposition, both from political and educational realms, is beginning to grow in response to the implementation of Common Core standards. North Carolina state superintendent June Atkinson pondered: "How can people argue against teaching North Carolina students to read, write, speak and listen? How could that be of the devil? How can that be bad for kids? I am so disappointed people would want to make this political football" (as cited in Stancill, 2013). While a proponent of the common core himself, Conley warned that, if executed poorly, these standards could result in "accountability on steroids, stifling meaningful school improvement nationwide" (2011, para. 2).

The argument exists that teaching the same standards nationally is a civil rights issue by providing equity and access to the same quality of education, which should then improve test scores by ensuring that everyone is measured by the same measuring stick, so to speak; however, there is no empirical evidence to support that national standards improve national testing performance (Tienken, 2010). Even countries like France and Denmark, with a well-established national curriculum, are outperformed by nations like Canada that are on a similar economic level but do not have national standards in place (Luebke, 2013). Proponents also argue that a national curriculum is useful for students moving across state lines during their academic career, but mobility statistics do not support this need. As of 2011 the inter-state mobility rate is a mere 1.6% of the total population, and of that population, only 0.3% of these are school-age children ("Closing the Door on Innovation: Why One National Curriculum is Bad for America," 2011).

Others are concerned with the lack of field testing for this new curriculum. Diane Ravitch, noted educational historian, expressed that our schools are now comprised of "guinea

pigs" trying out a largely untested curriculum (2013). Perhaps even more worrisome is the lack of empirical evidence supporting these standards. In Tienken's (2011) research on the growing body of evidence supporting the Common Core standards, he discovered that this was based upon the 2010 *Benchmarking for Success* report, which was also written by the same group that created the standards. Of the 138 references used in this report, Tienken asserted that many of them are repetitive sources and that only four could be considered truly empirical studies directly related to national standards and student achievement (2011). The standards themselves are also a source for dispute. College professors who have reviewed the standards at length argue that they are oddly worded and leave much open to interpretation, much like this English Language Arts standard: "Analyze different points of view of the characters and the audience or reader (e.g., created through the use of dramatic irony) creating such effects as suspense or humor" (Schmoker & Graff, 2011, p. 2). Other issues surrounding the standards themselves vary. Complaints expressed about English Language Arts are that they focus more on metacognition than content, they are too focused on informational texts (at least 50% of texts in grades 6-12 must be informational), and they convey vague expectations and reading lists (Carmichael et al, 2010; Luebke, 2013). Frustrations regarding mathematics standards include an avoidance of standard algorithms, fractions, and basic arithmetic skills, vague expectations for when to use a calculator, and the introduction of concepts before they are appropriate (such as introducing the idea of functions in first grade) (Carmichael et al, 2010).

Ravitch (as cited in Strauss, 2014) also relayed her fear that issuing national curriculum could lead to a test-based meritocracy by ranking and rating every student, teacher, and school in the country. Inevitably growing constituencies of opponents are voicing their concerns that a "one-size fits all" curriculum is counterintuitive and counterproductive in a society that values

individualization, differentiation, and customization and that it may place too much emphasis on standardized testing while discouraging teacher autonomy (Stancill, 2013; Tienken & Zhao, 2010; Westervelt, 2014). Furthermore, it ignores various subgroups like learning disabled students as well as disregards parent and teacher input in educational policy (Westervelt, 2014). Having a single set of standards is myopic in that it assumes that all students start and end at the same academic ability while overlooking student diversity (Tienken, 2011). This diversity has historically been viewed as a mark of strength in our educational system, and it is unfortunate that student diversity is now being viewed as negative as our system attempts to fit every student to the same constricted, standardized mold (Luebke, 2013). Opponents of a nationalized, standardized curriculum often draw the comparison of a doctor practicing medicine: would a person want a one-size-fits-all approach to one's medical treatment? Tienken and Zhao (2010) argued: "Why would you allow your child to receive programmed, standardized, one-size-fits-all instruction? We would not allow that for our children and we do not see any evidence that standardizing instruction will improve education for other peoples' children" (p. 7-8).

Further undermining confidence in the Common Core movement has been its effect on standardized testing, the related decline in test scores. Ravitch, who has made herself a vocal opponent of Common Core standards, reported that the dramatic drop in test scores was intentional through testing design. In every state where these tests have been implemented test scores have dropped by approximately 30%, which on NAEP assessments has translated to less than 4 in 10 students being labeled as proficient using the new Common Core standards (Gewertz, 2013; Strauss, 2014;). Given that this steep decrease in test scores is across the general population of students, it only follows that these assessments will hurt students with disabilities, economic disadvantages, and limited English proficiency even more (Ravitch, 2013).

Given the fact that many states are opting out of paper-and-pencil assessments in favor of online assessments, this leads to technology and additional funding concerns by states (Kober & Rentner, 2012). U.S. Secretary of Education Arne Duncan has been vocal in his rebuttal to concerns over the precipitous decline in test scores, arguing that "white suburban moms" are upset about the new Common Core tests because "their child isn't as brilliant as they thought they were" (as cited in Strauss, 2013, para. 2). As a result of the tremendous decline in scores and related concerns, as many as 10 states are now delaying implementation of Common Core assessments, and the board of New York's teachers recently unanimously voted to withdraw its support for the Common Core standards (Bidwell, 2014; Strauss, 2013). Principals who withdrew their support in New York testified that

> many children cried during or after testing, and others vomited or lost control of their bowels or bladders. Others simply gave up. One teacher reported that a student kept banging his head on the desk, and wrote, 'This is too hard,' and 'I can't do this,' throughout his test booklet" (Bidwell, 2014. para. 9).

With a sudden reversal of state support for the Common Core, the future of the program is uncertain at best. Although most states that originally adopted the initiative are still implementing the standards and their respective assessments, with the opposition growing, the effect of the standards on student learning is still undetermined at this time (Strauss, 2013).

Funding Issues

As mentioned earlier in this chapter, the U.S. Department of Education is prohibited from exercising any influence over a national curriculum through subsidizing it financially. As a result, the Gates Foundation offered its fiscal support. Over the course of 4 years, from 2010-2014, it is estimated that the Gates Foundation spent more than $350 to support the

implementation of the Common Core by creating course syllabi and instructional and assessment systems based on technology (Phillips & Wong, 2010). Despite this large influx of money on a national implementation level, individual states are still struggling with local implementation costs (Kober & Rentner, 2012). States like North Carolina, for example, have delayed joining a national Common Core assessment consortium because of difficulties finding funding to pay for these new tests (Owens, 2014). Other states that have joined consortiums, like PARCC or Smarter Balanced, are estimating that a per-student cost for each standardized assessment will range from a staggering $22.50 to $29.50, not including mid-year exams or other benchmark testing (Lu, 2014). Anticipating these funding issues prompted several states to apply for federal grants like Race to the Top (a total of $4.35 billion in federal funds) to fill in financial gaps; however, to be eligible for these funds, the Secretary of Education stipulated that the states applying had to first adopt the Common Core standards (Ravitch, 2013; Wagner, 2013). Given that the shift to Common Core occurred simultaneously with the Great Recession, enactment of a national set of standards and the complicated processes that came along with it posed a great financial challenge, to say the least. Many state departments of instruction were forced to lay off teachers and increase class size while concurrently procuring funding for a comprehensive new curriculum that led to tremendous financial strain on many states' budgets (Kober & Rentner, 2012). Sadly, in the 2009 Blueprint for Education Reform, it was suggested that the adoption of the Common Core standards could even be used as a qualification for being eligible for Title I funding for the schools with the highest need for funding (Stotsky, 2012).

At this point, after several years of research, development, and a nearly-nationwide implementation of the Common Core standards, abandoning the movement mid-implementation may be disastrous. As the change process dictates, all implementations have an implementation

dip where the process becomes more difficult before true, lasting change takes place. Several researchers believe that the Common Core standards implementation should continue through this "dip" but that some changes are necessary to make it succeed. These researchers believe that rather than as a tool for high-stakes testing, it should be used as a "low-stakes" tool to use for curriculum development and professional development. Furthermore, these researchers argue that Common Core standards and assessments should be subjected to field testing and revisions before using these standards for high-stakes assessments (Mathis, 2010).

## Summary

This chapter has addressed the complex influences surrounding student achievement with the low-income student. While many factors affect academic success, the most prevalent dynamics regarding this subject involve socioeconomic status of the child's family, standardized testing issues, state and national report cards, Title I funding, and the implementation of Common Core. It is important for the educational researcher to be aware of these extenuating circumstances when examining the how and why of a student's academic success.

# CHAPTER 3

# METHODS OF RESEARCH

This nonexperimental quantitative study with secondary data analysis was designed to determine how socioeconomic status and student achievement on high-stakes assessments are related. The study was focused on middle grades students in North Carolina public schools during the 2012 and 2013 end-of-grade state assessments. Comparisons were made between the 2012 assessments (pre-Common Core implementation) and 2013 assessments (post-Common Core implementation).

## Research Questions and Null Hypotheses

The following research questions and corresponding null hypotheses were addressed in this study. The level of socioeconomic status of the student, the grade level, and the year are independent variables, and the dependent variable was academic achievement as indicated by proficiency levels (percentage of students labeled as proficient) on standardized assessments in the areas of reading and mathematics in the middle grades (grades 6-8).

*Research Question 1*

Is there a significant difference between reading proficiency levels as compared by socioeconomic status levels for sixth grade students on the 2012 and 2013 state report cards?

$HO_{1a}$: There is no significant difference between reading proficiency levels as compared by socioeconomic status level for sixth grade students on the 2012 state report cards.

$HO_{1b}$: There is no significant difference between reading proficiency levels as compared by socioeconomic status level for sixth grade students on the 2013 state report cards.

*Research Question 2*

Is there a significant difference between mathematics proficiency levels as compared by socioeconomic status level for sixth grade students on the 2012 and 2013 state report cards?

$HO_{2a}$: There is no significant difference between mathematics proficiency levels as compared by socioeconomic status level for sixth grade students on the 2012 state report cards.

$HO_{2b}$: There is no significant difference between mathematics proficiency levels as compared by socioeconomic status level for sixth grade students on the 2013 state report cards.

*Research Question 3*

Is there a significant difference between reading proficiency levels as compared by socioeconomic status level for seventh grade students on the 2012 and 2013 state report cards?

$HO_{3a}$: There is no significant difference between reading proficiency levels as compared by socioeconomic status level for seventh grade students on the 2012 state report cards.

$HO_{3b}$: There is no significant difference between reading proficiency levels as compared by socioeconomic status level for seventh grade students on the 2013 state report cards.

*Research Question 4*

Is there a significant difference between mathematics proficiency levels as compared by socioeconomic status level for seventh grade students on the 2012 and 2013 state report cards?

$HO_{4a}$: There is no significant difference between mathematics proficiency levels as compared by socioeconomic status level for seventh grade students on the 2012 state report cards.

$HO_{4b}$: There is no significant difference between mathematics proficiency levels as compared by socioeconomic status level for seventh grade students on the 2013 state report cards.

*Research Question 5*

Is there a significant difference between reading proficiency levels as compared by socioeconomic status level for eighth grade students on the 2012 and 2013 state report cards?

$HO_{5a}$: There is no significant difference between reading proficiency levels as compared by socioeconomic status level for eighth grade students on the 2012 state report cards.

$HO_{5b}$: There is no significant difference between reading proficiency levels as compared by socioeconomic status level for eighth grade students on the 2013 state report cards.

*Research Question 6*

Is there a significant difference between mathematics proficiency levels as compared by socioeconomic status level for eighth grade students on the 2012 and 2013 state report cards?

$HO_{6a}$: There is no significant difference between mathematics proficiency levels as compared by socioeconomic status level for eighth grade students on the 2012 state report cards.

$HO_{6b}$: There is no significant difference between mathematics proficiency levels as compared by socioeconomic status level for eighth grade students on the 2013 state report cards.

*Research Question 7*

Is there a significant difference between 2012 and 2013 academic achievement scores on mathematics standardized tests for middle grades students?

$HO_7$: There is no significant difference between 2012 and 2013 academic achievement scores on the mathematics standardized tests for middle grades students.

*Research Question 8*

Is there a significant difference between 2012 and 2013 academic achievement scores on reading standardized tests for middle grades students?

$HO_8$: There is no significant difference between 2012 and 2013 academic achievement scores on the reading standardized tests for middle grades students.

*Research Question 9*

Is there a significant difference between proficiency levels in both reading and mathematics standardized tests when compared by the schools' economic levels in 2012 and 2013 for middle grades students?

$HO_{9a}$: There is no significant difference between proficiency levels in both reading and mathematics standardized tests when compared by the schools' economic levels in 2012 for middle grades students.

$HO_{9b}$: There is no significant difference between proficiency levels in both reading and mathematics standardized tests when compared by the schools' economic levels in 2013 for middle grades students.

## Population

The population for this study is all middle grades students (grades 6-8) in North Carolina during the 2011-2012 and 2012-2013 academic years for whom end of grade assessment scores were obtainable for both academic years. Additionally, only public schools with a configuration of grades 6-8 were considered for this study. Charter schools, private schools, or schools with a different grade level configuration (like K-8 schools) were not considered, nor were schools who

did not have achievement data for both consecutive school years. Additionally, economically disadvantaged students were identified on the state report card as a subgroup of students who qualified for free and reduced cost lunch at North Carolina public schools.

## Instrumentation

Academic achievement in the areas of reading and mathematics were obtained from the North Carolina Department of Public Instruction state report card website. These data are obtained through end of grade tests designed by the North Carolina Department of Public Instruction. These tests are norm-referenced assessments that use multiple choice questions to ascertain student mastery of state curriculum standards (NC Standard Course of Study in 2012 and the Common Core Curriculum in 2013). Students must answer a specific number of questions correctly in each subject area (reading and mathematics) to be considered "proficient" in the subject, and the cut score is specific to each grade level and content area. After student proficiency levels are determined, the data are disaggregated and reported on the North Carolina State Report Card.

The state report card, as discussed in Chapter 2, houses aggregated and disaggregated student data in a variety of areas. Students in grades 3-8 are administered a North Carolina end of grade assessment at the conclusion of each academic year (in the late spring). The state department of instruction establishes a testing window for each district (depending on how many school days the district has been in session to make allowances for days missed due to inclement weather), and strict testing procedures are established to ensure maximum security and reliability for tests administered. These timed, high-stakes standardized tests are typically comprised of a series of multiple-choice test items that measure students' skills in reading and mathematics. In the 2012-2013 school year North Carolina added a "gridded response" section in the

mathematics portion of the end of grade assessment in grades 5-8 to add an increased degree of difficulty for students.

North Carolina reports testing results based on four achievement levels on a scale of 1-4. A student obtaining a level 1 indicates insufficient mastery of the content for that grade level (and is therefore not prepared for the next grade level) while a student obtaining a level 2 indicates inconsistent mastery and that one is minimally prepared for the next grade level. These achievement levels are generally considered "not proficient" and therefore are not considered passing scores. A student obtaining a level 3 indicates sufficient mastery of the course content, and a student earning a level 4 indicates superior mastery of the content. In both cases, students are considered to be "proficient," and, therefore, these achievement levels are considered passing scores ("NC School Report Card: Glossary of Terms," n.d.).

Socioeconomic levels used for this study were divided into five levels as determined by the percentage of students receiving free or reduced price lunch: 1%-40% of students on free or reduced cost lunch, 41%-60% of students on free or reduced cost lunch, 61%-80% of students on free or reduced cost lunch, and 81%-100% of students on free or reduced cost lunch. I have combined levels 1%-20% and 21%-40% (the highest socioeconomic levels) because the population size is too small and therefore inadequate to be a representative sample.

## Data Collection

The data used for this study were collected from North Carolina School Report cards from the 2011-2012 and 2012-2013 school years. These public data were available online through the North Carolina School Report Card website (http://www.ncschoolreportcard.org/src/), which is the official website by which the North Carolina Department of Public Instruction reports testing and other data from public schools on a

yearly basis. I accessed this website via the internet to obtain these data. Furthermore, this research did not contain any identifiable information on students in this study.

## Data Analysis

In this study the level of socioeconomic status of the student, the academic year, and the grade of the student are the independent variables, and the dependent variable is academic achievement as indicated by proficiency levels (percentage of students labeled as proficient) on standardized assessments in the areas of reading and mathematics in the middle grades (grades 6-8). One way analyses of variance tests (ANOVAs) were performed to determine if significant differences exist between socioeconomic status levels and student proficiency levels as compared by socioeconomic status on reading and mathematics assessments, which addressed research questions 1 through 6. A paired sample t test was performed to compare proficiency averages between the 2012 and 2013 academic year for reading and math, which addressed research question 7 and 8. Finally, another one way analysis of variance (ANOVA) was performed to determine if a significant difference exists between economically disadvantaged students' proficiency levels and standardized assessments in 2012 and 2013, which addressed research question 9. The Statistical Program for the Social Sciences (SPSS) was used to analyze data, all of which were analyzed at the .05 level of significance.

## Chapter Summary

In this chapter the methodology of the research used in this nonexperimental, quantitative study was addressed. The purpose of this study is to determine whether a middle grades school's socioeconomic status (based on the percentage of students on free/reduced cost lunch) and student achievement on end of grade, high-stakes state standardized assessments (based on percentage of students achieving a score of "proficient") are related. The study focused on

middle grades students in North Carolina public schools during the 2012 and 2013 end of grade state assessments (using only public schools configured as grades 6-8 schools for which testing data were available for the academic years in question). Comparisons were made against the 2012 assessments (pre-Common Core implementation) and 2013 assessments (post-Common Core implementation) using statistical analyses using the Statistical Program for the Social Sciences (SPSS).

# CHAPTER 4
# INTRODUCTION

The purpose of this study was to determine whether a significant difference exists in academic achievement when compared by socioeconomic levels of the North Carolina middle grade learners as measured by reading and mathematics standardized tests. This study involved an analysis of data from the 2 most recent testing years as North Carolina's curriculum and testing instruments dramatically changed from 2012 to 2013 with the implementation of the Common Core curriculum, thus changing from an old curriculum to a new curriculum.

The nine research questions presented in Chapter 1 were used to guide the study, and the 16 hypotheses presented in Chapter 3 were used to test the data. Discussion of the findings for each is presented below.

Research Question 1

Is there a significant difference between reading proficiency levels as compared by socioeconomic status levels for sixth grade students on the 2012 and 2013 state report cards?

$HO_{1a}$: There is no significant difference between reading proficiency levels as compared by socioeconomic status level for sixth grade students on the 2012 state report cards.

A one-way analysis of variance (ANOVA) was performed to determine whether significant differences existed between reading proficiency levels based on socioeconomic levels for sixth grade students on the 2012 North Carolina state report card. The factor variable, the socioeconomic descriptor of the student population, included four levels: 1%-40% economically disadvantaged, 41%-60% economically disadvantaged, 61%-80% economically disadvantaged, and 81%-100% economically disadvantaged. The dependent variable was the proficiency level score on the sixth grade reading end of grade standardized assessment among students in each of these SES levels. The ANOVA was significant, $F(3,359) = 138.84$, $p < .001$. Therefore, the null

hypothesis was rejected. The strength of the relationship between reading proficiency scores and socioeconomic levels as assessed by $\eta^2$ was large (.58).

Because the overall *F* test was significant, post hoc multiple comparisons were conducted to evaluate pairwise difference among the means of the four groups. A Dunnett C procedure was selected for the multiple comparisons because equal variances were not assumed. There were significant differences between the means of the proficiency scores at every socioeconomic level. Schools with more students on free or reduced cost lunch scored significantly lower than schools with fewer students on free or reduced cost lunch. Schools with 1%-40% of students receiving free or reduced cost lunch scored significantly higher than schools with 41%-60% of students receiving free or reduced cost lunch, and the 41%-60% socioeconomic bracket scored significantly higher than schools with 61%-80% of the student population receiving free/reduced cost lunch. Likewise, schools in the 61%-80% socioeconomic bracket scored significantly higher than schools with 81%-100% of the student population receiving free or reduced cost lunch. The circles on the box plots denote outliers that are farther than 1.5 interquartile ranges (and closer than 3 interquartile ranges). The numbers next to the circles indicate the case number of the outlier. The 95% confidence intervals for the pairwise differences, as well as the means and standard deviations for the four socioeconomic levels, are reported in Table 1, and a box plot comparing the means between the groups is reported in Figure 1.

Table 1

*95% Confidence Intervals of Pairwise Differences in 2012 Mean Proficiency Reading Scores Among Different Levels of Socioeconomic Status of Sixth Grade Students*

| SES Level | N | M | SD | 1%-40% ED | 41%-60% ED | 61%-80% ED |
|---|---|---|---|---|---|---|
| 1-40% ED | 64 | 87.59 | 5.07 | | | |
| 41%-60% ED | 121 | 77.03 | 6.30 | [7.95, 13.18]* | | |
| 61-80% ED | 133 | 69.93 | 8.56 | [15.11, 20.22]* | [4.31, 9.89]* | |
| 81%-100% ED | 45 | 57.67 | 11.21 | [25.16, 34.69]* | [14.46, 24.25]* | [7.40, 17.12]* |

*Significant at the .05 level

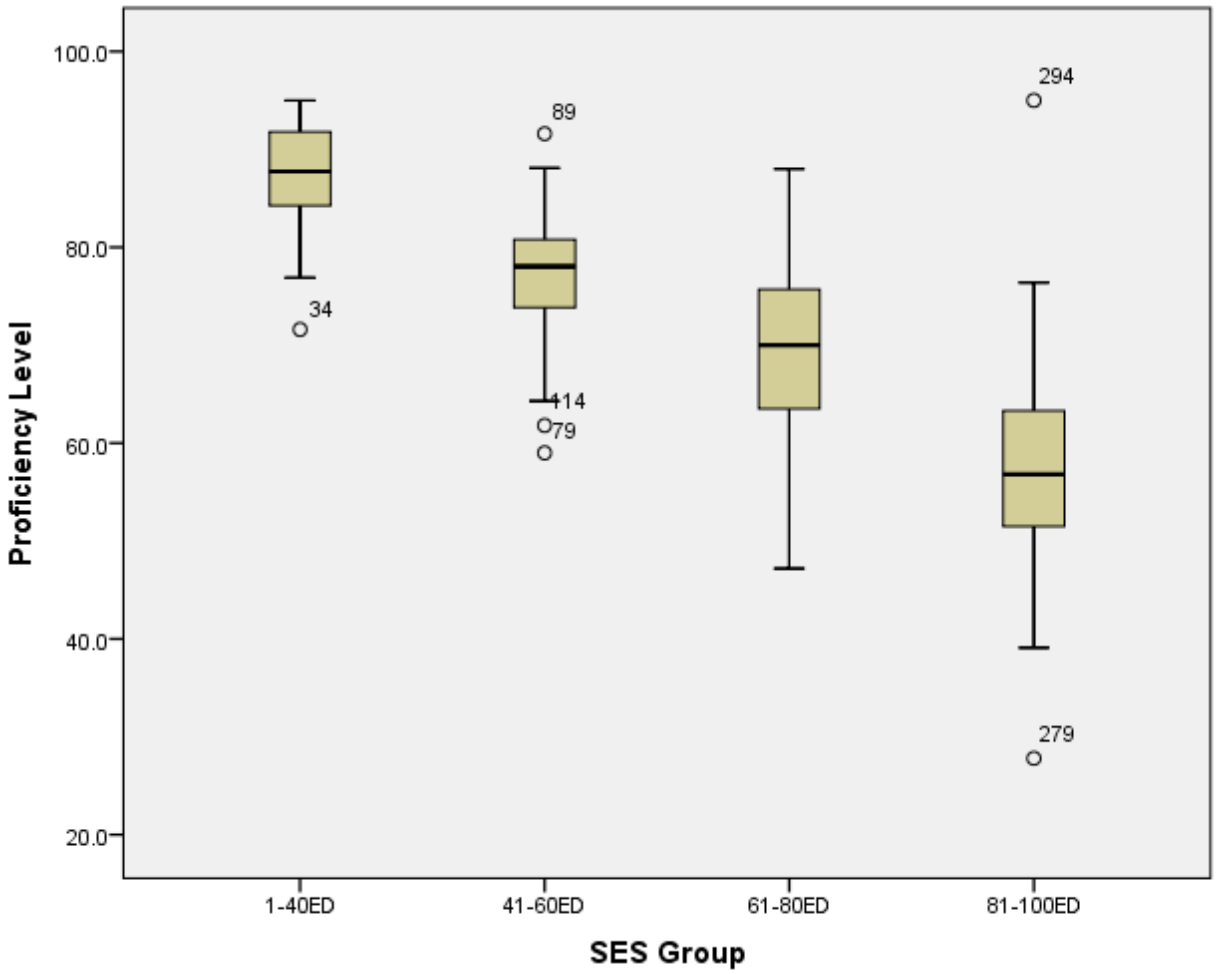


*Figure 1*. 2012 reading proficiency levels of sixth grade students according to socioeconomic group.

$HO_{1b}$: There is no significant difference between reading proficiency levels as compared by socioeconomic status level for sixth grade students on the 2013 state report cards.

A one-way analysis of variance (ANOVA) was performed to determine whether significant differences existed between reading proficiency levels based on socioeconomic levels for sixth grade students on the 2013 North Carolina state report card. The factor variable, the socioeconomic descriptor of the student population, included four levels: 1%-40% economically disadvantaged, 41%-60% economically disadvantaged, 61%-80% economically disadvantaged, and 81%-100% economically disadvantaged. The dependent variable was the proficiency level score on the sixth grade reading end of grade standardized assessment among students in each of these SES levels. The ANOVA was significant, $F(3,359) = 257.69$, $p < .001$. Therefore, the null hypothesis was rejected. The strength of the relationship between reading proficiency scores socioeconomic levels as assessed by $\eta^2$ was large (.68).

Because the overall *F* test was significant, post hoc multiple comparisons were conducted to evaluate pairwise difference among the means of the four groups. A Dunnett C procedure was selected for the multiple comparisons because equal variances were not assumed. There were significant differences between the means of the proficiency scores at every socioeconomic level. Schools with more students on free or reduced cost lunch scored significantly lower than schools with fewer students on free or reduced cost lunch. Schools with 1%-40% of students receiving free or reduced cost lunch scored significantly higher than schools with 41%-60% of students receiving free or reduced cost lunch, and the 41%-60% socioeconomic bracket scored significantly higher than schools with 61%-80% of the student population receiving free or reduced cost lunch. Likewise, schools in the 61%-80% socioeconomic bracket scored significantly higher than schools with 81%-100% of the student population receiving free or

reduced cost lunch. The circles on the box plots denote outliers that are farther than 1.5 interquartile ranges (and closer than 3 interquartile ranges. The numbers next to the circles indicate the case number of the outlier. The 95% confidence intervals for the pairwise differences, as well as the means and standard deviations for the four socioeconomic levels, are reported in Table 2, and a box plot and means plot comparing the means between the groups is reported in Figure 2.

Table 2

*95% Confidence Intervals of Pairwise Differences in 2013 Mean Proficiency Reading Scores Among Different Levels of Socioeconomic Status of Sixth Grade Students*

| SES Level | N | M | SD | 1%-40% ED | 41%-60% ED | 61%-80% ED |
|---|---|---|---|---|---|---|
| 1%-40% ED | 62 | 63.77 | 10.10 | | | |
| 41%-60% ED | 121 | 47.69 | 7.19 | [12.29, 19.88]* | | |
| 61%-80% ED | 126 | 38.59 | 7.94 | [21.33, 29.05]* | [6.60, 11.61]* | |
| 81%-100% ED | 54 | 43.94 | 6.51 | [34.41, 42.66]* | [19.55, 25.36]* | [10.36, 16.34]* |

*Significant at the .05 level

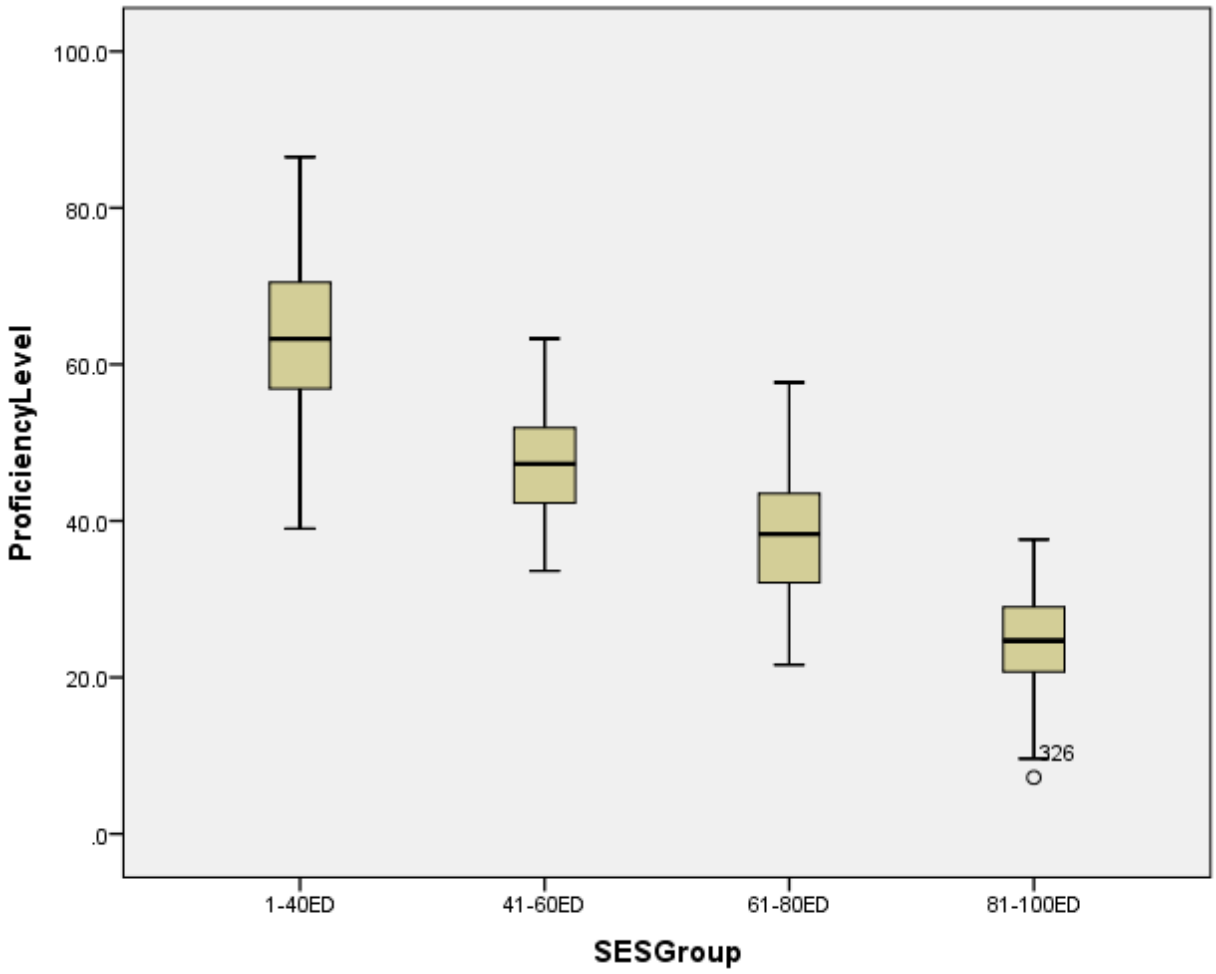


*Figure 2*. 2013 reading proficiency levels of sixth grade students according to socioeconomic group.

Research Question 2

Is there a significant difference between mathematics proficiency levels as compared by socioeconomic status level for sixth grade students on the 2012 and 2013 state report cards?

$HO_{2a}$: There is no significant difference between mathematics proficiency levels as compared by socioeconomic status level for sixth grade students on the 2012 state report cards.

A one-way analysis of variance (ANOVA) was performed to determine whether significant differences existed between mathematics proficiency levels based on socioeconomic levels for sixth grade students on the 2012 North Carolina state report card. The factor variable, the socioeconomic descriptor of the student population, included four levels: 1%-40% economically disadvantaged, 41%-60% economically disadvantaged, 61%-80% economically disadvantaged, and 81%-100% economically disadvantaged. The dependent variable was the proficiency level score on the sixth grade mathematics end of grade standardized assessment among students in each of these SES levels. The ANOVA was significant, $F(3,359) = 98.36$, $p < .001$. Therefore, the null hypothesis was rejected. The strength of the relationship between reading proficiency scores socioeconomic levels as assessed by $\eta^2$ was large (.45).

Because the overall *F* test was significant, post hoc multiple comparisons were conducted to evaluate pairwise difference among the means of the four groups. A Dunnett C procedure was selected for the multiple comparisons because equal variances were not assumed. There were significant differences between the means of the proficiency scores at every socioeconomic level; schools with more students on free or reduced cost lunch scored significantly lower than schools with fewer students on free or reduced cost lunch. Schools with 1%-40% of students receiving free or reduced cost lunch scored significantly higher than schools with 41%-60% of students receiving free or reduced cost lunch, and the 41%-60% socioeconomic bracket scored significantly higher than schools with 61%-80% of the student population receiving free or reduced cost lunch. Likewise, schools in the 61%-80% socioeconomic bracket scored significantly higher than schools with 81%-100% of the student population receiving free or reduced cost lunch. The circles on the box plots denote outliers that are farther than 1.5 interquartile ranges (and closer than 3 interquartile ranges). The numbers next to the circles

indicate the case number of the outlier. The 95% confidence intervals for the pairwise differences, as well as the means and standard deviations for the four socioeconomic levels, are reported in Table 3, and a box plot comparing the means between the groups is reported in Figure 3.

Table 3

*95% Confidence Intervals of Pairwise Differences in 2012 Mean Proficiency Mathematics Scores Among Different Levels of Socioeconomic Status of Sixth Grade Students*

| SES Level | N | M | SD | 1-40% ED | 41-60% ED | 61-80% ED |
|---|---|---|---|---|---|---|
| 1-40% ED | 64 | 90.15 | 4.28 | | | |
| 41-60% ED | 121 | 82.11 | 6.72 | [5.92, 10.18]* | | |
| 61-80% ED | 133 | 76.16 | 9.24 | [11.47, 16.51]* | [3.32, 8.57]* | |
| 81-100% ED | 45 | 65.23 | 10.56 | [20.49, 29.36]* | [12.38, 21.37]* | [6.24, 15.62]* |

*Significant at the .05 level

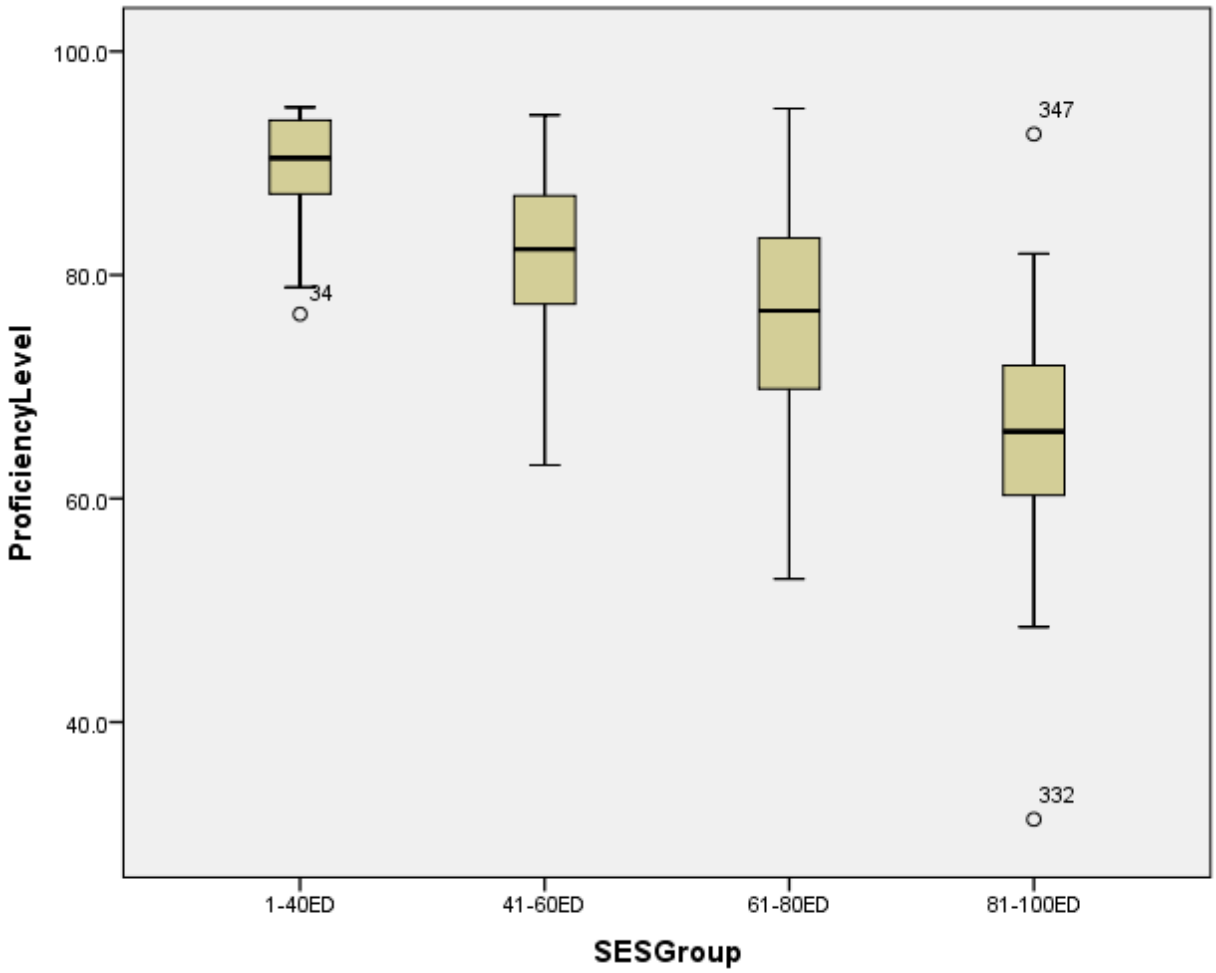


*Figure 3*. 2012 mathematics proficiency levels of sixth grade students according to socioeconomic group.

$HO_{2b}$: There is no significant difference between mathematics proficiency levels as compared by socioeconomic status level for sixth grade students on the 2013 state report cards.

A one-way analysis of variance (ANOVA) was performed to determine whether significant differences existed between mathematics proficiency levels based on socioeconomic levels for sixth grade students on the 2013 North Carolina state report card. The factor variable, the socioeconomic descriptor of the student population, included four levels: 1%-40% economically disadvantaged, 41%-60% economically disadvantaged, 61%-80% economically disadvantaged, and 81%-100% economically disadvantaged. The dependent variable was the

proficiency level score on the sixth grade mathematics end of grade standardized assessment among students in each of these SES levels. The ANOVA was significant, $F(3,359) = 163.64$, $p < .001$. Therefore, the null hypothesis was rejected. The strength of the relationship between reading proficiency scores socioeconomic levels as assessed by $\eta^2$ was large (.58).

Because the overall *F* test was significant, post hoc multiple comparisons were conducted to evaluate pairwise difference among the means of the four groups. A Dunnett C procedure was selected for the multiple comparisons because equal variances were not assumed. There were significant differences between the means of the proficiency scores at every socioeconomic level; schools with more students on free or reduced cost lunch scored significantly lower than schools with fewer students on free or reduced cost lunch. Schools with 1%-40% of students receiving free or reduced cost lunch scored significantly higher than schools with 41%-60% of students receiving free or reduced cost lunch, and the 41%-60% socioeconomic bracket scored significantly higher than schools with 61%-80% of the student population receiving free or reduced cost lunch. Likewise, schools in the 61%-80% socioeconomic bracket scored significantly higher than schools with 81%-100% of the student population receiving free or reduced cost lunch. The circles on the box plots denote outliers that are farther than 1.5 interquartile ranges (and closer than 3 interquartile ranges). The numbers next to the circles indicate the case number of the outlier. The 95% confidence intervals for the pairwise differences, as well as the means and standard deviations for the four socioeconomic levels, are reported in Table 4, and a box plot comparing the means between the groups is reported in Figure 4.

Table 4

*95% Confidence Intervals of Pairwise Differences in 2013 Mean Proficiency Mathematics Scores Among Different Levels of Socioeconomic Status of Sixth Grade Students*

| SES Level | N | M | SD | 1%-40% ED | 41%-60% ED | 61%-80% ED |
|---|---|---|---|---|---|---|
| 1%-40% ED | 62 | 57.82 | 13.77 | | | |
| 41%-60% ED | 121 | 39.44 | 9.41 | [13.25, 23.50]* | | |
| 61%-80% ED | 126 | 29.91 | 10.56 | [22.69, 33.14]* | [6.23, 12.85]* | |
| 81%-100% ED | 54 | 18.40 | 6.39 | [34.26, 44.58]* | [17.84, 24.52]* | [8.14, 14.87]* |

*Significant at the .05 level

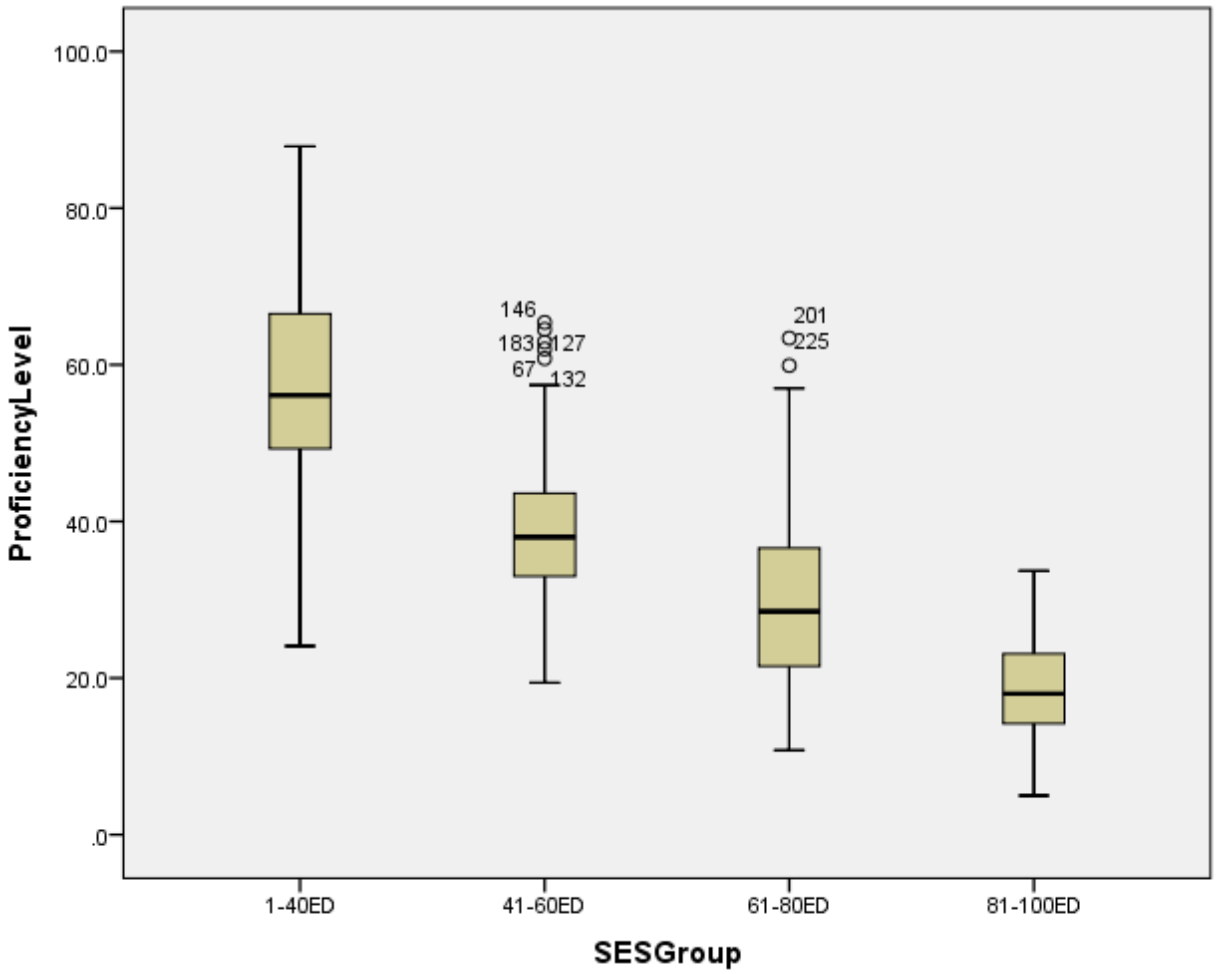


*Figure 4*. 2013 mathematics proficiency levels of sixth grade students according to socioeconomic group.

Research Question 3

Is there a significant difference between reading proficiency levels as compared by socioeconomic status level for seventh grade students on the 2012 and 2013 state report cards?

$HO_{3a}$: There is no significant difference between reading proficiency levels as compared by socioeconomic status level for seventh grade students on the 2012 state report cards.

A one-way analysis of variance (ANOVA) was performed to determine whether significant differences existed between reading proficiency levels based on socioeconomic levels for seventh grade students on the 2012 North Carolina state report card. The factor variable, the socioeconomic descriptor of the student population, included four levels: 1%-40% economically disadvantaged, 41%-60% economically disadvantaged, 61%-80% economically disadvantaged, and 81%-100% economically disadvantaged. The dependent variable was the proficiency level score on the seventh grade reading end of grade standardized assessment among students in each of these SES levels. The ANOVA was significant, $F(3,359) = 184.63$, $p < .001$. Therefore, the null hypothesis was rejected. The strength of the relationship between reading proficiency scores socioeconomic levels as assessed by $\eta^2$ was large (.61).

Because the overall *F* test was significant, post hoc multiple comparisons were conducted to evaluate pairwise difference among the means of the four groups. A Dunnett C procedure was selected for the multiple comparisons because equal variances were not assumed. There were significant differences between the means of the proficiency scores at every socioeconomic level; schools with more students on free or reduced cost lunch scored significantly lower than schools with fewer students on free or reduced cost lunch. Schools with 1%-40% of students receiving free or reduced cost lunch scored significantly higher than schools with 41%-60% of its students receiving free or reduced cost lunch, and the 41%-60% socioeconomic bracket

scored significantly higher than schools with 61%-80% of the student population receiving free or reduced cost lunch. Likewise, schools in the 61%-80% socioeconomic bracket scored significantly higher than schools with 81%-100% of the student population receiving free or reduced cost lunch. The circles on the box plots denote outliers that are farther than 1.5 interquartile ranges (and closer than 3 interquartile ranges). The numbers next to the circles indicate the case number of the outlier. The 95% confidence intervals for the pairwise differences, as well as the means and standard deviations for the four socioeconomic levels, are reported in Table 5, and a box plot comparing the means between the groups is reported in Figure 5.

Table 5

*95% Confidence Intervals of Pairwise Differences in 2012 Mean Proficiency Reading Scores Among Different Levels of Socioeconomic Status of Seventh Grade Students*

| SES Level | N | M | SD | 1%-40% ED | 41%-60% ED | 61%-80% ED |
|---|---|---|---|---|---|---|
| 1%-40% ED | 64 | 83.01 | 6.21 | | | |
| 41%-60% ED | 121 | 70.22 | 6.48 | [10.23, 15.35]* | | |
| 61%-80% ED | 133 | 63.04 | 9.67 | [16.98, 22.96]* | [4.51, 9.85]* | |
| 81%-100% ED | 45 | 47.71 | 47.71 | [31.05, 39.55]* | [18.48, 26.53]* | [11.02, 19.64]* |

*Significant at the .05 level

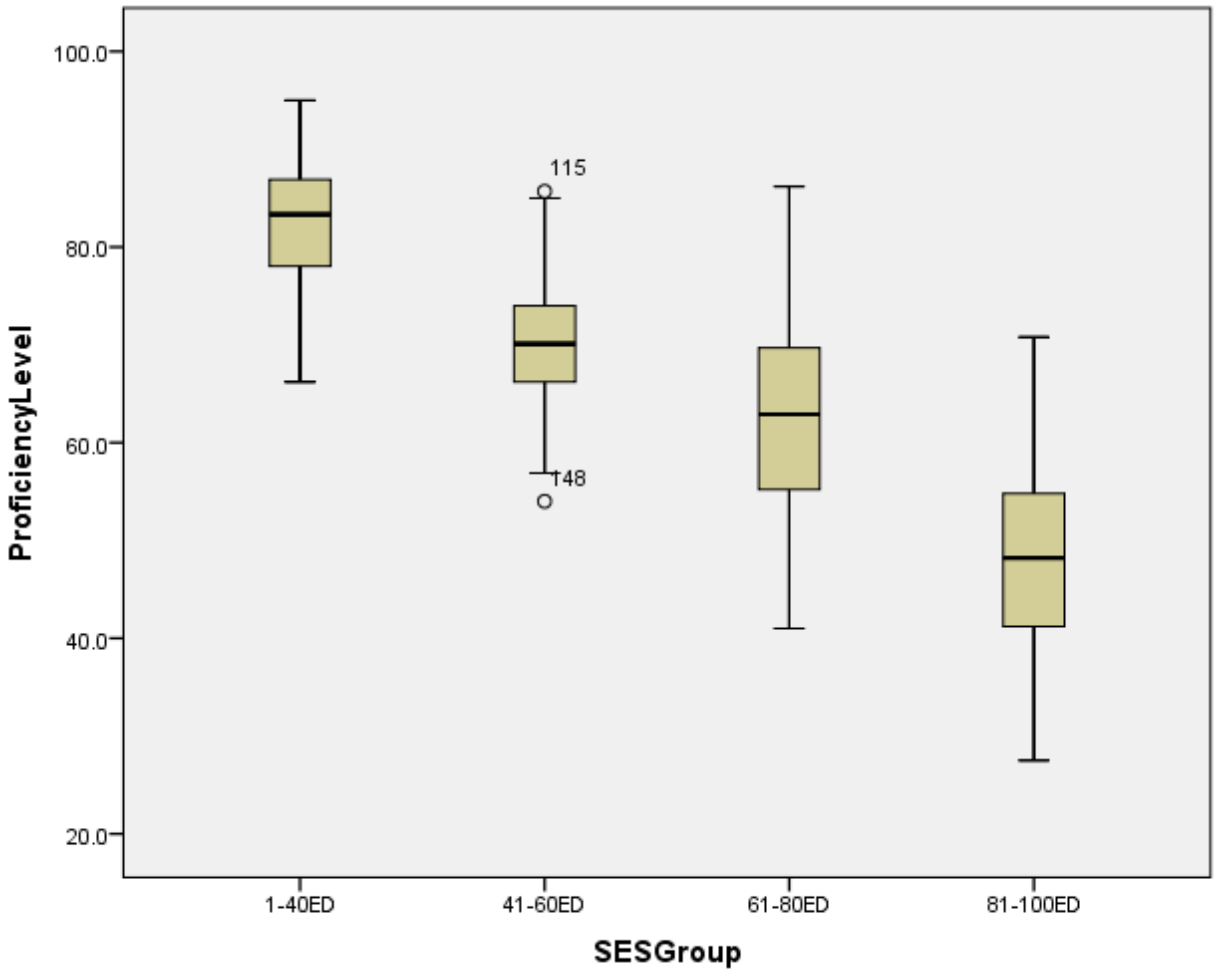


*Figure 5*. 2012 reading proficiency levels of seventh grade students according to socioeconomic group.

$HO_{3b}$: There is no significant difference between reading proficiency levels as compared by socioeconomic status level for seventh grade students on the 2013 state report cards.

A one-way analysis of variance (ANOVA) was performed to determine whether significant differences existed between reading proficiency levels based on socioeconomic levels for seventh grade students on the 2013 North Carolina state report card. The factor variable, the socioeconomic descriptor of the student population, included four levels: 1%-40% economically disadvantaged, 41%-60% economically disadvantaged, 61%-80% economically disadvantaged, and 81%-100% economically disadvantaged. The dependent variable was the proficiency level

score on the seventh grade reading end of grade standardized assessment among students in each of these SES levels. The ANOVA was significant, $F(3,359) = 232.68$, $p < .001$. Therefore, the null hypothesis was rejected. The strength of the relationship between reading proficiency scores socioeconomic levels as assessed by $\eta^2$ was large (.66).

Because the overall *F* test was significant, post hoc multiple comparisons were conducted to evaluate pairwise difference among the means of the four groups. A Dunnett C procedure was selected for the multiple comparisons because equal variances were not assumed. There were significant differences between the means of the proficiency scores at every socioeconomic level; schools with more students on free or reduced cost lunch scored significantly lower than schools with fewer students on free or reduced cost lunch. Schools with 1%-40% of students receiving free or reduced cost lunch scored significantly higher than schools with 41%-60% of students receiving free or reduced cost lunch, and the 41%-60% socioeconomic bracket scored significantly higher than schools with 61%-80% of the student population receiving free or reduced cost lunch. Likewise, schools in the 61%-80% socioeconomic bracket scored significantly higher than schools with 81%-100% of the student population receiving free or reduced cost lunch. The circles on the box plots denote outliers that are farther than 1.5 interquartile ranges (and closer than 3 interquartile ranges). The numbers next to the circles indicate the case number of the outlier. The 95% confidence intervals for the pairwise differences, as well as the means and standard deviations for the four socioeconomic levels, are reported in Table 6, and a box plot comparing the means between the groups is reported in Figure 6.

Table 6

*95% Confidence Intervals of Pairwise Differences in 2013 Mean Proficiency Reading Scores Among Different Levels of Socioeconomic Status of Seventh Grade Students*

| SES Level | N | M | SD | 1%-40% ED | 41%-60% ED | 61%-80% ED |
|---|---|---|---|---|---|---|
| 1%-40% ED | 62 | 65.65 | 9.33 | | | |
| 41%-60% ED | 121 | 49.55 | 6.94 | [12.57, 19.64]* | | |
| 61%-80% ED | 126 | 40.63 | 7.86 | [21.40, 28.64]* | [6.46, 11.37]* | |
| 81%-100% ED | 54 | 28.34 | 9.54 | [32.66, 41.96]* | [17.39, 25.02]* | [8.40, 16.18]* |

*Significant at the .05 level

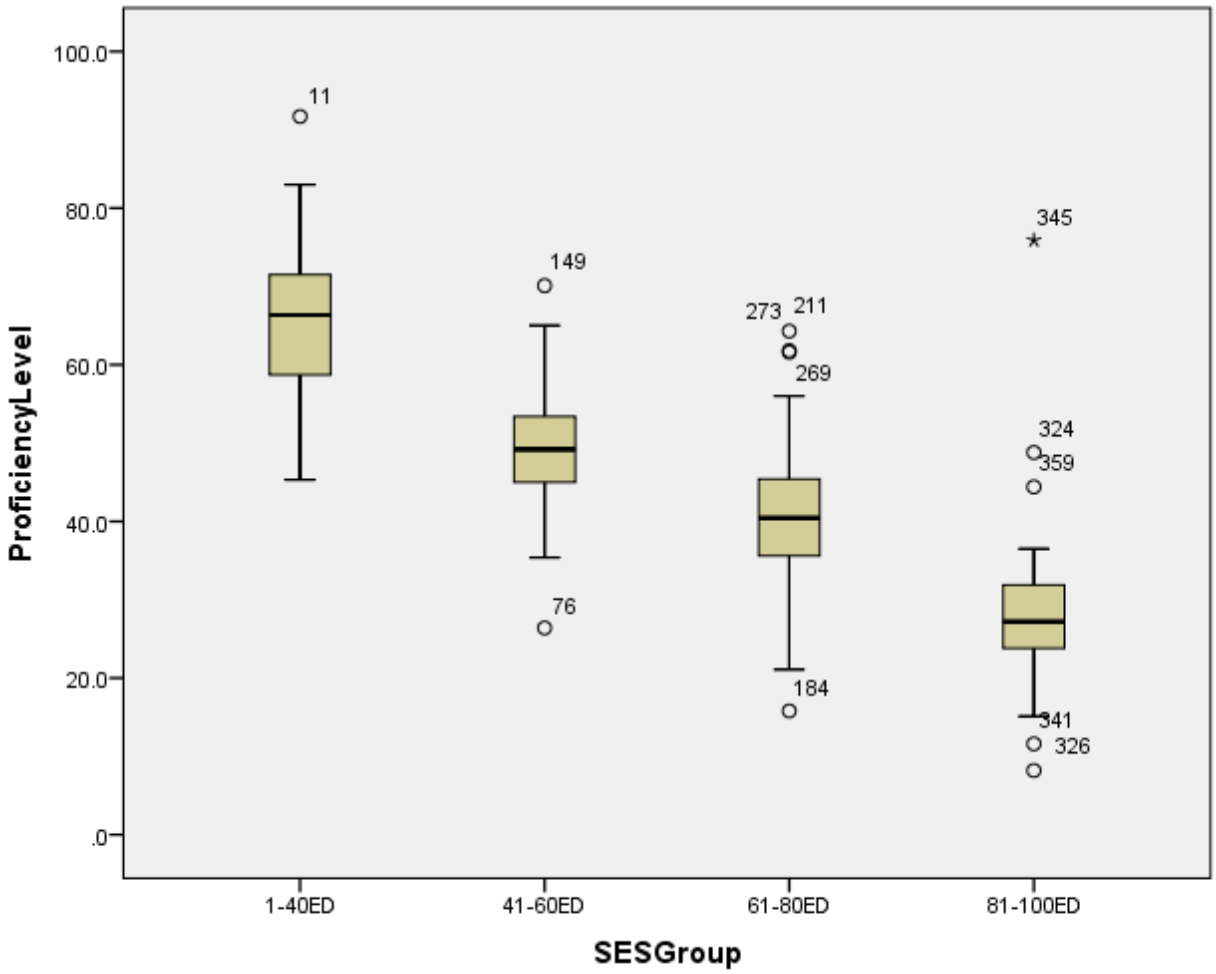


*Figure 6*. 2013 reading proficiency levels of seventh grade students according to socioeconomic group.

Research Question 4

Is there a significant difference between mathematics proficiency levels as compared by socioeconomic status level for seventh grade students on the 2012 and 2013 state report cards?

$HO_{4a}$: There is no significant difference between mathematics proficiency levels as compared by socioeconomic status level for seventh grade students on the 2012 state report cards.

A one-way analysis of variance (ANOVA) was performed to determine whether significant differences existed between mathematics proficiency levels based on socioeconomic levels for seventh grade students on the 2012 North Carolina state report card. The factor variable, the socioeconomic descriptor of the student population, included four levels: 1%-40% economically disadvantaged, 41%-60% economically disadvantaged, 61%-80% economically disadvantaged, and 81%-100% economically disadvantaged. The dependent variable was the proficiency level score on the seventh grade mathematics end of grade standardized assessment among students in each of these SES levels. The ANOVA was significant, $F(3,359) = 69.05$, $p < .001$. Therefore, the null hypothesis was rejected. The strength of the relationship between reading proficiency scores socioeconomic levels as assessed by $\eta^2$ was medium (.37).

Because the overall *F* test was significant, post hoc multiple comparisons were conducted to evaluate pairwise difference among the means of the four groups. A Dunnett C procedure was selected for the multiple comparisons because equal variances were not assumed. There were significant differences between the means of the proficiency scores at every socioeconomic level; schools with more students on free or reduced cost lunch scored significantly lower than schools with fewer students on free or reduced cost lunch. Schools with 1%-40% of students receiving free or reduced cost lunch scored significantly higher than schools with 41%-60% of

students receiving free or reduced cost lunch, and the 41%-60% socioeconomic bracket scored significantly higher than schools with 61%-80% of the student population receiving free or reduced cost lunch. Likewise, schools in the 61%-80% socioeconomic bracket scored significantly higher than schools with 81%-100% of the student population receiving free or reduced cost lunch. The circles on the box plots denote outliers that are farther than 1.5 interquartile ranges (and closer than 3 interquartile ranges). The numbers next to the circles and stars indicate the case number of the outlier. The 95% confidence intervals for the pairwise differences, as well as the means and standard deviations for the four socioeconomic levels, are reported in Table 7, and a box plot comparing the means between the groups is reported in Figure 7.

Table 7

*95% Confidence Intervals of Pairwise Differences in 2012 Mean Proficiency Mathematics Scores Among Different Levels of Socioeconomic Status of Seventh Grade Students*

| SES Level | N | M | SD | 1%-40% ED | 41%-60% ED | 61%-80% ED |
|---|---|---|---|---|---|---|
| 1%-40% ED | 64 | 90.28 | 4.05 | | | |
| 41%-60% ED | 121 | 82.34 | 6.50 | [5.90, 9.98]* | | |
| 61%-80% ED | 133 | 78.12 | 9.37 | [9.66, 14.67]* | [1.61, 6.84]* | |
| 81%-100% ED | 45 | 69.86 | 9.24 | [16.51, 24.38]* | [8.50, 16.47]* | [4.02, 12.50]* |

*Significant at the .05 level

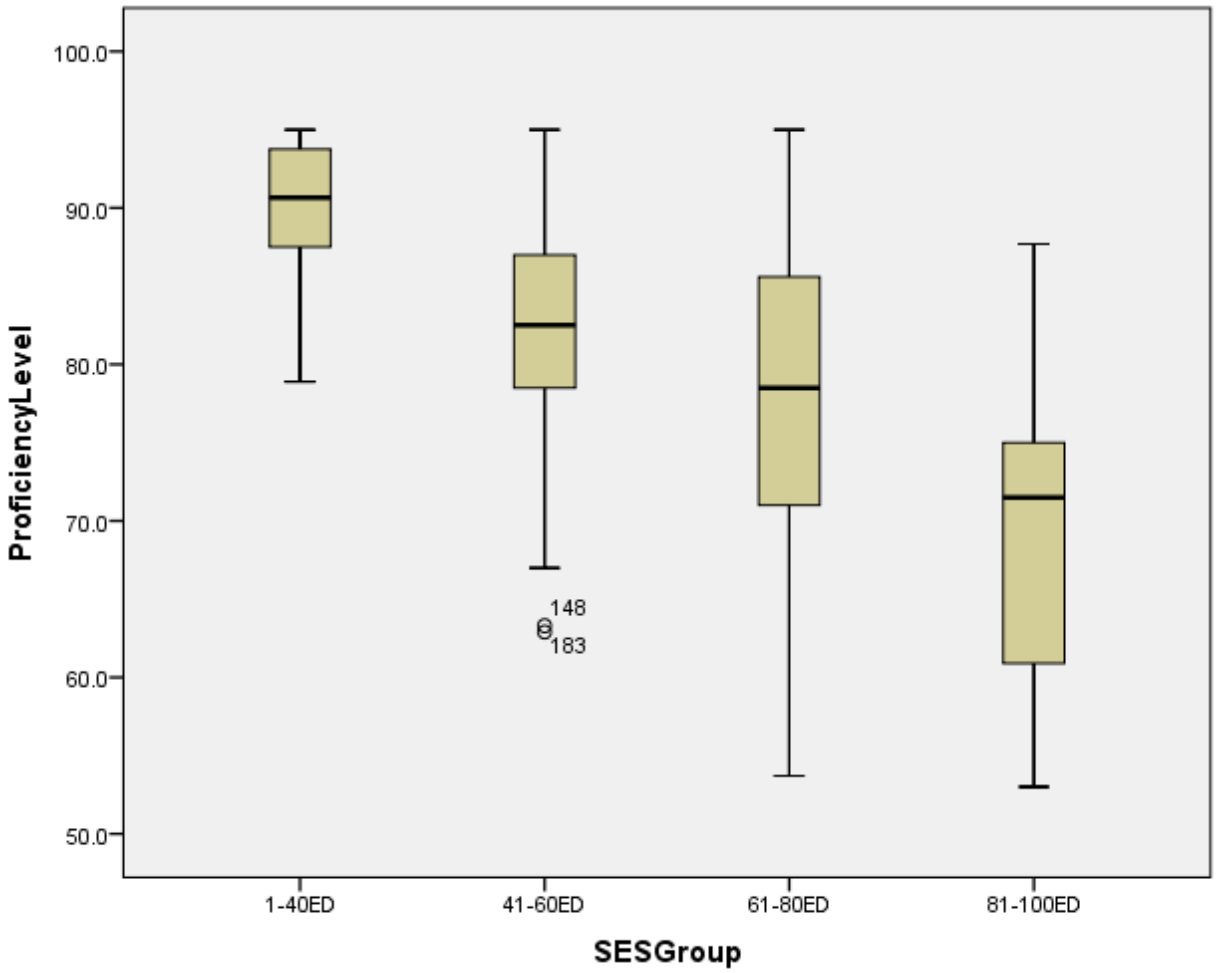


*Figure 7*. 2012 mathematics proficiency levels of seventh grade students according to socioeconomic group.

$HO_{4b}$: There is no significant difference between mathematics proficiency levels as compared by socioeconomic status level for seventh grade students on the 2013 state report cards.

A one-way analysis of variance (ANOVA) was performed to determine whether significant differences existed between mathematics proficiency levels based on socioeconomic levels for seventh grade students on the 2012 North Carolina state report card. The factor variable, the socioeconomic descriptor of the student population, included four levels: 1%-40% economically disadvantaged, 41%-60% economically disadvantaged, 61%-80% economically

disadvantaged, and 81%-100% economically disadvantaged. The dependent variable was the proficiency level score on the seventh grade mathematics end of grade standardized assessment among students in each of these SES levels. The ANOVA was significant, $F(3,359) = 156.32$, $p < .001$. Therefore, the null hypothesis was rejected. The strength of the relationship between reading proficiency scores socioeconomic levels as assessed by $\eta^2$ was large (.57).

Because the overall *F* test was significant, post hoc multiple comparisons were conducted to evaluate pairwise difference among the means of the four groups. A Dunnett C procedure was selected for the multiple comparisons because equal variances were not assumed. There were significant differences between the means of the proficiency scores at every socioeconomic level; schools with more students on free or reduced cost lunch scored significantly lower than schools with fewer students on free or reduced cost lunch. Schools with 1%-40% of students receiving free or reduced cost lunch scored significantly higher than schools with 41%-60% of students receiving free or reduced cost lunch, and the 41%-60% socioeconomic bracket scored significantly higher than schools with 61%-80% of the student population receiving free or reduced cost lunch. Likewise, schools in the 61%-80% socioeconomic bracket scored significantly higher than schools with 81%-100% of the student population receiving free or reduced cost lunch. The circles on the box plots denote outliers that are farther than 1.5 interquartile ranges (and closer than 3 interquartile ranges). The numbers next to the circles indicate the case number of the outlier. The 95% confidence intervals for the pairwise differences, as well as the means and standard deviations for the four socioeconomic levels, are reported in Table 8, and a box plot comparing the means between the groups is reported in Figure 8.

Table 8

*95% Confidence Intervals of Pairwise Differences in 2013 Mean Proficiency Mathematics Scores Among Different Levels of Socioeconomic Status of Seventh Grade Students*

| SES Level | N | M | SD | 1%-40% ED | 41%-60% ED | 61%-80% ED |
|---|---|---|---|---|---|---|
| 1-40% ED | 62 | 58.20 | 13.88 | | | |
| 41%-60% ED | 121 | 38.66 | 9.36 | [14.38, 24.69]* | | |
| 61%-80% ED | 126 | 29.87 | 9.59 | [23.16, 33.48]* | [5.56, 11.93]* | |
| 81%-100% ED | 54 | 21.00 | 7.73 | [31.77, 42.62]* | [14.10, 21.23]* | [5.30, 12.44]* |

*Significant at the .05 level

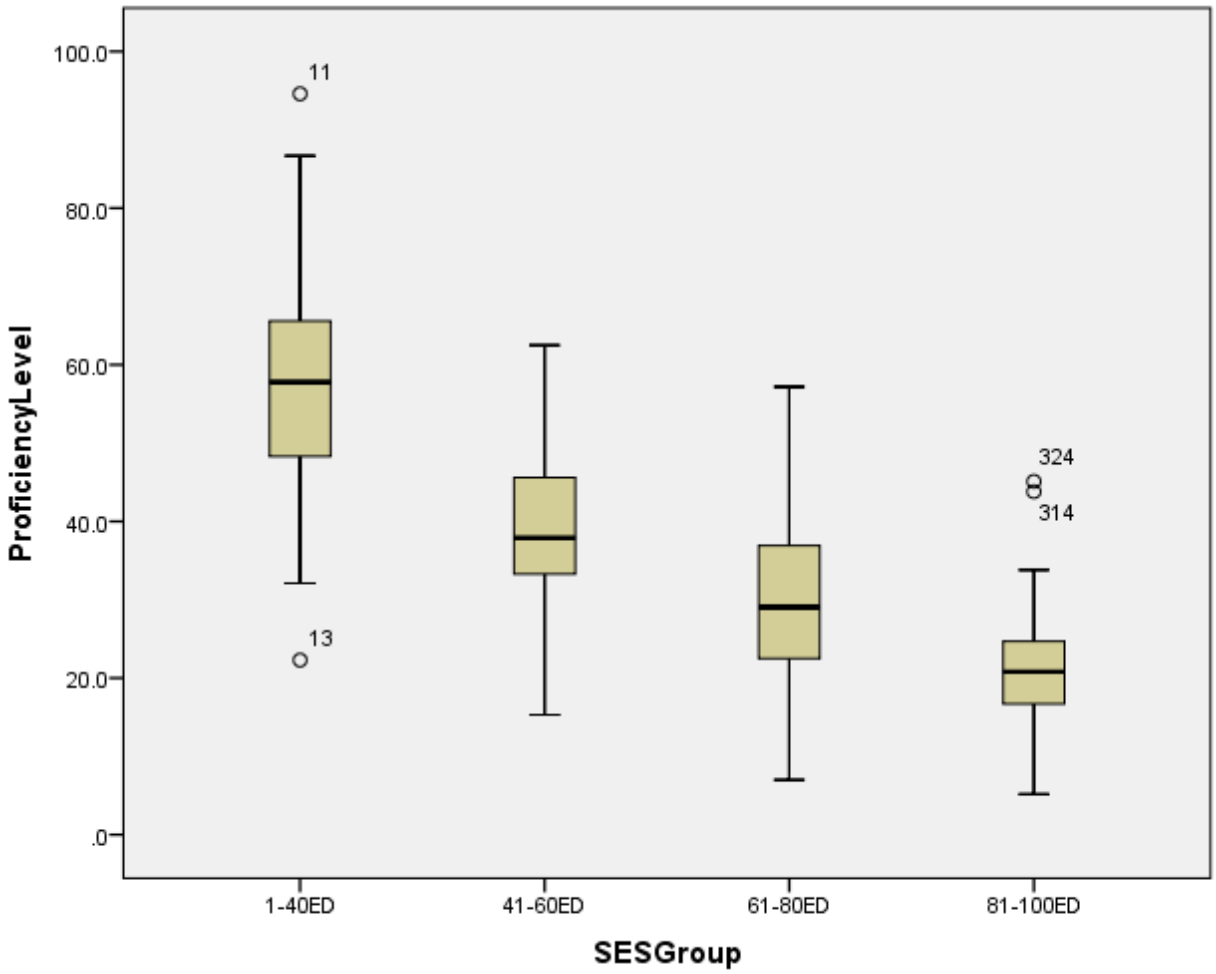


*Figure 8*. 2013 mathematics proficiency levels of seventh grade students according to socioeconomic group.

Research Question 5

Is there a significant difference between reading proficiency levels as compared by socioeconomic status level for eighth grade students on the 2012 and 2013 state report cards?

$HO_{5a}$: There is no significant difference between reading proficiency levels as compared by socioeconomic status level for eighth grade students on the 2012 state report cards.

A one-way analysis of variance (ANOVA) was performed to determine whether significant differences existed between reading proficiency levels based on socioeconomic levels for eighth grade students on the 2012 North Carolina state report card. The factor variable, the socioeconomic descriptor of the student population, included four levels: 1%-40% economically disadvantaged, 41%-60% economically disadvantaged, 61%-80% economically disadvantaged, and 81%-100% economically disadvantaged. The dependent variable was the proficiency level score on the eighth grade reading end of grade standardized assessment among students in each of these SES levels. The ANOVA was significant, $F(3,359) = 189.10$, $p < .001$. Therefore, the null hypothesis was rejected. The strength of the relationship between reading proficiency scores socioeconomic levels as assessed by $\eta^2$ was large (.61).

Because the overall *F* test was significant, post hoc multiple comparisons were conducted to evaluate pairwise difference among the means of the four groups. A Dunnett C procedure was selected for the multiple comparisons because equal variances were not assumed. There were significant differences between the means of the proficiency scores at every socioeconomic level; schools with more students on free or reduced cost lunch scored significantly lower than schools with fewer students on free or reduced cost lunch. Schools with 1%-40% of students receiving free or reduced cost lunch scored significantly higher than schools with 41%-60% of students receiving free or reduced cost lunch, and the 41%-60% socioeconomic bracket scored

significantly higher than schools with 61%-80% of the student population receiving free or reduced cost lunch. Likewise, schools in the 61%-80% socioeconomic bracket scored significantly higher than schools with 81%-100% of the student population receiving free or reduced cost lunch. The circles on the box plots denote outliers that are farther than 1.5 interquartile ranges (and closer than 3 interquartile ranges). The numbers next to the circles indicate the case number of the outlier. The 95% confidence intervals for the pairwise differences, as well as the means and standard deviations for the four socioeconomic levels, are reported in Table 9, and a box plot comparing the means between the groups is reported in Figure 9.

Table 9

*95% Confidence Intervals of Pairwise Differences in 2012 Mean Proficiency Reading Scores Among Different Levels of Socioeconomic Status of Eighth Grade Students*

| SES Level | N | M | SD | 1%-40% ED | 41%-60% ED | 61%-80% ED |
|---|---|---|---|---|---|---|
| 1%-40% ED | 64 | 85.13 | 5.30 | | | |
| 41%-60% ED | 121 | 74.09 | 6.82 | [8.65, 13.41]* | | |
| 61%-80% ED | 133 | 65.63 | 8.83 | [16.85, 22.15]* | [5.90, 11.03]* | |
| 81%-100% ED | 45 | 51.44 | 9.90 | [29.38, 38.00]* | [18.39, 26.91]* | [9.77, 18.60]* |

*Significant at the .05 level

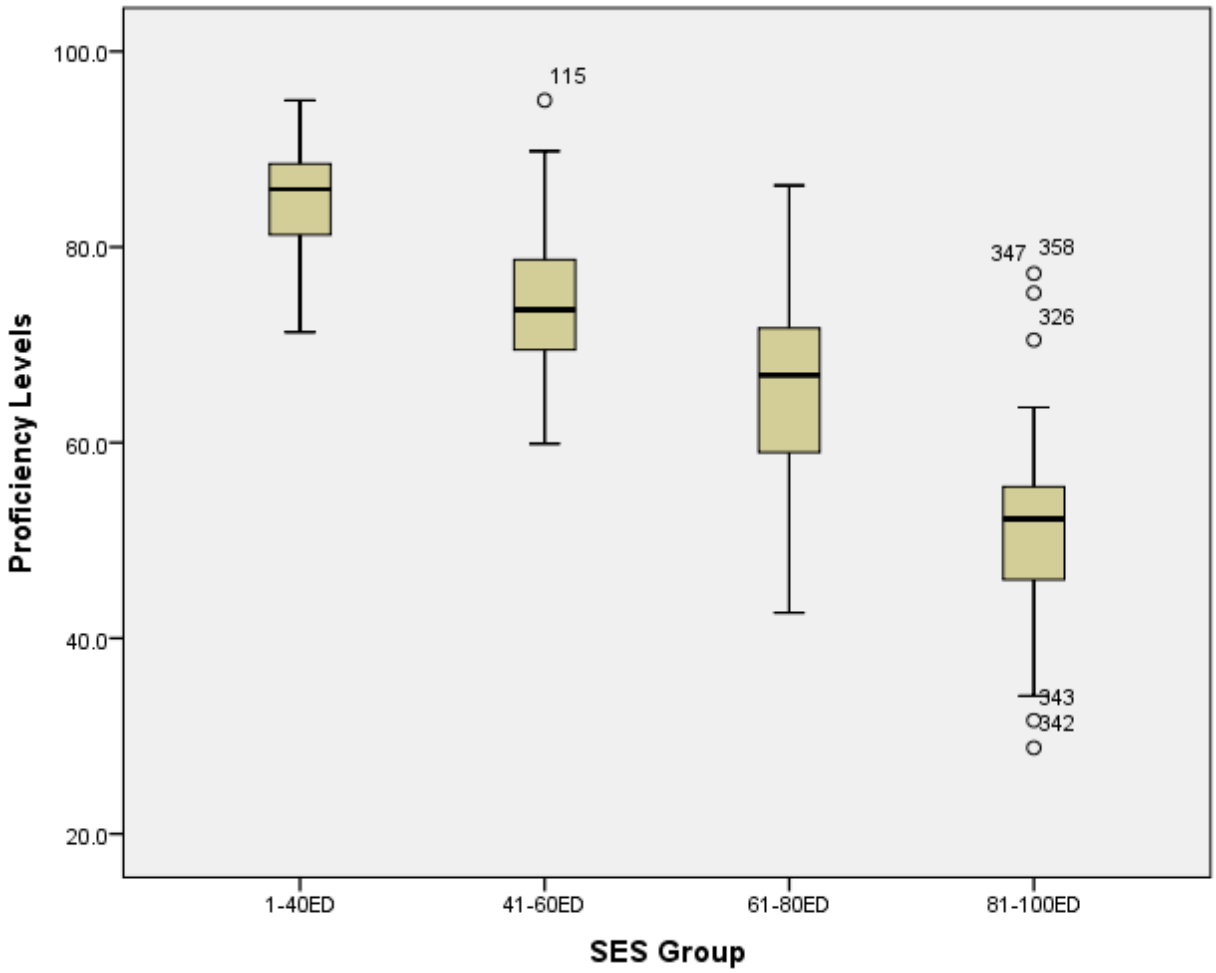


*Figure 9*. 2012 reading proficiency levels of eighth grade students according to socioeconomic group.

$HO_{5b}$: There is no significant difference between reading proficiency levels as compared by socioeconomic status level for eighth grade students on the 2013 state report cards.

A one-way analysis of variance (ANOVA) was performed to determine whether significant differences existed between reading proficiency levels based on socioeconomic levels for eighth grade students on the 2013 North Carolina state report card. The factor variable, the socioeconomic descriptor of the student population, included four levels: 1%-40% economically disadvantaged, 41%-60% economically disadvantaged, 61%-80% economically disadvantaged, and 81%-100% economically disadvantaged. The dependent variable was the proficiency level

score on the eighth grade reading end of grade standardized assessment among students in each of these SES levels. The ANOVA was significant, $F(3,359) = 209.95$, $p < .001$. Therefore, the null hypothesis was rejected. The strength of the relationship between reading proficiency scores socioeconomic levels as assessed by $\eta^2$ was large (.64).

Because the overall *F* test was significant, post hoc multiple comparisons were conducted to evaluate pairwise difference among the means of the four groups. A Dunnett C procedure was selected for the multiple comparisons because equal variances were not assumed. There were significant differences between the means of the proficiency scores at every socioeconomic level; schools with more students on free or reduced cost lunch scored significantly lower than schools with fewer students on free or reduced cost lunch. Schools with 1%-40% of students receiving free or reduced cost lunch scored significantly higher than schools with 41%-60% of students receiving free or reduced cost lunch, and the 41%-60% socioeconomic bracket scored significantly higher than schools with 61%-80% of the student population receiving free or reduced cost lunch. Likewise, schools in the 61%-80% socioeconomic bracket scored significantly higher than schools with 81%-100% of the student population receiving free or reduced cost lunch. The circles on the box plots denote outliers that are farther than 1.5 interquartile ranges (and closer than 3 interquartile ranges), and the star on the box plots denotes an outlier that is farther than 3 interquartile ranges. The numbers next to the circles and stars indicate the case number of the outlier. The 95% confidence intervals for the pairwise differences, as well as the means and standard deviations for the four socioeconomic levels, are reported in Table 10, and a box plot comparing the means between the groups is reported in Figure 10.

Table 10

*95% Confidence Intervals of Pairwise Differences in 2013 Mean Proficiency Reading Scores Among Different Levels of Socioeconomic Status of Eighth Grade Students*

| SES Level | N | M | SD | 1%-40% ED | 41%-60% ED | 61%-80% ED |
|---|---|---|---|---|---|---|
| 1%-40% ED | 62 | 58.90 | 11.40 | | | |
| 41%-60% ED | 121 | 41.70 | 7.53 | [12.98, 21.42]* | | |
| 61%-80% ED | 126 | 33.98 | 6.85 | [20.78, 29.06]* | [5.33, 10.11]* | |
| 81%-100% ED | 54 | 23.19 | 8.00 | [30.92, 40.50]* | [15.12, 21.90]* | [7.50, 14.09]* |

*Significant at the .05 level

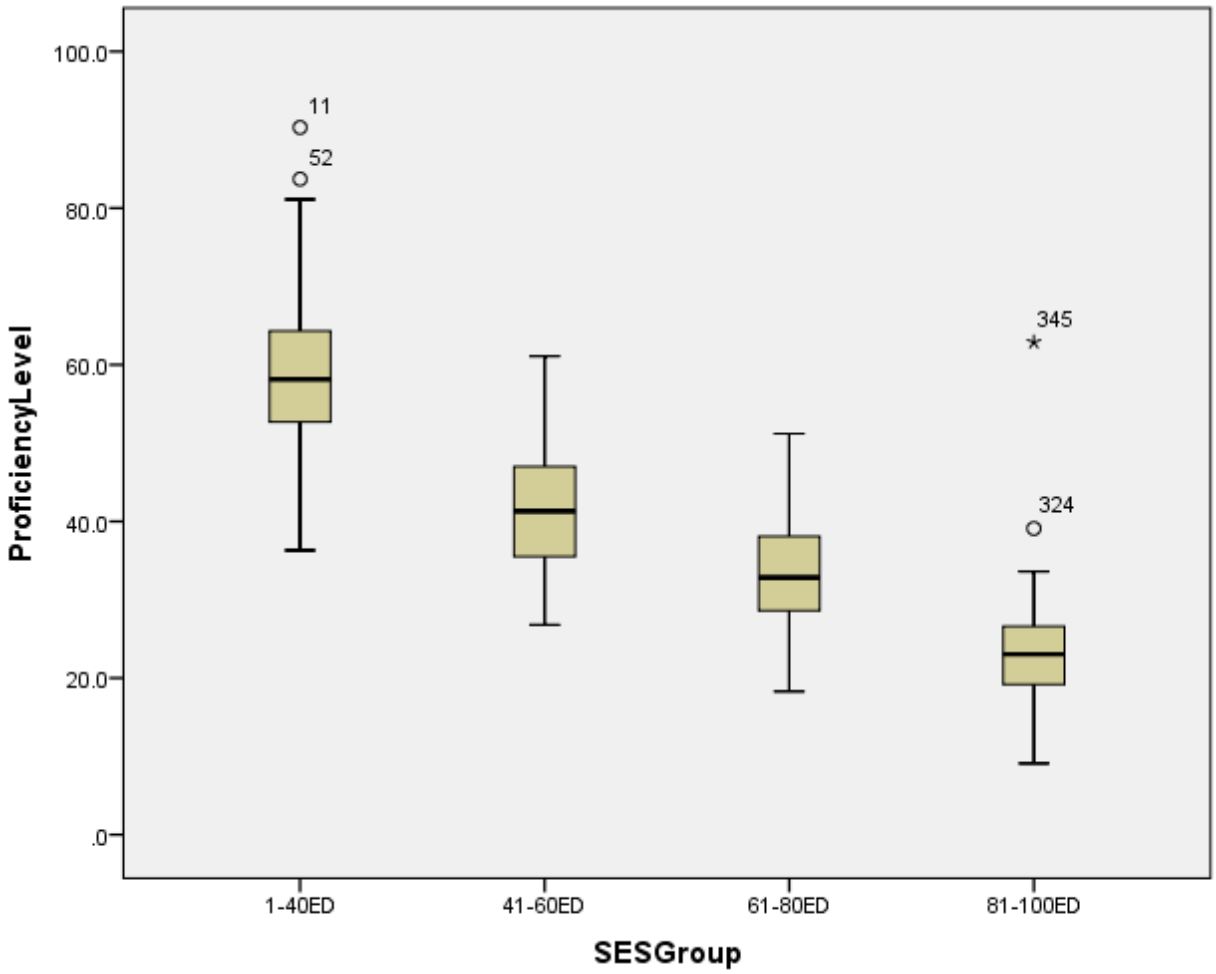


*Figure 10*. 2013 reading proficiency levels of eighth grade students according to socioeconomic group.

Research Question 6

Is there a significant difference between mathematics proficiency levels as compared by socioeconomic status level for eighth grade students on the 2012 and 2013 state report cards?

$HO_{6a}$: There is no significant difference between mathematics proficiency levels as compared by socioeconomic status level for eighth grade students on the 2012 state report cards.

A one-way analysis of variance (ANOVA) was performed to determine whether significant differences existed between mathematics proficiency levels based on socioeconomic levels for eighth grade students on the 2012 North Carolina state report card. The factor variable, the socioeconomic descriptor of the student population, included four levels: 1%-40% economically disadvantaged, 41%-60% economically disadvantaged, 61%-80% economically disadvantaged, and 81%-100% economically disadvantaged. The dependent variable was the proficiency level score on the eighth grade mathematics end of grade standardized assessment among students in each of these SES levels. The ANOVA was significant, $F(3,359) = 63.86$, $p < .001$. Therefore, the null hypothesis was rejected. The strength of the relationship between reading proficiency scores socioeconomic levels as assessed by $\eta^2$ was medium (.35).

Because the overall *F* test was significant, post hoc multiple comparisons were conducted to evaluate pairwise difference among the means of the four groups. A Dunnett C procedure was selected for the multiple comparisons because equal variances were not assumed. There were significant differences between the means of the proficiency scores at every socioeconomic level. Schools with more students on free or reduced cost lunch scored significantly lower than schools with fewer students on free or reduced cost lunch. Schools with 1%-40% of students receiving free or reduced cost lunch scored significantly higher than schools with 41%-60% of

students receiving free or reduced cost lunch, and the 41%-60% socioeconomic bracket scored significantly higher than schools with 61%-80% of the student population receiving free or reduced cost lunch. Likewise, schools in the 61%-80% socioeconomic bracket scored significantly higher than schools with 81%-100% of the student population receiving free or reduced cost lunch. The circles on the box plots denote outliers that are farther than 1.5 interquartile ranges (and closer than 3 interquartile ranges). The numbers next to the circles indicate the case number of the outlier. The 95% confidence intervals for the pairwise differences, as well as the means and standard deviations for the four socioeconomic levels, are reported in Table 11, and a box plot comparing the means between the groups is reported in Figure 11.

Table 11

*95% Confidence Intervals of Pairwise Differences in 2012 Mean Proficiency Mathematics Scores Among Different Levels of Socioeconomic Status of Eighth Grade Students*

| SES Level | N | M | SD | 1%-40% ED | 41%-60% ED | 61%-80% ED |
|---|---|---|---|---|---|---|
| 1%-40% ED | 64 | 92.77 | 3.15 | | | |
| 41%-60% ED | 121 | 87.31 | 5.65 | [3.76, 7.16]* | | |
| 61%-80% ED | 133 | 81.67 | 8.72 | [8.87, 13.32]* | [3.26, 8.02]* | |
| 81%-100% ED | 45 | 75.31 | 10.19 | [13.27, 21.65]* | [7.73, 16.27]* | [1.85, 10.87]* |

*Significant at the .05 level

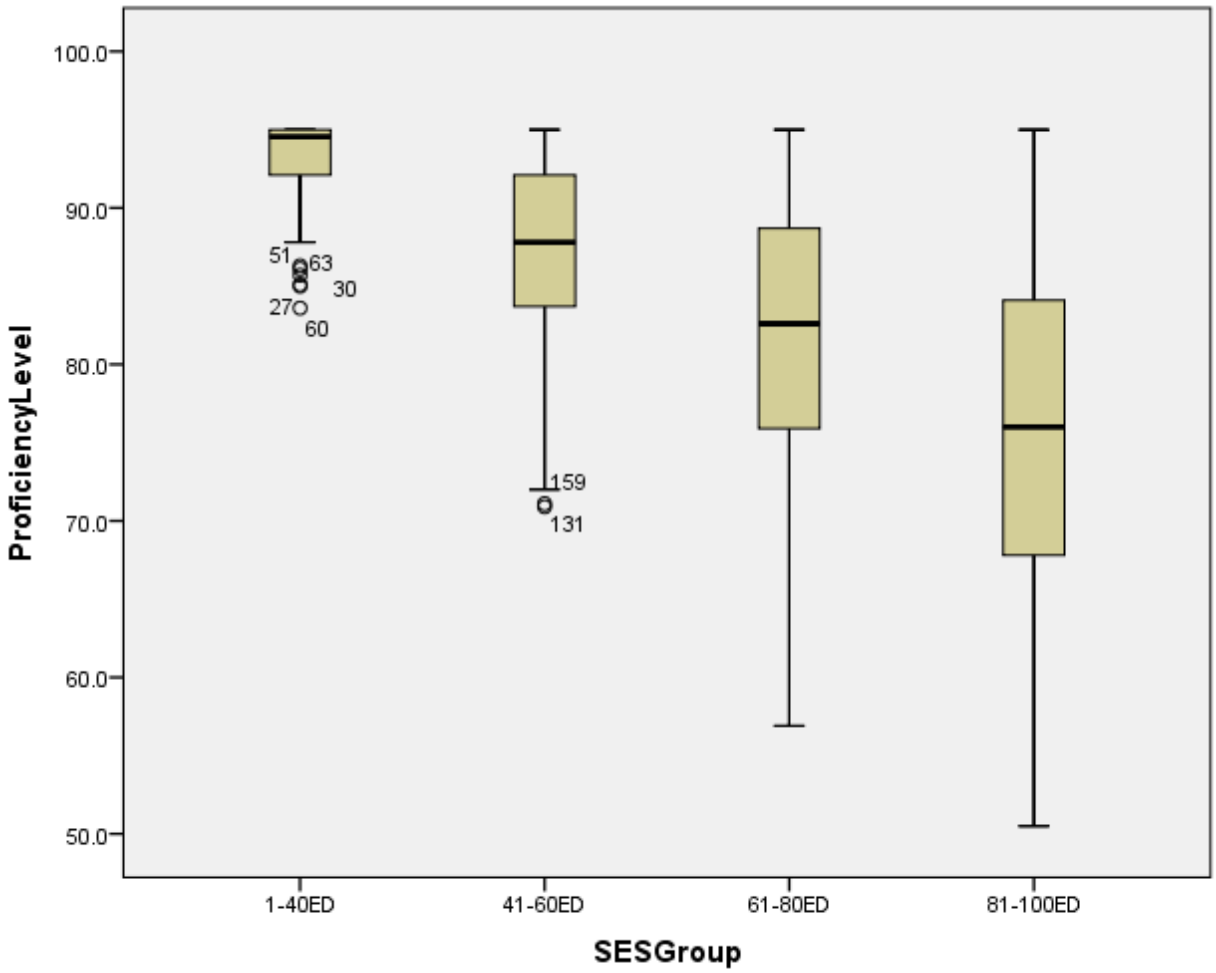


*Figure 11*. 2012 mathematics proficiency levels of eighth grade students according to socioeconomic group.

$HO_{6b}$: There is no significant difference between mathematics proficiency levels as compared by socioeconomic status level for eighth grade students on the 2013 state report cards.

A one-way analysis of variance (ANOVA) was performed to determine whether significant differences existed between mathematics proficiency levels based on socioeconomic levels for eighth grade students on the 2013 North Carolina state report card. The factor variable, the socioeconomic descriptor of the student population, included four levels: 1%-40% economically disadvantaged, 41%-60% economically disadvantaged, 61%-80% economically

disadvantaged, and 81%-100% economically disadvantaged. The dependent variable was the proficiency level score on the eighth grade mathematics end of grade standardized assessment among students in each of these SES levels. The ANOVA was significant, $F(3,359) = 147.74$, $p < .001$. Therefore, the null hypothesis was rejected. The strength of the relationship between reading proficiency scores socioeconomic levels as assessed by $\eta^2$ was large (.55).

Because the overall *F* test was significant, post hoc multiple comparisons were conducted to evaluate pairwise difference among the means of the four groups. A Dunnett C procedure was selected for the multiple comparisons because equal variances were not assumed. There were significant differences between the means of the proficiency scores at every socioeconomic level. Schools with more students on free or reduced cost lunch scored significantly lower than schools with fewer students on free or reduced cost lunch. Schools with 1%-40% of students receiving free or reduced cost lunch scored significantly higher than schools with 41%-60% of students receiving free or reduced cost lunch, and the 41%-60% socioeconomic bracket scored significantly higher than schools with 61%-80% of the student population receiving free or reduced cost lunch. Likewise, schools in the 61%-80% socioeconomic bracket scored significantly higher than schools with 81%-100% of the student population receiving free or reduced cost lunch. The circles on the box plots denote outliers that are farther than 1.5 interquartile ranges (and closer than 3 interquartile ranges), and the star denotes an outlier that is farther than 3 interquartile ranges. The numbers next to the circles and stars indicate the case number of the outlier. The 95% confidence intervals for the pairwise differences, as well as the means and standard deviations for the four socioeconomic levels, are reported in Table 12, and a box plot comparing the means between the groups is reported in Figure 12.

Table 12

*95% Confidence Intervals of Pairwise Differences in 2013 Mean Proficiency Mathematics Scores Among Different Levels of Socioeconomic Status of Eighth Grade Students*

| SES Level | N | M | SD | 1%-40% ED | 41%-60% ED | 61%-80% ED |
|---|---|---|---|---|---|---|
| 1%-40% ED | 62 | 54.38 | 15.25 | | | |
| 41%-60% ED | 121 | 33.98 | 9.67 | [14.80, 26.01]* | | |
| 61%-80% ED | 126 | 25.86 | 9.85 | [22.92, 34.12]* | [4.88, 11.35]* | |
| 81%-100% ED | 54 | 16.37 | 6.95 | [32.32, 43.71]* | [14.22, 21.01]* | [6.11, 12.89]* |

*Significant at the .05 level

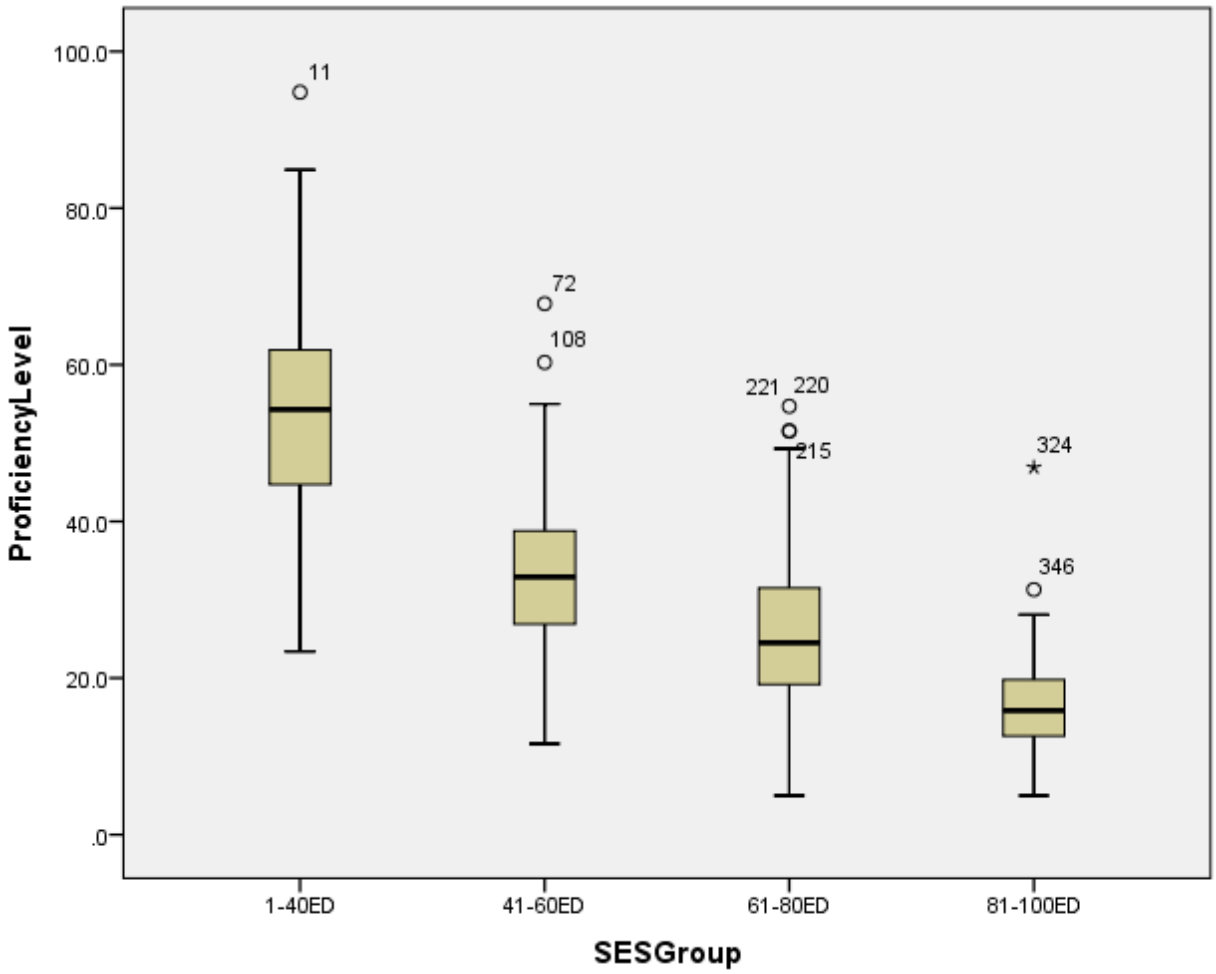


*Figure 12*. 2013 mathematics proficiency levels of eighth grade students according to socioeconomic group.

Research Question 7

Is there a significant difference between 2012 and 2013 academic achievement scores on mathematics standardized tests for middle grades students?

$HO_7$: There is no significant difference between 2012 and 2013 academic achievement scores on the mathematics standardized tests for middle grades students.

A paired-samples *t* test was conducted to evaluate whether a significant difference exists between academic achievement proficiency scores on mathematics standardized tests for middle grades students between 2012 and 2013. Mathematics achievement scores were significantly lower in 2013 than in 2012. The results indicated that the mean proficiency score ($M$ = 81.54, $SD$ = 10.07) was significantly higher in 2012 than in 2013 ($M$ = 34.83, $SD$ = 15.74), $t(1088) = 107.61$, $p < .001$. Therefore, the null hypothesis was rejected because test scores were significantly higher in 2012 than in 2013. The standardized effect size index, *d*, was 3.26, which is a large effect. The 95% confidence interval for the mean difference between the two years' scores was 45.86 to 47.56. A plot comparing the means of these scores is shown in Figure 13.

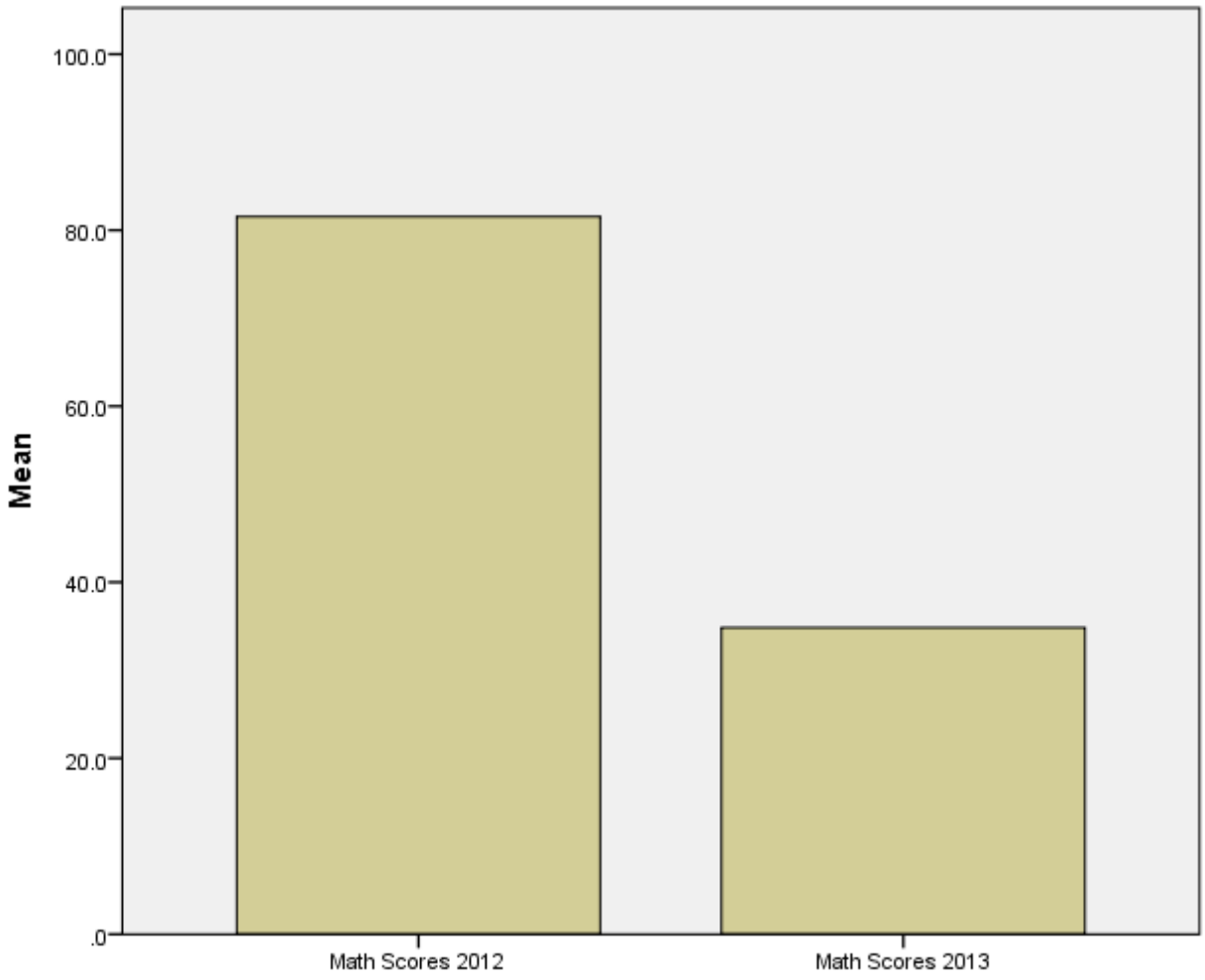


*Figure 13*. Means of mathematics scores in middle grades students compared by academic year.

Research Question 8

Is there a significant difference between 2012 and 2013 academic achievement scores on reading standardized tests for middle grades students?

$HO_8$: There is no significant difference between 2012 and 2013 academic achievement scores on the reading standardized tests for middle grades students.

A paired-samples *t* test was conducted to evaluate whether a significant difference exists between academic achievement proficiency scores on reading standardized tests for middle grades students between 2012 and 2013. Reading achievement scores were

significantly lower in 2013 than in 2012. The results indicated that the mean proficiency score ($M$ = 70.40, $SD$ = 12.65) was significantly greater in 2012 than in 2013 ($M$ = 43.06, $SD$ = 14.09), $t(1088) = 76.06$, $p < .001$. Therefore, the null hypothesis was rejected because test scores were significantly higher in 2012 than in 2013. The standardized effect size index, $d$, was 2.30, which is a large effect. The 95% confidence interval for the mean difference between the 2 years' scores was 26.63 to 28.04. A plot comparing the means of these scores is shown in Figure 14.

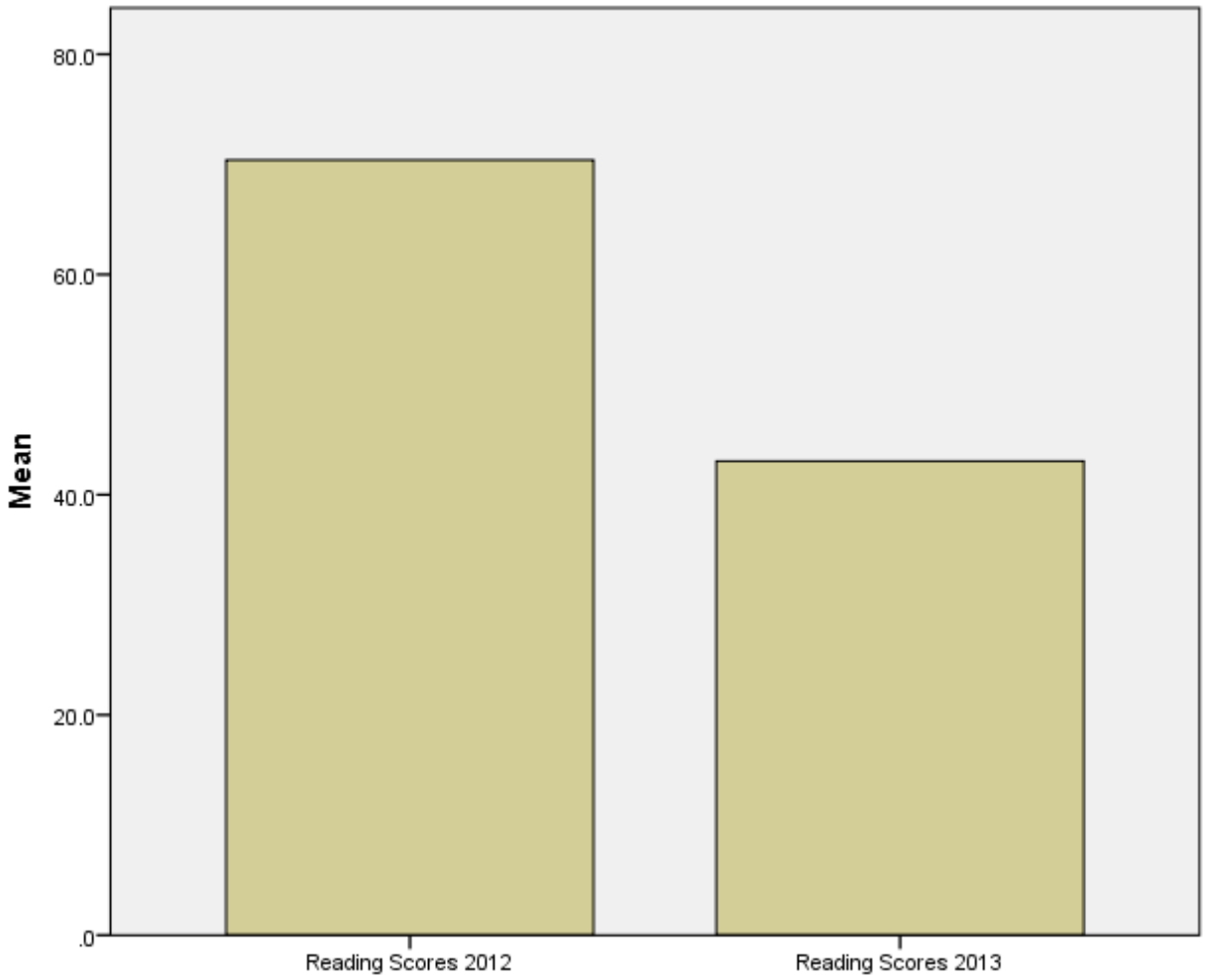


*Figure 14*. Means of reading scores in middle grades students compared by academic year.

Research Question 9

Is there a significant difference between proficiency levels in both reading and mathematics standardized tests when compared by the schools' economic levels in 2012 and 2013 for middle grades students?

$HO_{9a}$: There is no significant difference between proficiency levels in both reading and mathematics standardized tests when compared by the schools' economic levels in 2012 for middle grades students.

A one-way analysis of variance (ANOVA) was performed to determine whether significant differences existed between students' proficiency levels in reading and mathematics standardized tests when compared by the schools' economic levels for middle grades students on the 2012 North Carolina state report card. The factor variable, the socioeconomic descriptor of the student population, included four levels: 1%-40% economically disadvantaged, 41%-60% economically disadvantaged, 61%-80% economically disadvantaged, and 81%-100% economically disadvantaged. The dependent variable was the percentage of economically disadvantaged students passing both the reading and mathematics end of grade test for 2012 in each of these SES levels. The ANOVA was significant, $F(3,359) = 57.99$, $p < .001$. Therefore, the null hypothesis was rejected. The strength of the relationship between economically disadvantaged proficiency levels and the four socioeconomic levels as assessed by $\eta^2$ was medium (.33).

Because the overall *F* test was significant, post hoc multiple comparisons were conducted to evaluate pairwise difference among the means of the four groups. A Dunnett C procedure was selected for the multiple comparisons because equal variances were not assumed. There were significant differences between the means of students passing both the reading and math

standardized assessments at every socioeconomic level. Schools with more students on free or reduced cost lunch scored significantly lower than schools with fewer students on free or reduced cost lunch. Schools with 1%-40% of students receiving free or reduced cost lunch scored significantly higher than schools with 41%-60% of students receiving free or reduced cost lunch, and the 41%-60% socioeconomic bracket scored significantly higher than schools with 61%-80% of the student population receiving free or reduced cost lunch. Likewise, schools in the 61%-80% socioeconomic bracket scored significantly higher than schools with 81%-100% of the student population receiving free or reduced cost lunch. The circles on the box plots denote outliers that are farther than 1.5 interquartile ranges (and closer than 3 interquartile ranges), and the star on the box plots denote the outlier that is farther than 3 interquartile ranges. The numbers next to the circles and star indicate the case number of the outlier. The 95% confidence intervals for the pairwise differences, as well as the means and standard deviations for the four socioeconomic levels, are reported in Table 13, and a box plot comparing the means between the groups is reported in Figure 15.

Table 13

*95% Confidence Intervals of Pairwise Differences in Mean Proficiency Scores in Reading and Mathematics Standardized Tests of Middle Grades Students Among Different Levels of Socioeconomic Status*

| SES Level | N | M | SD | 1%-40% ED | 41%-60% ED | 61%-80% ED |
|---|---|---|---|---|---|---|
| 1%-40% ED | 64 | 66.27 | 10.43 | | | |
| 41%-60% ED | 121 | 57.97 | 8.06 | [4.36, 12.23]* | | |
| 61%-80% ED | 133 | 53.47 | 9.32 | [8.77, 16.84]* | [1.66. 7.34]* | |
| 81%-100% ED | 45 | 44.00 | 9.43 | [17.18, 27.36]* | [9.76, 18.18]* | [5.16, 13.77]* |

*Significant at the .05 level

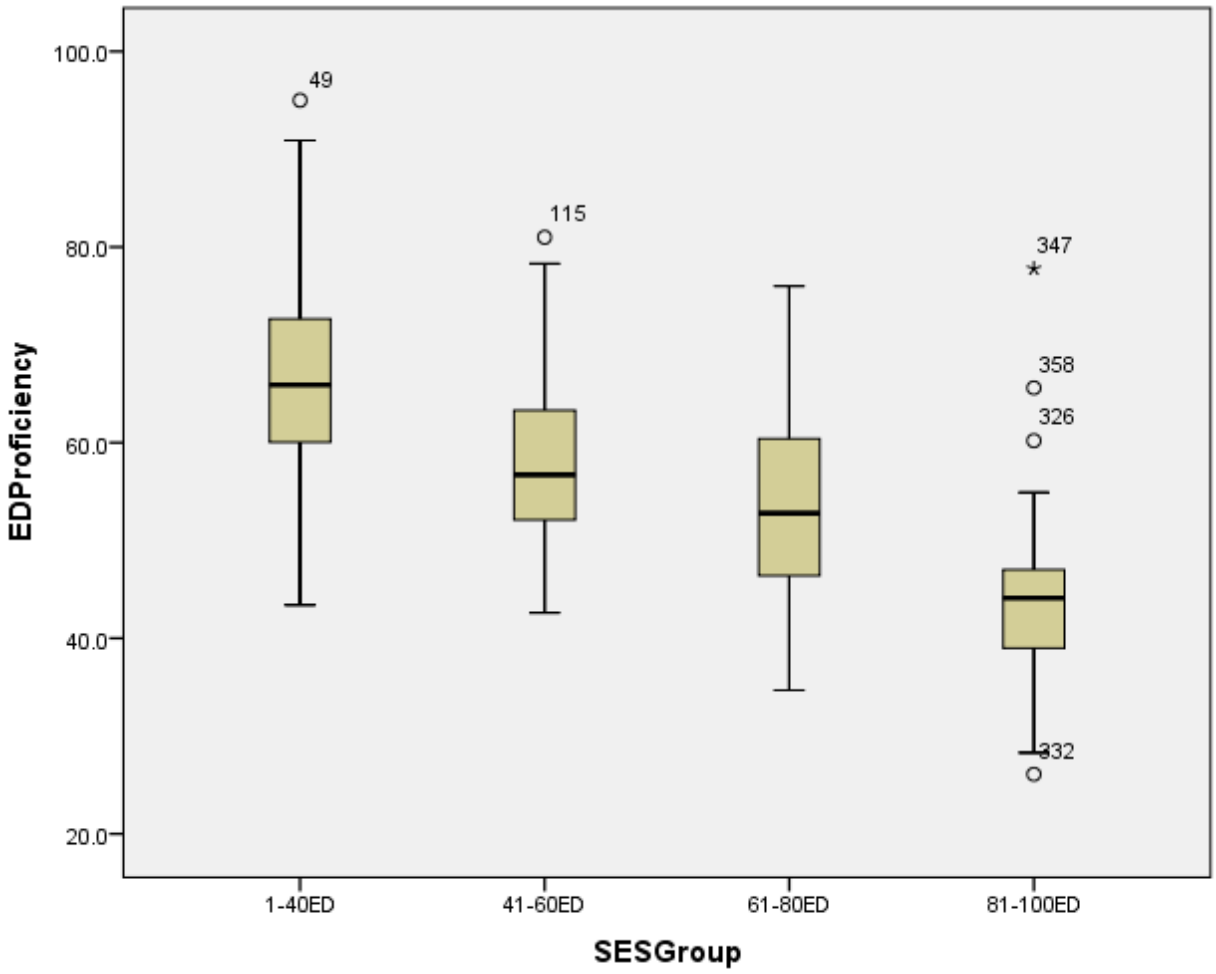


*Figure 15*. 2012 Proficiency levels middle grades students according to socioeconomic group.

$HO_{9b}$: There is no significant difference between proficiency levels in both reading and mathematics standardized tests when compared by the schools' economic levels in 2013 for middle grades students.

A one-way analysis of variance (ANOVA) was performed to determine whether significant differences existed between students' proficiency levels on reading and mathematics standardized tests when compared by the schools' economic levels for all middle grades students on the 2013 North Carolina state report card. The factor variable, the socioeconomic descriptor of the student population, included four levels: 1%-40% economically disadvantaged, 41%-60% economically disadvantaged, 61%-80% economically disadvantaged, and 81%-100%

economically disadvantaged. The dependent variable was the percentage of economically disadvantaged students passing both the reading and mathematics end of grade test for 2013 in each of these SES levels. The ANOVA was significant, $F(3,359) = 50.78$, $p < .001$. Therefore, the null hypothesis was rejected. The strength of the relationship between economically disadvantaged proficiency levels and the four socioeconomic levels as assessed by $\eta^2$ was medium (.30).

Because the overall *F* test was significant, post hoc multiple comparisons were conducted to evaluate pairwise difference among the means of the three groups. A Dunnett C procedure was selected for the multiple comparisons because equal variances were not assumed. There were significant differences between the means of economically disadvantaged students passing both the reading and math standardized assessments at every socioeconomic level. Schools with more students on free/reduced cost lunch scored significantly lower than schools with fewer students on free or reduced cost lunch. Schools with 1%-40% of students receiving free or reduced cost lunch scored significantly higher than schools with 41%-60% of students receiving free or reduced cost lunch, and the 41%-60% socioeconomic bracket scored significantly higher than schools with 61%-80% of the student population receiving free or reduced cost lunch. Likewise, schools in the 61%-80% socioeconomic bracket scored significantly higher than schools with 81%-100% of the student population receiving free or reduced cost lunch. The circles on the box plots denote outliers that are farther than 1.5 interquartile ranges (and closer than 3 interquartile ranges), and the stars on the box plots denote outliers that are farther than 3 interquartile ranges. The numbers next to the circles and stars indicate the case number of the outlier. The 95% confidence intervals for the pairwise differences, as well as the means and standard deviations

for the four socioeconomic levels, are reported in Table 14, and a box plot comparing the means between the groups is reported in Figure 16.

Table 14

*95% Confidence Intervals of Pairwise Differences in Mean Proficiency Scores in Reading and Mathematics Standardized Tests of Middle Grades Students Among Different Levels of Socioeconomic Status*

| SES Level | N | M | SD | 1%-40% ED | 41%-60% ED | 61%-80% ED |
|---|---|---|---|---|---|---|
| 1%-40% ED | 62 | 25.37 | 10.60 | | | |
| 41%-60% ED | 121 | 17.83 | 4.98 | [3.79, 11.29]* | | |
| 61%-80% ED | 126 | 15.04 | 6.34 | [6.48, 14.17]* | [0.90, 4.67]* | |
| 81%-100% ED | 54 | 11.04 | 4.79 | [10.38, 18.29]* | [4.70, 8.88]* | [1.74, 6.28]* |

*Significant at the .05 level

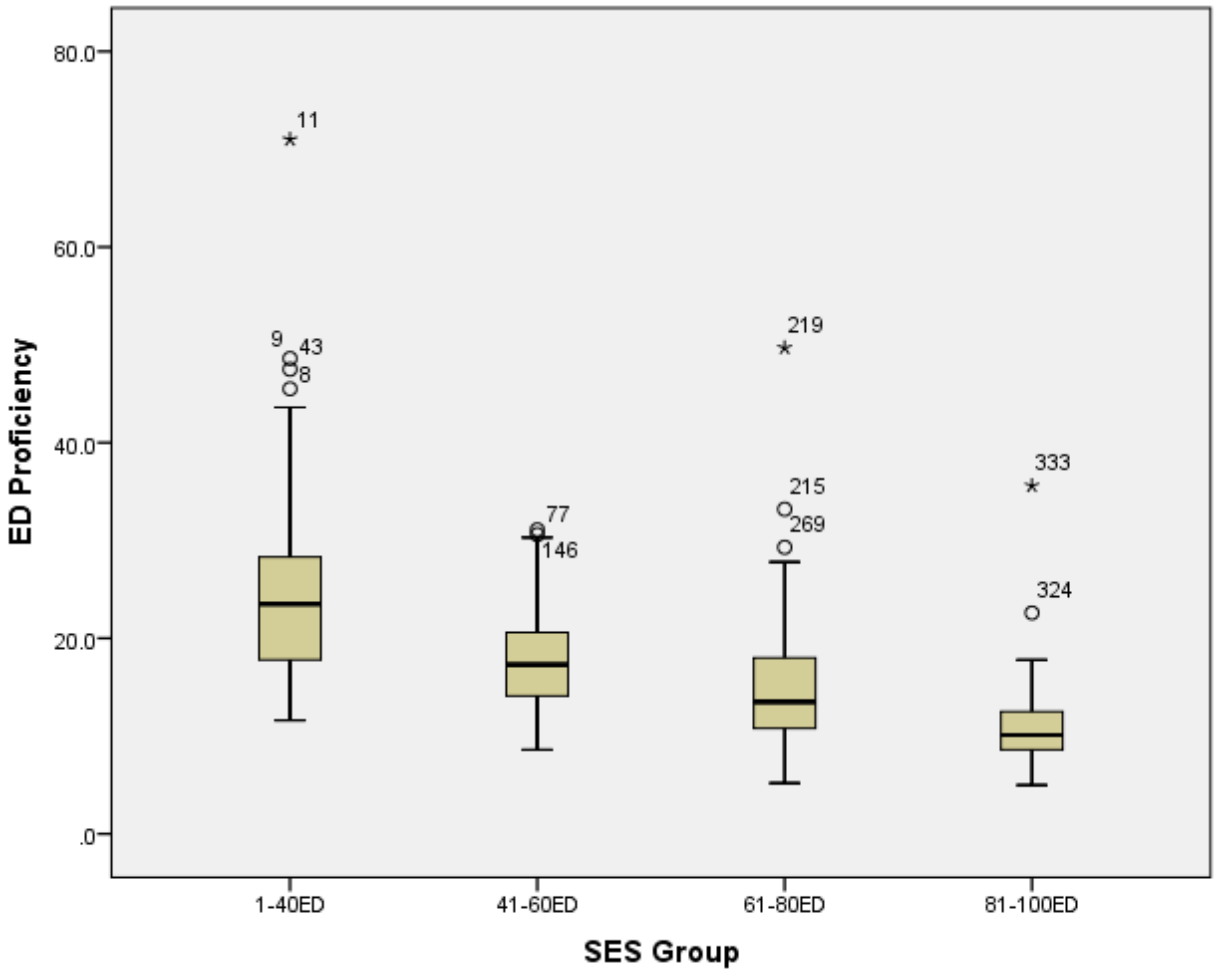


*Figure 16*. 2013 Proficiency levels of middle grades students according to socioeconomic group.

## Chapter Summary

In this chapter, standardized testing data of middle grades students in North Carolina were analyzed from state report cards from 2012 and 2013. There were nine research questions and 16 null hypotheses. Research Question 1 results indicate that significant differences exist between sixth grade reading proficiency levels as compared by socioeconomic status levels in both 2012 and 2013. Research Question 2 results indicate significant differences exist between sixth grade mathematics proficiency levels as compared by socioeconomic status levels in both 2012 and 2013. Research Question 3 results indicate significant differences exist between seventh grade reading proficiency levels as compared by socioeconomic status levels in both

2012 and 2013. Research Question 4 results indicate significant differences exist between seventh grade mathematics proficiency levels as compared by socioeconomic status levels in both 2012 and 2013. Research Question 5 results indicate significant differences exist between eighth grade reading proficiency levels as compared by socioeconomic status levels in both 2012 and 2013. Research Question 6 results indicate significant differences exist between eighth grade mathematics proficiency levels as compared by socioeconomic status levels in both 2012 and 2013. Research Question 7 results indicate that a significant difference exists between 2012 and 2013 academic achievement scores for all middle grades students on reading standardized assessments. Research Question 8 results indicate that a significant difference exists between 2012 and 2013 academic achievement scores for all middle grades students on mathematics standardized assessments. Lastly, Research Question 9 results indicate that significant differences exist between 2012 and 2013 academic achievement scores for middle grades students' proficiency levels in both reading and mathematics assessments when compared by the schools' economic levels.

# CHAPTER 5

# SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

## Introduction

The purpose of this study was to determine whether a significant difference exists in academic achievement when compared by socioeconomic levels of the North Carolina middle grade learners as measured by reading and mathematics standardized tests. This study involved an analysis of data from the 2 most recent testing years in North Carolina. Testing instruments dramatically changed from 2012 to 2013 with the implementation of the Common Core curriculum, thus changing from an old curriculum to a new curriculum.

## Summary and Findings

*Research Question 1*

Is there a significant difference between reading proficiency levels when compared by socioeconomic status levels for sixth grade students on the 2012 and 2013 state report cards?

A one-way analysis of variance (ANOVA) was computed to determine whether a significant difference existed between reading proficiency levels as compared by socioeconomic status levels for sixth grade students on 2012 and 2013 state report cards. In the 2012 and 2013 academic years it was determined that a significant difference exists between reading proficiency levels for sixth grade students. Schools with more students on free or reduced cost lunch scored significantly lower than schools with fewer students on free or reduced cost lunch. Schools with 1%-40% of students receiving free or reduced cost lunch scored significantly higher than schools with 41%-60% of students receiving free or reduced cost lunch, and the 41%-60% socioeconomic bracket scored significantly higher than schools with 61%-80% of the student population receiving free or reduced cost lunch. Likewise, schools in the 61%-80%

socioeconomic bracket scored significantly higher than schools with 81%-100% of the student population receiving free or reduced cost lunch.

*Research Question 2*

Is there a significant difference between mathematics proficiency levels when compared by socioeconomic status level for sixth grade students on the 2012 and 2013 state report cards?

A one-way analysis of variance (ANOVA) was computed to determine whether a significant difference existed between mathematics proficiency levels when compared by socioeconomic status levels for sixth grade students on 2012 and 2013 state report cards. In the 2012 and 2013 academic years it was determined that a significant difference exists between mathematics proficiency levels for sixth grade students. Schools with more students on free or reduced cost lunch scored significantly lower than schools with fewer students on free or reduced cost lunch. Schools with 1%-40% of students receiving free or reduced cost lunch scored significantly higher than schools with 41%-60% of students receiving free or reduced cost lunch, and the 41%-60% socioeconomic bracket scored significantly higher than schools with 61%-80% of the student population receiving free or reduced cost lunch. Likewise, schools in the 61%-80% socioeconomic bracket scored significantly higher than schools with 81-100% of the student population receiving free or reduced cost lunch.

*Research Question 3*

Is there a significant difference between reading proficiency levels when compared by socioeconomic status level for seventh grade students on the 2012 and 2013 state report cards?

A one-way analysis of variance (ANOVA) was computed to determine whether a significant difference existed between reading proficiency levels when compared by socioeconomic status levels for seventh grade students on 2012 and 2013 state report cards. In

the 2012 and 2013 academic years it was determined that a significant difference exists between reading proficiency levels for seventh grade students. Schools with more students on free or reduced cost lunch scored significantly lower than schools with fewer students on free or reduced cost lunch. Schools with 1%-40% of students receiving free or reduced cost lunch scored significantly higher than schools with 41%-60% of students receiving free or reduced cost lunch, and the 41%-60% socioeconomic bracket scored significantly higher than schools with 61%-80% of the student population receiving free or reduced cost lunch. Likewise, schools in the 61%-80% socioeconomic bracket scored significantly higher than schools with 81%-100% of the student population receiving free or reduced cost lunch.

*Research Question 4*

Is there a significant difference between mathematics proficiency levels when compared by socioeconomic status level for seventh grade students on the 2012 and 2013 state report cards?

A one-way analysis of variance (ANOVA) was computed to determine whether a significant difference existed between mathematics proficiency levels when compared by socioeconomic status levels for seventh grade students on 2012 and 2013 state report cards. In the 2012 and 2013 academic years it was determined that a significant difference exists between mathematics proficiency levels for seventh grade students. Schools with more students on free or reduced cost lunch scored significantly lower than schools with fewer students on free or reduced cost lunch. Schools with 1%-40% of students receiving free or reduced cost lunch scored significantly higher than schools with 41%-60% of students receiving free or reduced cost lunch, and the 41%-60% socioeconomic bracket scored significantly higher than schools with 61%-80% of the student population receiving free or reduced cost lunch. Likewise, schools in

the 61%-80% socioeconomic bracket scored significantly higher than schools with 81%-100% of the student population receiving free or reduced cost lunch.

*Research Question 5*

Is there a significant difference between reading proficiency levels when compared by socioeconomic status level for eighth grade students on the 2012 and 2013 state report cards?

A one-way analysis of variance (ANOVA) was computed to determine whether a significant difference existed between reading proficiency levels when compared by socioeconomic status levels for eighth grade students on 2012 and 2013 state report cards. In the 2012 and 2013 academic years it was determined that a significant difference exists between reading proficiency levels for eighth grade students. Schools with more students on free or reduced cost lunch scored significantly lower than schools with fewer students on free or reduced cost lunch. Schools with 1%-40% of students receiving free or reduced cost lunch scored significantly higher than schools with 41%-60% of students receiving free or reduced cost lunch, and the 41%-60% socioeconomic bracket scored significantly higher than schools with 61%-80% of the student population receiving free or reduced cost lunch. Likewise, schools in the 61%-80% socioeconomic bracket scored significantly higher than schools with 81%-100% of the student population receiving free or reduced cost lunch.

*Research Question 6*

Is there a significant difference between mathematics proficiency levels when compared by socioeconomic status level for eighth grade students on the 2012 and 2013 state report cards?

A one-way analysis of variance (ANOVA) was computed to determine whether a significant difference existed between mathematics proficiency levels when compared by socioeconomic status levels for eighth grade students on 2012 and 2013 state report cards. In the

2012 and 2013 academic years it was determined that a significant difference exists between mathematics proficiency levels for eighth grade students. Schools with more students on free or reduced cost lunch scored significantly lower than schools with fewer students on free or reduced cost lunch. Schools with 1%-40% of students receiving free or reduced cost lunch scored significantly higher than schools with 41%-60% of students receiving free or reduced cost lunch, and the 41%-60% socioeconomic bracket scored significantly higher than schools with 61%-80% of the student population receiving free or reduced cost lunch. Likewise, schools in the 61%-80% socioeconomic bracket scored significantly higher than schools with 81%-100% of the student population receiving free or reduced cost lunch.

*Research Question 7*

Is there a significant difference between 2012 and 2013 academic achievement scores on mathematics standardized tests for middle grades students?

A paired-samples *t* test was used to determine whether a significant difference existed between 2012 and 2013 academic achievement scores on mathematics standardized tests for middle grades students. It was determined through this test that there is a significant difference between mathematics achievement scores between these 2 academic years. 2013 middle grades mathematics achievement scores are significantly lower than 2012 middle grades mathematics achievement scores.

*Research Question 8*

Is there a significant difference between 2012 and 2013 academic achievement scores on reading standardized tests for middle grades students?

A paired-samples *t* test was used to determine whether a significant difference existed between 2012 and 2013 academic achievement scores on mathematics standardized tests for

middle grades students. It was determined through this test that there is a significant difference between mathematics achievement scores between these 2 academic years. 2013 middle grades reading achievement scores are significantly lower than 2012 middle grades reading achievement scores.

*Research Question 9*

Is there a significant difference between proficiency levels in both reading and mathematics standardized tests when compared by the schools' economic levels in 2012 and 2013 for middle grades students?

A one-way analysis of variance (ANOVA) was computed to determine whether a significant difference existed between middle grades students' proficiency levels in both reading and mathematics on standardized achievement tests when compared by the schools' economic levels on 2012 and 2013 state report cards. In both 2012 and 2013 it was determined that a significant difference exists between proficiency levels of students when comparing economic levels of the schools in two consecutive academic years. In both academic years schools with more students on free or reduced cost lunch scored significantly lower than schools with fewer students on free or reduced cost lunch. Schools with 1%-40% of students receiving free or reduced cost lunch scored significantly higher than schools with 41%-60% of students receiving free or reduced cost lunch, and the 41%-60% socioeconomic bracket scored significantly higher than schools with 61%-80% of the student population receiving free or reduced cost lunch. Likewise, schools in the 61%-80% socioeconomic bracket scored significantly higher than schools with 81%-100% of the student population receiving free or reduced cost lunch.

The purpose of this study was to determine whether a significant difference exists in academic achievement when compared by socioeconomic levels of the North Carolina middle

grade learners as measured by reading and mathematics standardized tests. Academic achievement was determined by the percentage of students scoring "proficient" on each subject-specific test, and socioeconomic status was determined by the percentage of student population in each school that received free or reduced cost lunch. The following conclusions are based on the findings of this study.

## Conclusions

Significant differences were found in proficiency levels of each grade level and in each subject area (both reading and math) in both 2012 and 2013. Schools with higher poverty levels scored significantly lower than schools in a higher income bracket. This relationship was consistently found for each socioeconomic group comparison (1%-40% of students on free or reduced cost lunch, 41%-60% of students on free or reduced cost lunch, 61%-80% of students on free or reduced cost lunch, and 81%-100% of students on free or reduced cost lunch). This suggests that there may be a negative correlation between socioeconomic status and academic achievement. The fewer students in poverty a school has the higher the academic achievement scores for that school, and the higher the poverty level in a school the lower the academic achievement. Verification of these findings would suggest that there has been little change in educational outcomes for impoverished children since the Coleman Report (1966).

Significant differences were also found between math scores as well as reading scores in 2012 and 2013 in middle level schools. Math scores were significantly lower in 2013 than in 2012, and reading scores were significantly lower in 2013 than in 2012. This suggests that the implementation of the Common Core curriculum may have had a negative impact on standardized test scores (and, by extension, student achievement) because Common Core was fully implemented in 2013.

Lastly, significant differences were found proficiency levels in reading and mathematics standardized tests when compared by the school's economic levels for middle grades students in 2012 and 2013. Economically disadvantaged students were identified on state report cards as a subgroup of students who were eligible to receive free or reduced cost lunch in North Carolina. Students at every economic level scored significantly lower in 2013 than they did in 2012 when compared by economic levels of the school. Students were proficient at lower rates in schools with higher numbers of economically disadvantaged students. Additionally, fewer students were labeled as academically proficient in 2013 than in 2012 when compared by the economic levels of the school.

2012 was the last year that North Carolina tested students on the Standard Course of Study curriculum, and 2013 was the first year students were tested on the new Common Core curriculum. Although correlation does not indicate causation, the evidence suggests that additional research is necessary to further investigate the possible effects of the Common Core curriculum on high poverty students. Verification of these findings through additional research would suggest one or more of the following possibilities related to the contemporary application of the Common Core curriculum:

- It will require additional time and effort to produce desired outcomes;
- It requires different assessment strategies. For example, paper and pencil standardize tests may not provide sensitivity to higher order learning skills;
- The Common Core, like other curriculum redesign and testing strategies driving the educational reform movement, cannot by itself solve the problems generated by poverty. (Glover, 2014)

## Implications for Future Research and Practice

After analyzing these data, it becomes apparent that student socioeconomic status and academic achievement continue to be negatively correlated, supporting earlier research by Sirin (2005) and White (1982); that is, the higher the poverty level within a school, the lower the academic achievement based on standardized test scores. However, the question still remains regarding the relationship between the new Common Core curriculum and standardized test scores. Although test scores with the new curriculum were significantly lower in 2013 than in 2012, correlation does not equal causation. One cannot prove that the Common Core curriculum caused lower test scores. Furthermore, it is often anticipated that test scores are lower the year a new curriculum is implemented, so the findings of this research are consistent with this expectation. It is this researcher's recommendation that this study be replicated longitudinally over the course of 5 years (a normal curriculum cycle) to determine whether standardized test scores continue to be significantly lower with the Common Core curriculum than they were with the previous North Carolina Standard Course of Study. Five-year trend evidence would provide appropriate evidence for the effects of the Common Core curriculum on high poverty students.

Additionally, those in control of the educational system must not continue to ignore the host of research that warns against using only standardized testing as the only means of measuring the quality and effectiveness of schools and student achievement. Kohn (2000) reminded the public that Piaget warned schools not to rely heavily upon standardized test scores and grades, as they do not serve as predictors for future success in the adult workplace. Popham (2001) argued that educators must also accept blame for placing too much emphasis on standardized testing because teachers and principals did not take a more aggressive stance against testing when the accountability movement gained momentum. Furthermore, Wiggins (2012) pointed out that there are always outliers regarding standardized testing trends. There are

some high poverty schools that score much higher than schools of similar demographics, and occasionally, there are low poverty schools that do not score as well as other wealthy schools. It is crucial that researchers study the high poverty outliers--that is, those schools that outperform schools with similar demographics, in order to determine which measures or programs educational leaders ascribe to the school's academic success.

One such outlier, Grassy Fork School in eastern Tennessee, became acclaimed for its academic turnaround because of its focus on differentiated instruction, differentiated (and quality) professional development, and attitude in its school leaders that changed the culture and climate in the school (Thomas, 2009). As a result, this school went from nearly being taken over by the state department of education to an example the rest of high poverty schools strive to follow. Educators and policymakers must stop being tolerant and accepting of the link socioeconomic status and student achievement by referring to it as a truth of our system (Wiggins, 2012).

Lastly, but perhaps most importantly, schools cannot effectively improve student academic achievement without dealing with one of the most critical issues in our schools today: student poverty. Just as a doctor cannot treat a patient's symptoms without attacking the infection, teachers cannot improve academic achievement in students without addressing the underlying economic issues that affect the student and family. Schools in high poverty areas already have difficulty in hiring and retaining high quality teachers due to the inherent difficulty in these positions and cycle of low expectations and poor performance (Potter 2013). When the deck is already stacked against high poverty schools and students, high quality instruction is paramount.

Some researchers suggest introducing socioeconomic integration by busing, much like what was implemented during the Civil Rights movement, to bring in better teachers and enhance parent engagement. A 2010 meta-analysis suggested that students in socioeconomically integrated schools performed better in mathematics achievement testing than nonintegrated schools (2013). It is important to note that because poverty is an issue that exists outside the control of our schools, "...no policy improves 'socioeconomic status' directly....good policy is based on an understanding of causal relationships between family background and children outcomes, as well as cost-effectiveness" (Duncan & Magnuson, 2005, p. 35). However, there are several ways schools can positively impact our high poverty students to address issues that stem from a low socioeconomic level:

- Provide access to high quality, experienced teachers;
- Provide access to school resources (both at school and at home);
- Maintain high expectations and high quality curriculum;
- Provide parent education and assistance from social services;
- Facilitate community services provided to families through the school (i.e., free dental clinics, parent education workshops, food pantry for families, etc.);
- Focus on early education programs (like Pre-Kindergarten/Head Start programs) and interventions for all at-risk students;
- Provide specialized training and high quality professional development for faculty and staff in best practices for high poverty students;
- Focus on the school becoming a community of learners;
- Improve parent involvement;
- Improve relationships between school and community;

- Increase school funding from local, state, and federal agencies;
- Offer summer enrichment and summer school programs; and
- Maintain for small school and class size (Brooks-Gunn & Duncan, 1997; Jensen, 2009; Muijs, Harris, Chapman, Stoll, & Russ, 2009; Reardon, 2013; Sirin, 2005).

While this list is not all-inclusive, it provides a beneficial starting point for schools that have a large population of high poverty students. However, improving academic achievement in the high poverty school is often an uphill battle.

Sadly, the founder of the Educational Testing Service, Henry Chauncey, has been quoted as saying "if there is anything in heredity (such as tall parents having tall children), one would expect children of high socioeconomic group parents to have more ability than children of low socioeconomic group parents" ("No Child Left Behind?," n.d.). In other words, according to the architect behind a multi-billion dollar standardized testing company, public schools are now a Darwinian model of survival of the fittest--or perhaps the richest. If this is the mantra behind standardized testing and accountability in our country, our schools, and therefore our nation's future, are in dire straits.

## Summary

This quantitative study was organized into five chapters. Chapter 1 included an introduction, statement of the problem, research questions, definitions of terms used in the study, significance of the study, limitations of the study, and delimitations of the study. Chapter 2 was a comprehensive review of literature that included sections discussing the history of standardized testing, state and national report cards, the development and implementation of the national common core curriculum, federal Title I programs, and the effect of socioeconomic status on student achievement. Chapter 3 described of the quantitative

research design and data collection procedures chosen for this study. A quantitative nonexperimental research design was chosen as data were collected from North Carolina state report cards to analyze middle level student academic achievement in reading and mathematics end of grade tests as determined by socioeconomic status levels in 2012 and 2013. Data for this research study were analyzed through quantitative methods using IBM SPSS to find the statistical calculations.

Chapter 4 reported the findings for this research study per research question. Nine research questions were used to frame the study, and 16 hypotheses presented in Chapter 3 were used to test the data. Detailed descriptions of the statistical analyses were provided as well as analyses to determine whether scores between 2012 and 2013 varied significantly according to subject area or by the proficiency levels in both subject areas among middle grade students when compared by school economic levels. Finally, Chapter 5 is a discussion of the conclusions drawn from the findings arranged by research question, implications for practice, and implications and recommendations for future research.

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