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A Study of the Impact of Socioeconomic Status on Student Achievement in a Rural East
Tennessee School System

A dissertation
presented to
the faculty of the Department of Educational Leadership and Policy Analysis
East Tennessee State University

In partial fulfillment
of the requirements for the degree
Doctor of Education

by
Eydie J. Pettigrew
May 2009

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Dr. Cecil Blankenship
Dr. James Lampley
Dr. Louise MacKay

Keywords: academic achievement, economically disadvantaged, poverty, socioeconomic status

ABSTRACT

A Study of the Impact of Socioeconomic Status on Student Achievement in a Rural East Tennessee School System

by

Eydie J. Pettigrew

The purpose of this study was to explore the impact of socioeconomic status on academic achievement as measured by the Tennessee Comprehensive Assessment Program Achievement Test and the Tennessee Comprehensive Assessment Program Writing Assessment. The population consisted of 8th grade students enrolled in 4 elementary schools in a rural school system in Tennessee. Data were analyzed for the population of the 2006-2007 academic school year. A 2-way analysis of variance model was used to compare the means among the schools, the means between economically disadvantaged students and those who were not economically disadvantaged, and whether there was a significant school by socioeconomic status interaction. The independent variables were the schools (School A, B, C, D) and the socioeconomic status of the students (those who qualified for free or reduced price meals and those who did not qualify for free or reduced price meals). The 5 dependent variables in the study were the number of items students answered correctly on the math, language arts, science, and social studies portions of the test and the holistic writing test scores.

The quantitative findings revealed the *F* test for the school by socioeconomic status interaction term was not significant in all 5 research questions. The mean score of economically

disadvantaged students was lower than noneconomically disadvantaged students in math, language arts, social studies, and science. Results indicated no difference in the mean writing scores between students who were economically disadvantaged and students who were not. When the main effect of school was significant, the Bonferroni post hoc multiple pairwise comparisons test was used to determine which pair of school means was different. The main effect of school was significant in math, social studies, science, and writing. There were no significant differences in the mean number of language arts items answered correctly among the schools.

DEDICATION

This research is dedicated to:

the memory of my mother, the hardships she overcame, and the successes she experienced in her life. Thank you, Maye Julian Jones, for passing your positive attitude and strengths on to your children: Julian, Ann, James Robert, Norman, Frances, Joe, Lee, Mickie, Vickie, Eydie, Sharon, and Lynda. Your laughter and smile will always be with us;

the memory of my father, Doyle Jones, who instilled in his children at an early age the importance of hard work;

my husband, George, who suffered with me greatly through this extended time;

my son Jason and daughter-in-law Guille who listened, made suggestions, gave encouragement, and assisted with technical support;

and my son George and fiancée Amye as they make their plans for a life together.

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CHAPTER 1

INTRODUCTION

According to the International Council of Nurses (2004), “Poverty is a human condition, a way of life that affects all interactions a person has with the world” (p. 5). For decades policy makers, educators, and concerned citizens across the world have joined forces to address this complex and pervasive problem that seems to be the *elephant in the room*. Most people see the elephant and admit that it is difficult to ignore such an all-encompassing issue, but the steps taken only slightly combat the obvious truth that continues to go unaddressed: lower socioeconomic status tends to negatively affect academic success.

The achievement gap in the educational setting of economically disadvantaged and noneconomically disadvantaged students is well documented. The gap is hefty and unrelenting; this fact is recognized and widely accepted (Barton, 2003; Crooks, 1995; Leach & Williams, 2007; Ross, Smith, Slavin, & Madden, 1997). The issue was brought to the public forefront during the 2000 presidential campaign as candidates from both parties vowed that if elected they would take action to close the gap (Barton). Three days after President George W. Bush’s inauguration in January 2001, action came in the form of the bipartisan supported *No Child Left Behind Act* (NCLB). The Act’s 1,100 pages set forth requirements forcing school systems to be accountable for all subgroups in the population, including students recognized as coming from a low socioeconomic background. According to NCLB legislation, all students must be performing at a *proficient* performance level in mathematics, language arts, and science by the year 2014. If any subgroup fails to progress at the expected rate, the school as a whole is considered as *failing* (*Federal education policy and the states*, 2006). In an educational setting so strongly focused on

standards-based accountability for students in all subgroups (Archibald, 2006), systems must not only be aware of the problems present when students grow up in poverty, they must also be aware of and willing to implement programs and initiatives designed to combat the problem and narrow the achievement gap, while ensuring success for students from all economic backgrounds.

Statement of the Problem

The achievement gap is a notoriously debated yet widely accepted educational term that refers to the inequality of academic performance among groups of students (Barton, 2003). According to Gamoran (2007), this inequality is one of the most significant problems faced by education in the United States. Gamoran asserted:

While average achievement levels in some school districts rank among the world's high-achieving nations, other districts rank among the world's low performers. The inequality is evident not only between districts but also within districts and within schools, where students of different social backgrounds attain widely varying outcomes. The problem is particularly pronounced for students who face economic disadvantages. (p. 3)

Data collected from *The Early Childhood Longitudinal Study, Kindergarten Class of 1998-99* (ECLS-K) tracked the achievement levels of a nationwide cohort of youngsters from their entrance into kindergarten through upper grades. By the time students reached the fifth grade, the economically disadvantaged (those living in households below the poverty level) were more likely to be deficient in reading and mathematics than were those children living above the poverty threshold. Eighty-four percent of those above the poverty level tested proficient in

mathematics; whereas, only 45% of students living in poverty were proficient (U.S. Department of Education, National Center for Education Statistics, 2007).

Students who lived below the poverty level often hailed from highly mobile families, lacked educational resources in the home, and failed to receive homework support and encouragement from less educated family members (*Addressing the achievement gap: A challenge to Washington state educators*, 2002). According to the U.S. Census Bureau (2000), the United States had one of the highest child poverty rates in the world as determined by international standards. In fact, in 2006, just over 17% of America's children lived in poverty (U.S. Census Bureau, 2006). Low socioeconomic status was not limited to one specific area of the country or one race; poverty targeted all races and all age groups in every state of the nation (Crooks, 1995). Although the issue of poverty was a problem in most areas, schools unfortunately provided the least support and help to these children who commonly needed it most (Cavanagh, 2007; Haycock, 2001).

In Tennessee students in the low socioeconomic bracket encompassed a growing percentage of the student population in many school districts. In 2006, there were 842,152 families with 1,412,824 children residing in the state. Of those, 42% (594,362) of children lived in low-income families, compared to the 39% national level of children living in low-income homes (National Center for Children in Poverty, n.d.). Numerous counties in the northeastern part of the state were considered persistently poor because more than 20% of the population was living in poverty (*Rural poverty at a glance*, 2004). For these children, low socioeconomic status eroded the solidity of their very existence (Heartland Alliance for Human Needs & Human Rights, 2007).

Unfortunately, poverty is cyclical and children often unwittingly grow to be what they live (Bowman, 1994). Poor children are very likely to become poor adults (Lewit, Terman, & Behrman, 1997). Poverty is a recurring cycle that often begins with parents' lack of education. "Poor educational attainment is a major cause of poverty, and poverty is a key influence on academic failure" (Arnold & Doctoroff, 2003, p. 518). Therefore, it should not be startling to find that poverty had a tremendous negative impact on individuals and society (Arnold & Doctoroff). Children who live in poverty often need additional resources from schools and teachers to overcome the daunting task of breaking the cycle. Regrettably, the schools that educate the masses of poverty-stricken children were frequently the systems receiving the least amount of funding, thus, at an economic disadvantage themselves (Archibald, 2006; Arnold & Doctoroff; Haycock, 2001). Although the task may seem discouraging and disheartening, the academic failure of low socioeconomic children is a problem that warrants special attention.

The purpose of this study was to look at the effects of socioeconomic status on student academic achievement as measured by the TCAP Achievement Test and TCAP Writing Assessment.

Research Questions

This study investigated the following questions as they related to the effects of socioeconomic classification on student achievement as measured by the Tennessee state mandated high stakes test:

1. *Are there differences in 8th grade TCAP scores for math based on school location (School A, School B, School C, and School D), socioeconomic status (students who were*

economically disadvantaged and those who were not economically disadvantaged), and the interaction between school and socioeconomic status?

- 2. Are there differences in 8th grade TCAP scores for language arts based on school location (School A, School B, School C, and School D), socioeconomic status (students who were economically disadvantaged and those who were not economically disadvantaged), and the interaction between school and socioeconomic status?*
- 3. Are there differences in 8th grade TCAP scores for social studies based on school location (School A, School B, School C, and School D), socioeconomic status (students who were economically disadvantaged and those who were not economically disadvantaged), and the interaction between school and socioeconomic status?*
- 4. Are there differences in 8th grade TCAP scores for science based on school location (School A, School B, School C, and School D), socioeconomic status (students who were economically disadvantaged and those who were not economically disadvantaged), and the interaction between school and socioeconomic status?*
- 5. Are there differences in 8th grade TCAP scores for writing assessment based on school location (School A, School B, School C, and School D), socioeconomic status (students who were economically disadvantaged and those who were not economically disadvantaged), and the interaction between school and socioeconomic status?*

Significance of the Study

Although schools are ultimately held responsible for all student learning, previous prominent educational research suggested that educators had little hope of overcoming the barriers and truly making a difference in the lives of poverty stricken children; instead,

responsibility rested squarely on the shoulders of the family (Coleman, 1966). Fortunately, however, more recent research and literature challenged the assumption that educators' hands were tied and that poor children were destined for failure (*Addressing the achievement gap: A challenge for Washington state educators*, 2002; Berliner, 2006). An increased focus on educating all students for higher standards has heightened the awareness of the achievement gap and is forcing policy makers, educators, administrators, and concerned community members across the country to face the issue head on. In a society that values education and recognizes the importance of knowledge to live a successful and productive life, it is unconscionable to allow such a discrepancy to continue.

Although poverty figures are indisputable, the precise and lasting effects of poverty on student success remain unclear (Duncan, Yeung, Brooks-Gunn, & Smith, 1998). Some educators, administrators, policy makers, and community members maintain that the achievement gap might simply be overstated and that all students (regardless of economic factors) are experiencing the same level of success (Brooks-Gunn & Duncan, 1997). Despite such statements, the researcher attempted to investigate the real world effects of the achievement gap. Do students living in low socioeconomic conditions perform at the same academic levels as their more affluent counterparts? The conclusions drawn from this research are intended to assist educators and administrators called to answer the federal mandate to educate all children regardless of circumstances. If an achievement gap does exist, the data from this research could be used to encourage funding for implementing and sustaining programs designed to meet the needs of this targeted subgroup.

Definitions of Terms

- Achievement gap: A difference in the academic success between students from affluent backgrounds and their lower-income peers (*Addressing the achievement gap: A challenge for Washington state educators*, 2002).
- Bias: “In a statistical context, a systematic error in a test score. In discussing test fairness, bias may refer to construct under representation of construct irrelevant components of test scores. Bias usually favors one group of test takers over another” (*Developing student achievement tests under no child left behind accountability requirements: A policy maker’s primer*, 2007, p. 22).
- Criterion referenced test: A test that measures a student’s performance against a predetermined set of standards that have been established based on the curriculum (Tennessee Department of Education, 2006).
- Economically disadvantaged: Students who meet the qualifications to be eligible for the federal free or reduced price meals program (United States Department of Agriculture, Food and Nutrition Service, 2007).
- Federal poverty level (FPL): The FPL for a family of four in 2007 was \$20,650, family of three \$17,170, and family of two \$13,690 (United States Department of Health & Human Services, (n.d.)).
- Free or Reduced price meals: Children from families who meet certain income criteria are eligible to receive free or reduced price meals at school (Tennessee Department of Education, 2006).
- National School Lunch Program: This federally funded program provides nutritionally balanced meals (breakfast and lunch) at no cost to schoolchildren whose reported family

income falls below 130% of the poverty level. Families with income levels between 130% to 185% below the poverty level receive meals at a significantly reduced rate (United States Department of Agriculture, Food and Nutrition Service, 2007).

- Per pupil expenditure: Total current operating expenditures on a per pupil basis (Tennessee Department of Education, 2006).
- Poverty: “[A] condition that extends beyond lack of income and goes hand in hand with lack of power, humiliation, and a sense of exclusion from access to goods and social services” (International Council of Nurses, 2004, p. 5).
- Reliability: “The degree to which the scores of every individual are consistent over repeated applications of a measurement procedure and, hence, are dependable and repeatable; the degree to which scores are free of errors of measurement” (*Developing student achievement tests under no child left behind accountability requirements: A policy maker’s primer*, 2007, p. 23).
- Socioeconomic status: “A combination of social and economic factors that are used as an indicator of household income and opportunity. The National Assessment of Educational Progress (NAEP) uses eligibility for the Department of Agriculture’s National School Lunch Program as a measure of socioeconomic status” (*The NAEP glossary of terms*, n.d., p. 6).
- Standards-based systems of assessment: “[I]nclude criterion-referenced test[s]. In such systems, test items reflect an established set of content standards that specify the knowledge and skills students are expected to acquire as a function of schooling” (*Developing student achievement tests under no child left behind accountability requirements: A policy maker’s primer*, 2007, p.23).

- Tennessee Comprehensive Assessment Program (TCAP): This criterion-referenced test is administered to all Tennessee students in grades 3-8 during the spring. The test measures students' basic skills in language arts, science, social studies, and mathematics (Tennessee Department of Education, 2007).
- Tennessee Comprehensive Assessment Program (TCAP) Writing Assessment: The writing assessment is a holistically scored exam that requires 5th, 8th, and 11th grade students in the state of Tennessee to construct a well-written essay in 35 minutes (Tennessee Department of Education, n.d.).
- Title I: Federally funded programs in high poverty schools that target children with low achievement (Tennessee Department of Education, 2006).
- Validity: "(1). An overall evaluation of the degree to which accumulated evidence and theory support specific interpretations of test scores; (2.) The extent to which a test measures what its authors or users claim it measures" (*Developing student achievement tests under no child left behind accountability requirements: A policy maker's primer*, 2007, p. 23).

Delimitations and Limitations

The population for this study consisted of students in a rural school district in East Tennessee who were eighth graders during the 2006-2007 academic school year and who had taken the TCAP achievement tests and writing assessment. These students were enrolled in four elementary schools in the school system. The 2007 Tennessee Department of Education Report Card profile described the school district as serving seven schools with an average daily attendance of 3,410 students. The number of the district's schools accredited by the Southern

Association of Colleges and Schools (SACS) was zero. The demographics of the student body consisted of .2% African American, .1% Asian or Pacific Islander, 2.4% Hispanic, .1% Native American or Native Alaskan, and 97.2% White. The percent of economically disadvantaged students was 69.3. The student population for that year was 48% female and 52% male. The per pupil expenditures per average daily attendance (ADA) was \$6,619 for the 2006-2007 school year (Tennessee Department of Education, 2006).

Based on the 2000 U. S. Census Bureau, the county reported 938 families living in poverty that had children under 18 years of age. The number of families reported at 150% below the poverty level was 1,638 with 2,220 families reported at 185% below the poverty level (U. S. Census Bureau, American FactFinder, 2000a).

The population reported by the county in the 2000 census was 20,659. Of those aged 18 to 24 years, 485 had less than a high school diploma. Of the population 25 years and over, 5,674 did not finish high school. Based on the percent of population 25 years and over, 37.1% were high school graduates, 3% had an associate's degree, 5% had a bachelor's degree, 2.1% had a master's degree, and 0.2% had a doctorate degree. (U. S. Census Bureau, American FactFinder, 2000b).

Like many rural school systems across the state, this system had a large percentage of students who qualified for the free and reduced price meals program and had demographics similar to other rural systems. Because the study used quantitative methodology, the results can be generalized to a larger population with similar characteristics.

Overview of the Study

This study is organized into five chapters. Chapter 1 included a brief introduction, statement of the problem, research questions, significance of the study, definitions of terms, delimitations and limitations, and an overview. Chapter 2 presents a review of the literature related to poverty and school success. This chapter includes sections about the historical perspective of socioeconomic status, reasons for childhood poverty, the effects of poverty on child development, the relationship between socioeconomic status and school achievement, programs designed to fight poverty, and a summary. Chapter 3 explains the research methods of the study including the population, design, data collection, data analysis, and research questions and hypotheses. Chapter 4 presents the findings of the study, and Chapter 5 includes the conclusions and recommendations for further research.

CHAPTER 2

REVIEW OF LITERATURE

Countless factors have been analyzed by educational researchers to explain why some students perform better on standardized tests or attain higher levels of academic achievement than other students. As a result, data have been gathered from myriad sources and analyzed by hundreds of individuals to confirm or refute a relationship between students' socioeconomic standing and their subsequent academic achievement. Although the issue is shrouded in emotion, an informed perspective is required to debate the matter effectively (Betson & Michael, 1997). A review of relevant literature related to socioeconomic status will help stakeholders and researchers understand this complex phenomenon and to be aware of society's attempts to lessen and, eventually, eradicate the wide achievement gap separating America's economically disadvantaged students from those student not economically disadvantaged.

Historical Perspective of Socioeconomic Status

As is so often the case, society's most vulnerable citizens frequently bear the brunt of situations well beyond their locus of control. Although this fact regularly went unrecognized in this country (as in nearly all others), children suffered most from living in poverty (Crooks, 1995). Some United States citizens, as well as legislators and policy makers, mistakenly viewed poverty in a stereotypical way as inner city, minority adults who refused to work (Crooks). However, looking at the historical perspective of socioeconomic status in the United States offers an enlightening view.

Trends

Although the 2001 passage of NCLB legislation again sparked interest in the achievement gap experienced by low-income students across the country, the legislation was simply the latest in a series of efforts to focus public attention and legislative policy on socioeconomic status. Through the years, American policy toward poverty swung on the pendulum of public opinion (Lewit et al., 1997).

In the 19th and early 20th centuries, the predominant approach to childhood poverty was for citizens and lawmakers to protect children from the negative impact of slothful parents who exhibited no work ethic. Policies such as foster care, orphanages, and strict supervision of families who received federal financial assistance, dominated the arena of public opinion regarding those who lived in the lower socioeconomic bracket (Lewit et al., 1997). However, as unemployment and poverty spread as a result of the Great Depression, the emphasis shifted to improving situations by providing direct cash assistance as restrictions on the use of such assistance were lessened in the late 1930s (Lewit et al.). By the 1960s, cash welfare programs were replaced by programs that provided in-kind support, specifically discussed in a later section. In the 20 years following 1975, total expenditures on these types of programs increased by 135%, while funding for cash assistance decreased by 8% (Lewit et al.). Poverty rates declined from the late 1950s into the 1970s because of a once again booming economy. However, as the economy began to slow, poverty rates began to rise, growing specifically for children who lived in poverty (Betson & Michael, 1997).

Just as social inequality existed in neighborhoods, such inequality also found its way into the public school system. The idea of an achievement gap, as it was commonly called, traced its origins to the first achievement tests administered by the U.S. Army during the First World War

(Gardner, 2007). Substantial progress was made in the 1970s and 1980s to eliminate the educational performance gap; however, the difference in scores remained relatively unchanged (*Addressing the achievement gap: A challenge for Washington state educators*, 2002). Causes of the achievement gap were deeply rooted within the educational system. From its earliest inception, the public education system was not meant to educate all students in exactly the same way. Early in the 1900s, schools began sorting students and preparing them for different paths beyond public education. Although American society demanded a free and public education for all citizens, some students were historically educated for some level of skill attainment, while others acquired advanced skills and were pushed to gain post-secondary knowledge (*Addressing the achievement gap: A challenge for Washington state educators*, 2002). However, the fact that an achievement gap existed based on socioeconomic status, race, or ethnicity suggested an unequal educational system (Lavin-Loucks, 2006). The Supreme Court's decision in *Brown v. Board of Education of Topeka, Kansas* in 1954, "made the principle of equal educational opportunities a corollary to the equal protection clause of the Fourteenth Amendment and had found that racially segregated schools, when maintained by force of law or by any official action, were inherently unequal" (*Federal education policy and the states*, 2006, para. 4.)

During the 1960s, President Lyndon Johnson's administrative policies addressed two important issues: civil rights and poverty. In 1965, Johnson signed the *Elementary and Secondary Education Act* (ESEA) into law. Title I of the act concentrated on the needs of economically disadvantaged children. Monies could be spent on instruction of the poorest students to improve educational opportunities and educational outcomes. The intention was to assist students in overcoming the effect that poverty had on learning. This act, with modifications, was continually reauthorized by Congress in following years and, in 2001,

President George W. Bush proposed a revision, *The No Child Left Behind Act*. This act (P.L. 107-110) was a reauthorization of ESEA incorporating new provisions. Like previous federal legislation, NCLB directed monies to the poorest schools and increased funds for Title I (*Federal education policy and the states*, 2006).

How Poverty is Measured

Every individual has an idea of what it means to live in poverty (Lewit et al., 1997). But the image is not necessarily the same for everyone. Although the concept of poverty might be straightforward and recognizable – a person living in poverty does not have the means to acquire the necessities of living in reasonable comfort – poverty in measurable terms is very complicated (Betson, 1997).

According to the U.S. Census Bureau Housing and Household Economic Statistics Division website (2007), the determination of poverty in America followed an official directive set forth by the Office of Management and Budget and was based on data from the U.S. Department of Agriculture about food budgets in 1963. Using a set of 48 predetermined income thresholds that differed by family size and age of family members, the Census Bureau determined who lived in poverty. Family income was computed by assessing the family's earnings from employment, compensation from unemployment benefits or workers' compensation, and various public assistance programs before taxes. The formula excluded noncash benefits (i.e., food stamps and housing subsidies), capital gains, and the income of nonrelatives such as housemates, and did not vary by geographical region. Since the adoption of the official measure in the early 1960s, poverty thresholds were adjusted annually for inflation but were otherwise little changed. While the government adopted an official measure of poverty,

many government programs use differing measures of socioeconomic status to define eligibility for assistance (U.S. Census Bureau Housing and Household Economic Statistics Division, 2007).

Although imperfect, the federal government's official measurement of poverty is important because it provided the basis for research about and discussions of socioeconomic status in the United States (Betson, 1997). Since the 1980s, the official poverty threshold was the subject of heated discussion and calls for overhauling the formula (Corak, 2005). Some argued that the formula needed to be recalculated to reflect spending patterns for food, clothing, and shelter (Corak) and to consider sources of income other than cash (Betson; Hill & Bruce, 2004).

Even though the measurement of poverty was cloaked in debate, the measurement was an important social indicator of which families in the United States were in most need of assistance from federal programs and policies (*Rural poverty at a glance*, 2004). However, the measurement certainly did not provide researchers, educators, policymakers, or concerned citizens with a complete description of what was needed by families to live a productive and stable life (U.S. Census Bureau Housing and Household Economic Statistics Division, 2007).

Reasons for Childhood Poverty

For the most part, children are completely dependent beings. They require assistance to survive and thrive. Most children live with their parents or other family members and depend upon those adults for their economic well-being (Betson & Michael, 1997). Because of this dependency, the Census Bureau assigns all members of a family the same socioeconomic status (U.S. Census Bureau Housing and Household Economic Statistics Division, 2007). Therefore, to understand childhood poverty, one must look at the reasons that parents and caregivers lived in poverty (Betson & Michael). Although the list was not inclusive, many individuals continued to

live in the low socioeconomic bracket because of race, location of residence, and family-structure.

Race

Unfortunately, socioeconomic disparities manifest themselves along racial divides. Lee and Burkham's (2002) study concluded that 34% of black children and 29% of Hispanic children were in the lowest quintile of SES compared to only 9% of white children. Minority children were disproportionately poor in the United States. Other researchers argued that the achievement gap was a gap between the *haves* and *have-nots* rather than an issue of racial discrimination (Leach & Williams, 2007; Thomas & Stockton, 2003). However, because ethnicity and socioeconomic status were strongly related, they were often difficult to disentangle (Arnold & Doctoroff, 2003; Lee & Burkham, 2002; Thomas & Stockton, 2003). As a result, minority students were often economically disadvantaged and frequently achieved at lower rates on standardized achievement tests than did their majority counterparts (*Addressing the achievement gap: A challenge for Washington state educators*, 2002; Arnold & Doctoroff; Barton, 2003; Brooks-Gunn & Duncan, 1997; Gardner, 2007). Although educators and administrators did not openly discriminate against minority students nor intentionally provide them with below standard educational opportunities, some researchers suggested that such cultural and racial biases were so engrained in the public school system that it was imperative, at least to acknowledge its existence (*Addressing the achievement gap: A challenge for Washington state educators*, 2003; Gardner; Leach & Williams; Tyack & Cuban, 1995).

Location of Residence

Neighborhoods have a tremendous impact on the acceptable behavior of residents and the establishment of cultural norms. Some researchers found that even when variables within the student and school were rigorously controlled, location of student residence negatively affected student achievement (Catsambis & Beveridge, 2001; Garner & Raudenbush, 1991). For obvious reasons, the location of residence was a powerful influence not only on the parents' achievement but on the achievement of the children as well. Residence in an impoverished neighborhood might expose vulnerable minors to crime, drug use, and more (Brooks-Gunn & Duncan, 1997). Regrettably, sometimes even good parents who attempted to live above the negative influence of the community all too often lost their children to the streets because the pull from peer groups was so strong (Berliner, 2006).

Zip codes not only influenced family behavior but also had a direct result on the quality of education offered by the local school system. Poor parents had limited choices when selecting neighborhoods and educational opportunities for their children (Brooks-Gunn & Duncan, 1997). These parents had little or no voice to express their concern about the limited educational opportunities presented to their children. Children from high-poverty school districts were less likely to have access to qualified and experienced teachers and more likely to face low expectations from teachers (Flores, 2007; Peske & Haycock, 2006). *The Funding Gap 2005*, published by The Education Trust, estimated that, nationwide in 2003, per pupil expenditure in high-poverty school systems averaged \$907 less than per pupil expenditure in low-poverty schools. In some states, this gap was much greater. New York reported a funding gap of \$2,280 between students in affluent and low-income systems (*The funding gap*, 2005). Funding for public schools in almost all states was based primarily on local funding and local property taxes.

Various districts had large differences in property wealth, differences in low- and high-income populations, and wide variations in dollars available for and spent on education (Cardenas, 1994; Flores; Slaven, 1999;).

Family-Structure

Children are dependent creatures and cannot alter their socioeconomic status until reaching adulthood (Brooks-Gunn & Duncan, 1997). Therefore, they are often constrained by the family-structure into which they are born. Several aspects of family-structure affected socioeconomic status. To begin, many children lived in poverty because parents who were economically disadvantaged reproduced at greater rates than the population as a whole (Betson & Michael, 1997). Furthermore, poor children were more likely to reside in households with fewer working adults than were nonpoor children (Betson & Michael). Obviously, with fewer working adults, a family's earning potential was significantly reduced (Lewit et al., 1997).

Another related and often cited source of childhood poverty was the likelihood that poor children resided in households headed by single females. Danzinger and Gottschalk (1995) estimated that children were five times more likely to be economically disadvantaged when reared in mother-only homes. Those households experienced financial difficulty because there was only one working adult and women typically earned lower salaries than men did (Corcoran & Chaudry, 1997). In contrast, children living in families headed by married couples had the lowest rate of poverty and tended to be more economically stable (*Rural poverty at a glance*, 2004). In Tennessee, 50.8% of children living in single-mother households in 2007 were economically disadvantaged; in contrast, only 9.7% of children living in homes with married parents experienced the same financial strain (Heartland Alliance for Human Needs & Human

Rights, 2007). For numerous reasons, the structure of the family unit had a tremendous impact on the well-being of the children.

Effects of Poverty on Child Development

In 1997, the United States Congress declared as the first National Education Goal that all children would come to school ready to learn (National Education Goals, 1997). The ability to acquire new knowledge is imperative for survival from the earliest age, and by the time students enroll in public education, they have learned many things. Most have mastered a language, learned a variety of symbols, and acquired the ability to demonstrate socially acceptable behavior (Bowman, 1994). However, not all students were on the same playing field when it came to school readiness. Although the importance of learning was undeniable, not all students had the same preparation for academic success nor were they developmentally ready for academics.

Problems Before and At Birth

Problems for low-income mothers and their children begin shortly after conception. An unfortunate majority of economically disadvantaged pregnant woman failed to obtain or receive adequate prenatal care (Crooks, 1995). Further complicating the matter, these women were also more likely to engage in inappropriate prenatal habits such as smoking, drinking, and using drugs (Wise & Meyers, 1988). Although not always the case, economically disadvantaged children encountered challenges very early in life.

The negative impact of poverty was also present in delivery rooms. A study by Starfield et al. (1991) revealed a strong relationship between low birth weight deliveries and socioeconomic status. After statistically controlling for numerous other factors, the researchers found that women with household incomes falling below the federal poverty threshold were

three times more likely to deliver a low birth weight baby than their more affluent counterparts. The weight of a child at birth was an important indicator of child health, and low birth weight was associated with increased health problems throughout childhood (Brooks-Gunn & Duncan, 1997). Additional research confirmed that low birth weight babies continued to have difficulty when entering the public school system. These children often struggled when learning to read, spell, and complete math problems (Bowen, Gibson, & Hand, 2002). Furthermore, low birth weight babies had difficulty paying attention and controlling unacceptable social behavior when entering the classroom years later (Anderson & Doyle, 2003). Collectively, studies revealed that socioeconomic status had a negative impact early in a child's existence.

Health and Mental Care

As babies grow into toddlers and toddlers grow to school-aged children, the effects of poverty continue to manifest. Children who lived in low-income homes routinely failed to receive the recommended health and dental screenings that might prevent or reduce future illnesses (National Center for Children in Poverty, 2007). Perhaps because of lack of preventative care, these children were more likely to suffer from and fail to receive treatment for common childhood illnesses (Children's Defense Fund, 2007; International Council of Nurses, 2004; Lewit et al., 1997). In addition, they were more likely to suffer from severe health issues such as heart problems (Currie, 2005). According to the Centers for Disease Control and Prevention (2007), children who lived in economically disadvantaged households were at least twice as likely to fail to receive treatment for dental decay as were their middle- and upper-class counterparts. Such poor health could have undeniable effects on the students' future academic performance.

Poverty also negatively affected children's mental well-being. Children who experience even short-term periods of poverty suffered more frequently from emotional and behavioral problems (Brooks-Gunn & Duncan, 1997). Furthermore, children without access to life-sustaining resources were more likely to suffer from depression and experience high levels of stress (Currie, 2005). Even though poverty might increase the risk of children suffering from mental problems, it equally decreased the likelihood that the child would have access to mental healthcare to counteract the negative effects (Children's Defense Fund, 2007). What's more, some researchers maintained that persistent poverty was a significant indicator of later behavior problems, which likely manifested when the child entered school (Korenman, Miller, & Sjaastad, 1995).

Cognitive Development

An examination of the effects of poverty on childhood development would be incomplete without some attention given to the impact of this condition on cognitive development. Few individuals deny the ability of the first years of a child's life to hinder or advance future development, both physically and cognitively. Regrettably, children who live in low-income home settings suffer many cognitive setbacks.

Although the scope of this paper did not allow for a detailed discussion, poor children suffered from many cognitive problems that made the achievement gap evident even before the child entered the public school system (Barton, 2003; Lavin-Loucks, 2006). As proof of this gap, children raised in families with incomes falling below the poverty threshold were 1.3 times more likely to suffer from learning disabilities and developmental delays than their middle- and upper-class counterparts were (Brooks-Gunn & Duncan, 1997). In addition, poverty could affect short-

term memory (Korenman et al., 1995). As is evident from reviewing academic research, inequality in cognitive development apparently continues to affect later academic achievement.

Relationship Between Socioeconomic Status and School Achievement

Children reared by economically disadvantaged parents present a challenge for public educators and administrators. Students who darken schoolhouse doorways not yet ready to learn for whatever reasons confront challenges throughout their lifetime (Rouse, Brooks-Gunn, & McLanahan, 2005). Socioeconomic status negatively influenced school readiness, academic achievement test scores, overall school success, and parental involvement.

Socioeconomic Status and School Readiness

School readiness is developed long before the official start of the child's formal education and previous learning environments are varied across social lines (Duncan, Ludwig, & Magnuson, 2007). Middle- and upper-class parents frequently enrolled their children in daycare programs that offered curricula geared specifically toward preparing the children for future academic success. However, low-income families lacked the finances to provide such a running start for their children (Phillips, Voran, Kisker, Howes, & Whitebook, 1994). Many of the nation's poorest children, in fact, had little or no experience in any type of educational setting prior to school enrollment (Berliner, 2006). Compounding the problem further, low-income households often had few or no books in the home, lacked technology that would further develop academic ability, and did not engage in learning activities such as taking children to a museum, library, theatre, or zoo (Lee & Burkham, 2002; Von Secker, 2004).

The impact of socioeconomic status on school readiness did not fade or disappear once formal education began. After they were enrolled, low-income children suffered every year

because of the academic school calendar. Even when academic progress was made, economically disadvantaged children showed greater intellectual loss during summer breaks than did their more affluent counterparts (Cooper, Nye, Charlton, Lindsay, & Greathouse, 1996; Reardon, 2003). Alexander, Entwisle, and Olson (2001) found that children in the middle and upper socioeconomic brackets made educational gains even during the months of summer vacation; however, students on the opposite end of the socioeconomic scale tended to have no educational gain when not academically engaged in the school setting. Even when educators were able to make progress with students, the impact of social standing counteracted growth.

Socioeconomic Status and Test Scores

Although standardized tests do not gauge the entire realm of student achievement, they are used as a *common yardstick* in society and viewed by many as being extremely important. For these reasons, educators and administrators must be concerned about how economic factors influence a student's performance on achievement tests. Caldas and Bankston (1997) reported that socioeconomic status as determined by a student's participation in the school free and reduced price meals program negatively affected achievement. Other research confirmed that economically disadvantaged students averaged lower scores on achievement tests regardless of the subject matter (Arnold & Doctoroff, 2003; Boloz & Varrati, 1983; Cooper & Crosnoe, 2007; Duncan, Yeung, Brooks-Gunn, & Smith, 1998; Flores, 2007; Taylor, 2005). For reasons beyond their control, low socioeconomic children faced an increased risk of failing mandated standardized achievement tests. Such failure could have devastating effects for the students, the school system, the family, and society at large (Cooper & Crosnoe). In a public system so enthralled with standardized tests, it is imperative to acknowledge that socioeconomic status

affects scores and take action to ensure the success of all students regardless of economic stability.

Socioeconomic Status and School Success

Because of diminished school readiness and poor performance on mandated achievement tests, economically disadvantaged children often experienced lowered levels of school success. Unfortunately, this lack of success began when students encountered educators who were socially conditioned to view poor people as morally inferior, in other words a class that remained in poverty by choice or attitude (Amatea & West-Olatunji, 2007). Some educators erroneously expressed the view that children who grew up in poverty were beyond repair. Educators often behaved as if these children were so damaged by their early experiences, they might be too difficult or impossible to educate (Wilkins, 2006). Such a misinformed view was certainly unfortunate because some educators failed to provide these needy students with a successful school experience that might eventually lead them to break the poverty cycle.

Some teachers unwittingly contributed to the failure of students when they imposed a majority cultural view of appropriate behavior and expected experiences. These educators often failed to realize that all students were not fortunate enough to have been trained in the dominant view of appropriate behavior. Similarly, teachers might assume that all students had many simple experiences that were often taken for granted (*Addressing the achievement gap: A challenge for Washington state educators*, 2002). Bowman (1994) maintained that to use “mainstream behavior [as the ...] sole criterion for healthy development” (Developmental Competence section, para. 8) miscalculated the learning potential of a great number of students. She argued that teaching to the majority culture led students and families to feel devalued and to sense the need of choosing whether to pledge allegiance to their school or their family (Bowman). Perhaps,

because students often feel alienated while at school, those from the low socioeconomic group may miss more class time than wealthier students. A study of longitudinal data revealed that chronic absenteeism rates were higher among low income children (National Center for Children in Poverty, 2007). Research posited that missing class time had a more detrimental impact on low-income students than it did on more affluent children (Boloz & Varrati, 1983; National Center for Children in Poverty, 2007).

Perhaps, the most obvious differences regarding school success were revealed when studying the disproportionate rate of failures between social classes. Because of the obstacles previously discussed, school failure was more likely an outcome for students who were economically disadvantaged (Amatea & West-Olatunji, 2007). Poverty had detrimental effects on its youngest victims because they were more likely to be retained and many eventually failed to complete high school (Lewit et al., 1997; Thomas & Stockton, 2003). Educators and administrators need to confront the realities of poverty head-on in order to reverse the damaging and harmful effects on the lack of school success.

Socioeconomic Status and Parental Involvement

For various reasons, parents from the lower-socioeconomic group were not as involved with the public school systems as were their more wealthy peers. Because students from the lower income bracket were more likely to exhibit inappropriate behavior (Brooks-Gunn & Duncan, 1997), the communication between school personnel and lower-income parents was often negative (Amatea & West-Olatunji, 2007). Thus, lower income parents regularly viewed any contact with school staff as confrontational and saw school as the enemy of the family (Lott, 2001). Furthermore, lower income parents were less likely to serve on a school committee or volunteer to participate in a school function (Barton, 2003). Cooper and Crosnoe (2007) found

that parental involvement was significantly associated with family income; parental participation decreased as the financial disadvantage of the family increased. Some parents must work two or more jobs or work the night shift in order to provide for the family's most basic needs, which made it nearly impossible to attend school functions (Gardner, 2007). Although the lack of parental participation could not entirely explain the achievement gap between lower and middle- and upper-class children, it was unarguable that parents who stayed connected to the school were more informed (Glick & Hohmann-Marriott, 2007; Lee & Bowen, 2006). Regrettably, however, because of the constraints placed on parents' finances and time, economically disadvantaged parents were less involved in nearly every aspect of their child's education.

Programs Designed to Fight Poverty

Because poverty has been a politically contentious issue for over half a century, a number of federal, state, and local programs have been and are being developed to provide assistance to those American families living below the poverty threshold. Although the programs were not equally distributed or equally effective, many of these programs were extremely beneficial for economically disadvantaged families (Currie, 1997). Governmentally sustained programs offer families and children the support and services necessary to improve their circumstances (National Center for Children in Poverty, 2007). A comprehensive review of policies aimed to benefit the poor would be extremely extensive; however, an overview of the Head Start Program and Federal Food Programs, which provide aid to families, offer a limited introduction to some of the most common help available to preschool and school-aged children.

Head Start

According to the Administration for Children and Families website (n.d), the Head Start program began in 1965 as a part of President Lyndon Johnson's War on Poverty and has enrolled over 24 million children since its launch. Project Head Start originally began as an 8-week summer program intended to help bring an end to poverty by offering services that would meet the social, emotional, nutritional, health, and psychological needs of low-income children. The program is overseen by the United States Department of Health and Human Services and is the longest-running program designed to assist low income families and children. The program provides grant money to local agencies to design and offer all-encompassing services and a comprehensive education for low-income children. Head Start offers not only educational assistance but health services as well. Participants in the program regularly receive dental exams, screenings for hearing and vision, and age appropriate immunizations. In 2006, Tennessee was awarded \$118,039,184 and enrolled 16,397 children across the state for involvement in Project Head Start (Administration for Children and Families, n.d.).

Because early childhood is a crucial time for intervention (Bowman, 1994; Perez-Johnson & Maynard, 2007), the Head Start Program provided vital information that better equipped parents to prepare their children and themselves for participation in the children's upcoming formal education. Head Start coordinators, teachers, and volunteers encouraged parents to serve as role models for their children by furthering their own education (Children's Defense Fund, 2007). Participation in Head Start and other early intervention programs boasted impressive short-term effects for children and parents; however, little research was conducted to evaluate the long-term impact of such programs (Arnold & Doctoroff, 2003; Currie, 1997).

Although the effects might not be substantially documented, the program's main principles are commendable. Key aspects of the program include: offering all-inclusive services, developing the parents' role as the primary influence on the child's cognitive and physical development, encouraging parental involvement in the policy and program decision-making process, and instituting and maintaining partnerships with community agencies to advance the delivery of services to participants (Devaney, Ellwood, & Love, 1997).

Federal Food Programs

On June 30, 2004, the *Child Nutrition and WIC Reauthorization Act of 2004* was signed into law by President George W. Bush. This act enlarged the accessibility of nourishing and healthy meals and snacks to more individuals in need (Food Research and Action Center, n.d.). Although the law provided funding for and encompassed various specific programs, three of the most common were the National School Breakfast and Lunch Program (formerly NSLP), the Food Stamp Program, and the Special Supplemental Food Program for Women, Infants, and Children.

The National School Lunch Program (NSLP) was created by Congress as a result of an investigation that revealed a link between the physical deficiencies of rejected World War II draftees and their childhood malnutrition. The *National School Lunch Act* was signed into law in 1946 as a way to protect the health of the nation's poorest children. In 1966, Congress piloted the School Breakfast Program (SBP) and made the entitlement program permanent in 1975. Later, in 1998, the legislators expanded the NSLP program to include the Afterschool Snacks and Suppers program that provided reimbursement for nutritious snacks offered during community and school based after-hours programs. During the 2005-2006 school year, an average of 248,412 Tennessee students participated in the SBP, and an average of 670,755 Tennessee students ate nutritious

meals as a result of the NSLP. During a normal school day, 9.9 million children across the nation participated in the SBP, and 17.7 million students received a free or reduced price lunch (Food Research and Action Center, n.d.). Often families living on a tight budget cannot provide appropriate and healthy meal choices for their children; these programs offer students and families the opportunity to meet the day's educational challenges without having to worry about meeting the first and most basic need – a full stomach. Meyers, Sampson, Weitzman, Rogers, and Kayne (1989) found that when compared to eligible children who did not participate children who ate breakfast as part of the SBP showed significant improvements in basic skills tests and had decreased tardy and absentee rates.

The Food Stamp program offers families the ability to provide healthy meals to all family members outside of the school setting. The program originated in the late 1930s and operated as a limited program from 1939 to 1943. The program was breathed new life in 1961 and offered nationwide in 1974. The modern Food Stamp Program was put into practice in 1977 as a way to alleviate hunger and provide economically disadvantaged families with the opportunity to serve nutritious meals to their families by purchasing food with monthly benefits. During the 2006 fiscal year, the Food Stamp Program provided \$976,012,959 to assist low-income families in the state of Tennessee. Total costs to the federal government in 2003 for the program were amassed at \$23.88 billion (Food Research and Action Center, n.d.). Studies indicated that participation in the Food Stamp Program increased the availability of key nutrients such as calcium and iron (Devaney & Moffitt, 1991; Fraker, 1990). In addition, research posited that economically disadvantaged children whose families received food stamps were more likely than poor nonparticipants to consume more than 70% of the recommended dietary allowance (Cook, Sherman, & Brown, 1995).

The Special Supplemental Food Program for Women, Infants, and Children (WIC) provides more than just nutritious foods. WIC also offers participants access to nutritional education and health care. The federal government provides funding to state agencies responsible for operating clinic sites to serve WIC participants. Clinics offer food packages, screenings, and referrals that make a remarkable difference in the overall well-being of participants. In 2002, Congress approved 4.387 billion dollars to continue funding the program. In 2006, an average 156,801 women, infants, and children in the state of Tennessee received benefits (Food Research and Action Center, n.d.).

Summary

It is clear that socioeconomic status impacts every aspect of a child's life from diapers to diploma. It threatens a child's continued existence, ability to develop physically, and capacity to grow intellectually (Children's Defense Fund, 2007). Even with all the research and data that detailed poverty's detrimental effects on society's most vulnerable victims, in 2006, a child was born into poverty every 35 seconds and nearly 13 million children lived in poverty every day (Children's Defense Fund, 2007). These statistics do not describe some unindustrialized nation in a foreign land; instead, they paint a dismal picture of one of the richest countries in the world – the United States of America. Just as the National Center for Children in Poverty (2007) works “to transform research into real progress” (p. 5), policy makers, administrators, educators, and community members must also take action to assure that this generation of low-income families can end the poverty cycle and permanently close the gap of academic achievement between affluent and economically struggling students.

CHAPTER 3

RESEARCH METHODS

The purpose of this study was to look at the effects of socioeconomic status on student achievement as measured by the TCAP Achievement Test and TCAP Writing Assessment. This chapter details the research methodology employed in the study. The chapter is organized into the following sections: population, design, data collection, data analysis, and research questions and hypotheses.

Population

The population consisted of eighth grade students enrolled in four elementary schools in a small rural school system in East Tennessee during the 2006-2007 academic school year. Of the 271 students, 142 were classified as economically disadvantaged and receiving either free or reduced price meals and 129 were classified as not economically disadvantaged. With such a large number, there was likelihood that even a small difference between the scores of students who were or were not classified as economically disadvantaged could be reported as statistically significant (Witte & Witte, 2007). For this reason, the effect size was also calculated and reported to present a more accurate representation of the true effect that socioeconomic status may have on student achievement.

Design

Data were analyzed from the records of eighth grade students enrolled in an East Tennessee rural school district during the 2006-2007 academic school year. This study proposed to contribute information about the effects of socioeconomic classification on student

achievement as measured by the state mandated tests in math, language arts, social studies, science, and writing.

Data Collection

Prior to data collection, the Institutional Review Board of East Tennessee State University granted permission to conduct the research, and written permission to collect archival data was obtained from the director of the school system. The data analyzed for this research were collected from the school system with the assistance of the testing supervisor and the technology supervisor. The system used the Tennessee Statewide Student Management System (TSSMS) to maintain student demographics, attendance, grades, and academic history. Eligibility for free or reduced price meals was obtained from the TSSMSS by the school system's technology supervisor. TCAP Achievement Test scores and TCAP Writing Assessment scores were gathered by the system's testing supervisor. Once data were released to the researcher, the information was maintained on a personal computer and analyzed using version 15 of the Statistical Package for the Social Sciences (SPSS) computer software program.

Records were collected for all eighth grade students who were enrolled in the four elementary schools in the county during the 2006-2007 school year. Because test scores and academic information is personal, strict confidentiality was maintained and students were identified only by a coded number assigned by the testing supervisor. For the purposes of this research, students were assigned to two groups. Students assigned to group one were those who qualified for and participated in the free or reduced price meals program; group two students were classified as those who did not qualify or did not participate in the free or reduced price meals program.

In this study, data were analyzed based upon performances on the TCAP Achievement Test and TCAP Writing Assessment. There were two independent variables. One was the school classification (Schools A, B, C, and D). The second independent variable was the socioeconomic status of students, which had two levels: (1) students qualified and participating in free or reduced price meals program and (2) students that did not qualify or participate in free or reduced price meals program.

There were five dependent variables in the current research. The eighth grade TCAP Language Arts test consisted of 67 questions and was measured as the number of items answered correctly. The potential range of the TCAP Language Arts test was 0 to 67. The second dependent variable was the eighth grade TCAP Math test, which consisted of 67 items and was measured as the number of items answered correctly. The potential range of the TCAP Math test was 0 to 67. The third and fourth dependent variables were the eighth grade TCAP Science and TCAP Social Studies tests, which consisted of 60 questions each. The measurement on both was the number of items answered correctly. The potential ranges of both the TCAP Science and TCAP Social Studies tests were 0 to 60. Finally, the fifth dependent variable in this study was the eighth grade TCAP Writing Assessment score. This test had a potential range of 0 to 6.

Data were analyzed and conclusions drawn based upon students' performances on the TCAP state mandated achievement test and writing assessment scores. Students in grades 3 through 8 are tested annually as part of this program to assess their progress; students in grades 5 and 8 complete the writing assessment. The Division of Assessment, Evaluation and Research with the Tennessee Department of Education assists schools with all aspects of TCAP, including proper use of assessment results. Tennessee also participates in state-level National Assessment

of Educational Progress (NAEP) assessments for elementary grades 4 and 8 in reading and math. This participation is required under NCLB for states that receive Title 1 grants.

The 2007 TCAP Achievement Test was criterion-referenced and evaluated student performance against the *State Curriculum Content Standards* in language arts, math, social studies, and science. This standards-based system of assessment was timed and consisted of multiple-choice questions only. Scores ranked student performance as either below proficient, proficient, or advanced. Through contractual collaboration between CTB/McGraw-Hill and the Tennessee Department of Education, the TCAP Achievement Test is administered in the spring of each year under strict ethical and security guidelines. *Tennessee Code Annotated* 49-1-607 stated that anyone not following the guidelines or “compromising the integrity of the testing process, shall be placed on immediate suspension, and such actions will be grounds for dismissal, including dismissal of tenured employees. Such action shall be grounds for revocation of state license” (Acts 1992, Chapter 535, p. 4). Furthermore, any school district teacher giving the test must sign a *Testing Code of Ethics* document. Also, the *Tennessee Comprehensive Assessment Program Achievement Test~Grades K-8 Teacher’s Instruction Manual* (2007) advised teachers that the guidelines for administering tests should be followed properly to help ensure validity and accuracy.

In addition, students in grades 4 and 8 were required to complete the 2007 TCAP Writing Assessment in February. Students responded to a statewide assigned prompt and had to complete their essay within the 35 minutes allowed. The writing assessment measured student mastery of the English language and ability to organize thoughts; therefore, students produce a rough draft within the time constraint. Student essays were graded by professionally trained readers and scored holistically from a score of 0 to 6, with higher scores reflecting more effective written

communication (Tennessee Department of Education, n.d.). The same ethical and security guidelines were followed as with the achievement test.

The *No Child Left Behind* Act of 2001 legislation required that by the spring of 2006 all public schools should assess students in grades 3 to 8 to determine whether they were meeting standards in math and reading and that by the year 2013-2014 all learners should attain the level of proficient or advanced (*Developing student achievement tests under no child left behind accountability requirements: A policy maker's primer*, 2007). Most standardized tests are developed by commercial test publishers (Center for Public Education, 2006), and the growth in testing has been challenging for the testing industry. Toch (2006) maintained the process of constructing quality tests was complex and time-consuming. Test-makers determined the content and time-span of tests, employed curriculum specialists to compose questions that aligned with state standards, and then

questions are field-tested on thousands of students to ensure that they don't discriminate against groups of students but do discriminate between strong and weak students, a complex mathematical task that requires comparing how students do on other questions with how they perform on the questions being trial-tested. Test-makers also have to ensure that every multiple choice question has one, and only one, correct (or clearly best) answer and that the questions on a test reflect an appropriate range of difficulty. Another complex statistical computation has to be performed to ensure that the same scores on different tests represent the same level of performance (p. 8).

In addition, achievement tests have to meet psychometric standards for validity, reliability, and lack of bias (Joint Committee on Testing Practices, 2004). Jorgensen (2005), a vice president of product research for Harcourt Assessment, maintained that to be fair and

unbiased published tests must assess a learner's achievement without any influence of "extraneous factors such as student gender, culture, ethnicity, geography, or socioeconomic status" (Section 1, para. 2). Advocates of achievement tests argued test scores used appropriately could effectively identify strengths and weaknesses, assess academic progress or decline, and help determine aptitude for certain abilities (Eggen & Kauchak, 2003; *Views on standardized testing*, n.d.).

Critics contended that tests discriminated against non-English speaking students and children from cultural minorities and that bias in testing could occur during the actual testing process, in the subject matter of the test, or in how the test results were used (Eggen & Kauchak, 2003; Sayegh, 2004). Furthermore, because schools in the United States are not centralized, curriculum material is presented at different times using diverse approaches; therefore, students could possibly be tested on subject matter that was never taught in the classroom (Hlebowitsh, 2001). Popham (1999) maintained student achievement test scores could be attributed not only to what a child learned in school, but also to "a student's native intellectual ability and a student's out-of- school learning" (Section 7, para. 4).

Data Analysis

This study used a quantitative methodology to determine if there were differences in the TCAP scores of those students classified as low socioeconomic status and those not classified as low socioeconomic status. The scores from math, language arts, science, social studies, and writing were used to make comparisons within and among each of the four schools. The 8th grade in the four elementary schools was selected because those students were required to take both the writing assessment and achievement tests.

Descriptive statistics were used to provide the reader with a profile of the population. Beyond description, inferential statistics were employed to verify the effects and relationships between socioeconomic status and school success. The inferential statistics included two-way analysis of variance (ANOVA). All statistical analysis conducted used an alpha of 0.05 to determine statistical significance. The effect size was also calculated and reported.

Research Questions and Hypotheses

The following research questions and hypotheses served as a guide for completing the research. Two-way ANOVA models were used to evaluate the null hypotheses. Significant main effects in the two-way ANOVA models were followed by an appropriate *post hoc* test. Equal variances were assumed, and the Bonferroni *post hoc* test was used to evaluate pairwise differences. In addition, because significant interaction indicated that a main effect (factor) could not be evaluated in isolation from the other main effect (factor) in the model, the null hypotheses for the main effects was not tested in the event there was a significant two-way interaction. Instead, the nature of the interaction was explored using descriptive statistics.

Research Question #1: *Are there differences in 8th grade TCAP scores for math based on school (School A, School B, School C, and School D), socioeconomic status (students who were economically disadvantaged and those who were not economically disadvantaged), and the interaction between school and socioeconomic status?*

To answer this research question, a two-way ANOVA model was used. The null hypotheses for this ANOVA model were as follows:

Ho₁: There is no difference in the 8th grade TCAP math means among the schools.

Ho1₂: There is no difference in the 8th grade TCAP math means among students based on socioeconomic status (students who were economically disadvantaged and those who were not economically disadvantaged).

Ho1₃: For 8th grade TCAP math test, there is no significant school by socioeconomic status interaction.

Research Question #2: *Are there differences in 8th grade TCAP scores for language arts based on school (School A, School B, School C, and School D), socioeconomic status (students who were economically disadvantaged and those who were not economically disadvantaged), and the interaction between school and socioeconomic status?*

To answer this research question, a two-way ANOVA was conducted to evaluate the following null hypotheses:

Ho2₁: There is no difference in the 8th grade TCAP language arts means among the schools.

Ho2₂: There is no difference in the 8th grade TCAP language arts means among students based on socioeconomic status (students who were economically disadvantaged and those who were not economically disadvantaged).

Ho2₃: For 8th grade TCAP language arts test, there is no significant school by socioeconomic status interaction.

Research Question #3: *Are there differences in 8th grade TCAP scores for social studies based on school (School A, School B, School C, and School D), socioeconomic status (students who were economically disadvantaged and those who were not economically disadvantaged), and the interaction between school and socioeconomic status?*

To answer this research question, a two-way ANOVA was utilized to test the following null hypotheses:

Ho3₁: There is no difference in the 8th grade TCAP social studies means among the schools.

Ho3₂: There is no difference in the 8th grade TCAP social studies means among students based on socioeconomic status (students who were economically disadvantaged and those who were not economically disadvantaged).

Ho3₃: For the 8th grade TCAP social studies test, there is no significant school by socioeconomic status interaction.

Research Question #4: *Are there differences in 8th grade TCAP scores for science based on school (School A, School B, School C, and School D), socioeconomic status (students who were economically disadvantaged and those who were not economically disadvantaged), and the interaction between school and socioeconomic status?*

The two-way ANOVA model was used to answer this research question, evaluating the following null hypotheses:

Ho4₁: There is no difference in the 8th grade TCAP science means among the schools.

Ho4₂: There is no difference in the 8th grade TCAP science means among students based on socioeconomic status (students who were economically disadvantaged and those who were not economically disadvantaged).

Ho4₃: For the 8th grade TCAP science test, there is no significant school by socioeconomic status interaction.

Research Question #5: *Are there differences in 8th grade TCAP scores for writing assessment based on school (School A, School B, School C, and School D),*

socioeconomic status (students who were economically disadvantaged and those who were not economically disadvantaged), and the interaction between school and socioeconomic status?

A two-way ANOVA was conducted to test the following null hypotheses:

Ho5₁: There is no difference in the 8th grade TCAP writing assessment means among the schools.

Ho5₂: There is no difference in the 8th grade TCAP writing assessment means among students based on socioeconomic status (students who were economically disadvantaged and those who were not economically disadvantaged).

Ho5₃: For the 8th grade TCAP writing assessment, there is no significant school by socioeconomic status interaction.

Summary

Chapter 3 presented the research design, population, data collection, data analysis, and the null hypotheses used in this quantitative, quasi-experimental study. In addition, the testing instruments, Tennessee Comprehensive Assessment Program Achievement Test and Tennessee Writing Assessment Test, were detailed. Finally, null hypotheses and statistical tests for each research question were identified. In Chapter 4 the results of each statistical test are presented.

CHAPTER 4

DATA ANALYSIS

In 2001, President George W. Bush, with bipartisan support, implemented the *No Child Left Behind Act*, which set forth a plan of action for schools to work toward elimination of the educational achievement gap by 2014 (*Federal education policy and the states*, 2006). School systems across the nation accepted the challenge to abolish the gap and seemed to be making headway; however, some educators and policymakers argued that eradication of the achievement gap was impossible because of forces beyond the reach of the schoolhouse door – namely, the effects of socioeconomic status on student achievement. Although various public programs exist to help alleviate the impact of poverty on student success, administrators must question whether schools are gaining ground or are any closer to narrowing the gap. The rural Tennessee school system studied as a part of this research is no different; administrators question whether living in low socioeconomic conditions has a tremendous negative impact on student academic success. The purpose of this study was to look at the relationship of socioeconomic status on student achievement as measured by the TCAP Achievement Test and TCAP Writing Assessment. Five research questions and 15 null hypotheses were tested.

The study's population consisted of 271 eighth grade students enrolled in four elementary schools in a small rural school system in East Tennessee during the 2006-2007 academic school year. The population was divided into two groups—students who were economically disadvantaged (those eligible for and participating in the National Free or Reduced Price School Lunch Program) and those who were not economically disadvantaged. The research focused on four areas of the TCAP Achievement Test (math, language arts, social studies, and science) and scores attained by students for the TCAP Writing Assessment. For each area of the test and for

each individual research question, records were analyzed for students who took that particular portion of the exam. For this reason, the total number of student scores presented for each research question varied slightly. Of the 271 student records analyzed, 142 participated in the free or reduced price meals program and were, therefore, classified as economically disadvantaged. The remaining 48% (129 students) did not participate in the program and were categorized as not economically disadvantaged. Table 1 shows the demographic profile of the population.

Table 1

Demographics of Population

	Economically Disadvantaged		Not Economically Disadvantaged		Total	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
School A						
Students	48	62	29	38	77	100.0
School B						
Students	45	49	47	51	92	100.0
School C						
Students	25	42	34	58	59	100.0
School D						
Students	24	56	19	44	43	100.0
Total	142	52	129	48	271	100.0

Analysis of Research Questions

Research Question #1

Are there differences in 8th grade TCAP scores for math based on school (School A, School B, School C, and School D), socioeconomic status (students who were economically disadvantaged versus students who were not economically disadvantaged), and the interaction between school and socioeconomic status?

To answer this research question, a two-way ANOVA model was used. The null hypotheses for the two-way ANOVA model were as follows:

Ho₁: There is no difference in the 8th grade TCAP math means among the schools.

Ho₂: There is no difference in the 8th grade TCAP math means between students who were classified as economically disadvantaged and those who were not economically disadvantaged.

Ho₃: For the 8th grade TCAP math test, there is no significant school by socioeconomic status interaction.

A two-way analysis of variance model was used to analyze the scores of the 270 students who were present to complete the math portion of the TCAP Achievement Test. The criterion variable, the number of math items answered correctly, had a potential range of 0 to 67. The two main effects of the ANOVA model were school and socioeconomic status. School had four categories (School A, School B, School C, and School D), while socioeconomic status had two levels (students who were economically disadvantaged and those who were not economically disadvantaged). Students who were economically disadvantaged were those students who qualified for the free or reduced price meals program.

The F test for the school by socioeconomic status interaction term was not significant, $F(3, 262) = 1.42, p = .24$, partial $\eta^2 = .02$. Therefore, the null hypothesis for the interaction term was retained.

There was a significant difference in the number of math items answered correctly among the schools, $F(3, 262) = 10.90, p < .01$. Therefore, the null hypothesis for the main effect of school was rejected. The effect size as measured by partial η^2 was medium (.11). That is, school accounted for 11% of the variance in the number of math items answered correctly.

Because the overall F test for the main effect of school was significant, the Bonferroni *post hoc* multiple pairwise comparisons test was used to determine which pairs of school math means were different. The Bonferroni test showed there was a significant difference in the unweighted mean number of math items answered correctly between School A and School B ($p < .01$) and between School B and School C ($p < .01$). In each case the unweighted mean number of math items answered correctly for School B ($M = 50.84$) was considerably higher than the mean number of math items answered correctly for School A ($M = 41.52$) and School C ($M = 42.61$). No other pairs of school math means were significantly different.

There was a significant difference in the mean number of math items answered correctly between students who were economically disadvantaged and students who were not economically disadvantaged, $F(1, 262) = 12.75, p < .01$. Therefore, the null hypothesis for the main effect of socioeconomic status was rejected. The effect size as measured by partial η^2 was small (.05). That is, socioeconomic status accounted for 5% of the variance in the number of math items answered correctly. The unweighted mean number of math items answered correctly by students who were not economically disadvantaged ($M = 47.85$) was higher than the mean for

students who were economically disadvantaged ($M = 42.64$). Table 2 shows the descriptive statistics for the number of math items answered correctly by school and socioeconomic status.

Table 2

Descriptive Statistics for Number of Math Items Answered Correctly by School and Socioeconomic Status

School	Socioeconomic Status	<i>N</i>	<i>M</i>	<i>SD</i>	<i>M</i> (Unweighted)
A	Economically Disadvantaged	48	40.00	12.17	
	Not Economically Disadvantaged	29	43.03	10.55	
	School A Total	77	41.14	11.61	41.52
B	Economically Disadvantaged	44	47.36	10.29	
	Not Economically Disadvantaged	47	54.32	10.15	
	School B Total	91	50.96	10.75	50.84
C	Economically Disadvantaged	25	37.92	11.09	
	Not Economically Disadvantaged	34	47.29	12.06	
	School C Total	59	43.32	12.47	42.61
D	Economically Disadvantaged	24	45.29	13.03	
	Not Economically Disadvantaged	19	46.74	12.48	
	School D Total	43	45.93	12.66	46.01
SES	Economically Disadvantaged	141	42.83	12.07	42.64
	Not Economically Disadvantaged	129	48.81	11.86	47.85
Grand Total		270	45.69	12.32	

Research Question #2

Are there differences in 8th grade TCAP scores for language arts based on school (School A, School B, School C, and School D), socioeconomic status (students who were economically

disadvantaged versus students who were not economically disadvantaged), and the interaction between school and socioeconomic status?

To answer this research question a two-way ANOVA model was used to test the following null hypotheses.

Ho2₁: There is no difference in the 8th grade TCAP language arts means among the schools.

Ho2₂: There is no difference in the 8th grade TCAP language arts means between students who were classified as economically disadvantaged and those who were not classified as economically disadvantaged.

Ho2₃: For 8th grade TCAP language arts test, there is no significant school by socioeconomic status interaction.

A two-way analysis of variance model was used to examine the records of 271 8th grade students present to complete the language arts portion of the TCAP Achievement Test. As with the previous research question, the criterion variable, the number of language arts items answered correctly, had a potential range of 0 to 67. The two main effects of the ANOVA model were school and socioeconomic status. School had four categories (School A, School B, School C, and School D), while socioeconomic status had two levels (students who were economically disadvantaged and those who were not economically disadvantaged). Students who were economically disadvantaged were those students who qualified for the free or reduced price meals program.

The *F* test for the school by socioeconomic status interaction term was not significant, $F(3, 263) = .43$, $p = .73$, partial $\eta^2 = .01$. Therefore, the null hypothesis for the interaction term was retained.

There were no significant differences in the mean number of language arts items answered correctly among the schools, $F(3, 263) = 1.67, p = .17$. Therefore, the null hypothesis for the main effect of school was retained. The effect size as measured by η^2 was small (.02). That is, school accounted for only 2% of the variance in the number of language arts items answered correctly.

There was a significant difference in the mean number of language arts items answered correctly between students who were economically disadvantaged and those who were not, $F(1, 263) = 8.07, p = .01$. Therefore, the null hypothesis for the main effect of socioeconomic status was rejected. The effect size for the main effect of socioeconomic status was small (.03), indicating that socioeconomic status accounted for only 3% of the variance in the number of language arts items answered correctly. The unweighted mean number of language arts items answered correctly for students who were not economically disadvantaged ($M = 45.28$) was higher than the mean for students who were economically disadvantaged ($M = 41.06$). Descriptive statistics for the number of language arts items answered correctly by school and socioeconomic status are displayed in Table 3.

Table 3

Descriptive Statistics for the Number of Language Arts Items Answered Correctly by School and Socioeconomic Status

School	Socioeconomic Status	<i>N</i>	<i>M</i>	<i>SD</i>	<i>M</i> (Unweighted)
A	Economically Disadvantaged	48	40.06	11.90	
	Not Economically Disadvantaged	29	43.10	10.48	
	School A Total	77	41.21	11.41	41.58
B	Economically Disadvantaged	45	43.16	12.46	
	Not Economically Disadvantaged	47	47.81	10.75	
	School B Total	92	45.53	11.79	45.48
C	Economically Disadvantaged	25	39.44	12.32	
	Not Economically Disadvantaged	34	46.35	11.40	
	School C Total	59	43.42	12.19	42.90
D	Economically Disadvantaged	24	41.58	9.59	
	Not Economically Disadvantaged	19	43.84	13.76	
	School D Total	43	42.58	11.52	42.71
SES	Economically Disadvantaged	142	41.19	11.78	41.06
	Not Economically Disadvantaged	129	45.78	11.38	45.28
Grand Total		271	43.38	11.79	

Research Question #3

Are there differences in 8th grade TCAP scores for social studies based on school (School A, School B, School C, and School D), socioeconomic status (students who were economically

disadvantaged versus students who were not economically disadvantaged), and the interaction between school and socioeconomic status?

A two-way ANOVA model was used to test the subsequent null hypotheses.

Ho3₁: There is no difference in the 8th grade TCAP social studies means among the schools.

Ho3₂: There is no difference in the 8th grade TCAP social studies means between students who were economically disadvantaged and those who were not economically disadvantaged.

Ho3₃: For the 8th grade TCAP social studies test, there is no significant school by socioeconomic status interaction.

A two-way analysis of variance model was used to evaluate 270 student records of those who were present to complete the social studies portion of the TCAP exam. The criterion variable, the number of social studies items answered correctly, had a potential range of 0 to 60. The two main effects of the ANOVA model were school and socioeconomic status. School had four categories (School A, School B, School C, and School D), while socioeconomic status had two levels (students who were economically disadvantaged and those who were not economically disadvantaged). Students who were economically disadvantaged were those students who qualified for the free or reduced price meals program.

The *F* test for the school by socioeconomic status interaction term was not significant, *F* (3, 262) = .21, *p* = .89, partial $\eta^2 < .01$. Therefore, the null hypothesis for the interaction term was retained.

There was a significant difference in the number of social studies items answered correctly among the schools, *F* (3, 262) = 3.92, *p* = .01. Therefore, the null hypothesis for the

main effect of school was rejected. The effect size as measured by partial η^2 was small (.04). That is, school accounted for 4% of the variance in the number of social studies items answered correctly.

Because the overall F test for the main effect of school was significant, the Bonferroni *post hoc* multiple pairwise comparisons test was used to determine which pairs of school social studies means were different. The Bonferroni test showed there was a significant difference in the unweighted mean number of social studies items answered correctly between School C and School D ($p = .01$). The unweighted mean number of social studies items answered correctly for School D ($M = 40.34$) was higher than the unweighted mean number of social studies items answered correctly for School C ($M = 34.01$). No other pairs of school social studies means were significantly different.

There was a significant difference in the mean number of social studies items answered correctly between students who were economically disadvantaged and students who were not economically disadvantaged, $F(1, 262) = 5.55, p = .02$. Therefore, the null hypothesis for the main effect of socioeconomic status was rejected. The effect size as measured by partial η^2 was small (.02). That is, socioeconomic status accounted for 2% of the variance in the number of social studies items answered correctly. The unweighted mean number of social studies items answered correctly for students who were not economically disadvantaged ($M = 38.52$) was higher than the mean for students who were economically disadvantaged ($M = 35.74$). Table 4 shows the descriptive statistics for the number of social studies items answered correctly by school and socioeconomic status.

Table 4

Descriptive Statistics for the Number of Social Studies Items Answered Correctly by School and Socioeconomic Status

School	Socioeconomic Status	<i>N</i>	<i>M</i>	<i>SD</i>	<i>M</i> (Unweighted)
A	Economically Disadvantaged	47	36.28	9.91	
	Not Economically Disadvantaged	29	38.31	9.28	
	School A Total	76	37.05	9.66	37.29
B	Economically Disadvantaged	45	35.42	9.32	
	Not Economically Disadvantaged	47	38.32	9.08	
	School B Total	92	36.90	9.26	36.87
C	Economically Disadvantaged	25	31.84	9.10	
	Not Economically Disadvantaged	34	36.18	8.70	
	School C Total	59	34.34	9.05	34.01
D	Economically Disadvantaged	24	39.42	8.21	
	Not Economically Disadvantaged	19	41.26	9.41	
	School D Total	43	40.23	8.70	40.34
Total	Economically Disadvantaged	141	35.75	9.49	34.74
	Not Economically Disadvantaged	129	38.19	9.11	38.52
	Total	270	36.91	9.37	

Research Question #4

Are there differences in 8th grade TCAP scores for science based on school (School A, School B, School C, and School D), socioeconomic status (students who were economically disadvantaged and students who were not economically disadvantaged), and the interaction between school and socioeconomic status?

A two-way ANOVA model was used to assess the records of 268 eighth grade students who completed the science portion of the TCAP exam.

Ho4₁: There is no difference in the 8th grade TCAP science means among the schools.

Ho4₂: There is no difference in the 8th grade TCAP science means between students who were economically disadvantaged and those who were not economically disadvantaged.

Ho4₃: For the 8th grade TCAP science test, there is no significant school by socioeconomic status interaction.

As with the previous research question, the criterion variable, the number of science items answered correctly, had a potential range of 0 to 60. The two main effects of the ANOVA model were school and socioeconomic status. School had four categories (School A, School B, School C, and School D), while socioeconomic status had two levels (students who were economically disadvantaged and those who were not economically disadvantaged). Students who were economically disadvantaged were those students who qualified for the free or reduced price meals program.

The F test for the school by socioeconomic status interaction term was not significant, $F(3, 260) = .19, p = .90$, partial $\eta^2 < .01$. Therefore, the null hypothesis for the interaction term was retained.

There was a significant difference in the number of science items answered correctly among the schools, $F(3, 260) = 3.65, p = .01$. Therefore, the null hypothesis for the main effect of school was rejected. The effect size as measured by partial η^2 was small (.04). That is, school accounted for 4% of the variance in the number of math items answered correctly.

Because the overall F test for the main effect of school was significant, the Bonferroni *post hoc* multiple pairwise comparisons test was used to determine which pairs of school science means were different. The Bonferroni test showed that the mean number of science items answered correctly for School D was significantly different from School A ($p = .02$) and from School C ($p = .02$). The unweighted mean number of science items answered correctly for students at School D ($M = 40.34$) was higher than School A ($M = 35.26$) and School C ($M = 35.04$). No other pairs of school science means were different.

There was a significant difference in the mean number of science items answered correctly between students who were economically disadvantaged and students who were not economically disadvantaged, $F(1, 260) = 7.34, p = .01$. Therefore, the null hypothesis for the main effect of socioeconomic status was rejected. The effect size as measured by partial η^2 was small (.03). That is, socioeconomic status accounted for 3% of the variance in the number of science items answered correctly. The unweighted mean number of science items answered correctly for students who were not economically disadvantaged ($M = 38.41$) was higher than the mean for students who were economically disadvantaged ($M = 35.31$). Table 5 shows the descriptive statistics for the number of science items answered correctly by school and socioeconomic status.

Table 5

Descriptive Statistics for the Number of Science Items Answered Correctly by School and Socioeconomic Status

School	Socioeconomic Status	<i>N</i>	<i>M</i>	<i>SD</i>	<i>M</i> (Unweighted)
A	Economically Disadvantaged	47	33.77	8.76	
	Not Economically Disadvantaged	29	36.76	8.72	
	School A Total	76	34.91	8.81	35.26
B	Economically Disadvantaged	43	34.67	9.06	
	Not Economically Disadvantaged	47	38.94	9.03	
	School B Total	90	36.90	9.24	36.81
C	Economically Disadvantaged	25	33.40	8.56	
	Not Economically Disadvantaged	34	36.68	9.05	
	School C Total	59	35.29	8.93	35.04
D	Economically Disadvantaged	24	39.42	8.51	
	Not Economically Disadvantaged	19	41.26	9.31	
	School D Total	43	40.23	8.81	40.34
Total	Economically Disadvantaged	139	34.96	8.93	35.31
	Not Economically Disadvantaged	129	38.19	9.05	38.41
Total		268	36.51	9.12	

Research Question #5

Are there differences in 8th grade TCAP scores for writing based on school (School A, School B, School C, and School D), socioeconomic status (students who were economically

disadvantaged and those who were not economically disadvantaged), and the interaction between school and socioeconomic status?

An ANOVA model was used to test the following null hypotheses.

Ho5₁: There is no difference in the 8th grade TCAP writing means among the schools.

Ho5₂: There is no difference in the 8th grade TCAP writing means between students who were classified as economically disadvantaged and those who were not classified as economically disadvantaged.

Ho5₃: For the 8th grade TCAP writing test, there is no significant school by socioeconomic status interaction.

A two-way analysis of variance model was used to examine the records of the 257 students tested by the TCAP Writing Assessment Instrument in February 2007. The criterion variable, the writing test score, had a potential range of 0 to 6. The two main effects of the ANOVA model were school and socioeconomic status. School had four categories (School A, School B, School C, and School D), while socioeconomic status had two levels (students who were economically disadvantaged and those who were not economically disadvantaged). Students who were economically disadvantaged were those students who qualified for the free or reduced price meals program.

The F test for the school by socioeconomic status interaction was not significant, $F(3, 249) = 1.77, p = .15$, partial $\eta^2 = .02$. Therefore, the null hypothesis for the interaction term was retained.

There was a significant difference in the mean writing test scores among the schools, $F(3, 249) = 31.35, p < .01$. Therefore, the null hypothesis for the main effect of school was

rejected. The effect size as measured by partial η^2 was large (.27). That is, school accounted for 27% of the variance in the mean writing scores.

Because the overall F test for the main effect of school was significant, the Bonferroni *post hoc* multiple pairwise comparisons test was used to test the differences in school unweighted means. The Bonferroni test showed the writing mean for School B was significantly different from the means of the three other schools ($p < .001$). In each case, the unweighted writing mean for students in School B ($M = 4.887$) was higher than the unweighted writing mean for School A ($M = 4.012$), School C ($M = 3.980$), and School D ($M = 4.069$).

There was no significant difference in the mean writing scores between students who were economically disadvantaged ($M = 4.16$) and students who were not economically disadvantaged ($M = 4.31$), $F(1, 249) = 2.75$, $p = .10$. Therefore, the null hypothesis for the main effect of socioeconomic status was retained. The effect size as measured by partial η^2 was small (.01). That is, socioeconomic status accounted for 1% of the variance in the mean writing scores. Descriptive statistics for mean writing scores by school and socioeconomic status are displayed in Table 6.

Table 6

Descriptive Statistics for Writing Scores by School and Socioeconomic Status

School	Socioeconomic Status	<i>N</i>	<i>M</i>	<i>SD</i>	<i>M</i> (Unweighted)
A	Economically Disadvantaged	45	3.95	.60	
	Not economically Disadvantaged	29	4.07	.65	
	School A Total	74	4.00	.62	4.01
B	Economically Disadvantaged	41	4.66	.88	
	Not economically Disadvantaged	43	5.12	.76	
	School B Total	84	4.89	.85	4.89
C	Economically Disadvantaged	25	3.96	.35	
	Not economically Disadvantaged	32	4.00	.57	
	School C Total	57	3.98	.48	3.98
D	Economically Disadvantaged	24	4.08	.584	
	Not economically Disadvantaged	18	4.06	.725	
	School D Total	42	4.07	.640	4.07
SES	Economically Disadvantaged	135	4.19	.728	4.16
	Not economically Disadvantaged	122	4.42	.851	4.31
	Grand Total	257	4.30	.80	

Summary

This chapter detailed the statistical results of the analyzed data. Chapter 5 provides a summation and interpretation of the findings for each research question and the implications for

current and future educational practices. The following chapter also provides recommendations for continuing research related to academic success and socioeconomic status.

CHAPTER 5

FINDINGS, CONCLUSIONS, LIMITATIONS, AND RECOMMENDATIONS

The purpose of this study was to examine the relationship of socioeconomic status with student achievement as measured by the TCAP Achievement Test and TCAP Writing Assessment. The analysis focused on the number of questions correctly answered on four portions of the achievement test (math, language arts, social studies, and science) and the holistic score received on the writing assessment. A summary of the findings, conclusions and implications of the study, and recommendations for future research are detailed in the following sections.

Summary of the Findings

A quick glance in most educational journals published from the 1990s forward would yield at least one study that attempted to confirm or refute a relationship between student socioeconomic standing and academic achievement as measured by performance on some high stakes exam. Although the issue of socioeconomic status is emotionally charged, an informed perspective is required to best prepare educators, administrators, and policymakers to confront the challenge of meeting the federal mandate that requires academic success of all students regardless of economic status.

The findings presented as a part of this investigation highlighted an unfortunate truth that even as society continued to make great strides to lessen the negative impact of socioeconomic status on a child's existence, academic achievement continued to be greatly affected by financial factors well beyond the student's control. The current research examined the impact on a variety of standardized tests using quantitative statistical methods and found that low socioeconomic

status (students classified as economically disadvantaged) negatively influenced academic achievement.

Conclusions

The statistical analyses of this study focused on five research questions and 15 null hypotheses. The independent variables were school (School A, B, C, and D) and socioeconomic status (students who were economically disadvantaged and those who were not economically disadvantaged). There were five dependent variables in the study. Four were the number of items answered correctly on the TCAP math, language arts, science, and social studies tests. The fifth dependent variable was the TCAP Writing Assessment score. The population consisted of 271 eighth grade students enrolled in four schools in a rural district in Tennessee. The following sections review each research question and provide conclusions based on the findings related to it.

Research Question #1

Are there differences in eighth grade TCAP scores for math based on school (School A, School B, School C, and School D), socioeconomic status (students who were economically disadvantaged versus students who were not economically disadvantaged), and the interaction between school and socioeconomic status?

Although the F test for the school by the socioeconomic status interaction term was not significant, the results of the two-way ANOVA revealed there was a significant difference in the number of math items answered correctly among the schools and between the students who were and were not economically disadvantaged. There was a statistically significant difference with a small effect size in the mean number of math items answered correctly between students who

were and were not economically disadvantaged. Five percent of the variance in the number of math items answered correctly was accounted for by socioeconomic status.

The Bonferroni test showcased a medium effect size for the difference among the schools with a significant difference in the unweighted mean number of math items answered correctly between School A and School B and between School B and School C. In this case, School B had a much higher mean ($M = 50.84$) than School A ($M = 41.52$) and School C ($M = 42.61$). No other pairs of school were different.

Research Question #2

Are there differences in eighth grade TCAP scores for language arts based on school (School A, School B, School C, and School D), socioeconomic status (students who were economically disadvantaged versus students who were not economically disadvantaged), and the interaction between school and socioeconomic status?

The findings of the F test for the school by socioeconomic status test showed no significant interaction and the two-way ANOVA showed no significant difference in the means among the schools; however, as with the math test, the language arts test revealed a significant difference in the mean number of items answered correctly between students who were and were not economically disadvantaged with socioeconomic status accounting for 3% of the variance in the number of language arts items answered correctly.

Research Question #3

Are there differences in eighth grade TCAP scores for social studies based on school (School A, School B, School C, and School D), socioeconomic status (students who were economically disadvantaged versus students who were not economically disadvantaged), and the interaction between school and socioeconomic status?

The results of the F test for the school by socioeconomic status interaction were not significant. Nevertheless, the two-way ANOVA showed there were significant differences in the number of social studies items answered correctly among the schools and between students who were and were not economically disadvantaged. Although a statistically significant difference did exist, the practical effect size was small in both instances.

The Bonferroni test revealed the unweighted mean for School D ($M = 40.34$) was higher than the unweighted mean for School C ($M = 34.01$). No other pairs of school means were significant.

Research Question #4

Are there differences in eighth grade TCAP scores for science based on school (School A, School B, School C, and School D), socioeconomic status (students who were economically disadvantaged and students who were not economically disadvantaged), and the interaction between school and socioeconomic status?

As was the case with the three previous research questions, the results of the F test showed no significant interaction term. On the other hand, the two-way ANOVA test revealed a significant difference in the mean number of science items answered correctly among the schools. A significant difference was also found in the number of items answered correctly between students who were and were not economically disadvantaged. Socioeconomic status accounted for 3% of the variance in the number of science items answered correctly.

The Bonferroni test revealed that School D ($M = 40.34$) was significantly higher than School A ($M = 35.26$) and School C ($M = 35.04$). No other pairs of school were different.

Research Question #5

Are there differences in eighth grade TCAP scores for writing based on school (School A, School B, School C, and School D), socioeconomic status (students who were economically disadvantaged and those who were not economically disadvantaged), and the interaction between school and socioeconomic status?

The results of the *F* test exposed no significant status interaction. The two-way ANOVA showed no difference in the mean writing scores between students who were and were not economically disadvantaged and a significant difference in the mean writing test scores among the schools.

School accounted for 27% of the variance in the mean writing scores. The Bonferroni test revealed that the unweighted writing mean for students in School B ($M = 4.887$) was higher than the average of students in Schools A ($M = 4.012$), C ($M = 3.980$), and D ($M = 4.069$).

Recommendations for Practice

The results of this study echoed the findings of previous research, that economic well-being impacted a student's academic achievement (Arnold & Doctoroff, 2003; Boloz & Varrati, 1983; Caldas & Bankston, 1997; Cooper & Crosnoe, 2007; Duncan et al., 1998; Flores, 2007; Taylor, 2005). As educators across the country make provisions to assure that all students regardless of economic stability are academically successful, attention should be given to strategies that could potentially narrow the academic achievement gap among the social classes. It is crucial that school districts such as the one studied assess the findings of this research and others like it. The following suggestions are offered to administrators, educators, and community

members who are concerned with increasing the academic achievement of our nation's children living in poverty.

As is so often the case, awareness may be the most important and most effective recommendation. All stakeholders must be made aware of the possible negative impact low socioeconomic status can have on student achievement. Local school district administrators should routinely review the economic demographics of the population served and assure that all faculty and staff members are made aware of the potential students who may be negatively affected by their financial vulnerability.

Awareness is merely the first step on the bridge of action that might span the achievement gap. Beyond knowledge of the problem, stakeholders need to be educated about programs designed to fight poverty. School systems should work as community advocates educating the general population about assistance programs that may help. Anyone who has daily contact with a student struggling beneath the yoke of childhood poverty should be well informed of the type of assistance available.

School systems have readily available data that identifies students who may be at risk for falling into the ever-widening gap that separates the affluent from the struggling. With these data, educators should work to put after-school programs in place that target those struggling students. Tutoring programs should be made available early in the child's academic career. In far too many school districts, tutoring is not routinely offered until the secondary level. By this point, most disadvantaged students are several grade levels behind their more affluent counterparts. Systems should target the low socioeconomic students for additional help early at the primary and elementary levels and continue to offer not only after-school programs but summer programs as well. Other research studies found that students in the low socioeconomic

bracket tended to have little or no educational gain when not academically engaged in the school setting (Alexander et al., 2001; Cooper et al., 1996; Reardon, 2003). With this knowledge, systems need to work actively to counteract summer stagnation. Educators must be vigilant to identify struggling students and offer extra help and tutoring when necessary.

Furthermore, school systems must actively work to eliminate the negative stereotype surrounding poor students and provide early positive classroom experiences. When students encounter educators who are willing to hold high expectations and help students achieve academically, they are more likely to experience the type of school success required to eventually break the poverty cycle. Students who believe from an early age that education is out of their reach need classroom experiences with teachers who know differently.

Finally, school systems should implement school involvement activities specifically geared toward parents from the lower socioeconomic group. When scheduling events, staff members should offer activities at varying times. In addition, educators and administrators must make interactions between the school and the home more positive and less intimidating for parents who may have only negative memories of their experiences in school.

Recommendations for Further Research

No Child Left Behind legislation makes it every educator's responsibility to assure that all students are performing at a proficient or advanced academic level. Living in poverty will no longer be justification for limited school success. The achievement gap did not develop overnight and will undoubtedly take enormous effort to overcome. As school systems work to bridge the gap, they will consult studies such as this one to offer rationalization for program implementation and research-based changes to assure the success of students in all

socioeconomic conditions. To assist school districts with this great challenge, research needs expansion to provide a more detailed picture of not only the impact of socioeconomic status on achievement but also strategies to target students in the lower socioeconomic bracket.

Suggestions for future research include, but are certainly not limited to, the following:

1. This research provided a snapshot of student achievement by analyzing success for one school year. Additional longitudinal studies need to be undertaken to track the impact of socioeconomic status on a student's entire school career.
2. One promising strategy to compact the negative influence of poverty on academic achievement is the implementation of after-school and summer programs designed specifically for financially struggling families. A future study could track the success of students who were involved in such a program. Does extra help provide students with the necessary boost to overcome the harrowing school success gap?
3. Even though this study focused only on quantitative data, a mixed methods approach could be employed to provide a richer insight into the all-encompassing effects of poverty on school success. A study that includes interviews of students, administrators, educators, and parents could provide enormous insight regarding how economic status impacts educational advancement.
4. This study was limited to data from one rural Tennessee school system. Economically disadvantaged children, however, sit in classrooms across the country every single day. The study should be expanded to include school systems across the state.
5. The study's gauge of academic success was achievement on standardized exams. However, this is a limited assessment of academic achievement. The study should be

expanded to include other measures of school success such as course grades, grade point averages, failure rates, and high school graduation.

6. The study found some discrepancies in the achievement of lower-income students among the four schools. Because teacher attitudes and expectations are often decisive factors in student achievement, additional research should be conducted to investigate the significance and impact of these attitudes at each individual school.
7. Although the review of the literature cited limited parental involvement as a side-effect of socioeconomic status, the study did not address the impact of such limited involvement on student achievement. Studies of the educational attitudes of poverty stricken families should be undertaken to assess the impact of parental attitude and involvement on achievement.
8. The study also found significant differences among the schools in the mean scores in math, science, social studies, and writing. Additional studies that explore instructional practices and leadership styles present in the four schools and how these affect student achievement should be conducted.

In conclusion, this research study was by no means intended to address the impact of financial well-being on all aspects of a student's academic experience. Instead, it was simply intended to offer documentation that the achievement gap exists in this particular rural Tennessee school system and to foster communication and open dialogue to address the needs of poverty-stricken students. From these findings, it is apparent that socioeconomic status has the potential to affect educational achievement negatively. By simply being made aware of the potentially devastating effects of growing up in poverty, the school system studied and others similar to it

across the nation may wish to pool more resources to investigate further and combat sooner the negative impact of socioeconomic status on academic achievement.

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APPENDIX

Director's Letter

December 12, 2008

Dear Director of Schools,

As a student at East Tennessee State University, I am currently involved in my dissertation phase of the Educational Leadership and Policy Analysis doctoral program. My dissertation, *A Study of the Impact of Socioeconomic Status on Student Achievement in a Rural East Tennessee School System*, is to explore the impact of socioeconomic status on academic achievement as measured by the Tennessee Comprehensive Assessment Program Achievement Test and the Tennessee Comprehensive Assessment Program Writing Assessment.

I am seeking permission to access eighth grade scores from the 2006-2007 school year for students from the four school: xxxxxx, xxxxxx, xxxxxx, and xxxxxx. The names will be assigned a random number to prevent the identification of any student.

Thank you for your time and cooperation. If you have any questions, you may contact me at xxxxx or by email at xxxxx. The results of this research will be available to you upon your request.

Sincerely,

Eydie J. Pettigrew
Librarian
xxxxxxxxx High School

Permission is granted for Eydie J. Pettigrew to utilize eighth grade *TCAP* scores of students enrolled in the school year 2006-2007 in the four elementary schools in xxxxxxxx system.

Signature

Date

VITA

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