Differences in Mathematics and Literacy Achievement Between African American Males and Other 11th-Grade students

Jeffery Flanigan
Harding University

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DIFFERENCES IN MATHEMATICS AND LITERACY ACHIEVEMENT BETWEEN AFRICAN AMERICAN MALES AND OTHER 11TH GRADE STUDENTS

by

William Jeffrey Flanigan

Dissertation

Submitted to the Faculty of Harding University

Cannon-Clary College of Education

in Partial Fulfillment of the Requirements for

the Degree of

Doctor of Education

in

Educational Leadership P-20

December 2014
DIFFERENCES IN MATHEMATICS AND LITERACY ACHIEVEMENT BETWEEN AFRICAN AMERICAN MALES AND OTHER 11TH GRADE STUDENTS

by

William Jeffrey Flanigan

Dissertation

Dissertation Advisor

David Ziegler

Dissertation Reader

10-07-14

Date

10-7-14

Date

David Collins

Dissertation Reader

10-7-14

Date

Dean of the Cannon-Clary College of Education

10/7/14

Date

Faci Pearson Yeche

Assistant Provost for Graduate Programs

10-7-14

Date
ACKNOWLEDGMENTS

First of all, I want to acknowledge my Lord and Savior Jesus Christ and the many blessings He has given me via my immediate family support system and special people who have helped me accomplish this and many other tasks in my life. Luke 12:48 states, “……for everyone to whom much is given, from him much will be required; and to whom much has been committed, of him they will ask the more.” I was raised on this scripture, and I attempt to follow it in every aspect of my life.

I wish I could acknowledge by name all of the people who have played integral roles in my life to this point. However, the list is far too large to include them all, but know that I would not be who or where I am without each of them. I thank my committee members, Dr. David Bangs and Dr. David Collins for taking the time to read and re-read this document. I thank my committee chair, Dr. Usenime Akpanudo; words cannot express how you have been a blessing in my life as an advisor. I thank my favorite teacher ever, Mrs. Darlene Montgomery, for loving me enough to push me. I thank my Dad, Dr. Lonnie Williams, for your constant support. I thank my best friends JJ Jones, Cory Childs, Dr. Logan Hampton, and the brothers of Absolut Faith (ΑΦΑ, KK, Fall ’96) for your eternal brotherhood.
DEDICATION

I dedicate this dissertation to my wife, Korillene Flanigan, for your undying support of me through this process; I am eternally thankful. My schedule was already hectic with my roles as a Pastor and Coach, but when I added doctoral candidate, you dealt with the insanity without hesitation. You are my rock and the backbone of our family. I love you always.

My inspiration to persevere through this process comes from six places: my children. Teah, Emirra, Jaden, Jordan, Elise, and Jackson, you all push me to be the best example of a man that I can be. I pray that you reach heights in your lives that are even out of my purview. I love you all more than I could ever capture in words.

I dedicate this to my parents, Shirlee Flanigan-Isbell (Mama) and Oda Mae Hendricks (Granny), who have been a constant source of support and motivation for me all of my life. Mama, terminal education was a term you drilled in me from my earliest memories in life. Granny, you taught me that students do not care how much you know until they know how much you care. Both of you have truly been my catalysts to success, and I am eternally grateful and I will always love you for that.

Lastly, this dissertation is dedicated to the memory of the following Angels in my life: My father, Ellis Flanigan; my great-grandmother, Mattie Rhynes-Dawson (Big Mama); my favorite aunt, Billie C. Williams (Aunt B); John and Fannie Gatlin; Mr. F. L.
Curry, known to me as “Prof Stick;” and finally, to my mother-in-law, Darlene Dixon. I am who I am because of each of your influence.
ABSTRACT

by
William Jeffrey Flanigan
Harding University
December, 2014

Title: Differences in Mathematics and Literacy Achievement Between African American Males and Other 11th-Grade students (Under the direction of Dr. Usenime Akpanudo)

The gap in school performance between African American students and students of other subpopulations has shown up in a range of academic success measures including course grades, test scores, course selection, and college graduation rates (Johnston & Viadero 2000); college and high school grade point averages [GPAs] (Banks & Banks, 2004); and dropout rates (Gordon, 1999; Green, 2001; Irvine & Armento, 2001; Jencks & Phillips, 1998; Kober, 2001; Lee, 2002). These indicators all point to a disturbing pattern in the educational system and beg the question: What is going on with the education of African American males in the United States? The purpose of this dissertation was to determine if such an achievement gap existed between African American males and their 11th Grade counterparts in three Northeast Arkansas schools on the Arkansas Augmented Benchmark Examination for grades 3-8 in mathematics and literacy. For this longitudinal study, a causal-comparative, non-experimental strategy was used. Data for this study comprised existing standardized test scores obtained from a stratified random sample of 180 students at three high schools (grades 9 through 12) in three urban school districts in Northeast Arkansas. At each school, the inclusion criterion for students in the sample was their continuous residency within the school district between the grade levels being...
evaluated. Only students who met this criterion were considered for selection. Mixed factorial ANOVAs were run to test each of the four hypotheses. The results of these analyses indicated that African American males scored significantly and consistently lower than to their classmates of other subpopulations in the study. Thus, each of the four hypotheses was rejected.
# TABLE OF CONTENTS

LIST OF TABLES....................................................................................................................xi

LIST OF FIGURES ..................................................................................................................xii

CHAPTER I—INTRODUCTION .......................................................................................... 1

Statement of the Problem .................................................................................................... 3

Background ......................................................................................................................... 3

Hypotheses .......................................................................................................................... 8

Description of Terms .......................................................................................................... 9

Significance .......................................................................................................................... 11

Process to Accomplish ....................................................................................................... 13

CHAPTER II—REVIEW OF RELATED LITERATURE .............................................. 16

Evidence of the Gap ........................................................................................................... 18

Accounting for the Gap—The Sociocultural Environment ........................................... 21

Accounting for the Gap—The School Environment ....................................................... 30

Conclusion ........................................................................................................................ 36

CHAPTER III—METHODOLOGY ............................................................................... 38

Research Design ............................................................................................................... 40

Sample .............................................................................................................................. 41

Instrumentation ............................................................................................................... 42

Data Collection Procedures ........................................................................................... 45
Analytical Methods.................................................................................................................46
Limitations ..............................................................................................................................47
CHAPTER IV—RESULTS..........................................................................................................49
Hypothesis 1............................................................................................................................49
Hypothesis 2............................................................................................................................55
Hypothesis 3............................................................................................................................60
Hypothesis 4............................................................................................................................65
CHAPTER V—DISCUSSION......................................................................................................72
Conclusions.............................................................................................................................73
Implications.............................................................................................................................79
Recommendations...................................................................................................................82
REFERENCES ..........................................................................................................................93
APPENDIX...............................................................................................................................123
LIST OF TABLES

1. Demographics of All 11th Grade Students ......................................................... 42

2. Descriptive Statistics for Race/Gender over Time for 11th Grade Students’ Mathematics Achievement .......................................................... 50

3. Results of Mixed Factorial ANOVA for Mathematics Achievement of 11th Grade Students by Race/Gender over Time .......................................................... 52

4. Descriptive Statistics for Race/Gender over Time for 11th Grade Students’ Literacy Achievement .......................................................... 56

5. Results of Mixed Factorial ANOVA for Literacy Achievement of 11th Grade Students by Race/Gender over Time .......................................................... 58

6. Descriptive Statistics for Race over Time for 11th Grade Male Students’ Mathematics Achievement .......................................................... 60

7. Results of Mixed Factorial ANOVA for Mathematics Achievement of 11th Grade Students by Race over Time .......................................................... 62

8. Descriptive Statistics for Race over Time for 11th Grade Male Students’ Literacy Achievement .......................................................... 66

9. Results of Mixed Factorial ANOVA for Mathematics Achievement of 11th Grade Students by Race over Time .......................................................... 69
LIST OF FIGURES

1. Mean mathematics achievement for main effect of time ...........................................53
2. Mean mathematics achievement for race/gender main effect .....................................54
3. Linear and quadratic trends of mathematics achievement for main effect of time ........55
4. Mean literacy achievement for interaction of race/gender and time .........................59
5. Mean mathematics achievement for interaction of race and time .............................63
6. Mean mathematics achievement for race/gender main effect ..................................64
7. Linear and quadratic trends of mathematics achievement for main effect of time ....65
8. Mean literacy achievement for gender main effect ....................................................69
9. Mean literacy achievement for race main effect .......................................................70
10. Linear trend of literacy achievement for main effect of time ....................................71
CHAPTER 1

INTRODUCTION

The demographic makeup of students in America’s public schools is constantly changing. Current figures indicate that, of the nearly 50 million students enrolled in K-12 schools, those of minority ethnic background comprise nearly 43% of the population (Planty et al., 2008). Furthermore, between 2001 and 2008, the population of White students decreased by 5% (National Center for Education Statistics [NCES], 2009). For many students, particularly those of minority ethnic background, other demographic characteristics such as poverty and language status might create additional challenges to their success in school.

According to Planty et al. (2008), of the 17% of school-age children who were living below the poverty level in 2006, 10% were White, 33% were African American, and 26% were of Hispanic origin. Furthermore, 20% of school-age children spoke a language other than English at home, and almost three-quarters of those students spoke Spanish. As astounding as these numbers appear, they do not completely reflect the true demographic diversity of school-aged children in the United States because many other demographic characteristics are not typically considered. For instance, there are no means by which to estimate the number of children whose primary language at home may be a variant or dialect of English, different from the formal English taught in schools. Clearly, this can be of relevance to the academic achievement of many ethnic minority students,
especially low-income African American students whose use of the English language at home might differ significantly from that used in schools.

It is not surprising, therefore, that a continued interest exists among educational leaders to understand what is described as the gap in educational achievement between students of these demographic subpopulations when compared to their White counterparts (Davis, 2003; Hale, 2001; Hilliard, 2003). Thernstrom and Thernstrom (2003) reported that average Black and Hispanic students graduate from high school with eighth-grade academic skills. Similarly, the NCES (2004) noted that Black students continue to trail White students with respect to educational access, achievement, and attainment. According to the report, African American males specifically face more challenges to academic attainment and are the most challenging to educate when compared to students of other subpopulations.

Other sources painted an even bleaker picture. Data from the Schott Foundation for Public Education (2010) indicated that the nation graduates only 47% of Black males who enter the ninth grade. Garibaldi (2007) and Strayhorn (2008) stated that the education of most Black males has been fraught with separate and unequal opportunities. In addition, Black males significantly lag behind their counterparts in terms of graduating from high school (Bell, 2010; Schott Foundation for Public Education, 2010). Therefore, despite the fact that there has been much interest in this area of study, lingering questions remain regarding the true nature of this gap, the factors contributing to it, and possible ways of addressing the gap.
Statement of the Problem

The purposes of this study were four-fold. The first purpose was to determine differences over time between 11th grade African American males versus all other 11th grade students in mathematics achievement. Second, this study was conducted to determine the differences over time between 11th grade African American males versus all other 11th grade students in reading achievement. The third purpose of this study was to determine the differences over time between 11th grade African American males versus all other 11th grade male students in mathematics achievement. Finally, this study aimed to determine the differences over time between 11th grade African American males and all other male students in reading achievement.

Background

The gap in school performance between African American students and students of other subpopulations has shown up in a range of academic success measures including course grades, test scores, course selection, and college graduation rates (Johnston & Viadero, 2000); college and high school GPAs (Banks & Banks, 2004); and dropout rates (Gordon, 1999; Green, 2001; Irvine & Armento, 2001; Jencks & Phillips, 1998; Kober, 2001; Lee, 2002). These indicators all point to a disturbing pattern in the educational system and beg the question: What is going on with the education of African American males in the United States?

Why is there a Gap?

Many reasons have been offered to explain the existence of this achievement gap. Some of the earliest attempts to explain these disparities centered on genetic differences between the races. For instance, Jensen’s (1974) exhaustive treatise proposed that genetic
explanations appeared to stand up best to scientific examination and evaluation when considering the differences in mental abilities between African Americans and Caucasians in the United States. He opined that all other explanations fall short when subjected to rigorous scientific evaluation. In a more recent assessment of the evidence from several controlled studies, Dickens (2005) argued that control experiments that would best permit specific conclusion on the direct influences of genetics on the abilities between races are almost impossible to conduct:

The indirect evidence on the role of genes in explaining the black-white gap does not tell us how much of the gap genes explain and may be of no value at all in deciding whether genes do play a role. Because the direct evidence on ancestry, adoption, and cross-fostering is most consistent with little or no role for genes, it is unlikely that the black-white gap has a large genetic component. (p. 64)

Similarly, Singham (2003) pointed out that no clear genetic or other immutable traits exist that conceivably explains the gap.

You will find a range of analyses (and a corresponding variety of suggested solutions): biased standardized tests, tests that do not match the learning styles of Black students, less money spent on educating Black students, socioeconomic differences, lack of motivation, negative peer pressure, lack of family support for education, teacher biases, and many other possibilities. All of these figure prominently in the menu of causes. (p. 587)

Singham indicated that attempts to explain or solve the problem from this approach have produced inadequate outcomes.
Because of this difficulty with purely nature versus nurture explanations, greater attention has become focused on the school-related challenges associated with the achievement gap. From an educational standpoint, it would appear that, regardless of what is known or yet to be known about the physiological discrepancies between races, interventions resulting from a formal education should at the very least show an appreciable impact toward mitigating these differences (Dickens, 2005). In attempts to achieve this end, school administrators across America have dedicated funds and resources, invested in programs, sponsored workshops, offered teacher incentives, raised accountability standards, and even evoked the name of the President in efforts to boost the academic achievement of their students, particularly African American males (Bell, 2010). Despite these efforts, in all but a very limited number of cases, the interventions have not always yielded the desired results.

Still concerned with school level influences, other researchers have focused their attention on how Black students are taught. Research on the effective teaching of Black students emphasizes, among other things, the importance of teacher beliefs regarding the potential of students (King, 1994b; Ladson-Billings, 1994). It is argued that Black students are less likely to perform well in classrooms where the teacher’s view of them stems from a deficit perspective (Mitchell, 1998; Quirocho & Rios, 2000). This model of teacher-learner relationship made popular by Payne (2005) is one in which the learner is viewed as lacking certain characteristics pertinent to academic success (the classic glass half empty). In this relationship, the teacher is cast as a pedagogue conferring the knowledge needed to fill the learner’s empty vessel. It is argued that even the mere
perception of such a student-teacher relationship by the learner can lead to negative outcomes that show up in student academic performance (Payne, 2005; Tatum, 2003).

Such models can be very informative to this conversation considering the fact that, more than any other time in the history of American education, a greater number of Black males are receiving their education from people of racial and cultural backgrounds different from their own (Douglas, Lewis, Douglas, Scott, & Garrison-Wade, 2008). This situation may create a unique set of cultural dynamics that affect student achievement. If it can be assumed that teachers bring to their classrooms epistemological assumptions formulated from their personal experiences, then, it would not be unreasonable to conclude that these beliefs may well influence the way they teach significantly. Pang and Sablan (1995) supported this notion. Their findings suggested that a teacher’s personal frame of reference is a dominating factor in the classroom.

**School Disengagement**

Another critical school-related factor frequently associated with the achievement gap is the issue of school disengagement (Carter, 2003; Polite, 2000). According to Smyth (2006), disengaged youth are defined as those who attend to some educational framework but are not involved in meaningful learning. Cohen-Navot, Ellenbogen-Frankovits, and Reinfeld (2004) also noted that school disengagement is expressed through truancy, poor scholastic achievements, alienation from school, and negative school behavior. Among African American students, disengagement is often elevated to the level of an imprimatur that accords significant social status. Fordham and Ogbu (1986) described this phenomenon as the creation of an oppositional social identity. This identity results from the young person’s processing of conflicting social signal to the end
that academic achievement, among other things, is often seen as something other than authentically Black; and is thus rejected.

Certain styles of speech, dress, and music, for example may be embraced as “authentically Black” and become highly valued, while attitudes and behaviors associated with Whites are viewed with disdain. The peer group’s evaluation of what is Black and what is not can have a very powerful impact on adolescent behavior….Unfortunately for Black teenagers, these cultural stereotypes do not usually include academic achievement. Academic success is most often associated with being White. (Tatum, 2003, pp. 61-62)

Although peer perception is very important to many young people, high academic achievement, unfortunately, is not always valued above being popular in many societies.

Over the last two decades, ideas such as disengagement and oppositional social culture have received considerable attention from researchers seeking to understand the academic challenges facing African American students (Smyth, 2006). Unfortunately, these new ideas have so far only contributed modest evidence toward a better understanding of the phenomenon (Ferguson, 2000; Polite & Davis, 1999).

Other Perspectives

Aside from explanations that are at the extreme ends of the nature-nurture continuum, another opinion holds that an understanding of this phenomenon requires an appreciation of the complex and often overlapping nature of the factors involved (Ferguson, 2000; Polite & Davis, 1999). From this perspective, clarity on the issue will come from an understanding of the complex interplay of students’ family history, cultural attitudes, home environment, and school environment. Osborne (1997), for instance,
found self-esteem and identification with academics to be highly correlated with academic achievement among African American males. Douglas et al. (2008) found that Black students typically received less family support for schoolwork compared to their peers of other ethnicities. Others have observed that African American students are more likely to grapple with the additional task of establishing a positive racial self-identity while dealing with the regular demands of school, compared to their peers of other ethnicities (Hudley & Graham, 2001; Monteith & Spicer, 2000; Winant, 1998). It, therefore, seems reasonable to consider these factors as well when attempting to understand the educational achievement of African American males.

In the increasingly globalized flat earth, the issue of the achievement gap between African American males and other subpopulations is one that should be of concern to all stakeholders in American education. As such, an examination of the issue must rise above an exercise in assigning blame, credit, superiority, or short-term political victory. Rather, the emphasis should be the fact that, if this issue is not properly addressed, it would limit the ability of a sizable segment of the population to contribute meaningfully to the overall good of their country.

Hypotheses

There are clearly competing explanations and suggestions for dealing with the challenge of academic achievement among African American males (Bell 2009, 2010; Schott Foundation for Public Education, 2010). The aim of the current study, however, was not to assess the relative importance of any one of these explanations or suggestions. Rather, this study was intended to first, determine if an achievement gap exists within a select population of students. This study also sought to examine the pattern of this gap
over a period spanning from third grade to eighth grade for the 11th grade participants. In line with these purposes, the researcher generated the following null hypotheses:

1. No significant difference will exist over time between 11th grade African American males and all other 11th grade students on mathematics achievement.

2. No significant difference will exist over time between 11th grade African American males and all other 11th grade students on literacy achievement.

3. No significant difference will exist over time between 11th grade African American males and all 11th grade White male students on mathematics achievement.

4. No significant difference will exist over time between 11th grade African American males and all 11th grade White male students on literacy achievement.

**Description of Terms**

**Literacy achievement.** Literacy achievement was defined in this study as a participant’s raw score on the literacy portion of the Arkansas Augmented Benchmark Examination. The Arkansas Department of Education (2009) noted that the Arkansas Augmented Benchmark Examination includes six criterion-referenced tests given to students within the state of Arkansas. In Arkansas, the test items are based on the academic standards in the Arkansas Curriculum Frameworks and are developed by committees comprising Arkansas teachers with support from the Arkansas Department of Education and the testing contractor. Criterion-referenced tests are administered in grades 3-8, End-of-Course Exams in Algebra I and Geometry, and a Literacy Exam at grade 11.
Each Arkansas Augmented Benchmark Examination exam is constructed so that a specific score for Science, Mathematics, or Literacy corresponds to the Advanced, Proficient, Basic, and Below Basic performance levels. In the future, these values might correspond to different raw scores, but they will have the same meaning in terms of student performance. In addition, the Mathematics and Literacy assessments are on a vertical scale across grades, meaning the scale score associated with a particular performance level increase as the grade increases, whereas the Science assessments are not. The third grade Literacy Arkansas Augmented Benchmark Examination scale score ranges were 0–329 for below basic, 330–499 for basic, 500–653 for proficient, and 654–999 for advanced. The fifth grade Literacy Arkansas Augmented Benchmark Examination scale score ranges were 0–381 for below basic, 382–603 for basic, 604–798 for proficient, and 799–999 for advanced. The eighth grade Literacy Arkansas Augmented Benchmark Examination scale score ranges were 0–506 for below basic, 507–699 for basic, 700–913 for proficient, and 914–999 for advanced (Arkansas Department of Education, 2009). Each participant’s scaled scores on this test were used in this study as the operational definition of literacy.

**Mathematics achievement.** Mathematics achievement was defined in this study as each participant’s raw score on the Mathematics portion of the Arkansas Augmented Benchmark Examination. The classification of scaled scores on the mathematics portion of the Arkansas Augmented Benchmark Examination is identical to the literacy portion of the exam that has already been described in this section.

**Socioeconomic status.** Socioeconomic status (SES) refers to an individual’s or group’s position within a hierarchical social structure. SES depends on a combination of
variables, including occupation, education, income, wealth, and place of residence. Sociologists often use SES as a means of predicting behavior (Socioeconomic status, n.d.). In this study, SES was operationalized using the student reported free and reduced lunch participation status information that is reported along with Arkansas Augmented Benchmark Examination results. Students who report participation in the program were considered to be of lower SES, and students who were nonparticipants were assumed to be of a higher SES.

**Subpopulation.** The combined population of a school consists of the aggregate population of all student subpopulations. In accordance with the Arkansas Department of Education, under No Child Left Behind (NCLB, 2002), six student subgroups, or subpopulations, are recognized in Arkansas. These subpopulations are economically disadvantaged students, students with disabilities, students who are limited English proficient, African American students, White students, and Hispanic students. When a school has 40 or more test-taking individuals in a subgroup, the subgroup must reach the same benchmark for proficiency in both mathematics and literacy as the test-taking population as a whole (Arkansas Department of Education, 2009). In this study, the term subpopulation was used to describe modified configuration ADE racial subgroupings. On the basis of this definition, four distinctive subpopulation groups were identified namely: African American males, African American females, White males, and White females.

**Significance**

**Research Gaps**

The study of academic achievement among the African American male subpopulation is of great significance to educational leaders. As was pointed out earlier,
this subpopulation of students has traditionally encountered challenges in the educational system. Beyond these challenges, incarceration and college retention rates point to a dismal plight for many African American males. Funding, policies, reform practices, redistricting, and standards are in place to stop the trajectory of African American males from academic peril. In most instances, the spiral of African American males’ education continues to plummet exponentially (Bell, 2010). Socializing African American males for educational success is critical in forging academic success and prowess in this often neglected population (Bell, 2009, 2010).

Although acknowledging that a gap exists is a key step in the process, determining the root cause(s) of the achievement gap is even more crucial. In addition, determining whether the gap exists across a majority of school populations with varying demographics is also important to ultimately reversing this trend. The vast majority of research highlighting the schooling of African American students focuses on their negative educational outcomes instead of their educational successes (Bonner, 2001, 2003, 2005, Bonner & Jennings, 2007; Fries-Britt, 1997, 1998, 2004; Fries-Britt & Turner, 2002; Harper, 2004, 2008).

**Possible Implications for Practice**

According to many researchers, the nature of the gap indicates that African American students are capable of performing at high levels of proficiency, provided they are educated under favorable circumstances. Unfortunately, the same researchers state that this opportunity is not being afforded to African American students regularly (Delpit, 1995; Hale, 2001; Irvine, 1990; Kozol, 1991; Orfield, 1983). Through NCLB (2002), there have been more efforts to reduce the achievement gap in mathematics and literacy.
These efforts have resulted in some reductions of the gap. However, more research is necessary to pinpoint the reasons for the gap. This issue affects schools all over the country, regardless of community demographics, socioeconomic status, or geographical region. It is the responsibility of everyone involved with the education of students to exhaust all means to eradicate the gap completely. Finally, it is of paramount importance that all educators, particularly educational leaders, find a way to close the gap between African American males and their peers. Moreover, it is vitally important also to improve the performance of all students regardless of gender or race.

**Process to Accomplish**

**Design**

A causal-comparative, non-experimental strategy was used in this study. To test each hypothesis, a 2 x 3 mixed factorial design was used. For each test, the independent variables were subpopulation (either African American males and all other 11th grade students or all White 11th grade male students) and change over time (measured by scores from grades 3, 5, and 8. Mathematics achievement and literacy achievement were the dependent variables, respectively.

**Sample**

The study used a stratified random sample of 180 11th grade students chosen from three schools in central Arkansas. The schools were chosen for their similarities in student demographics and grade configuration. The inclusion criterion for students at each school was their continuous residency within the school district between the grade levels being evaluated (grades 3-8). Only students who met this criterion were considered for selection. Using this method, 60 11th grade students from each school were selected.
Each group of students contained exactly 30 African American males for a total of 90 African American males and 90 other students who were not African American males, but equally divided based on gender.

**Instrumentation**

The primary instrument for this study was the Arkansas Comprehensive Testing Assessment and Accountability Program (ACTAAP) Augmented Benchmark Exam. This instrument was used to measure the mathematics and reading achievement for the two hypotheses in the study. Two components make up this test for grades 3-8: a criterion-referenced test and a norm-referenced test. The criterion-referenced tests component focuses on establishing student performance levels and contains items specifically designed to align with Arkansas state education standards.

The ACTAAP Augmented Benchmark Exam is constructed to a common blueprint for each administration to ensure that each administration of the test measures the same construct. Although test forms are built to a common blueprint and statistical targets to ensure that the underlying construct of different test forms is consistent, post equating is used to adjust for any differences in difficulty that do occur between different forms of the test. The test design provides information about how many operational and field test items are in each session for each item type. It should be noted that there are six embedded field test forms. The test layout provides information on how the test is configured (Pearson, 2010).

A post-equating methodology is carried out using a common item, non-equivalent groups linking strategy. The initial linking set comprises custom-developed multiple-choice items. Therefore, the percentage of linking items on the 2009 test forms is large
and allows a robust linkage to be made between the 2009 and 2008 test forms. Accuracy rates are reasonably high at .89 or above for all grades and subjects (Pearson, 2010).

The reliability approach approved by the Technical Advisory Committee is the Stratified Alpha method developed by Audrey Qualls in 1995 (Pearson, 2010). In this approach, reliability for each item is estimated separately and is then combined with other item types’ reliabilities to yield a more accurate estimate of the overall reliability. This approach accounts for the variance of each item in estimating reliability of the test. It is known that various item types have or contribute to the variance of test differentially. By estimating the reliability separately by item type and then combining those reliabilities, the variance conditioned on item type can be weighed appropriately.

**Data Analysis**

To address Hypothesis 1, a 2 x 3 mixed factorial analysis of variance (ANOVA) was conducted using subpopulation (African American males versus all other students) and time (measured by scores from Grades 3, 5, and 8) as independent variables, and mathematics achievement as the dependent variable. Hypothesis 2 was analyzed using a 2 x 3 mixed factorial ANOVA with subpopulation (African American males versus all other students) and time as independent variables and literacy achievement as the dependent variable. Hypothesis 3 was examined using a 2 x 3 mixed factorial ANOVA with race/gender (African American males versus all White males) and time as independent variables and mathematics achievement as the dependent variable. Hypothesis 4 also used a 2 x 3 mixed factorial ANOVA with race/gender (African American males versus all White males) and time as independent variables and literacy achievement as the dependent variable.
CHAPTER II

REVIEW OF RELATED LITERATURE

African American students continue to achieve at an academic level much lower than other student subpopulations in the United States. The gap between African American students and other student subpopulations becomes even greater when only African American males are considered (White, 2009). According to Alonzo, Tindal, and Robinson (2008), this achievement gap develops in the early childhood grades and appears to increase as students move from one grade level to the next. This problem is so pervasive that, regardless of the index employed in measuring academic success (standardized test scores, high school GPAs, college GPA, or graduation and dropout rates), the gap between African American students and other students subpopulations persists (Banks & Banks, 2004; Gordon, 1999; Green, 2001; Irvine & Armento, 2001; Jencks & Phillips, 1998; Kober, 2001; Lee, 2002).

If indeed the education of all children is critical to the progress of the nation, then, the importance of understanding the issues underlying this problem cannot be overemphasized. As would be expected, this fact has not been lost of educational policy makers. Numerous educational reforms in the United States have been geared toward improving the quality of education received by students from this subpopulation. The case of Brown v. Board Of Education was a major step in this direction. This 1954 landmark ruling of the United States Supreme Court held that racial segregation in public
schools was unconstitutional. This decision overruled the separate, but equal doctrine instituted by the *Plessy v. Ferguson* decision of 1896, which authorized the segregation of African Americans in public schools (Ravitch, 2007).

In more contemporary times, researchers continued to seek out variables that might be related to this achievement problem. Ladson-Billings (1994) described it in this manner, “...the quest for quality education remains an elusive dream for the African American community. However, it does remain a dream—perhaps the most powerful for the people of African descent of this nation” (p. ix). If this is true, one can understand why there continues to be widespread concern about the persistence of this achievement gap (Norman, Ault, Bentz, & Meskimen, 2001).

Research about African American male students has traditionally focused on their poor academic achievement, resistance to authority, and discriminatory policies that affect them (Dhondy, 1974; Fine, 1991; Fordham, 1988, 1996; Fordham & Ogbu, 1986; MacLeod, 1987; Noguera, 2008; Ogbu, 1974, 1978; Solomon, 1992). They have been shown to be at high risk of academic failure, dropout, suspension, expulsion, or referral to special education programs and excessively overrepresented in almost every category of academic failure (Dallmann-Jones, 2002; Martin, Martin, Gibson, & Wilkins, 2007). On the other hand, they are hugely underrepresented in advanced and honors courses (Garbarino, 1999; Strayhorn, 2008) and are often considered the weakest link in the American educational system (White, 2009). Therefore, although much has been written about the issue in general, it would appear that very little has been done actually to understand the nuanced and often localized differences in the overall problem. A major shortcoming of this approach to the problem is the assumption that the academic
challenges for all children in this subpopulation are similar merely because they share racial characteristics. In focusing solely on this approach, many researchers have lost sight of the issues that are relevant for one group of African American students but might not be applicable to another group of African American students (Duncan, 1999; Freeman, 1999; Hrabrowski, 1998; Ogbu, 1991; Patterson, 2006; Perry, Stelle, & Hilliard, 2003; Polite & Davis, 1999; Thernstrom & Thernstrom, 2003).

If determining best practices that will help educators best serve all students populations is of importance to stakeholders in education, then, great effort must be devoted to the understanding of those factors that might cause some students to fall between the cracks or fall behind. The ultimate goal would be to define such issues more clearly and tailor research-based classroom practices in such a way that they become effective in reducing and eventually eliminating such gaps (Norman et al., 2001).

This chapter includes a review of the literature related to this issue. The review is organized around three main themes that capture the general direction of the discussion in this area. First, the nature and extent of the gap is presented. Second, a review of the sociocultural models for understanding this gap is presented. Finally, an effort is made to outline the school related variables that might affect achievement among African American males.

**Evidence of the Gap**

White (2009) noted that the gap in performance between African American males and their peers is perceptible as early as the first day of kindergarten and continues to widen thereafter. According to the NCES (2000), African American kindergartners trailed their White and Asian American peers on tests of general knowledge, early
reading, and early mathematics skills. This trend continues all the way through high school and graduation (White, 2009).

According to a study by the Council of the Great City Schools (2010), by fourth grade, only 12% of African American male students read at or above grade level compared to 38% of White males. By eighth grade, it falls to just 9% for African American males compared to 33% for Whites. African American male students are almost twice as likely as White males to drop out of school. In addition, in some big American cities, the dropout rate is around 50% (Whitaker, 2010). After leaving school, these dropouts seem to encounter only more failure. Among 16- to 24-year-old African American men not enrolled in school, fewer than half have jobs and about a third of the men are in prison, in jail, on probation, or on parole (Kirp, 2010a). In the 2008 National Assessment of Educational Progress (NAEP), the massive, federally mandated report card on student performance, measured in grades 4, 8, and 12. In that report, the reading scores of African American boys in eighth grade were barely higher than the scores of White girls in fourth grade. In mathematics, 46% of African American boys demonstrated basic or higher grade-level skills, compared with 82% of White boys. On the National Education Longitudinal Survey, 54% of 16-year-old African American males scored below the 20th percentile, compared with 24% of White males and 42% of Hispanic males. According to the College Board (2010) report, African American male students are 2.4 times as likely to have been suspended and twice as likely to have repeated a grade compared to White males. High-school graduation rates tell the same story; just 42% of African American males graduated on time in 2006 compared with 71% of White males.
According to the NCES (1998), African American 17-year-olds had an average reading proficiency that was equal to that of White 13-year-olds. In 1995, the percentage of African American high school status dropouts was 11.4%, and White high schools status dropouts were 8.4%. Approximately 10% of the African American students who drop out of high school have less than a ninth grade education, and about 25% have less than a 10th grade education (NCES, 1997). According to Sanders (1998), a researcher from Johns Hopkins University, African American students’ academic achievement is significantly below that of their White counterparts. This achievement gap will significantly influence the future of America, as it will require more than just non-minority achievement to maintain world power status in the United States.

Lederman (2007) noted that this achievement gap is not only germane to secondary education, but it continues into higher education. About half of Americans from minority, low-income backgrounds go on to attend college, compared to about two-thirds of middle income, non-minority Americans and 80% of those with large incomes. Barely two in five African American and Hispanic freshmen earn a bachelor's degree within six years of entering college, compared to about 60% of White freshmen and 64% of Asian Americans. In addition, Lederman pointed out that White Americans are twice as likely as African Americans and three times as likely as Hispanic Americans to have earned a bachelor's degree by the age of 29. Today, among young adults 25 to 29 years old, 37% of Whites have earned a bachelor’s degree. That is nearly twice the rate of African Americans (20%) and three times the rate of Hispanics (12%).
Accounting for the Gap—The Sociocultural Environment

These gaps in degree attainment are partially due to the gaps in college-going rates, but they also reflect racial disparities in students’ success once in college (Engle & Theokas, 2010). Holzman (2006) noted that African American male students usually attend racially segregated high schools, earn lower scores on national assessments, are suspended and expelled more often than White males, and are assigned to special education courses at higher rates compared to White males; therefore, African American male students are unlikely to attend college. Additionally, having well-educated parents did not close the gap. In 2006, 43% of African American high-school seniors with at least one college-educated parent failed to demonstrate even basic reading comprehension, nearly twice the percentage of Whites (Kirp, 2010b).

The Role of Gender

Gender might further moderate the relationship between minority status and educational achievement among African Americans (Fashola, 2005; Isom, 2007). In addition, “The combination of race and gender may constitute a ‘double jeopardy’ of sorts, further imposing barriers to the academic success of many African American males” (Uwah, McMahon, & Furlow, 2008, p. 297). A Canadian study by Frenette and Zemen (2007) found that the reason for the gender gap in college might be that girls outperform boys on standardized tests, in GPAs, and in time spent on homework, and that parents encourage girls more compared to boys. For the past 20 years, African American males, as a group, have had lower graduation rates, lower standardized test scores, and higher dropout rates when compared to their female, European American counterparts.
Further, on many important indicators of wellbeing (e.g., incarceration rates, unemployment, mortality rates), African American males, on average, fared more poorly than almost any other group (Feagin & Sikes, 1994; Skolnick & Currie, 1994), and their European American female counterparts were more successful. Kirp (2010b) noted that African American males also fare badly when compared to African American females, who grow up in similar family and cultural circumstances and attend the same schools.

African American males are three times more likely than African American females to be suspended; their high-school graduation rate is 9% lower; and they are only half as likely to get a college degree (Kirp, 2010b). In particular, “African American, Hispanic, and low-income males lag behind their female peers in terms of educational attainment and are far outpaced by White, Asian-American, and middle-class men and women” (King, 2006, p. 2). King (2006) acknowledged that females outnumber males across all racial groups, but the imbalance is most pronounced for African Americans.

According to the American Council on Higher Education, in 2006, African American women (81%) completed high school at a higher rate than African American male students (72%) (King, 2006). The gender gap has increased the most since 2000 for low-income, traditional-aged students due to media influence, slower maturation rates for boys, who thus have difficulty meeting school requirements, and attention deficit disorder (King, 2006). Fordham (1996) posited that when compared to African American males, African American females persisted academically because they were better able to ignore discrimination. Cho (2007) found that over the past 30 years, women have outperformed men on test scores and the number of mathematics and science courses completed; therefore, women are better prepared to capitalize on the educational aspiration of
attending and completing college. These disparities can lead to issues with self-image and self-esteem for the African American male student.

**Negative Self Image**

Achievement within the classroom is also affected by socioeconomic factors such as negative self-image, poverty, and the oppositional culture (White, 2009). Ogbu (1990) described these factors as creating a cultural frame of reference that negatively affected the academic achievement of ethnic minority students. Marble (1986) suggested that this makes it difficult for African American males to define themselves outside of a narrow set of negative stereotypes that the larger society has imposed on them. An example of this can be seen in the fact that many African American male students tend to view their personal success in terms of athletic ability and other nonacademic indicators (Isom, 2007). According to Kunjufu (1986), such attitudes and stereotypes are easily internalized, and can lead to negative oneself, the educational process, and society as a whole.

It is, therefore, not surprising to find African American males disproportionately associated with negative stereotypes and activities (Hernstein & Murray, 1994; Kunjufu, 1989; Rowan, 1996). Rowan (1996), for instance, observed that African American males make up merely 6% of the United States population but represent approximately 50% of the prison population and 35% of special education students. According to Clark (1983), these discrepancies engender racial rage, dissatisfaction for educators, and economic and social discord for African Americans. Hart and Kritsonis (2006) examined how African American males are depicted in the media. It was determined that the rate of aggressive behavior portrayed in the media for African American males is twice the actual
occurrence and exceeds the population of African American males in the United States. This fact elevates the potential harm the resulting stereotype can cause when one considers the influence that the media has on youth (Wood, Wong, & Chachere, 1991).

Scholars such as Gibbs (1988), Hilliard (2003), and Hoberman (2000) noticed that the media images of African American men are heavily skewed toward the criminal or the sensational. These negative images often become a common standard for all African American males (Majors & Billson, 1992; Tatum, 1997; Wharton, 1988) and reinforce the cycle of negative beliefs (Hoberman, 2000).

Prier and Beachum (2008) suggested that African American males might use hip-hop and rap music as a counterbalance to develop a sense of self-awareness. It is not surprising, therefore, that oftentimes the values and behaviors expressed by hip-hop and rap artists replace the values that have been taught by parents, grandparents, or the church (Oliver, 2006). Hip-hop artist T.I. (2001) boasts in his song, Still Ain’t Forgive Myself, about not needing school, not doing homework, and life on the street. Likewise, national recording artist Eminem (2001), a high school dropout, raps about how the principal and school failed him and hip-hop saved him. Such hip-hop and rap music icons saturate the minds of many African American male students with sentiments contrary to conventional school expectations and mores.

**The Effect of Poverty**

Although much has been written about the need to improve the self-esteem of African American students (i.e., Banks & Grambs, 1972; Branch & Newcombe, 1986; Crooks, 1970), students must demonstrate academic competence (Ladson-Billings, 1995). In addition to negative self-image, another SES factor that is often associated with the
The low academic achievement of African American males is poverty. Consequently, academic underachievement among African American males has been particularly evident in urban areas where income levels are typically at their lowest for people of all ethnic backgrounds (EPE Research Center, 2004).

According to Payne (2005), it is not just poverty in the sense of lack of wealth but also poverty of the kind she describes as generational. Payne defined generational poverty as that which spans at least two generations. She contrasted this with situational poverty, which is poverty that results from a temporary (situation) loss of wealth due to factors such as death, loss of employment, or ill health. Payne noted that success in school is particularly challenging for students of this background, as they are unaware of the “hidden rules of the middle class” (p. 9) that serve as the primary culture of reference for most American public schools.

The challenges to academic achievement related to poverty set in early (EPE Research Center, 2004). By the time a student enters kindergarten and first grade, mathematics and reading achievement gaps between poor students and their more affluent counterparts are already present (Entwisle, Alexander, & Olson, 2005). Similarly, data from the NCES (2000) indicated that the average cognitive scores of pre-kindergarten students in the highest economic bracket were significantly higher compared to the average score of students in the lowest socioeconomic brackets. As further evidence of the influence of poverty, Viadero (2000) concluded that being raised in a low-income family often means having fewer educational resources at home and ultimately poor school performance. This is especially troubling given that academic
success has been recognized as one of the primary avenues for social mobility in the United States (Finn & Rock, 1997; Jordan & Sanders, 2000).

According to the for NCES (2005), African Americans have much higher poverty rates compared to other groups. In 2005, 30% of African American children under the age of 18 were living in poverty, compared to 10% of Caucasian children. The Congressional Black Caucus Foundation (Toldson, 2008) conducted one study that exemplifies the relationship between poverty and academic achievement. Their results indicated that students who reported an annual household income of less than $20,000 were twice as likely to report a D or lower grade, compared to students from households making $50,000 or more per year. Unfortunately, African American youth who acknowledged not attending school in the last year were also overrepresented in the population whose families were making less than $20,000 per year (Toldson, 2008).

Ultimately, living in poverty introduces a host of other social challenges that may be detrimental to the school performance of African American males. (Noguera, 2003b; Oliver, 2006; Prier & Beachum, 2008). These include households that lack male role models and are headed by single mothers or elderly grandparents. According to the Pew Research Center (2011) in 2008, 52% of African American youth under the age of 18 were living in such single-parent households compared to 74% of White youth who lived in a 2-parent household. Although no direct causal relationship have been established, Madyun and Lee (2010) argued that children who live in a single female-headed household are consistently outperformed academically by students living in a 2-parent household.
**Oppositional Culture (Acting White)**

There are different theories about the reason for the achievement gap. One of such is the Oppositional Culture Theory. Ogbru’s (1978, 1991) explanation for racial differences in academic disengagement is eminent in the academic achievement literature. Ogbru (1978) described the oppositional culture explanation as secondary cultural discontinuities that arise after groups had made contact (Ogbru, 1985). Ogbru (1985) sought to explain his thoughts on academic achievement with reference to broader societal structures and historical tenets relating to the gap (Herron-McCoy, 2009). Lundy (2003) defined Oppositional Culture Theory as a culture of poverty theory of African American academic performance. Fordham and Ogbru (1986) noted that due to past discriminatory practices and limited educational resources, some African American students develop an oppositional culture to academic achievement. Ogbru (1991) explained that cultural opposition occurs when members of a minority group adopt behaviors that directly contradict a specific, prominent aspect of the dominant culture.

Ogbru (1990) further observed the achievement gap between White and Non-White students by means of a cultural-ecological theory. Ogbru described this theory of minority student performance in the following way.

[T]here are two sets of factors influencing minority school: how society at large and the school treats minorities (the system) and how minority groups respond to those treatments and to schooling (community forces). The theory further posits that differences in school performance between immigrant and nonimmigrant minorities are partly due to differences in their community forces. (p. 122)
Thus, if minority students do not trust the system, then, their communities are not likely to support them in their academic endeavors. This can lead to poor academic achievement.

According to Fordham and Ogbu (1986), African American youth who accept or adhere to adopting oppositional culture tend to sustain pejorative evaluations of the opportunity structure, and most importantly, associate doing well in school as acting White. They also suggested that African American peer groups discourage their peers from putting forth the effort to do well in school as well as adopting the attitudes and behaviors necessary to advance academic achievement. Ogbu (1990) continued that the involuntary minority students who adopt the behaviors and attitudes conducive to school success, those who use Standard English and those who behave according to the standard practices of the school, are often accused by their peers of acting White. Gosa and Young (2007) argued that Fordham and Ogbo's (1986) cultural ecological thesis suggests that the poor academic achievement of African American youth can be attributed to the adoption of an oppositional collective identity. Fordham and Ogbu suggested this cultural opposition to acting White also led to being culturally opposed to succeeding in schools.

Different scholars design the acting White hypothesis in different ways.

Freyer (2006) described the acting White hypothesis as “a set of social interactions in which minority adolescents who get good grades in school enjoy less social popularity than White students who do well academically” (p. 52). At the 1994 annual meeting of the American Educational Research Association, King (1994a) and Hollins (1994) presented a symposium entitled, *The Burden of Acting White Revisited*. These scholars provided alternate explanations of this behavior. They suggested that, for
too many African American students, the school remains an alien and hostile place. This hostility is manifest in the *styling* and *posturing* (Majors & Billson, 1992) that the school rejects. Thus, the African American student wearing a hat in class or baggy pants might be sanctioned for clothing choices rather than specific behaviors. School is perceived as a place where African American students cannot be themselves (Hollins, 1994; King, 1994a). At the 2004 Democratic National Convention, then Senator Barack Obama (2004) stated, “… it is the fact that reading a book or getting good grades might be perceived as acting White.” The oppositional culture theory leads African Americans to define academic achievement as the prerogative of White students and to invest themselves in other alternatives outside of academic success (Freyer, 2006). Majors and Billson (1992) suggested that in order for African American males to refrain from using self-protective strategies such as cool-pose, curricula should incorporate an array of Afrocentric ideals through the teaching of values and other African American self-interests.

Ogbu and Simons (1998) suggested minority students are forced to conform to White or dominant norms of education and community interpretations that do not approve or support their dominant attitudes or behaviors. This transforming identity role in school is viewed as the curriculum serving as a means to impose White culture on them. This imposition challenges the curriculum in terms of why the history of and experiences of minorities are not included (Herron-McCoy, 2009). These questions lead to issues concerning the achievement gap that are directly related to the school, teachers, and administration.
Accounting for the Gap—The School Environment

Historically, from elementary to post-secondary education, the academic performance of African Americans is lower than other racial groups (Allen, 1991; Graham, 1994). According to Rosenberg and Simmons (1971), 38% of African American students in an urban public school system in the southeast had grades of A or B compared to 48% for White students. Rosenberg and Simmons further asserted that based on standardized tests given each year, notably during high school, the achievement gap between White and African American students widens. Nationally, only 47% of African American male students received diplomas with their 2005 cohort (Schott Foundation for Public Education, 2008). A significant racial achievement gap exists as 74% of their White male peers graduated from the same national cohort (NCES, 2009). Three years later, the gap expanded as the 2008 cohort graduation rate for African American males remained at 47%, and the graduation rate of White males increased to 78% (Schott Foundation for Public Education, 2010).

The demographics within schools in America are changing rapidly. Between 1993 and 2003, Hispanics accounted for 64% of the students added to public school enrollment, African Americans accounted for 23% of the increase, and Asians 11%. Meanwhile, during the same period, White enrollment declined by 1% (Fry, 2006). Despite the belief regarding the American educational system is a melting pot; the teaching profession is quite homogenous. The teaching profession has not been able to make accommodations necessary to address changes in demographics. Contrasting this change in diversity in the student population, Caucasian females continue to dominate the teaching profession (Slater, 2008). Caucasian females are the epitome of a classroom
teacher being the largest percentage of gender and race in the profession (National Center for Educational Information, 2005). Another trend within the teaching profession is the underrepresentation of males, especially African American (Johnson, 2008).

**Dearth of African American Male Teachers**

According to White (2009), one factor that could immediately change this trend would be the hiring of more African American male teachers. The effects of having a common face, background, and role model, as well as differentiated male teaching strategies, could be potentially invaluable to resurrecting the academic performance of African American males. Previous studies revealed students achieve at a higher rate when taught by a teacher of the same race (Irvine, 2002). According to Lynn (2002), male teachers in early childhood programs and elementary schools need to serve as role models, especially for African American males reared by women in single-parent homes. The great shortage of African American male teachers has an impact on high school dropout rates, especially among inner-city African American males. Given that many young inner-city African American males have shown disinterest in secondary schooling, Lynn noted that one also can see, in part, why these same males show a disinterest in enrolling in college.

Monroe and Obidah (2004) cited research concluding African American males would perform better in the classroom of an African American male due to teacher-student cultural synchronization. Based on the study’s findings, African American male teachers felt they were a factor in improving the academic performance of African American male students, and they could assist in increasing the graduation rate and decreasing the achievement gap. African American male teachers are thought to be more
equipped to improve the academic performance of African American male students compared to teachers of other races and gender due to the similar-to-me effect.

The similar-to-me effect is a type of rater effect in which the assessor or an evaluator judges more favorably those people seen as similar to himself/herself (Wheeler, Haertel, & Scriven 1992). In a similar-to-me relationship in the classroom, the teacher is more likely to help students similar to them because they can build a rapport easier. The connection is based off shared backgrounds and culture. The students are more willing to accept instruction, discipline, and criticism from an individual with whom they look like and perceive to have been through similar experiences (Wentzel, 1999).

There are an abundant number of quantitative research studies, which provide statistics on the correlation between the lack of African American teachers at a school and the poor academic performance of African American male students at the same school (Ascher 1991; Corbett & Wilson, 2002; Fremon & Hamilton, 1997; Hamre & Pianta, 2006). Corbett and Wilson (2002) concluded that when African American male students connect and build a relationship with African American male teachers, they are more likely to improve academic performance and persistence. Hamre and Pianta (2006) found that a positive teacher-student relationship with the same race and gender could influence a student’s achievement up to eight years later. Ascher (1991) concluded when there is a limited presence of African American male teachers, the African American male students are more likely to be disinterested in school and more likely to be absent, which leads to decreased academic performance.
Teacher Expectations

Additionally, some African American male students fail to graduate because their educational needs are not addressed (Balfanz & Legters, 2006). Ogbu (2003) pointed out that the low performance of African American students in high school has been due to inferior school resources, a lack of parent involvement, and low teacher expectations. When teachers hold high expectations for African American students, they have higher educational aspirations (Flowers, Milner, & Moore, 2003). Likewise, Way and Robinson (2003) found that for minority, low SES students, the school’s influence, academic achievement, goals, and psychological well-being are more important than family or friends in increasing educational aspirations.

African American students depend on support from teachers to increase academic achievement (Douglas, 2006). When successful African American students were interviewed, they acknowledged that their success was due to a strong college preparatory curriculum, high expectations for all students, discipline policies that were clear and fair to all students, a respect between teachers and students, and clean well-equipped schools (Holzman, 2006).

Some researchers suggested that good teaching practices weigh heavily in addressing the achievement gap (Hanushek, Kain, & Rivkin, 2003; The Teaching Commission, 2004). Further, African American males more often believed that their teachers did not support them or care about their success, compared to their peers of other races (Noguera, 2003a). A relationship exists between African American male student academic performance, teacher quality, and positive student to teacher relationships (Neild & Farley-Ripple, 2008; Woodland, 2008). Moreover, experienced, highly
qualified teachers are better equipped to provide rigorous, culturally responsive instruction that may lead to improved academic outcomes for African American male students (College Board, 2010; Ladson-Billings, 1995; Tate, 2008). Irvine (1990) dealt with the lack of what she termed cultural synchronization between teachers and African American students. Her analysis included the micro-level classroom interactions, the midlevel institutional context (i.e., school practices and policies such as tracking and disciplinary practices), and the macro-level societal context. More recently, Perry's (1993) analysis has included the historical context of the African American's educational struggle.

The issue of teachers’ attitudes toward students is not a new one. Several studies have been conducted chronicling the interactions between teachers and African American students. Woolfolk and Woolfolk (1974) indicated that students correctly perceive verbal and non-verbal communications of their teachers. Feldman and Donohoe (1978) indicated that African American and White teachers were non-verbally more positive in their behavior to students of their race. Simpson and Erickson (1983) examined teachers' verbal and non-verbal behaviors in first grade classrooms to assess differences based on sex of the student, race of the student, and race of the teacher. The subjects were eight African American and White female teachers in an urban public elementary school system. Simpson and Erickson noted, "White teachers were found to be more differential in their behavior toward male and female students than African American teachers" (p. 193). This study indicated that on the non-verbal level, White teachers might react in a more negative or critical way toward African American males. Both researchers
recommended that more research was needed to investigate the effects of teacher
behavior on African American males.

Some participants in Hopkins' (1997) study characterized the attitudes of some
teachers toward African American males as poor and negative. They saw this as a
continuing reality. His study participants identified three specific teacher attitude
problems: (a) low expectations for African American males, (b) fear of African American
males, and (c) apathy toward African American males. Teachers who expect that African
American male students cannot achieve academically will model inappropriate behaviors
to support this erroneous assumption asserted Reglin (1994).

**Culturally Relevant Instruction**

Ladson-Billings (1990) noted that African American males need to see something
that they relate to within the school curricula. She used the term culturally relevant
teaching. Culturally relevant teaching is used to describe the kind of teacher that it is
better suited for using the students’ culture (as opposed to fitting the school culture to the
students’ culture) as the basis for helping students understand themselves and others,
structure social interactions, and conceptualize knowledge. Her key claim is that the
pedagogy must accommodate students in preserving their cultural identity as they engage
in successful academics (Herron-McCoy, 2009).

Balfanz and Legters (2006) suggested institutional practices contribute to the
disproportionate dropout rate of African American male public school students. The
dropout rate among 16 through 24 year old African American males ranged from nearly
six percentage points higher in 2005 to four percentage points higher in 2008 compared
to their White male peers (U.S. Census Bureau, 2010). In Freeman’s (1997) research,
students offered the following suggestions to increase African American participation in school: “improve school conditions, provide interested teachers and active counselors, instill possibilities early and expand cultural awareness” (p. 530). Ogbu (1987) added:

The failure of school personnel to understand and respect minority children’s culturally learned behaviors often results in conflicts that obstruct children’s adjustment and learning. Note however, that I am not saying that it is only school personnel who have an obligation to understand and accommodate cultural differences; minority children also have an obligation to understand and accommodate school culture. It is a two-way thing. (p. 319)

Although the dropout rate for African American males has declined to approximately 9% in 2008, it remains higher than the dropout rate for all males combined (NCES, 2009).

**Conclusion**

Although this literature review offered multiple factors that could create a gap in academic achievement between African American males and their counterparts, the literature is not clear on any one main factor, or any one solution. The literature on this topic does point out, however, that African American males are capable of achieving at or above the rate of the peers. With the exception of Hernstein and Murray’s (1994) *The Bell Curve*, no reviewed literature asserted that there was a genetic factor to the achievement gap. Culpability for the gap was distributed equally among all stakeholders in the literature review. Many contributory factors to the gap are the responsibility of the American educational system and its practices. Subsequently, many others are the responsibility of African American males, their families, and their communities.
The literature presented did discuss, however, the educational flaws that place African American males at a distinct disadvantage (Montgomery, 2010). These educational flaws began when the first Africans arrived in the colonies. The fact that slaves were not allowed to learn to read or write contributed to the belief that African Americans were brutes, inferior to Whites, and unable to achieve academic success. This has contributed to the negative stereotypes that still exist today (Anderson, 1990).

Powell (2008) stated that African American males “don’t treat academics with the same intensity as they do basketball or football” (p. 73). Eitle and Eitle (2002) concurred and stated that African American males’ “overemphasis on sports, coupled with the obstacles for social mobility, leads them on a treadmill to oblivion” (p. 124). This implies a simple shift in focus and intensity could close the gap for many African American low achievers. Rather or not the solution is as simple as this, most scholars agree that there is a solution, even if no one agrees on what that solution is.
CHAPTER III

METHODODOLOGY

Problems associated with the academic achievement of African American males have been extensively researched in public school settings across the United States (Noguera, 2003b). From these investigations, several factor groupings have been identified as fundamental to explaining the academic underachievement of African American males. These include but are not limited to individual, family, community, cultural, and societal factors (NAEP, 2003). In addition to the aforementioned factor groupings, specific factors such as school curriculum, student learning style, and teacher expectations have been known to affect the educational achievement of students in general (Kunjufu, 1989). According to Shaffer, Ortman, and Denbo (2002), the recent emphasis on accountability for student outcomes has made it increasingly necessary for American educators to not only understand these factors but to also seek out strategies and procedures to better educate such students. According to Noguera (2003b), African American males represent a subpopulation for which educators have found these challenges to be especially true.

Despite decades of research and information that specifically focus on the academic achievement gap between White students and students of color, this gap still remains one of the most pressing issues in American education (Johnston & Viadero, 2000). In many school districts, students in the African American subpopulation are less
likely to perform well on tests, not read at their grade level, and not be highly motivated to perform well in school (White-Johnson, 2001). According to the National Urban League (2006) in *The State of Black America* report, this plight does not improve for African American males as they progress through school. For example, when African American males become teenagers, they show a higher propensity than their White counterparts do to drop out of school (18% compared to 14% of White males). Holzman (2006), who noted that African American males usually have the poorest grades, the lowest test scores, and the highest rates of dropout, further highlighted these challenges. Despite extensive research on this phenomenon across the United States, very little research in this area has been conducted in the state of Arkansas.

The purpose of this study, therefore, was to determine differences over time between 11th grade African American males, all other 11th grade students, and all other male students over time (measured by scores in grades 3, 5, and 8) in mathematics and literacy achievement. In line with this purpose, the researcher generated the following hypotheses:

1. No significant difference will exist over time between 11th grade African American males and all other 11th grade students on mathematics achievement.

2. No significant difference will exist over time between 11th grade African American males and all other 11th grade students on literacy achievement.

3. No significant difference will exist over time between 11th grade African American males and all 11th grade White male students on mathematics achievement.
4. No significant difference will exist over time between 11th grade African American males and all 11th grade White male students on literacy achievement.

This chapter will discuss the design of the research, how the sample was obtained, and a description of the sample population. There will be a discussion of the instrument used to measure student achievement, as well as how the data was collected and analyzed. Finally, a summary of the limitations to the study is presented.

**Research Design**

A causal-comparative, non-experimental strategy was employed for this longitudinal study. Data for this study comprised existing standardized test scores for students at three high schools (grades 9 through 12) in three urban school districts in Northeast Arkansas. According to Johnson and Christensen (2008), causal-comparative research methods are appropriate when the researcher “relies on the collection of quantitative data, i.e. numerical data” (p. 33), and where “there is no manipulation of an independent variable and no random assignment to groups by the researcher” (p. 43). Gay, Mills, and Airasian (2009) also stated that a causal-comparative study was appropriate when the purpose of the study is to explore the cause and effect relationships after the fact. Finally, General Linear Model (GLM) mixed 2 x 3 factorial ANOVAs were used to test each of the four hypotheses in this study. For each test, the independent variables were subpopulation and time, and mathematics achievement and literacy achievement were the dependent variables, respectively.
Sample

A stratified random sample of 180 11th grade students chosen from three high schools in Northeast Arkansas was used for this study. According to Gay et al. (2009), stratified random sampling techniques are appropriate when a researcher seeks to ensure a balanced representation of the relevant subgroups within the sample. In this study, the three Arkansas schools from which data were obtained were chosen for their similarities in student demographics and grade configuration. At each school, the inclusion criterion for students in the sample was their continuous residency within the school district between the grade levels being evaluated. Only students who met this criterion were considered for selection. Excluded from selection were all students who did not test within the districts during the selected periods. Students who did not complete both the reading and mathematics portions of the ACTAAP Augmented Benchmark Exam during the selected years were excluded from the study as well. Furthermore, all students who were exempt from testing for the purposes of special education and Limited English Proficient were excluded from this study.

Using this method, 60 11th grade students from each school were selected. Each group contained 30 African American males for a total of 90 African American males (across the three schools), and 90 students who were not African American males, but equally divided on the basis of gender, 45 males and 45 females. The three schools from which participants were chosen had a combined population of 1,664 students. According to Johnson and Christensen (2008), having an equal number of students in each of the comparison groups is of great importance when running ANOVA models.
Data for the study were obtained from school district offices in the form of Microsoft Excel spreadsheets. Each spreadsheet dataset contained 11th grade students’ raw scores in both mathematics and reading for the 2003-2004 (third grade), 2005-2006 (fifth grade), and 2008-2009 (eighth grade) school years. The datasets also contained information on demographic variables such as school lunch status, gender, ethnicity, IEPs, gifted and talented, etc. The demographic data were used to separate the students by race and gender for the purpose of this study. To ensure confidentiality, the researcher collected no personally identifying information about participants. Table 1 displays the demographic data for all 11th grade students in this study.

Table 1

Demographics of All 11th Grade Students

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Male</th>
<th>% Low SES</th>
<th>Gifted &amp; Talented</th>
<th>IEP</th>
<th>Female</th>
<th>% Low SES</th>
<th>Gifted &amp; Talented</th>
<th>IEP</th>
<th>Total Low SES</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>90</td>
<td>78.9</td>
<td>6</td>
<td>19</td>
<td>30</td>
<td>73.3</td>
<td>8</td>
<td>3</td>
<td>77.5</td>
</tr>
<tr>
<td>White</td>
<td>30</td>
<td>26.7</td>
<td>10</td>
<td>6</td>
<td>30</td>
<td>16.7</td>
<td>11</td>
<td>2</td>
<td>21.7</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>65.8</td>
<td>16</td>
<td>25</td>
<td>60</td>
<td>45.0</td>
<td>19</td>
<td>5</td>
<td>58.3</td>
</tr>
</tbody>
</table>

Instrumentation

The primary instrument used in this study was the Arkansas Augmented Benchmark Examination for grades 3-8. The Arkansas Augmented Benchmark Examination is a component of the ACTAAP. In this study, scores from this instrument
were used as the operational definitions (measures) for mathematics and literacy achievement respectively.

In Arkansas, results from the Arkansas Augmented Benchmark Examination are used to determine the adequate yearly progress of schools as mandated by the NCLB Act (2002). In line with this mandate, Arkansas Augmented Benchmark Examination tests are typically given over a 4-day period to students in grades 3-8. Students are given approximately two and a half hours each day to complete the test. In the areas of literacy and mathematics, test items typically consist of multiple-choice and open response type questions. A student’s performance on each test is reported in the form of raw scores, open response items correct, and multiple-choice items correct. The raw scores are also translated into four levels of performance classification: advanced, proficient, basic, and below basic. These performance categories are based on the set scaled score ranges for each grade level that correspond to a particular performance level as determined by Pearson. It is these scaled scores and performance classifications that are used to make comparisons of yearly progress in each subject area.

The reliability of the Arkansas Augmented Benchmark Examination, according to the Arkansas Department of Education (2008), stems from the fact that it is constructed to a common blueprint for each administration to ensure that each administration of the test is measuring the same construct. Information from the test publishers indicates that to further ensure reliability of the test scores, post equating is used to adjust for any differences in difficulty that do occur between different forms of the test (Pearson, 2010). According to Pearson (2010), the post-equating methodology is carried out using a common item, non-equivalent groups linking strategy. The initial linking set comprises
custom-developed multiple-choice items. Therefore, the percentage of linking items on the 2009 test forms is large and allows a robust linkage to be made between the 2009 and 2008 test forms. Accuracy rates are reasonably high at .89 or above for all grades and subjects. This approach, which was approved by the Technical Advisory Committee, is based on the Stratified Alpha method developed by Audrey Qualls in 1995. In this approach, the Pearson company noted that “reliability for each item type was estimated separately for reliability and then combined with other item types’ reliabilities to yield a more accurate estimate of the overall reliability” (p. 59). This approach accurately accounts for the variance of each item in estimating reliability of the test. Pearson argued that, by first estimating a separate reliability for each item type and then combining those reliabilities, the variance conditioned on item type across the entire test is weighed appropriately.

Although reliability is an important consideration when evaluating an instrument, validity is probably an even more important consideration (Joint Committee on Standards for Educational and Psychological Testing of the AERA, APA, & NCME, 1999). Messick (1989) defined validity as “… an integrated evaluative judgment of the degree to which empirical evidence and theoretical rationales support the adequacy and appropriateness of inferences and actions based on test scores or other modes of assessment” (p. 5). Suen (1990) stated that content validity is how items in an assessment properly reflect the item domain or the construct of interest. Thus, content validity provides critical evidence in support of the domain relevance and a clear representation of the content in the test (Messick, 1989). According to Pearson (2010), a true assessment does not randomly combine tasks and questions. Rather, each assessment question or task
must favorably contribute to the result. This relationship of the tasks on an assessment is defined as the internal structure of the assessment.

The Arkansas Department of Education (2008) determined that the Arkansas Augmented Benchmark Examination is not only reliable but also valid. They noted that the Arkansas Augmented Benchmark Examination tests have “…technically sound levels of reliability, validity, and fairness, based on the extensive research that underlies both the criterion-referenced test and norm-referenced test item sets” (p. 6). Content-related evidence, internal structure evidence, and other evidences of fairness for each test back these validity assertions. For instance, correlations for the internal structure among the reporting strands for subtests of the Arkansas Augmented Benchmark Examination are reported to range from 0.50 to 0.99 (Pearson, 2010). Finally, each Arkansas Augmented Benchmark Examination test is aligned to the appropriate grade level criteria of the Arkansas State Content Educational Standards in mathematics and literacy (Arkansas Department of Education, 2008).

**Data Collection Procedures**

Permission was granted by the superintendent of each of the school districts that participated in the study. Each superintendent was sent an email with an attached letter outlining the study and requesting permission for use of his or her ACTAAP Augmented Benchmark Exam data. Signed permission letters were returned electronically to the researcher. Following approval by the Institutional Review Board in November 2012, student scores on in literacy and mathematics for the years 2003-2004, 2005-2006, and 2008-2009, respectively, were collected for analysis. Each district’s data were sent
directly to the researcher in the form of a Microsoft Excel spreadsheet. All data were coded as necessary to protect the confidentiality of participating schools.

**Analytical Methods**

The Statistics Package for the Social Sciences (SPSS 18.0) was used for data analysis. Before running statistical tests, data were examined and checked to ensure the accuracy and to verify that the assumptions were met for the tests of significance. Specifically, the assumptions for running mixed factorial ANOVA GLMs such as a normal distribution, homogeneity of variances, and sphericity were checked (Sirkin, 2006). According to Sirkin (2006), “ANOVA can be used to compare more than two means and is very versatile” (p. 318). A mixed factorial ANOVA, therefore, was considered appropriate for the four hypotheses because it is considered robust even when there are violations to some of the assumptions.

For hypothesis 1, subpopulation (African American males versus all other students) and time (measured by scores in grades 3, 5, and 8) were the independent variables, and mathematics achievement was the dependent variable. Hypothesis 2 had subpopulation (African American males versus all other students) and time as independent variables and literacy achievement as the dependent variable. Hypothesis 3 had subpopulation (African American males versus all White males) and time as independent variables and mathematics achievement as the dependent variable. Finally, hypothesis 4 had subpopulation (African American males versus all White males) and time as independent variables and literacy achievement as the dependent variable.
Limitations

Non-experimental research projects usually involve several limitations that are beyond the control of the researcher (Johnson & Christensen, 2008). Such limitations can adversely affect the internal validity of the study (Patten, 2012). Despite this possible threat to the internal validity of nonexperimental research studies, such designs are still widely used in the social sciences, especially where true experimental manipulations of the independent variables may not only present logistical challenges, but ethical ones as well (Johnson & Christensen, 2008). Subsequently, it is left for the end users of such research to evaluate whether or not such limitations are compelling enough to diminish the findings of the study.

In addition to its nonexperimental design, the design of this study did not effectively account for other variables that might potentially have an effect on student achievement. Because of this, the ability to definitively ascribe causation to the relationship between the independent and dependent variables is limited. Another limitation to this study was the fact that the researcher did not directly measure student achievement. Therefore, the accuracy of these measures was dependent totally upon the accuracy of the benchmark tests and the accuracy of each district’s record keeping. Although it can be assumed that the process of such data collection is typically meticulous, the possibility for human error in data collection and entry cannot be ruled out. Despite this, all data collected were checked for accuracy, and procedures were taken to ensure the data received from the schools were coded and transferred from MS Excel to SPSS without any additional errors.
A third limitation to the study was the sample size. Although 180 students are an adequate sample for most studies (Patten, 2012), it is a relatively small number considering there are over 454,000 students attending public schools in Arkansas. Furthermore, this study was limited to schools in Northeast Arkansas; thus, the findings might be limited if generalized beyond that population.
CHAPTER IV

RESULTS

The researcher used a causal-comparative, non-experimental strategy for this longitudinal study. Data for this study comprised existing standardized test scores for students at three high schools (grades 9 through 12) in three urban school districts in Northeast Arkansas. The researcher focused on 180 (60 from each school) 11th grade students chosen from the three Northeast Arkansas high schools. There were 90 African American males, 30 African American females, 30 White males, and 30 White females. The independent variables were the subpopulation African American males versus all other students, the subpopulation African American males versus all other males, and time. The dependent variables were mathematics and literacy achievement measured by scale scores from their Arkansas Augmented Benchmark Examination for grades 3-8. Mixed factorial ANOVAs were run to test the four research hypotheses. The results of these analyses are in this chapter.

Hypothesis 1

Hypothesis 1 states that no significant difference will exist over time between 11th grade African American males and all other 11th grade students on mathematics achievement. To test this hypothesis, a mixed factorial ANOVA was conducted. Before conducting ANOVA, the data were screened for outliers, and examined for the assumptions of independence of observations, normality, homogeneity of variances, as
well as sphericity. Table 2 displays the group means and standard deviations for race/gender over time for 11th grade students’ mathematics achievement.

Table 2

*Descriptive Statistics for Race/Gender over Time for 11th Grade Students' Mathematics Achievement*

<table>
<thead>
<tr>
<th>Time</th>
<th>Race/Gender</th>
<th>M</th>
<th>SD (SE)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Third Grade</td>
<td>African American Males</td>
<td>29.23</td>
<td>13.91</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>All Other 11th Grade Students</td>
<td>40.23</td>
<td>16.41</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>34.73</td>
<td>16.14</td>
<td>180</td>
</tr>
<tr>
<td>Fifth Grade</td>
<td>African American Males</td>
<td>34.29</td>
<td>14.38</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>All Other 11th Grade Students</td>
<td>44.96</td>
<td>14.46</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>39.62</td>
<td>15.34</td>
<td>180</td>
</tr>
<tr>
<td>Eighth Grade</td>
<td>African American Males</td>
<td>23.90</td>
<td>9.82</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>All Other 11th Grade Students</td>
<td>35.24</td>
<td>13.41</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>29.57</td>
<td>13.02</td>
<td>180</td>
</tr>
<tr>
<td>Total</td>
<td>African American Males</td>
<td>29.12</td>
<td>(1.32)</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>All Other 11th Grade Students</td>
<td>40.14</td>
<td>(1.32)</td>
<td>90</td>
</tr>
</tbody>
</table>

An examination of box and whisker plots for each set of mathematics achievement scores revealed no extreme outliers within the samples. Furthermore, because the study was designed in such a way that participants were exclusively in only one of the two race/gender categories (African American males/all other 11th grade students), the assumption of independence (which specifically applied to this variable) was met.
To test the assumption of normality, histograms as well as Kolmogorov-Smirnov (KS) statistics were examined for each group across the three sets of mathematics achievement scores. The shape of the histograms for each group appeared normal. Results for the KS tests revealed no significant deviation from a normal distribution for the third-grade scores for African American males $D(90) = 0.084, p > .05$, as well as for all other 11th grade students $D(90) = 0.066, p > .05$. Similarly, the fifth $D (90) = 0.089, p > .05$, and eighth $D (90) = 0.072, p > .05$ grade distribution of mathematics achievement scores for all other students were not significantly different from normal. However, the assumption of normality was violated in the fifth $D (90) = 0.096, p = .04$, and eighth $D (90) = 0.127, p = .001$ grade distribution of mathematics achievement scores of African American males. Despite this violation, analysis of data using ANOVA was deemed appropriate as ANOVA is considered robust to mild violations of the assumption of normality (Field, 2005; Leech, Barrett, Morgan, & Leech, 2011). Furthermore, although Levene’s test revealed a violation of homogeneity of variances among the groups for eighth-grade mathematics score, $F (1, 178) = 11.90, p = .001$, no transformation was deemed necessary as the assumption was met across mathematics scores for the two other years. Finally, results of Mauchly’s test revealed that the assumption of sphericity was not violated $\chi (2) = 3.50, p = .174$. Results of the mixed ANOVA analysis are displayed in Table 3.
Table 3

Results of Mixed Factorial ANOVA for Mathematics Achievement of 11th Grade Students by Race/Gender over Time

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
<th>ES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race/Gender</td>
<td>16351.50</td>
<td>1</td>
<td>16351.50</td>
<td>34.57</td>
<td>.001</td>
<td>0.163</td>
</tr>
<tr>
<td>Error</td>
<td>84253.08</td>
<td>178</td>
<td>473.33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>9092.36</td>
<td>2</td>
<td>4546.18</td>
<td>87.36</td>
<td>.008</td>
<td>0.329</td>
</tr>
<tr>
<td>Race/Gender*Time</td>
<td>10.34</td>
<td>2</td>
<td>5.17</td>
<td>0.09</td>
<td>.905</td>
<td>0.001</td>
</tr>
<tr>
<td>Error</td>
<td>18527.14</td>
<td>356</td>
<td>52.04</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results of the mixed ANOVA analysis indicated no significant interaction between race/gender and time $F(2, 356) = 0.09, p = .905$. Therefore, the null hypothesis could not be rejected.
Figure 1. Mean mathematics achievement for main effect of time.

However, there was a statistically significant main effect for race/gender $F(1, 178) = 34.55, p < .001$ such that the African American males scored significantly lower ($M = 29.14, SE = 1.32$) than other 11th graders ($M = 40.14, SE = 1.32$) across all three grade levels (see Figure 2).
There was also a statistically significant main effect for time $F(2, 356) = 87.36, p < .001$ (See Table 3). As a follow up test to the significant main effect for time, polynomial contrasts and quadratic trends were analyzed (see Figure 3).

*Figure 2. Mean mathematics achievement for race/gender main effect.*
Figure 3. Linear and quadratic trends of mathematics achievement for main effect of time.

Polynomial contrasts reveals significant linear $F(1, 178) = 40.72, p < .001$ and quadratic $F(1, 178) = 147.96, p < .001$ trends over time on mathematics achievement regardless of race/gender grouping.

**Hypothesis 2**

Hypothesis 2 states that no significant difference will exist over time between 11th grade African American males and all other 11th grade students on literacy achievement. To test this hypothesis, a mixed factorial ANOVA was conducted. Before conducting ANOVA, the data were screened for outliers, and examined for the assumptions of independence of observations, normality, homogeneity of variances, as
well as sphericity. Table 4 displays the group means and standard deviations for race/gender over time for 11th grade students’ literacy achievement.

Table 4

Descriptive Statistics for Race/Gender over Time for 11th Grade students’ Literacy Achievement

<table>
<thead>
<tr>
<th>Time</th>
<th>Race/Gender</th>
<th>M</th>
<th>SD (SE)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Third Grade</td>
<td>African American Males</td>
<td>46.56</td>
<td>13.91</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>All Other 11th Grade students</td>
<td>54.19</td>
<td>16.41</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>50.38</td>
<td>16.14</td>
<td>180</td>
</tr>
<tr>
<td>Fifth Grade</td>
<td>African American Males</td>
<td>51.06</td>
<td>14.38</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>All Other 11th Grade students</td>
<td>65.39</td>
<td>14.46</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>58.23</td>
<td>15.34</td>
<td>180</td>
</tr>
<tr>
<td>Eighth Grade</td>
<td>African American Males</td>
<td>61.88</td>
<td>9.82</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>All Other 11th Grade students</td>
<td>71.09</td>
<td>13.41</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>66.49</td>
<td>13.02</td>
<td>180</td>
</tr>
<tr>
<td>Total</td>
<td>African American Males</td>
<td>53.17</td>
<td>(1.43)</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>All Other 11th Grade students</td>
<td>63.56</td>
<td>(1.43)</td>
<td>90</td>
</tr>
</tbody>
</table>

An examination of box and whisker plots for each set of literacy achievement scores revealed no extreme outliers within the samples. Furthermore, because the study was designed in such a way that participants were exclusively in only one of the two race/gender categories (African American males/all other 11th grade students), the assumption of independence (which specifically applied to this variable) was met.
To test the assumption of normality, histograms as well as Kolmogorov-Smirnov (KS) statistics were examined for each group across the three sets of literacy achievement scores. Although the shape of the histograms for each group appeared normal, results for the KS tests revealed no significant deviation from a normal distribution for African American males third grade scores $D(90) = 0.086, p > .05$, fifth grade scores $D(90) = 0.077, p > .05$, well as their eighth grade scores $D(90) = 0.074, p > .05$. The distribution of literacy scores for all other 11th grade students on the other hand was not different from normal only for fifth grade literacy scores $D(90) = 0.082, p > .05$. However, the third grade $D(90) = 0.170, p < .05$, and eighth grade $D(90) = 0.112, p < .05$ distributions for all other 11th grade students both violated the assumption of normality. Despite this violation, analysis of data using ANOVA was deemed appropriate as ANOVA is considered robust to mild violations of the assumption of normality (Field, 2005; Leech et al., 2011). Examination of Levene’s test revealed a violation of homogeneity of variances among the groups for third grade literacy scores, $F(1, 178) = 10.04, p = .001$, but not for fifth and eighth grade scores. No transformation was deemed necessary as the assumption was met across literacy scores for the two other years. Results of Mauchly’s test also revealed that the assumption of sphericity was violated $\chi(2) = 38.01, p < .05$, with epsilon values greater than .75. As a result, the Huynh-Feldt correction of the ANOVA $F$ statistic was interpreted for both the interaction effect, and the main effect of time (Leech et al., 2011). Results of the mixed ANOVA analysis are displayed in Table 5.
Table 5

Results of Mixed Factorial ANOVA for Literacy Achievement of 11th Grade students by Race/Gender over Time

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
<th>ES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Between Groups</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race/Gender</td>
<td>14588.08</td>
<td>1</td>
<td>14588.08</td>
<td>26.55</td>
<td>.001</td>
<td>0.130</td>
</tr>
<tr>
<td>Error</td>
<td>97811.01</td>
<td>178</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Within Subjects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>23371.11</td>
<td>1.7</td>
<td>13750.23</td>
<td>146.89</td>
<td>.000</td>
<td>0.001</td>
</tr>
<tr>
<td>Race/Gender*Time</td>
<td>1103.11</td>
<td>1.7</td>
<td>649.01</td>
<td>6.93</td>
<td>.002</td>
<td>0.103</td>
</tr>
<tr>
<td>Error</td>
<td>28321.76</td>
<td>302.5</td>
<td></td>
<td>93.61</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results of the mixed ANOVA analysis indicated a statistically significant main effect for race/gender $F(1, 178) = 26.55, p < .001$, and significant main effect for time $F(1.7, 356) = 146.89, p < .001$. Therefore, the null hypothesis could not be rejected. However, these significant main effects were qualified by a significant interaction between race/gender and time $F(1.7, 356) = 6.93, p = .002$. As a result of the significant interaction, simple effect contrast of race/gender categories across the three time periods was conducted in order to better understand the trend effect of race/gender on students’ literacy achievement over time. Figure 4 graphically represents this interaction between race/gender and time.
Results of the simple effects contrast revealed that African American males consistently scored lower than all other 11th graders across the three times. Furthermore, the mean difference (gap) between the groups in the first year [third grade] ($MD = 7.66, SE = 2.74$) was significantly different from the gap between the groups in the second year [2nd grade] ($M = 14.33, SE = 2.19$). The gap between the groups for both of the previous years was also significantly different from the mean differences between the groups during the third year [eighth grade] ($MD = 9.22, SE = 1.86$).
Hypothesis 3

Hypothesis 3 states that no significant difference will exist over time between 11th grade African American males and all White 11th grade male students on mathematics achievement. To test this hypothesis, a mixed factorial ANOVA was conducted. Before conducting ANOVA, the data were screened for outliers, and examined for the assumptions of independence of observations, normality, homogeneity of variances, as well as sphericity. Table 6 displays the group means and standard deviation for race over time for 11th grade male students’ mathematics achievement.

Table 6

*Descriptive Statistics for Race over Time for 11th Grade Male Students’ Mathematics Achievement*

<table>
<thead>
<tr>
<th>Time</th>
<th>Race</th>
<th>M</th>
<th>SD (SE)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Third Grade</td>
<td>African American Males</td>
<td>29.23</td>
<td>13.91</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>White Males</td>
<td>44.45</td>
<td>16.84</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>33.03</td>
<td>16.05</td>
<td>120</td>
</tr>
<tr>
<td>Fifth Grade</td>
<td>African American Males</td>
<td>34.29</td>
<td>14.38</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>White Males</td>
<td>48.37</td>
<td>14.62</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>37.81</td>
<td>15.62</td>
<td>120</td>
</tr>
<tr>
<td>Eighth Grade</td>
<td>African American Males</td>
<td>23.90</td>
<td>9.82</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>White Males</td>
<td>38.13</td>
<td>12.48</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>27.46</td>
<td>12.18</td>
<td>120</td>
</tr>
<tr>
<td>Total</td>
<td>African American Males</td>
<td>29.14</td>
<td>(1.24)</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>White Males</td>
<td>43.65</td>
<td>(2.15)</td>
<td>30</td>
</tr>
</tbody>
</table>
An examination of box and whisker plots for each set of mathematics achievement scores revealed no extreme outliers within the samples. Furthermore, because the study was designed in such a way that participants were exclusively in only one of the two race/gender categories (African American males/all White 11th grade male students), the assumption of independence (which specifically applied to this variable) was met.

To test the assumption of normality, histograms as well as Kolmogorov-Smirnov (KS) statistics were examined for each group across the three sets of mathematics achievement scores. The shape of many of the histograms appeared to be skewed. Results for the KS tests revealed no significant deviation from a normal distribution for the third grade scores for African American males $D(90) = 0.084, p > .05$, as well as for all White 11th grade male students $D(30) = 0.115, p > .05$. Similarly, the eighth grade distribution of mathematics achievement scores for all White male students was not significantly different from normal $D(30) = 0.093, p > .05$. However, the assumption of normality was violated in the distribution of mathematics scores for fifth grade $D(90) = 0.096, p = .04$, and eighth $D(90) = 0.127, p = .001$ grade African American males. Likewise, normality was violated in the distribution of scores for all White male students in the fifth grade $D(30) = 0.183, p = .01$. Despite these violations, ANOVA was deemed appropriate as it is robust to mild violations of the assumption of normality (Field, 2005; Leech et al., 2011). Levene’s test revealed no statistically significant inequalities in group variances across the three years. Similarly, results of Mauchly’s test revealed that the assumption of sphericity was not violated $\chi(2) = 4.39, p = .112$. Results of the mixed ANOVA analysis are displayed in Table 7.
Table 7

*Results of Mixed Factorial ANOVA for Mathematics Achievement of 11th Grade students by Race over Time*

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
<th>ES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Between Groups</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td>14213.63</td>
<td>1</td>
<td>14213.63</td>
<td>34.04</td>
<td>.001</td>
<td>0.224</td>
</tr>
<tr>
<td>Error</td>
<td>49279.28</td>
<td>118</td>
<td>417.62</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Within Subjects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>4811.02</td>
<td>2</td>
<td>2405.51</td>
<td>40.96</td>
<td>.000</td>
<td>0.258</td>
</tr>
<tr>
<td>Race*Time</td>
<td>17.34</td>
<td>2</td>
<td>8.67</td>
<td>0.15</td>
<td>.863</td>
<td>0.001</td>
</tr>
<tr>
<td>Error</td>
<td>13858.51</td>
<td>236</td>
<td>58.72</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results of the mixed ANOVA analysis indicated no significant interaction between race and time $F(2, 236) = 0.15, p = .863$. Therefore, the null hypothesis could not be rejected.
Figure 5. Mean mathematics achievement for interaction of race and time.

However, there was a statistically significant main effect for race $F(1, 118) = 34.04, p < .001, \eta^2 = 0.22$ such that the African American males scored significantly lower ($M = 29.14, SD = 11.26$) than White male 11th graders ($M = 43.65, SD = 13.34$) over time (see Figure 6).
There was also a statistically significant main effect for time $F(2, 236) = 40.96, p < .001$.

As a follow up test to the significant main effect for time, polynomial contrasts were analyzed (see Figure 7).

*Figure 6. Mean mathematics achievement for race/gender main effect.*
Polynomial contrasts reveals significant linear $F(1, 118) = 21.89, p < .001, \eta^2 = 0.16$ and quadratic $F(1, 118) = 68.82, p < .001, \eta^2 = 0.37$ trends over time on mathematics achievement regardless of race.

**Hypothesis 4**

Hypothesis 4 states that no significant difference will exist over time between 11th grade African American males and all 11th grade White male students on literacy achievement. To test this hypothesis, a mixed factorial ANOVA was conducted. Before conducting ANOVA, the data were screened for outliers, and examined for the assumptions of independence of observations, normality, homogeneity of variances, as
well as sphericity. Table 8 displays the group means and standard deviation for race over time for 11th grade male students’ literacy achievement.

Table 8

Descriptive Statistics for Race over Time for 11th Grade Male Students’ Literacy Achievement

<table>
<thead>
<tr>
<th>Time</th>
<th>Race</th>
<th>M</th>
<th>SD (SE)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Third Grade</td>
<td>African American Males</td>
<td>46.56</td>
<td>14.79</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>White Males</td>
<td>58.00</td>
<td>19.42</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>49.42</td>
<td>16.74</td>
<td>120</td>
</tr>
<tr>
<td>Fifth Grade</td>
<td>African American Males</td>
<td>51.06</td>
<td>14.19</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>White Males</td>
<td>66.65</td>
<td>14.07</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>54.95</td>
<td>15.65</td>
<td>120</td>
</tr>
<tr>
<td>Eighth Grade</td>
<td>African American Males</td>
<td>61.88</td>
<td>12.39</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>White Males</td>
<td>71.83</td>
<td>12.21</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>64.37</td>
<td>13.03</td>
<td>120</td>
</tr>
<tr>
<td>Total</td>
<td>African American Males</td>
<td>53.16</td>
<td>(1.35)</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>White Males</td>
<td>65.49</td>
<td>(2.33)</td>
<td>30</td>
</tr>
</tbody>
</table>

An examination of box and whisker plots for each set of literacy achievement scores revealed no extreme outliers within the samples. Furthermore, because the study was designed in such a way that participants were exclusively in only one of the two race/gender categories (African American males/11th grade White male students), the assumption of independence (which specifically applied to this variable) was met.
To test the assumption of normality, histograms as well as Kolmogorov-Smirnov (KS) statistics were examined for each group across the three sets of literacy achievement scores. Although histograms for most groups appeared normal, results for the KS tests revealed no significant deviation from a normal distribution for African American males third grade scores $D(90) = 0.086, p > .05$, fifth grade scores $D(90) = 0.077, p > .05$, well as their eighth grade scores $D(90) = 0.074, p > .05$. On the other hand, the distribution of scores for all White 11th grade male students was not different from normal for fifth grade $D(30) = 0.077, p > .05$ and eighth grade $D(30) = 0.123, p > .05$. However, the third grade distributions for all White 11th grade male students violated the assumption of normality $D(30) = 0.197, p < .05$. Despite this violation, ANOVA was deemed appropriate as it is considered robust to mild violations of the assumption of normality (Field, 2005; Leech et al., 2011). Concerning homogeneity of variances, Levene’s test revealed no statistically significant violation to the assumption. Finally, Mauchly’s test revealed that the assumption of sphericity was violated $\chi(2) = 22.47, p < .05$, with epsilon values greater than .75. As an adjustment for this violation, the Huynh-Feldt correction of the ANOVA $F$ statistic was interpreted for both the interaction effect, and the main effect of time (Leech et al., 2011). Results of the mixed ANOVA analysis are displayed in Table 9.
Table 9

Results of Mixed Factorial ANOVA for Literacy Achievement of 11th Grade students by Race over Time

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>Df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
<th>ES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td>10264.43</td>
<td>1</td>
<td>10264.42</td>
<td>20.99</td>
<td>.000</td>
<td>0.151</td>
</tr>
<tr>
<td>Error</td>
<td>57685.24</td>
<td>118</td>
<td>488.86</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Subjects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>9593.60</td>
<td>2</td>
<td>5515.17</td>
<td>78.85</td>
<td>.001</td>
<td>0.401</td>
</tr>
<tr>
<td>Race*Time</td>
<td>384.27</td>
<td>2</td>
<td>192.14</td>
<td>3.16</td>
<td>.052</td>
<td>0.026</td>
</tr>
<tr>
<td>Error</td>
<td>14357.10</td>
<td>236</td>
<td>60.84</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results of the mixed ANOVA analysis indicated no significant interaction between race and time $F(2, 236) = 3.16, p = .052$. Therefore, the null hypothesis could not be rejected.
However, there was a statistically significant main effect for race $F(1, 118) = 20.99$, $p < .001$, $\eta^2 = 0.15$, such that the African American males scored significantly lower ($M = 53.16$, $SE = 1.35$) than other 11th Grade males ($M = 65.49$, $SE = 2.33$) over time (see Figure 9).
Similarly, there was a statistically significant main effect for time $F(2, 236) = 78.85, p < .001$. As a follow up test to the significant main effect for time, polynomial contrasts were analyzed (see Figure 10).

*Figure 9.* Mean literacy achievement for race main effect.
Figure 10. Linear trend of literacy achievement for main effect of time.

Polynomial contrasts reveals significant linear $F(1, 118) = 110.99, p < .001, \eta^2 = 0.49$ trend, on mathematics achievement regardless of race grouping. The quadratic trend was however, not statistically significant $F(1, 118) = 0.86, p = .355, \eta^2 = 0.01$. 
CHAPTER V

DISCUSSION

The academic disparity or achievement gap, between African American students and their White counterparts, remains an issue of great concern to American educators. Many decades after the dismantling of deeply rooted, statutory, and socially enforced systems of school segregation, the gap in academic success between these two segments of our student population persists (Bowles & Gintis, 1976, 2002; Carter, 2003; Davis, 2003; Douglas et al., 2008). In recent years, the No Child Left Behind Act (2002) has brought a renewed focus on this gap with its emphasis on educational accountability that is based on measurable outcomes. In compliance with this law, school districts across the country have been required to disaggregate student test scores and other performance data by demographic characteristics (subpopulations) to facilitate a meaningful evaluation of student success (Editorial Projects in Education Research Center, 2011).

From a national perspective, the outcome of this new emphasis has been a mixed bag. While national data indicate that test scores for African American students in reading and mathematics have improved over time, the gap between students in this subpopulation and their White peers persists (National Center for Educational Progress, 2003). For instance, reports from the National Center for Education Statistics (2009) reveal that while the gaps between African American and White students in mathematics and reading were on the decrease between 1992 and 2007, African American students
continued to trail their White peers by an average 20 test-score points on NAEP assessments. This gap, according to the reports, represented a difference of at least two grade levels worth of learning.

In consideration of these trends at the national level, the researcher in the current study sought to investigate the nature of this gap in a section of the country that features prominently in the history of the struggle for equal educational opportunity for students of all subpopulations. Although other researchers have suggested a variety of factors as explanations for this gap (Alonzo et al., 2008; Aos, Lieb, Mayfield, Miller, & Pennucci, 2004; Bell, 2009, 2010; Clark, 1983; Council of the Great City Schools, 2010; Davis, 2003; Dickens, 2005; Duncan, 1999; Duncan & Brooks-Gunn, 1997; Fashola, 2005), the goal of this study was not to explore such factors or propose additional explanations. On the contrary, this study aimed to provide a glimpse into three Northeast Arkansas school districts to determine if such a gap exists among that population of students. In this chapter, a summary of the conclusions drawn from the study in addition to recommendations and implications are presented.

Conclusions

Each of the four hypotheses proposed in this study was tested by conducting a Mixed Factorial ANOVA. For these analyses, the independent variables were subpopulation (African American males versus all other students; and African American males versus White males) and time, and the dependent variables were mathematics and literacy performance as measured by Arkansas Augmented Benchmark Examination for grades 3-8. Analyses of the hypotheses included an examination of the main effects for independent variable, as well as their combined interaction effects.
Hypothesis 1

An analysis of this hypothesis revealed no statistically significant interaction between the independent variables of race/gender and time. However, there was a statistically significant main effect for race/gender such that the African American males scored significantly lower than other 11th graders across all three grade levels. Similarly, there was also a statistically significant main effect for time involving one significant (quadratic) change in the direction of the mean mathematics scores over time. These results suggest that when African American males are compared to the rest of their classmates (in this case the population consisting of White males, White females, and African American females) and followed across three grade levels, their average mathematics achievement is significantly lower than that of the other students. It is worth noting again that these findings did not show any interaction between race/gender and time. Such an interaction would have been an indication that over time (between certain grade level markers), that the pattern of mathematics achievement was different for the subpopulation groupings. On the contrary, the findings here indicate that the mathematics achievement of all students (regardless of subpopulation) in this region of the country has risen and fallen in a synchronous manner, while maintaining the gap earlier identified. Regardless of subpopulation, the pattern of mathematics achievement has been such that fifth grade scores were the highest, and eighth grade scores were the lowest. These findings provide confirmation of a gap (between the subpopulation of African American males and other 11th grade students) in mathematics in this population of Arkansas students that is consistent with the national pattern (National Center for Education Statistics 2009). The findings of this study are also consistent with the findings of
Rickard (2005) who found that African American students from the state of Arkansas had the lowest eighth grade mathematics scores in the country.

Hypothesis 2

Analysis of this hypothesis revealed a statistically significant interaction between the independent variables of race/gender and time. In addition to this, there were also statistically significant main effects for race/gender and time. These results suggest that when African American males are compared to the rest of their classmates (in this case the population consisting of White males, White females, and African American females) and followed across three grade levels, their average literacy achievement is significantly lower than that of the other students. The interaction of the two main effects showed that the gap between African American males and all other 11th grade students was widest widened at the fifth and eighth grades compared to their initial testing point in the third grade. Again, these results are in line with several national studies that show a gap between African American males and other students in literacy at all levels (Bonner, 2003, 2005; Clark, 1983; Cohen-Navot et al., 2004; Lee, 2002; Marble, 1986; Mikulecky, Albers, & Peers, 1994; Montgomery, 2010). However, it is not clear why the gap in this study was widest at these grade levels. A possible reason may be the fact that the initial disadvantage of African American males at lower grade levels could have become magnified at the upper-grade levels. Unfortunately, the current study was not designed to explore such possibilities. Whatever the case may be, the findings in this study indicate that the literacy performance of 11th grade African American males in northeastern Arkansas is markedly different from those of their other classmates. Finally, it is worth pointing out that Rickard (2005) found that African Americans in Arkansas ranked 46th
out of 50 states and the District of Columbia on national eighth grade literacy scores. Although, Rickard’s data did not distinguish between males and females, it can still be seen as an additional indicator of the dire state of literacy outcomes for African American males in this part of the country.

**Hypothesis 3**

An analysis of this hypothesis revealed no statistically significant interaction between the independent variables of race and time. However, there was a statistically significant main effect for race such that the African American males scored significantly lower than all 11th grade White males across all three grade levels. Similarly, there was also a statistically significant main effect for time involving one significant (quadratic) change in the direction of the mean mathematics scores over time. While achievement for both subpopulations (African American Males and White Males) decreased from the fifth grade to the eighth grade, African American males performed at a level significantly lower than their White male counterparts at every grade level. Findings for this hypothesis mirror the national statistics, which indicate that White students score, on average, 26 points higher than African American students in mathematics (Vanneman, Hamilton, Baldwin, Anderson, & Rahman, 2009). In Arkansas, the gap between African Americans and White students in mathematics achievement has gone from a 27% proficiency gap in the third-grade, to 35% proficiency gap in the eighth grade (Barth & Nitta, 2008).

The across the board drop in mathematics achievement between the fifth and eighth grades was a particularly interesting finding. One possible explanation may be the fact that the level of rigor in the mathematics content increases at higher grade levels as
suggested by (Mikulecky et al., 1994). Another possibility could be the fact that children beginning school with any form of disadvantage or risk factor rarely ever catch up without well-targeted intervention. This is certainly consistent with the work of Cutuli et al. (2013) who studied homeless and highly mobile students. They found that such students lagged behind their peers in the sixth through eighth grades and were never able to catch up. It is possible that similar factors are responsible for the pattern observed in this study. However, regardless of how interesting such a pattern may be, the design of this study was not such that a definitive explanation can be provided for this phenomenon.

**Hypothesis 4**

After analyzing this hypothesis, no significant interaction effect existed between the variables of race and time. However, there was a significant main effect for both variables such that African American males consistently scored lower than White males on literacy achievement over all three grades. Although scores for both groups went up over the course of the three grade levels, the gap between the two subpopulations remained intact. The National Assessment of Educational Progress’ report card says that only 8% of African American males in America are proficient in reading compared to over a third of White males (National Assessment of Educational Progress, 2003). In Arkansas, approximately twice the number of White 11th graders (55%) score at proficient or advanced levels in literacy compared to African American 11th graders (19%) (Rickard, 2005). Again, in this case as with the comparison of African American males to other eleventh graders, the linear trend in achievement across the years revealed students of this subpopulation were unable to catch to their peers in literacy. Thus,
confirming once more that the gap in literacy achievement between this subpopulation and their White male peers exists and persists among students in this part of the country.

**Summary**

The results of this study support the existence of a gap in mathematics achievement between the African American male subpopulation in northeastern Arkansas and other 11th grade students in the same region. This gap remained even when the African American male subpopulation was compared with only their White male counterparts. Similarly, the results of the study confirm the existence of a comparable gap in literacy achievement between the African American male subpopulation and their White male counterparts; as well as with all other 11th grade students in the region. The gap in literacy achievement however was somewhat different when African American males were compared to the larger group of 11th grade students (which included White females, African American females, and White males), than when they were compared only to White males. This difference was such that the gap in the former comparison was significantly wider in the period between the fifth and the eighth grades than it was in the latter comparison. One possible explanation for the widening of the gap in this case may be the higher literacy achievement of female students at these grade levels observed by another researcher (Cho, 2007).

Furthermore, the results of this study show that although literacy achievement for all students (regardless of subpopulation) continued to rise as they advanced from the third to the fifth grade, and on to the eighth grade; their mathematics performance presented a different trend over time. Mathematics performance across the board increased between the third and fifth grades, but took a sharp dip as students progressed
to the eighth grade. Barth and Nitta (2008) noticed evidence of a similar decline among students over a longitudinal study. However, the purpose of this study was to examine if an academic achievement gap existed between African American males and their 11th-grade counterparts in the population of interest and if such a trend persisted over time. The current findings provide evidence of such a gap and trend. It is also worth noting that these findings are consistent trends in national level data and similar studies.

Implications

According to the United States Census Bureau (2010), there are 134,433 African Americans under the age of 18 in Arkansas with a male to female breakdown of 48.8% and 51.2% respectively. Therefore, roughly 65,603 African American males are currently or will soon be attending school in Arkansas. That represents almost 10% of all students in the state of Arkansas. This number represents the proportion of the student population that is too large to be ignored. The results of the current study indicate that African American males in Northeast Arkansas are not performing above other members of their subpopulation across the country. The implications of this state of affairs are great and far-reaching. Some of the most obvious implications and recommendations for how educational leaders may respond to them are presented here.

The first implication of the achievement gap, specifically to the state of Arkansas, is the negative effect on the gap in income in the state. Arkansas has lagged behind other states in addressing its racial and income achievement gaps (Barth & Nitta, 2008). Rickard (2005) noted that Arkansas’ household income average is 24% less than the national average ($42,785 to $56,604 per year). More recently, the United States Census Bureau (2012) found that Arkansas’ household income average is still considerably less
than the national average ($40,531 to $53,046 per year). The income gap is even greater for African Americans, as their household average is $29,511, compared to $45,196 per year for white households (Rickard, 2005). The Southern Education Foundation’s (2002) *Miles to Go* report about Arkansas schools made the correlation between the income gap and the achievement gap. The report noted that the gap in academic achievement in Arkansas schools is the primary cause for the gap in income. Arkansas’ economy is adversely affected as the achievement gap continues to linger. The lower the household incomes in Arkansas get, the fewer resources are available to improve Arkansas public schools. The gaps in resources carry over to the gaps in academic performance (Southern Education Foundation, 2002). Reardon (2011) found that as the income gap increases, so does the achievement gap. According to his research, the achievement gap between students from low socioeconomic background and other students is up to 40% larger among children born in 2001 than among those born in 1976. Schools in areas of high poverty being funded at unequal levels are directly tied to the gap in student achievement. If this gap is not closed and Arkansas’ household income level continues to lag behind the national average, a large portion of Arkansas’ population will not be able to receive a competitive public school education. Thus, they will be excluded from being able to compete in the state, national or global economy and the entire state of Arkansas will suffer as a result.

Another possible implication of the achievement gap is its impact on college graduation rates in the state of Arkansas. Rickard (2005) noted that only one state-West Virginia-had fewer college graduates than Arkansas. By 2013, Arkansas had only improved to 48th, inching ahead of Louisiana and West Virginia (Lumina Foundation,
2013). Furthermore, Arkansas ranked 49th in the percent of high school graduates receiving two-year degrees, 49th in the percent of adults over 25 with BA degrees, and 49th in the percent of adults with advanced degrees. In 2000, only 18% of Arkansas adults had a bachelor’s degree (Southern Education Foundation, 2002). At the national level, African American males have the lowest college completion rates of all subpopulations (Harper, 2006; Lumina Foundation, 2013; Strayhorn, 2010). In 2002, African American males accounted for only 4.3% of students enrolled at colleges and universities. This was the same percentage reported for the year 1976 by Harper (2006) and by Strayhorn (2010).

The lack of college graduates also ties into the first implication. If the racial and ethnic groups in Arkansas were to match the academic achievement of their White counterparts, they would be able to reap the benefits of the ensuing earning power of higher education. Subsequently, Arkansas’ economy would stand to gain $1.6 billion in personal income and $543 million in tax revenue (Southern Education Foundation, 2002).

However, probably the most critical implication of the achievement gaps in literacy and mathematics is the alarming number of African American males in prison. Unfortunately, it is in this measure that young African American males vastly outpace members of all other subpopulation. Several studies directly link low educational attainment and poverty to crime and the risk of entering the correctional system (Block & Heineke, 1975; Cook, 2012; Kelly, 2000; McLaughlin, 2011). McLaughlin specifically notes that African American males living in low-income communities have a higher percentage of adult males behind bars than in schools or in the workforce. The specific figures are quite disturbing. Cook (2012) for instance notes that as recently as 2001, there
were more African American males incarcerated (842,000) than in institutions of higher education (712,724). West (2010) also points out that African American males are incarcerated at a rate six times higher than White males.

The effects of such a large number of citizenry destined for incarceration can hardly be good for the national economy. According to the U.S. Department of Justice (2004), close to $24 billion dollars in goods is lost yearly due to property crime. This, however, is only part of the story. The lack of productivity from those held in the correctional system costs society at least $5,700 per year per prisoner (Kelly, 2000). These far-reaching implications make a clear case for educational leaders to do everything in their respective areas of influence to help close the achievement gap between African American males and other subpopulations.

**Recommendations**

**Potential for Practice/Policy**

The achievement gap affects schools at all levels and regardless of socioeconomics or geographic location. Any issue that negatively affects education anywhere is an issue that must be addressed in education everywhere. The uniqueness of the American educational system compared to its global equivalents is the fact that the system is designed for the education of all students, without regard to ability, class level, race, creed, or religious beliefs. Thus, any student or group of students that is not being properly educated requires the implementation of changes to address the concern immediately.

The results of this study confirm the existence of such a gap among schools in northeastern Arkansas. That being the case, one change the researcher recommends is
that the public school funding system is corrected to create equitable funding for schools with high minority populations and those in high poverty areas. In 1983, the Arkansas Supreme Court found the school funding system to be unconstitutional. The ruling determined that there was no rational relationship to educational needs in funding public school systems (Dupree v. Alma School District No. 30, 1983). As a result of the ruling, the state legislature changed how it funded public schools. More recently, Lake View School District, No. 25 v. Huckabee (2001) found that the school funding system was inequitable and inadequate. Thus, the Arkansas school funding system was again deemed unconstitutional. Arkansas is almost last in the nation in per-pupil expenditures in public schools. As of 2000, Arkansas’ expenditures per student were 84% of the national average or 42nd in the nation (Southern Education Foundation, 2002). Arkansas has to increase the financial investment in all of their students, specifically minorities and students from areas of high poverty, if there is an expectation of raised student achievement.

Another recommendation is that Arkansas school leaders increase professional development for teachers in the area of the achievement gap to improve teacher effectiveness. Schools must have teachers who are committed and willing to adapt and adjust. They must also be willing to grow continually professionally (Billig, Jaime, Abrams, Fitzpatrick, & Kendrick, 2005). According to the superintendents of each of the school districts represented in this study, none of them offer professional development specifically geared to African Americans, Hispanics or students from low socioeconomic backgrounds (personal communication, August 2012). Gonzalez and Darling-Hammond (1997), Mikulecky et al. (1994), and Sims (2011) all found that effective teachers are able
to observe best practices and make the connection between new knowledge in their area of expertise and their own context and experience. Professional development deepens teachers’ understanding of themselves and their roles in both perpetuating and combating inequities in their schools (Deshmukh-Towery, Oliveri, & Gidney, 2007). Kirabo-Jackson (2009) also found that as staff development increases, student performance improves. Therefore, to help combat the continued trend of the achievement gap, Arkansas school leaders need to devote mandatory, intensive professional development for teachers and administrators focused specifically on the issue of the achievement gap and African American students, males in particular. Research in four African American middle schools, with demographics similar to the schools in this study showed gaps in reading/language arts between the target schools’ scores and the district average were more than halved due to increased teacher involvement in their professional development (Kirabo-Jackson, 2009). Billig et al., (2005) reported on four other schools similar in demographics to the schools in this study across the country that has made strides in closing their achievement gap. These schools narrowed their achievement gaps partly due to increased professional development focused on the achievement gap. Professional development focused on the achievement gap has proven to reduce the gap in schools with similar demographics to the schools in this study.

Arkansas school leaders should also consider implementing culturally responsive pedagogy in their schools. The concept of culturally responsive pedagogy is a reshaping of teaching practices to improve the educational performances of African American, Latino, and other minority students (Gay, 2000). Ladson-Billings (1995) describes this teaching, which she calls culturally relevant, as instruction that “empowers students
intellectually, socially, emotionally, and politically by using cultural referents to impart knowledge, skills, and attitudes” (p. 18). The basis for culturally responsive pedagogy is connected to the premise that, by making content connections to students’ culture, beliefs, and practices, students may have the potential to improve their academic achievement. Additionally, there will be a positive effect on the overall school experience for minority students (Gay, 2000; Hollie, 2001; Howard, 2001; Ladson-Billings, 1995; Lee, 1995, 1998; Lipman, 1995; Lynn, 2006; Parsons, 2005; Pierce, 2005; Sheets, 1995; Tate, 1995; Terry, 2010; Wortham, 2002).

In Arkansas, the most noticeable subpopulation gap continues to be an African American/White gap. However, as the number of Hispanic residents of the state increases, it may also become important to explore the achievement of students of this subpopulation. According to Barth & Nitta (2005), the effects of the gap between the Hispanic student subpopulation and other subpopulations may greatly affect the fortunes of the state and the country as a whole. Given that 40% of public school students in Arkansas are African American origin, Hispanic origin, or low socioeconomic status (Southern Education Foundation, 2002); it would be a grave mistake to ignore the cultural backgrounds of such a large population of our students in our pedagogy.

For instance, Tate (1995) found that the culturally responsive pedagogy worked effectively when used within the context of mathematics. He discovered teachers that incorporated issues within the community into the framework of their classes improved student’s proficiency in mathematics. Similarly, Nasir (2000) observed an increase in mathematics comprehension when dominoes were regularly introduced as manipulatives in mathematics classes. Howard and Terry (2011) found that students who were allowed
to develop their literary works in a spoken word course improved their proficiency in English courses. African American students also saw significant gains in literacy when teachers replaced standard readings such as *The Iliad, The Odyssey,* and *Cyrano* with readings from African American authors such as Richard Wright, Alex Haley, and Tupac Shakur (Howard & Terry, 2011). Other researchers have found that students tend to perform better when they can identify with the content of instruction and cultural setting of instruction (Gay, 2000; Howard, 2001; Howard & Terry, 2011). Implementing culturally sensitive strategies in Arkansas schools could be one way of checking the achievement gap.

Finally, it is recommended that the state of Arkansas mandate students enroll in high-quality Pre-K at four-years-old. *Lake View vs. Huckabee* (2001) obligated the state of Arkansas to fund high-quality Pre-K programs to meet the constitutional standards of an adequate K-12 education. In 2003, Arkansas state law mandated public schools to cooperate with the state departments to establish or expand Pre-K in areas where schools have had chronically low test scores on literacy and mathematics (Southern Education Foundation, 2006, p. 13). However, there was no enrollment mandate, as there is in K-12. Therefore, to ensure all is being done to close the achievement gap early, enrollment in Pre-K should be available for all students in Arkansas. Several studies have shown that even earlier integration into the educational process can be beneficial to all children, specifically, those in at-risk populations (see, for example, Aos et al., 2004; Barnett, 2008; Camilli, Vargas, Ryan, & Barnett, 2010; Consortium for Longitudinal Studies, 1983; Love et al., 2002; McKey et al., 1985; Puma et al., 2005). Barnett (2008) also noted that well-designed preschool education programs produce long-term improvements
in school success, including higher achievement test scores, lower rates of grade repetition and special education, and higher educational attainment. The Southern Education Foundation (2006) in a report entitled *Miles to Go-Arkansas Pre-Kindergarten: The Key to a Better Future for All* noted that high-quality Pre-K provides children with a jumpstart that helps them stay in school and achieve at higher levels over time. Likewise, the Consortium for Longitudinal Studies (1983), also found that while economically disadvantaged children reap long-term benefits from attending preschool, students in all other socioeconomic categories benefit as well.

If this is the case, then Arkansas school leaders and legislators must continue to ensure the development of high-quality Pre-K programs throughout the state to facilitate the closing of the achievement gap. Arkansas school leaders and legislators need only to look at neighboring state to see improvement in their educational programs through the implementation of high-quality Pre-K programs. Pre-K in Oklahoma delivered the largest gains in early learning skills to minority and low-income children (Southern Education Foundation, 2006). The Oklahoma study showed all students, regardless of race or ethnicity, improved in basic cognitive skills (Georgetown University, 2004). Several other states have begun the process of offering public school Pre-K programs (Southern Education Foundation, 2006).

Leaders within the American educational system must commit to raising performance expectations for all students and not accepting that the gap is inevitable. Many factors could make the implementation of these recommendations a difficult and tedious task for schools and districts. These factors include, but are not limited to, funding, logistics, organization, and staffing. However, the potential outcome is well
worth the effort. Legislators, community stakeholders, and school leaders must work together to combat the issue of the achievement gap while recognizing that there may be significant costs. Due to the consistently changing racial demographics of our country, public schools can no longer be identified as being white schools or black schools. Rather, they must be ready to provide a free appropriate public education to any student that attends.

By no means are these recommendations meant to be an exhaustive list. They are just a few that this researcher postulates may be implemented in schools and districts. More in-depth analysis should be done to create a more exhaustive list that reflects the varying population and landscape of the national educational system. There may even be several schools and districts who have already implemented these or similar recommendations to address this issue. However, until the research results begin to trend consistently toward nonexistence of an achievement gap, more work needs to be done.

**Future Research Considerations**

There is hope that progress can be made in closing the achievement gap. In the 1970s and 1980s, when the federal Elementary and Secondary Education Act targeted funds for poor students and these students attended increasingly integrated schools, the African American-white achievement gap was cut in half (Grissmer, Flanagan, Kawata, & Williamson, 2000). Unfortunately, that progress did not continue, and the achievement gap based on students’ race and income worsened in the 1980s. The results of the 2007 NAEP Nation’s Report Card revealed that three states that border Arkansas-Oklahoma, Texas, and Tennessee-have significantly smaller achievement gaps between low-income and middle-class students, as well as between white and African American students.
The parameters of this study can be used to analyze a larger, more diverse population of students; specifically, the population of students that also includes other minorities, i.e., Hispanics, Asian-Pacific Islander, Native Americans in addition to African Americans and Whites. Rural, urban, and metropolitan school settings should also be analyzed and compared to each other as well. The school districts used in this study are considered average size districts in the state of Arkansas, but compared to large, border state districts within just a 3-hour driving radius (Memphis and St. Louis); they would be considered miniscule. Spurlock (2011) noted that the achievement gap indeed exists in Memphis. Her research suggested that lawmakers and school leaders in Memphis needed to implement programs prior to Pre-K to help close the gap. The gap is also showing up in St. Louis schools. Only 12% of African American fourth-grade males are proficient in reading, compared with 38% of White males. Additionally, only 12% African American eighth grade boys are proficient in mathematics, compared with 44% of White males (Schoenherr, 2010). This study could be replicated in those cities to analyze further and confirm an achievement gap.

Prior research has associated several different factors with having a significant effect on the achievement gap. Two of these factors are student socioeconomic characteristics and parental education level. While researchers are not in agreement with the causes and mechanisms of the relationship, they all agree that there is a relationship between a student’s socioeconomic characteristics and their academic achievement (see, for example, Bowles & Gintis 1976, 2002; Brooks-Gunn & Duncan, 1997; Duncan & Brooks-Gunn 1997; Duncan, Brooks-Gunn, & Klebanov, 1994; Hernstein & Murray 1994; Jacoby & Glauberman 1995; Lareau, 1989, 2003). Lareau (1989) noted that parents
with higher levels of education provided more resources and opportunities for cognitive
and academic skill development for their children when compared with less-educated
parents, on average, all else being equal.

This study did not include any socioeconomic data or data concerning the
educational background of the parents or guardians of the students (Lareau, 1989). This
study, while validating other studies concerning the existence of an achievement gap,
could be broadened to include these factors that may or may not have an effect on
reducing the gap uncovered by this study. Some socioeconomic information is available
for each student in the study through the original data source. However, a survey could be
developed to ask more specific questions about factors such as household income, single
or two-parent household, biological, and/or step-parent in the household, and living with
someone other than at least one biological parent. Thus, the study could be repeated while
giving surveys that also ask each student for information about their parent’s level of
education. After analyzing the data controlling for these various factors, the researcher
could determine if there were other causes of the achievement gap.

Most of the evidence concerning the achievement gap is focused on inter-group or
comparisons between groups. However, more evidence needs to be collected concerning
intra-group, or comparisons within groups, concerning achievement gaps. For example,
this study could be repeated within the group African American males. A comparison
could be made to determine if African American males in 2-parent homes perform better
in mathematics and literacy achievement than African American males in single parent
homes. The study could also be replicated based on household income. A comparison
could be made to determine if African American males in homes with a household
income above $50,000 perform better in mathematics and literacy achievement than African American males in homes with a household income below $50,000. These are two of the many possible intra-group comparisons that are needed truly to discern the data concerning African American male student achievement.

Additional research can focus specifically on teacher expectations of African American male achievement compared to their counterparts. Research exists for over three decades that educational scholars have emphasized that teachers’ expectations for students’ future performance are accurate (for example, see Egan & Archer, 1985; Good, 1987; Hoge & Butcher, 1984; Mitman, 1985; Monk, 1983; Pedulla, Airasian, & Madaus, 1980). Thus, a teacher’s expectations of a student can be an accurate determinant of their actual achievement. This study could be repeated to include surveys from the student’s teachers regarding their general expectations of African American male student performance. The data could then be analyzed to determine if teacher expectations had a significant effect on performance for African American male students.

The data from this study adds to the growing body of evidence that confirms an achievement gap indeed exists in many places and at multiple levels in the American educational system. Numerous studies from various areas in the country were identified in the research for this study. There are many angles to consider concerning contributory factors to the achievement gap. No research has pinpointed one specific factor that is responsible for the existence of the gap that separates African American males and other students. Therefore, further research should continue on this topic. There is likely no single factor that is responsible for the gap, rather a combination of varying factors that may combine different case by case. Research must continue so that educators can
identify and then eliminate any factor responsible for stifling the educational achievement of any one student, much less the millions of students that this gap affects. Including the results and findings of this study, it is apparent that the issue of an achievement gap among African American males and their school counterparts is neither germane to certain areas of the country, nor a figment of anyone’s imagination.
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102


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to the Annual meeting of the Australian Association for Research in Education, Adelaide, Australia.

http://dictionary.reference.com/browse/socioeconomic status


Appendix A

Status of Request for Exemption from IRB Review
(For Board Use Only)

Date: November 2, 2012
Proposal Number: 2012 – 113
Title of Project: Differences in Mathematics and Literacy Achievement Between African American Males and other Eleventh-Grade Students
Name and Contact information for the Principal Investigator: Jeff Flanigan, jeffflanigan@yahoo.com

☑ Research exempted from IRB review.
☐ Research requires IRB review.
☐ More information is needed before a determination can be made. (See attachment.)

I have reviewed the proposal referenced above and have rendered the decision noted above. This study has been found to fall under the following exemption(s):

1 ☐  2 ☐  3 ☐  4 ☑  5 ☐  6 ☐

In the event that, after this exemption is granted, this research proposal is changed, it may require a review by the full IRB. In such case, a Request for Amendment to Approved Research form must be completed and submitted.

This exemption is granted for one year from the date of this letter. Renewals will need to be reviewed and granted before expiration.

The IRB reserves the right to observe, review and evaluate this study and its procedures during the course of the study.

Rebeca O. Weaver
Chair
Harding University Institutional Review Board