5-2018

The Urban Black Male: Early Indicators of Algebra 1 Failure

Roy D. Harris
Olivet Nazarene University, harrisroy@sbcglobal.net

THE URBAN BLACK MALE: EARLY INDICATORS OF ALGEBRA I FAILURE

by

Roy D. Harris

Dissertation

Submitted to the Faculty of

Olivet Nazarene University

School of Graduate and Continuing Studies

in Partial Fulfillment of the Requirements for

the Degree of

Doctor of Education

in

Ethical Leadership

May 2018

THE URBAN BLACK MALE: EARLY INDICATORS

OF ALGEBRA 1 FAILULRE

by

Roy D. Harris

Dissertation

Darcel Y. Brady, Ph.D. — May 6, 2018
Dissertation Adviser

Kelly S. Brown, Ed.D. — May 5, 2018
Dissertation Reader

Kelly S. Brown, Ed.D. — May 5, 2018
Dissertation Coordinator

Houston Thompson, Ed.D. — May 5, 2018
Program Director

Carol Summers, Ed.D. — May 5, 2018
Vice President for Academic Affairs

ACKNOWLEDGMENTS

The path taken towards completion of this project was filled with time donated by my family. In as such, I want to thank my children, Kiera, Cinque, and Lee for creating the home environment that allowed me to pursue this dissertation with fidelity. Your support and encouragement made all the difference I needed to persevere. I want to especially thank my wife Stacey for being the constant supportive voice encouraging me to keep my end goal in mind. Your exhilaration about the process was truly motivating.

I want to thank my parents Elise Harris (deceased) and Roy Harris for instilling in me at a young age the notion that a quality education has the ability to enhance a life. Education has enhanced my life and I hope it has enhanced the lives of those students I was lucky enough to have served in the classroom.

Lastly, I would like to thank my uncle Michael (deceased) for being my uncle, educational mentor, life motivator and challenger of every thought I ever had concerning every topic we ever discussed.

ABSTRACT

The meager mathematical performance of the Black male student has been a well-documented event that was well over 30 years in the making. The purpose of this study was to contribute to the literature on 9th grade urban Black male Algebra performance and to identify the existence of any early predictors of high school Algebra I failure. Specifically, the study sought to identify any difference in the preferred learning styles, mathematics self-efficacy scores, and standardized test scores, among 31 urban Black males 14-16 years who passed high school Algebra I, first semester of the 2016-2017 school year and 11 urban Black males who failed high school Algebra I, first semester of the 2016-2017 school year. Data were collected via use of a learning styles inventory, mathematical self-efficacy tool, and individual student standardized test performance. The data analysis was completed using Chi Square analysis and *t*-test. Upon completion of the data analysis process no statistically significant findings were identified in the preferred learning styles, mathematics self-efficacy scores, or standardized test scores between the two groups investigated. The mathematics self-efficacy scores from the research participants in this current study averaged below the 60th percentile indicating the research participants themselves had low math self-efficacy perceptions and are in need of high school Algebra I supports. Furthermore, the results of self-efficacy findings are in alignment with other research that suggests low math self-efficacy is a good indicator of future poor math performance.

TABLE OF CONTENTS

Chapter Page

APPENDICES

LIST OF TABLES

LIST OF FIGURES

Figure Page

CHAPTER I

INTRODUCTION

The academic failure of any single student should never sit well with a teacher who is truly committed to the success of each student assigned to his or her classroom for the delivery of instruction. According to Jordan and Cooper (2003), concentrated poverty, proliferation of urbanization, and racial isolation, have led many scholars and educators to conclude that little can be done within the current educational system to improve the conditions for poor students in general, and Black male students in particular. Having a front row seat to the slow systemic demise of an entire generation of Black youth is unthinkable to most. However, such is the reality for urban educators across America who have watched negative news casts targeting Black males or have been bombarded with multiple negative images of Black males (Harper & Davis, 2012). The images being forwarded to America suggest that the environment of all Black males consist of drugs, crime, athletics, and academic failure when the simple truth is that Black males succeed in every type of school across the world (Harper & Davis). The failure of the urban Black male to obtain sustained academic success in mass numbers has become the next great controversial dilemma in need of successful unraveling as the 21st century begins to take shape (Dyce, 2013).

"Across the nation school districts are concerned about the decline in the academic performance of our students. But, no group of students is more troubling than

the academic performance of our male students" (Jackson & Hilliard, 2013, p. 311). Additionally, in American math classes across the nation, an unacceptable number of Black males between 14-16 years of age continue to fail Algebra I at the high school level. "In order for the United States to continue producing a large number of highly educated and skilled workers, we must improve the education outcomes of nonwhite youth" (Riegle-Crumb & Grodsky, 2010, p. 248). According to Riegle-Crumb, Moore, and Ramos-Wada (2011), an increase in the number of persons working in the fields of science and mathematics is needed for America to maintain its current world status and the talent to accomplish that task currently exists within the racial class boundaries classified as other than White. But for many educators working with the high school age Black male student, a clear rationale for the wide spread failure is a fundamental first step necessary to reverse this trend.

Mathematics failure for high school students in America is not entirely a new discussion. According to Mayfield and Glenn (2008), poor international mathematics performance testing by American students has been documented as early as the 1960s. The discussion of poor academic performance via the achievement gap among Black and White students began to take shape in 1965 with the advent of large-scale surveys with nationally representative samples (Hedges & Nowell, 1999). Even when well-known studies such as Jensen (1980) and Kennedy, van de Reit, and White (1963) have their results dismissed, because it is alleged that the samples used in their studies did not meet the definition of a nationally representative sample, studies such as Palumbo and Kramer-Vida (2012); Osborne, McGurk, and Shuey (1982); Braun, Wang, Jenkins, and Weinbaum (2006) still find the existence of large disparities in learning among Black and

White students still exist (Hedges & Nowell). A great deal of literature continues to confirm the deficiency in learning by Black students and many studies have begun to shed light not only on the achievement gap, but also the performance of the Black male student (Braun, Chapman, & Vezzu, 2010; McCombs 2000; McKown 2013).

The academic plight of the urban Black male student continues as a topic of interest in the educational arena because the negative academic performance of this particular population continues to be widespread and easily recognizable in many urban public school systems within the United States (Boykin, Noguera, & Association for Supervision and Curriculum, 2011; Jordan & Cooper, 2003).The academic performance of the Black male student has not been an educational phenomenon with a readily available solution. In fact, no viable and sustainable solution to this disturbing dilemma has surfaced despite the efforts of front line administrators, teachers, politicians, and parents working collectively to bring this academic crisis to an end (Jordan & Cooper).

Each day during the school year, many urban Black male high school students travel to and from school under conditions that require an inner desire in tandem with sheer will power to achieve. This same desire for academic success is both visible and tangible in the early school years and rapidly starts to dissipate for many by the start of 5th grade (Kunjufu, 1982). The academic performance of Black males is not viewed negatively in the early years of learning. Rather, the academic achievement for Black youth in grades K-2 track positively with the same standardized test performance of their White counterparts of the same age and in the same grade span (Davis 2003). However, achievement gaps between 4thth grade Black males and their White male counterparts widens and becomes significant upon the entry to high school. The disparity in

achievement between Black males and White males then increases annually thereafter (Kunjufu).

By the time many urban Black male students reach 4thth grade, their once existent passion for reading and their quick mathematical computation skills are no longer visible in large quantities. The start of high school for many of America's youth is a true celebratory event. Conversely, for many high school age urban Black males, entry into high school quickly serves as confirmation of suspected academic inadequacies that became self-apparent in grades 7 and 8. According to Kunjufu (1982), when school failure likened to the above is observed, it is the result of The Fourth Grade Failure Syndrome. "Fourth grade failure syndrome is the poor transition boys make between the primary and intermediate division" (Kunjufu, p. 9).

Statement of the Problem

Despite its importance, many students fail to succeed at high school algebra (Booth, Barbieri, Eyer, & Pare-Blagoev, 2014). "Low Algebra skills and high failure rates in ninth-grade algebra is a concern in schools across the country" (Nomi & Allensworth, 2013, p. 756). Algebra I success was achieved when the program participant exceeded an achievement grade of 70% or higher on a scale of 0%-100%. Additionally, according to Riegle-Crumb and Grodsky (2010), high school algebra is the gate keeper course impacting: (a) higher level mathematics, (b) high school completion, (c) introduction to science, technology, engineering, and mathematics (STEM), and (d) is a predictor of future college completion. New education standards have placed high school Algebra I completion front and center on the agenda for urban school reform practices. If urban Black males are to ever achieve college completion rates in high numbers, it should

be clear that the road to college success starts with the completion of Algebra I at the high school level.

The seemingly forgotten effort to adequately address the social ill of urban Black male school failure has reached critical mass and is in need of immediate attention. According to McGee (2013), Black males' academic achievement is a complex and multilayered issue. The instances of Algebra I failure by Black males in the aforementioned age group suggest that no real intervention measures for Algebra I success were actively in place or have yet not yet been identified.

To assist the Black male in his quest for algebra success, math interventions are necessary for those students who struggle with Algebra I. Algebra interventions are enacted when a student is not performing up to minimum standards in high school algebra. "An academic intervention is needed when a student is falling behind in school ("Academic Intervention" 2016, p2).

The failure of Algebra I mathematics at the high school level often has led to a lower curriculum track assignment for the Black male student. The new track assignment lacks the rigorous instruction required for success in higher level mathematics and science course work (Ballon, 2008). Ballon suggested that when Black male students do not have access to higher level mathematics and science classes then entry into post-secondary institutions of learning becomes difficult. According to Nomi and Allensworth (2013), in the current environment, schools are responsible for preparing all students for rigorous secondary course work and a competitive work environment. The poorly performing Black male student assigned to a lower curriculum track will have access to neither rigorous instruction nor the collaborative instructional teaming activities openly

visible in the college setting. Without access to college, the ability to enter lucrative career fields becomes illusive thereby disqualifying the Black male high school student from a higher education and a multitude of quality of life opportunities that would be beneficial to both Black males entering adulthood and the entire Black community for generations to come.

Background

The decision handed down in the *Brown v. Board of Education of Topeka Kansas*., 347 U.S. 483 (1954) case has been hailed as the single most important court decision in American educational history. Ironically, the plaintiffs in this case wanted the same thing for their children more than 50 years ago that many parents still want for their children today—"the best education possible" (Blanchett, Mumford, & Beachum, 2005, p. 70). In a span of just over 60 years, similar concerns over educational equality still exist with regard to urban Black males. The *Brown v. Board of Education of Topeka Kansas*., 347 U.S. 483 (1954) decision was handed down not too long ago and from then to current day, the less than stellar academic performance of the urban Black male is still not equal to that of his White counterparts. Today, "African American students, as a group, usually (not always) score the lowest on standardized test" (Jairrels, 2009, p. 7). According to Crumpton and Gregory (2011), the poor academic performance displayed by the urban Black male student is continued when Black males do not see the relationship between academic success and ability to accomplish their future goals.

The current academic performance of the urban Black male cannot be the condition sought for those who advocated for equal access to education for students of color. The architects of the *Brown v. Board of Education of Topeka Kansas*., 347 U.S.

483 (1954) case envisioned for urban Black males equitable treatment of all and real opportunities to learn without fear or occurrences of intimidation (Blanchett, et al. 2005). Has the attainment of a quality education become illusive to the urban Black male? How can we as a nation meet the learning needs of this population of Black males in need of academic intervention?

For many Black males, their learning needs go unmet because the instruction, they are receiving in their respective classrooms is not in alignment with their natural learning styles (Keefe, 2001; McKinley, & ASCD, 2010).

> Black students perform significantly better when instruction is delivered with an openness to oral expressiveness, has stylistic creativity and adaptability; hands–on work; whole-to-part learning; practical and relevant application of learning; and attention to the salience of nonverbal communication, movement, and rhythm (McKinley, & ASCD p. 104)

School success for Black males in the urban environment has definitely become an ever-changing obstacle course. For many Black males, school failure becomes a reality with the accumulation of certain issues. According to Herbert (1998), inappropriate counseling from the guidance department, curricular experiences that do not match the learning styles of Black males, and family issues are just a few issues negatively impacting the success of our nation's Black males. Too frequently and impacting far too many, our nation's young urban Black males arrive at the proverbial fork in the road and choose the path of criminal behavior that becomes a one-way ticket to a life forever entangled with the penal system. "Since 1964 approximately half of the

violent crime committed each year in the United States is attributable to Young Black males" [*sic*](Clarke, 1996, p. 46).

Research Questions

The current study was guided by the following research questions:

1. What differences exist, if any, in the Preferred Learning Styles between those urban Black males 14-16 years of age who passed Algebra I first semester and those urban Black males 14-16 years of age who failed Algebra I first semester of the 2016-2017 school year?
2. What differences exist, if any, in mathematics self-efficacy among students who passed Algebra I first semester and those students who failed Algebra I first semester of the 2016-2017 school year?
3. What Algebra I predictors exist, if any, between the preferred learning styles, math self-efficacy scores, and the standardized test performance scores of participants 14-16 years of age, who passed Algebra I first semester and participants who failed Algebra I first semester of the 2016-2017 school year?

Description of Terms

Academic Intervention. "Instructional support offered to a student falling behind in school work with the intent to increase the likelihood of academic success ("Academic Intervention", 2016, p. 1).

Culture. "a group's preferred way of perceiving, judging, and organizing their ideas, situations, and events they encounter in their daily lives" (Durodoye & Hildreth, 1995, p. 241-248).

Dyscalculia. Most frequently, "dyscalculia is associated with severe problems with mathematics and is generally agreed to be a neurologically based disorder of mathematical abilities" (Wadlington & Wadlington, 2008, p. 2).

Preferred Learning Style. "the composite of characteristics cognitive, affective, and physiological factors that serve as relatively stable indicators of how a learner perceives, interacts with, and responds to the learning environment" (Keefe, 2001, p. 140).

Significance of the Study

"The acquisition of mathematics knowledge and problem-solving skills in middle school is the foundation for a trajectory leading to mathematics success in high school, college, and beyond" (Woolley, Strutchens, Gilbert & Martin, 2010, p. 41). For the multitudes of Black males 14-16 years of age who struggle with Algebra I at the high school level, math success at the middle school level was not attained. The findings of the current study provided light where only darkness was apparent. The participants of this study learned new information about themselves including under what circumstances they learn best.

Previous research on the plight of the urban Black male high school student focused on providing updated information of the phenomena and extended the conversation around increasing overall learning opportunities for students of color (Blanchett et al. 2005; Boykin et al. 2011; Braun et al. 2010). The research from this study will be beneficial to mathematic instructors seeking to reverse the present course of algebra success for Black males between 14 – 16 years of age.

Herbert (1998) suggested that the current state of academic failure among urban Black males in the academic arena of mathematics and specifically high school Algebra I, could not continue to move in its current direction without a systemic change in the pedagogical development of the Black male student. The change becomes difficult to enact because so much literature has suggested Black students are genetically inferior academically to their white counter parts. According to Green and Wright (1991), for the past 40 to 50 years, Americans have been bombarded with the belief that African American children are deficient and do not have the ability to achieve academically like other children.

Process to Accomplish

The current study was conducted via a quantitative mix method experimental research design. Data were collected for this current study through the use of two measurement tools. The Learning Style Inventory and the Mathematics Self-Efficacy Scale were administered to student research participants on the campus of a school in the Midwestern portion of the United States.

According to enrollment data for the current 2015-2016 school year, the ethnic make-up of the student body attending the school where this current study was conducted reflected a school ethnicity that was 99% Black, with .02% White and .08% other than White or Black composing the remaining one percent of the student population. The population group for the study was sampled in accordance with the guidelines of research participant sampling. Sampling is an acceptable nonprobability participant identification strategy that allows the researcher to select participants with selected desirable characteristics (Salkind, 2012).

The total student enrollment of the school where this study was conducted consisted of a student body of 1,264 students. Of the 1,264 students, 365 were 9th grade students. Of the 365 9th grade students, 141 students were identified as Black males between the ages of 14-16 years of age. Of the 141 Black male students identified, 32 failed the first semester of 9th grade Algebra I and received a final grade of 59% or below which equates to course failure represented by a single letter grade of F. This subgroup of students became the focal point of this study of which all future data were collected, coded, and finally analyzed then subsequently reported relative to this current study. Data for the current study were collected in several different settings and in many different ways.

This researcher facilitated the entire data collection process from beginning to end. Each participant was given an informed consent form to take home for parental review and subsequent parent's signature. The form discussed the purpose of the study, potential risk, a contact person, benefits of the study to the researcher and to the participants, and location of the study. The participants completed two measurement tools in the media center of the school where the study was conducted. The study was conducted at the end of day. Only students who returned completed informed consent forms where allowed into the media center while the measurement tools were being administered. The administration of the measurement tools took one hour and five minutes to complete. After the entire data process was concluded, all data was properly collected and stored under a two-lock system for later data analysis. Participants were dismissed from the data collection session to return to their normal after school routines.

Measures

The following is a brief discussion of the two measurement tools used. The first tool used was the Learning Style Inventory. The Learning Style Inventory is a 24 item Likert scale measurement tool that is designed to assist the learner in developing strategies to enhance their leaning potential (Bixler, 2016). This particular inventory has not been validated, but similar validated inventories with the same purpose generate data with acceptable internal consistency ranges. Specifically, internal consistency coefficients of a similar inventor known as the Learning style Profile ranged from .47 - .76. The 10-day test-retest ranged from .36 - .82 with an average coefficient of .62 (Keefe, et al. (1986). With regard to reliability and validity, the internal constancy and test-retest scores were not stellar, but the tool does provide insight into individual learning styles of each research participant and information in that area is essential to the study.

The second measurement tool used was the Mathematics Self-Efficacy tool, an 18 item measurement tool that measures the students' beliefs regarding their ability to perform various math-related tasks and behaviors (Betz & Hackett 1993). To complete the measurement, examinees rate each item on a ten-point scale that ranges from 0-9. There are three subscales associated with this measurement where data were collected and analyzed. The three subscales include: 1. Mathematics Task Self-Efficacy, 2. Math-Related School Subjects Self-Efficacy, and 3. Total Mathematics Self-Efficacy Scores. The internal consistency reliability was .96 for the entire scale. Also test-retest reliability after two weeks was reported at .94. Validity scores were not available for this version of the measurement. The measurement requires 15 minutes for participant completion.

Data associated with math performance was lavishly available. Pertinent data analyzed consisted of a review of eighth grade math final grades, 8th grade math performance on standardized test for those participants with data available, test scores from the high school entrance exam, observation notes, and 2015-2016 school year first semester Algebra I final grade.

For Research Question 1, data collection began by obtaining informed consent from the parent or guardian of each Black male who participated in the current study. To answer this question, each participant was asked to complete two measures in a time span of 65 minutes. The Learning Style Indicator was administered to gather data on the test taker's preferred learning style. The Second measurement taken by study participants was the Mathematics Self-Efficacy Scale. This scale measured student beliefs about their ability to perform mathematical computations. Upon completion of both measurements, each participant was then given his preferred learning style and encouraged to have all instruction delivered take place in a manner closely related to his preferred learning style. Data were then collected on this occurrence and later analyzed.

Research Question 2 sought to identify each participant's perceptions about their own mathematical abilities. To address this research question, the researcher administered the Mathematics Self-Efficacy tool. The tool was also administered after school directly after the Learning Style Inventory was administered in the media center of the school where this study was conducted. The administration of this tool takes about 15 minutes and only students who had returned parental consent forms where allowed in the media center where the tool was administered.

Research Question 3 was associated with the identification of any early predictors of Algebra I failure among participants who passed Algebra I and students who failed Algebra I first semester of the 2016-2017 school year when their preferred learning styles, math self-efficacy scores, and standardized test performance scores in combination were analyzed. Algebra success is achieved by students when the class final score reaches 70% or higher for the semester.

The researcher answered this question by reviewing baseline data from student entry records and by performing an analysis of current student performance data. Early predictions consisted of: 1. Black males with GPAs above 3.5 achieve math success in high school algebra the first time enrolled, 2. Black males with high math self-efficacy achieve math success in high school algebra the first time enrolled, and 3. Black males with high math self-efficacy, GPAs above 3.5, and an understanding of their preferred learning style achieve math success the first time enrolled in high school algebra. These data were then run through data analytical software, frequency, performance trends, categorical information, and other statistical analysis functions that may prove informative and relative to this study.

Summary

The systemic failure of Algebra I by urban Black male students between the ages of 14-16 years of age must be corrected with speed and diligence. Most educators familiar with the current academic performance of the urban Black male understand that the current debacle did not appear overnight and thus do not expect a remedy overnight. However, a course correction is long overdue and must begin to take shape relatively soon. “If this issue of Black male disengagement in education continues to occur on its

present course and is not addressed with clarity, this democratic nation of ours will decay" (Dyce, 2013, p. 165). America cannot continue to prosper and maintain its position as a global leader without the success of the middle-class family. According to Madland, Bunker and Center for American, (2011), the situation becomes more pronounced when poor Black families cannot raise children to become middle class citizens, the sustainability and academic achievement of our country is negatively impacted. Increasing and improving the academic outcomes for poor children and in particular Black youth continues to be a pressing issue deserving of immediate corrective action confronting current day academia (Dyce).

The voices leading the conversation may change, but the low academic performance among Black males in the area of academic success has been the focal point in academia for many years (Cleveland & ASCD, 2011; Irvine, 1990; Kunjufu, 2001; McKinley, 2010). Most discussions on the topic of Black male academic performance in the urban school setting are discouraging and the tone commands attention to the future of this population.

In the next chapter, the researcher will review the literature detailing the academic shortcomings of the urban Black male student that when reviewed in its entirety will provide evidence for an immediate course correction for the benefit of the urban Black male student.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

The educational status of Black male youth continues to receive increased attention (Davis, 2014). Within the last decade, the urban Black male's academic story in general has been widely discussed in the research literature. Specific emphasis has been placed on the persistent poor academic performance of this particular population when compared to the performance of other ethnic groups of similar age (Whiting, 2006; Kafele, 2012). While there are many facets that have contributed to the current academic plight of the urban Black male, the study of the urban Black male and his specific performance in the area of mathematics remains a largely understudied area of educational research (Thompson & Davis, 2013).

When speaking of the performance of the urban Black male in the area of mathematics success, the literature has been short on words. African American students have unique issues, inclusive of poverty, that prevent them from performing well academically (Sommers, Owens, & Pilawsky, 2008). In short, the academic performance of the urban Black male 14-16 years of age in the area of high school algebra success can no longer be ignored or tabled to be discussed at a later date.

According to Davis (2014), not all black males get the opportunity to take algebra in middle school. When urban Black males are not able to receive the same instructional supports received by their ethnic/suburban counterparts, the uphill battle for mathematics

success becomes even more difficult to attain and remains further out of reach for far too many Black males.

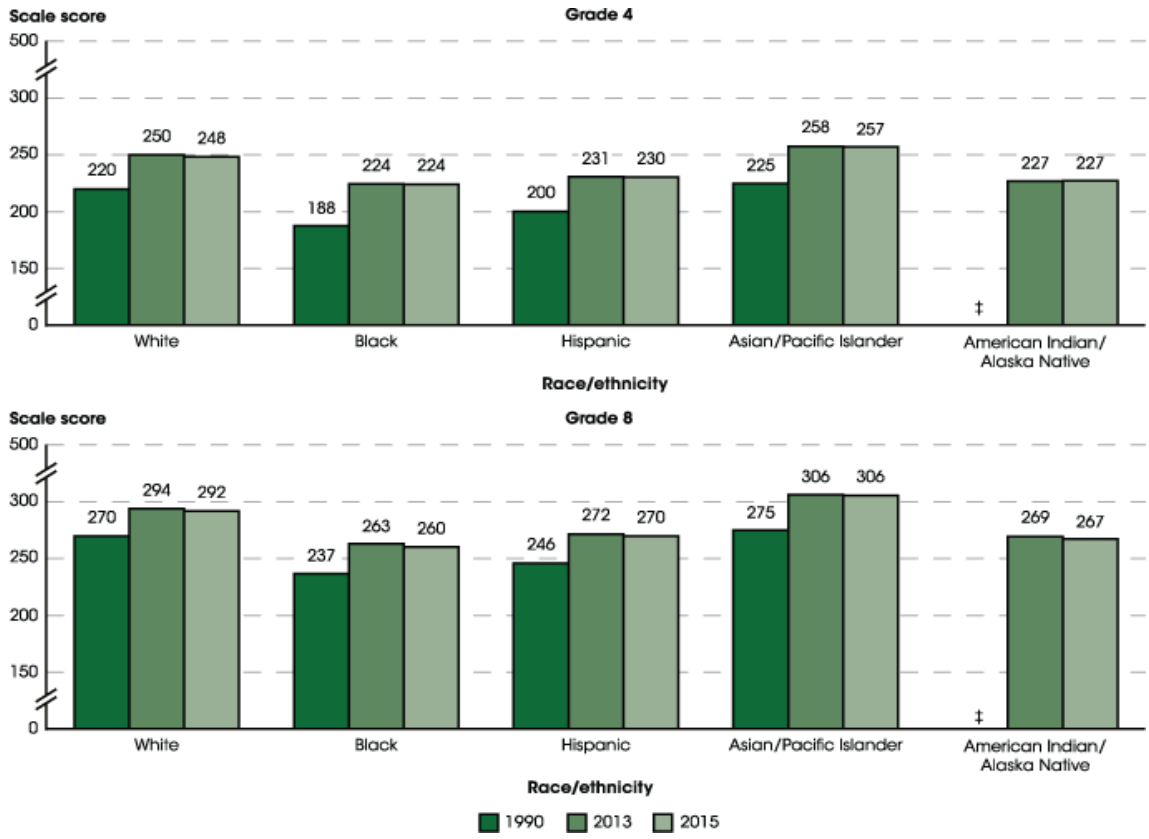
Black males have struggled and continue to struggle in large quantities in the area of mathematics across multiple grade levels (Dillihunt & Tyler, 2006; Schott Foundation, 2015). According to Gabriel (2010), only 12% of Black eighth grade males were proficient in mathematics in the city of Baltimore compared to 44% of White eighth grade males. This data summary indicates that in 2010 a greater number of Black males arrived to high school in Baltimore ill prepared for the rigors of high school Algebra I. According to the 2010-2011 Maryland School Readiness Report, young Black males enter the early schooling process at age 5 with early academic deficits in larger percentages than any other group by race and age. On average, black, Hispanic, and American Indian students demonstrate statistically significantly lower reading, math, and vocabulary skills at school entry than white and Asian American children (Sandowski, 2006)

Ill Prepared and not Algebra Ready

Academic readiness starts in the early years of elementary school and continues through out middle school (Kafele, 2012). According to data from the National Center for Educational Statistics (2016) report on mathematics performance, young Black males continue to struggle with their standardized test performance across grade levels. The negative trend has been statistically visible in the form of multiple data sets from 1990, 2013, and 2015 (see table 1). These same scores do not belong to public education alone, but rather represent achievement levels for Black males in both public and private schools in 4^{th} and 8^{th} grade (National Center for Educational Statistics, 2016).

Table 1

Cohort Performance of 4th & 8th Grade Males by Ethnicity, 1990, 2013, and 2015

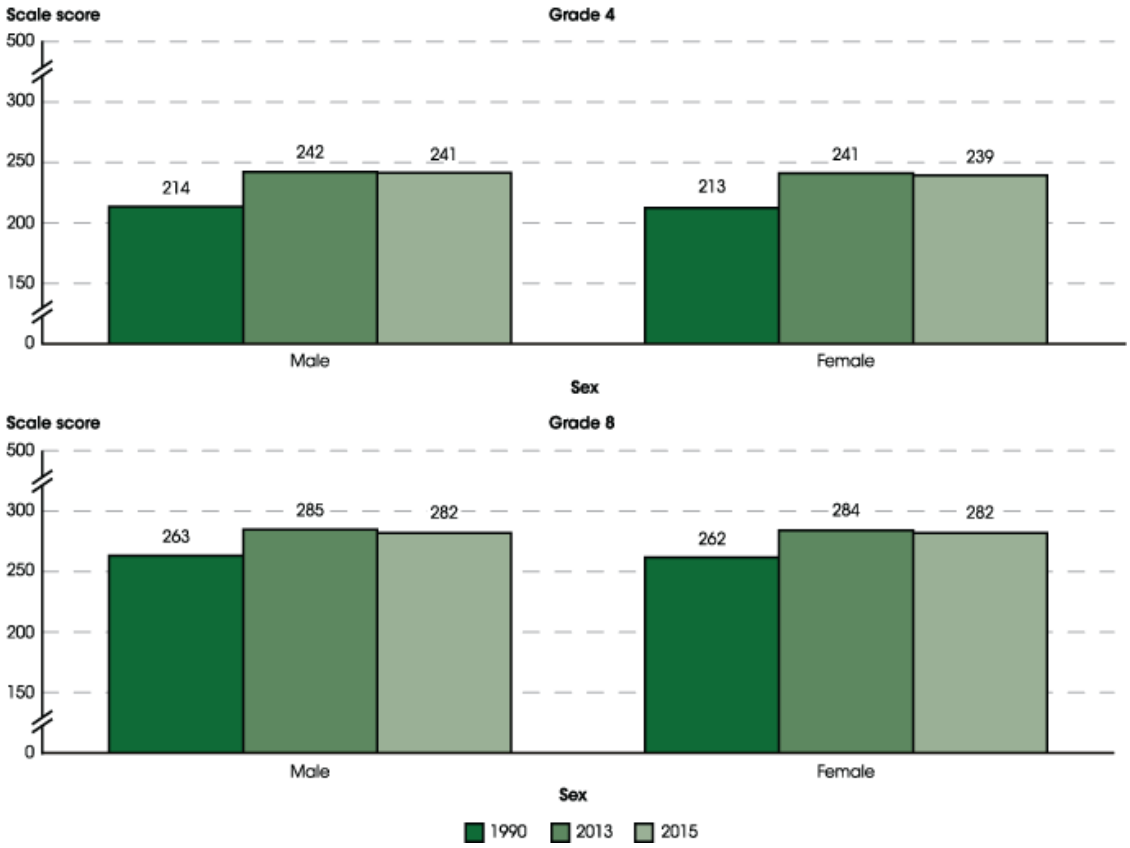


Note. Reproduced from National Assessment on Educational Progress (2015).

Achievement data taken from assessments given by the National Assessment on Educational Progress (NAEP) in mathematics from 1990, 2013, and 2015 identified Black males in the 4th grade as scoring the lowest when performance data is disaggregated for males by in Table 1 and by gender in Table 2. The performance patterns remain constant on multiple assessments in multiple states across the country.

Table 2

4th & 8th Grade Math Performance on NAEP for 1990, 2013, and 2015



Note. Black, White, Asian from left to right. Reproduced from National Assessment on Educational Progress (2015).

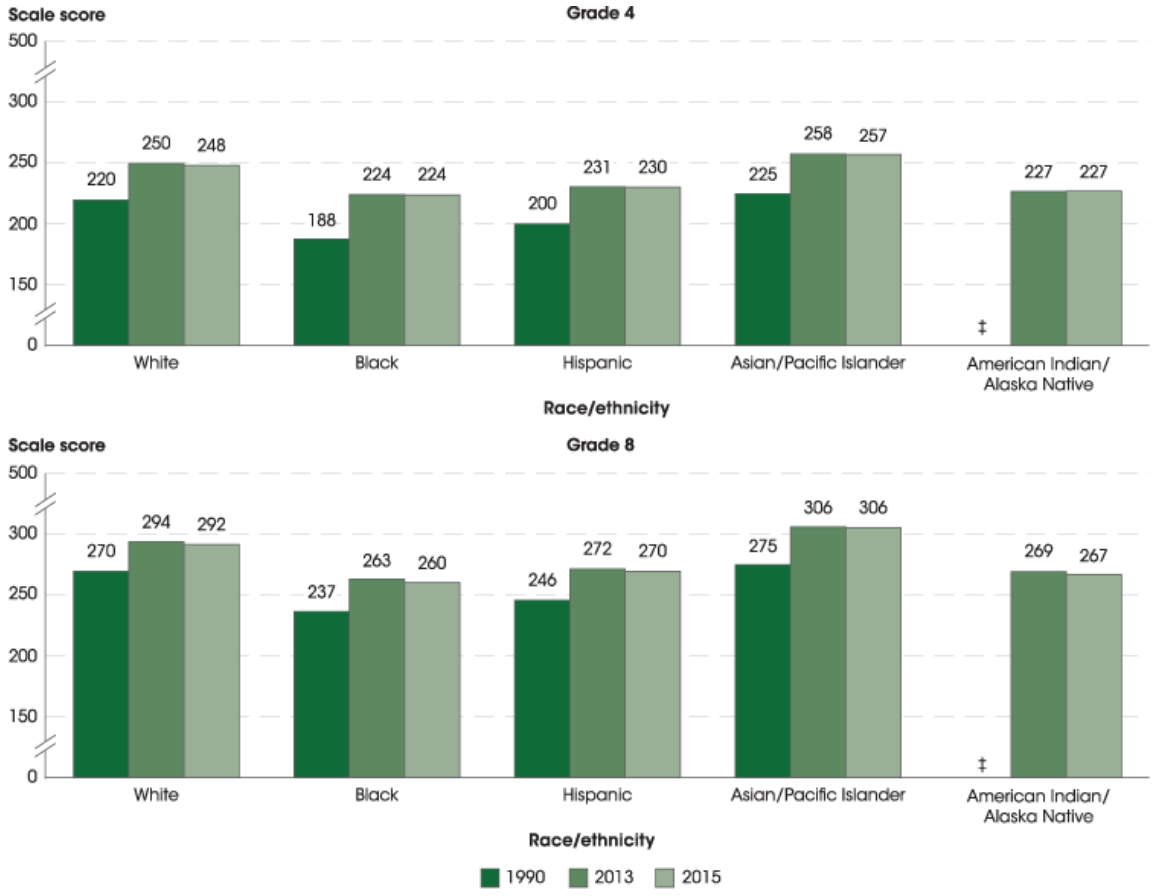
Performance indicators suggest the need for intervention in the early years of mathematical literacy attainment. A review of the data from the NAEP (2015) report identified a trend suggesting Black males enter the mathematics learning arena in 4th grade with gaps in their learning, and the gaps remain unchanged through the middle school years of mathematical instruction (National Center for Educational Statistics, 2015).

As our nation's Black males progress through the early elementary school grades K-5 and in the middle school grades 6th - 8th, mathematical computation skills have still

not reached acceptable achievement levels (Booth, Barbieri, Eyer, & Pare-Blagoev, 2014; Kafele, 2012). According to NAEP mathematical assessment data from 1990, Black males in the 4th grade scored nearly 40 percentile points lower than Asian males in the 4th grade, 32 percentile points lower than White males in the 4th grade, and 12 percentile points lower than Hispanic males in the 4th grade Table 3.

Table 3.

4th & 8th Grade Math Performance by Ethnicity and Sex for 1990, 2013, 2015.



Note. Reproduced from National Assessment on Educational Progress (2015).

When NAEP assessed 8th grade males in 2015, some 25 years later, the mathematics performance level of Black males on NAEP assessments was fundamentally unchanged. The math achievement gap was still visible, and even more concerning was

the fact that the mathematics performance gap increased in some instances. Specifically, Black males scored nearly 50 percentile points lower than Asian 8th grade males, 32 percentile points lower than 8th grade white males, and 10 percentile points lower than 8th grade Hispanic males (see table 3). Based on NAEP data from 2015, many Black males at the middle school level have already demonstrated via their performance on standardized test that they are not algebra ready.

According to Whiting (2006), the majority of urban Black males receive their education via their local public-school system. In recent years, many urban public school systems have had or are currently dealing with budgetary constraints, an inability to attract certified teachers, high student dropout rates, high teacher turnover rates, high student absenteeism, and problematic student behavior (Ahram, Stembridge, Fergus, *& n.* Noguera *n.d.)*. These issues have negatively impacted the urban Black male student in his quest for algebra success to the point where algebra readiness for this population has been placed in harm's way.

Nomi and Allensworth (2013) investigated the impact that expanded instructional time had on the academic outcomes of students enrolled in 9th grade algebra. The students attended Chicago Public Schools and were identified by their performance on the 8th grade standardized test. Students with deficient math scores were referred to as below norm students and received two hours of algebra instruction daily. Students with acceptable 8th grade math performance scores were referred to as above norm students and received a single hour of algebra daily. At the heart of this intended intervention was the fact that the below norm students would be exposed to an additional instructional

hour of algebra. The failure of this highly anticipated intervention was not expected since the program was designed to improve algebra success for a great number of urban youth.

School districts across the country have been trying to reverse the downward spiral of district test scores in the area of high school algebra. According to a litany of research literature, algebra by nature is a complex subject requiring skilled math instructors to impart good instruction to oftentimes struggling math learners with concept gaps, (Novotná, & Hoch, 2008; Zientek, Younes, Nimon, Mittag, & Taylor, 2013), learning disabilities and undiagnosed mathematic disabilities (Steele, 2010).

The study conducted by Nomi and Allensworth (2013) suggested to those unfamiliar with the art of imparting good instruction of complex concepts that a course correction in the form of more algebra instruction appears to be incorrect. Nomi and Allensworth concluded that simply providing students with expanded instructional time in algebra alone is not a viable intervention and that such an approach could have negative consequences. Specifically, for many targeted students the added instructional time boosted their test score. Unfortunately, failure rates increased for untargeted students and was attributed to the student selection and the algebra class placement process. There are no quick fixes when working with students with mathematical computation gaps and the practice of additional algebra classes does not yield desired outcomes (Snipes, Finkelstein & Regional Educational Laboratory WestEd, 2015).

Many urban students have difficulty with complex mathematical concepts with the rigorous standards negatively impacting the inequality of higher level mathematics taken by students associated with a low social economic status (SES) and identified with Black ethnicity (Cha, 2015).

Eunsook, Sas, and Sas, J. (2006) investigated test taking strategies by high performing and low performing students in the area of mathematics and suggested that math success for urban Black males could be enhanced by using best practices when preparing to study. The major focus of the study was to identify those practices committed by high achieving advanced mathematics students and express to low performing mathematics students practices that have been shown to lead to higher performance scores. The practices utilized by the high performing math students included, efficient note taking, actual problem solving rather than reviewing problems previously completed, and test preparation taking place over a number of days rather than last minute preparation.

Eunsook et al (2006) concluded that the major difference in the test preparation process between the two groups was the use of deep level strategies in the assessment preparation process. Deep level strategies can be likened to identifying and solving actual math problems versus reviewing notes and simply looking over past work covered in class.

When mathematics is not made relevant to students, they will often times make computational errors in an effort to remove themselves from the assignment at hand. Some errors are common for beginning algebra students, but persistent errors may be indicative of misconceptions in earlier delivered instruction (Booth, et al. 2014).

Booth et al. (2014), launched a study to identify patterns in the mathematical errors made by students assigned to high school algebra. According to Booth et al. effective interventions are available when identification of persistent errors and the time in the curriculum when the errors occur can be established. Moreover, targeted

instruction is made available to students in need and learning gaps are closed so that algebraic misconceptions do not hinder future mathematical performance. Booth et al. concluded that error patterns do exist in the computational abilities of high school students assigned to high school algebra. Booth et al. further concluded that if the conceptual errors still occurred toward the end of the year and after targeted interventions have been applied, the errors may be associated with other mathematical deficiencies.

Dillihunt and Tyler (2006) investigated the effectiveness of the types of instruction delivered to African American students. Specifically, traditional instruction, also known as direct instructional practices were compared to instruction delivered under the construct of the Multiple Intelligence theory (MI). Dillihunt and Tyler, advocates of the Multiple Intelligence theory, suggest that low income students arrive to school with experiences from their communities that lend themselves to mathematic success. Additionally, the researchers hold the belief that mathematical success can be achieved by minority students too if educators would only deliver instruction along the lines of their daily experiences and associated with one of the eight intellectual capacity levels likened to most persons. Gardner's (1997) eight intellectual capacities include verbal/linguistic, visual/spatial, bodily/ kinesthetic, intrapersonal, logical/mathematical, musical/rhythmic, interpersonal, and naturalist (Gardner).

The results of the Dillihunt and Tyler (2006) study showed struggling algebra learners could be positively impacted from a change in instruction type. Specifically, these findings suggest that urban Black male algebra performance outcomes could be positively impacted by adjusting instructional delivery routines to meet the identified intelligence capacities of each student assigned. Additionally, students receiving

instruction under multiple intelligence conditions scored higher on measurable assessments than students in the direct instruction conditions.

Able and Willing but Unaccounted for in STEM

African American males are not present in large numbers in science, technology, engineering, and mathematic (STEM) courses in high school across the country and an extreme achievement gap exists between White and Black students in science, technology, engineering, and math fields. "Despite significant funding of IT/STEM youth programs over the last two decades, African American , Latino, and female students remain underrepresented in the related workforce, particularly in the area of computer science" (Duran, Hoft, Laswson, Medjahed, & Orady, 2014, p. 117).

Duran et al. (2014), conducted a study to determine if enhanced inquiry by urban students/Black students could be achieved with 18 months of intervention in an afterschool program with specific emphasis placed on IT/STEM learning. The success experienced by the participants was contributed largely to the instructional design that utilized inquiry based learning and collaborative learning strategies supported by hands on technology usage. Duran et al. concluded that the afterschool program had a major impact in the changing of thought process concerning IT/STEM, how high school students view IT/STEM, how the students used technology, and their decision to enter the IT/STEM career field. When learning is designed with the students' needs in mind, as evidenced by this study, enhanced outcomes for students can be achieved.

Strayhorn (2015) conducted a study with the purpose of identifying practices that tend to draw Black males into successful STEM careers. According to Strayhorn, there are three guiding factors that drive Black males into STEM coursework and ultimately

STEM careers. The first behavior was attitude. According to Grandy (1998) as cited in (Strayhorn) "attitudes towards math and science courses also influenced Black student's success; similar results were reported elsewhere (p.47)". The Strayhorn study also attributed education aspirations and nonacademic factors such as self-efficacy as behaviors that promote STEM awareness and STEM career selection among college bound Black males.

Research findings from the Strayhorn (2015) study yielded three conclusions. First, Black males with confidence in their abilities and belief in themselves tend to major in STEM, earn good grades, and persist in college. Next, young Black males who are drawn to science and mathematics at an early age grow up to become Black males who take STEM courses and pursue STEM careers. Finally, Black males with positive experiences in STEM courses develop a sense of belonging that reduces departure from the STEM path. Whether or not Black males 14-16 years of age can excel in STEM courses is not in question. What is important at this juncture is the identification of the process that will allow urban Black males to bask in the findings of this study and experience the pleasures of sustained academic performance in STEM throughout high school and into post-secondary learning.

Peters-Burton, Lynch, Behrend, and Means, (2014), identified a new type of high school concept taking shape in areas across the United States referred to as Inclusive, Science, Technology, Engineering, and Mathematics focused high schools (ISHS). According to Peters-Burton et al., the goal of ISHS schools is to identify students from underrepresented ethnicities in high school and equip them with the tools to be successful in STEM college courses and STEM careers. Peters-Burton et al separated the new ISHS

schools from traditional STEM schools by the type of students who eventually enroll. Traditionally, the early concept STEM high schools enrolled those students who had a previously identified history of success in the focus areas of STEM. ISHS students do not have and are not required to have such identified areas of success in STEM.

Peters-Burton, et al. (2014), suggested that there are 10 critical components that may work together to increase the likelihood of success with high school STEM programs for populations such as urban Black males. Peters-Burton et al. also suggested that success of the ISHS is likely to be sustained when the 10 components work in tandem. The components are: 1. Use of a STEM focused curriculum, 2. Reform instructional strategies and project based learning, 3. Integrated, innovative technology use, 4. Blended formal/informal learning beyond the typical school day, week, or year, 5. Real world STEM partnerships, 6. Early college-level course work, 7. Well prepared STEM teaching staff, 8. Inclusive STEM mission, 9. Administrative structure, and 10. The implementation of supports for underrepresented students (p. 67).

High School Course Selection

Black males attending urban schools do not always receive the best in educational services for a variety of reasons. Decisions are made in middle school to assign students to different high school levels and tracks that are low level and affect post-secondary opportunities (Archbald, Glutting, & Qian, 2009). In order for students to take higher order instructional classes, such classes have to be offered and offered at different levels (Spade, Columba, & Vanfossen, 1997). "In high school, course section and taking are important structural predictors of student achievement especially in mathematics" (Kelly, 2009, p. 48). In a study conducted some 19 years ago, Spade et al. (1997) reviewed the process by which students were able to select high school courses. The high schools

selected for the study were considered to be high performing high schools and were selected from an assortment of neighborhoods. The researchers identified differences in the courses offered and the processes used to select high school courses. Students from more affluent neighborhoods had a wider choice of courses to select from that were also college preparatory in nature. Where there were more pre-college courses offered, there was also present a well-established process for course selection that allowed input from staff, counselors and parents.

Other studies have also suggested that a successful course selection process is tuned to the needs of the individual students. Specifically, many researchers found that the availability of diverse course offerings and procedures used by counselors, teachers, and schools to place students in courses is important in linking students to different opportunity structures (Spade, Columba, & Vanforseen, 1997)

The current academic performance of the urban Black male 14-16 years of age is of concern in academia. Despite increased enrollment in advanced courses, urban Black males and other minorities still maintain great disparities in achievement levels in such courses when data was reviewed by ethnicity. Rigorous course selection and course taking does contribute to the academic success of urban Black males enrolled in mathematics classes according to Riegle-Crumb and Grodsky (2010). Riegle-Crumb and Grodsky explored the differences in mathematic course taking and the achievement gap between Black and White students despite more Black students enrolling in advanced math classes across the country. The participant group consisted of 10^{th} grade high school students who submitted data over a two-year period. The researchers collected data for this qualitative study via surveys, questionnaires, and achievement tests completed by the

student participants. The researchers analyzed the data via multivariate regression analyses.

Riegle-Crumb and Grodsky (2010) drew four findings from their study. Their first conclusion was that being in an advanced math class improved math achievement for all students. Additionally, their second conclusion was that math gaps for Black students are most evident in advanced math classes, with differences in achievement determined by the number of courses previously taken. Their third conclusion suggested that African American youth from segregated schools still fared the worst in their efforts to close the achievement gap with White students enrolled in the same courses. The fourth finding suggested Black students with similar socioeconomic indicators as White students do not enroll in advanced math courses in the same manner and suggested that other variables are in play.

Kelly (2009) also investigated the difference in mathematic course taking between Black students and White students. The researcher concluded that Black students are more likely to be enrolled in low level math tracks by 10^{th} grade and ill prepared for college success. Kelly concluded that socioeconomic status does impact course selection and that desired course selection odds are better achieved at predominantly Black schools. Black students are disadvantaged at predominantly white schools, and course selection discrepancies are virtually non-existent between Black students and White students at Catholic schools. According to Kelly, issues of student inequality are remedied and intentional inclusive activities lead by students and staff members are hallmark actions in the Catholic school environment.

Cha (2015) conducted a study to determine why the disparities in high school level mathematics course taking was so disproportionate when enrollment data was viewed by ethnicity in an area public high school. Data obtained from the study showed that as the level of mathematics increased, the percentage of students taking advanced mathematics courses decreased. In public schools where students are able to select their course independently, students opt to select courses that are equivalent to the higher level courses rather than take the actual courses.

At the student level, the observed difference in the probability of taking higher mathematics courses can be largely explained by differences in ethnicity and family background, particularly parents' educational expectations and SES, consistent with previous studies (Adelman, 2006; Bozixk & Ingels, 2008; Coger et al. 2009; Riegle-Crumb & Grodsky, 2010) [sic] as quoted in (Cha, p. 14).

Diminished Urban Parent Participation in the Education Process

Hilgendrf (2012) investigated the extent to which students, parents, and teachers, perceived Black male support was available at school. This qualitative study had a participant group that consisted of three Black males, their parents, and teachers who all had varying opinions concerning the academic support offered at their school. The researchers organized the data using NVIVO qualitative data analysis program. The researchers concluded that in spite of effective support being offered, there was no universal agreement concerning the actual support offered to Black males.

Hilgendrf (2012) investigated and confirmed that the assistance offered by schools to students may not always transfer as actual assistance to the students or their parents. In three qualitative case studies, the researcher identified varying degrees of

support offered to African American boys and their families. Some participants identified school staff persons as being helpful and supportive. According to Hilgendrf, supportive behaviors included encouraging talks, and instrumental help. However, the researcher also concluded that the perception of supportive behaviors is dependent on the vantage point from which the support is being viewed. Hilgendrf further surmised that schools in general truly believe that they service their students well. But when students struggle academically, early intervention is the best prescription to enhance the possibility for future academic success. For most schools that belief can be seen daily in the attention given to the academic needs of those Black males assigned for instruction in high schools across the nation. For other schools, the same belief is not transferred to the students and is not visible to the parents.

Effective parenting by urban parents tends to lead to true academic achievement by urban students particularly in urban Black males. Robinson and Werblow (2012) investigated the multiple ways Black single mothers support their Black sons in light of the many obstacles in the path leading to academic success. The participant group for this qualitative study consisted of 11th grade students providing data in a multiple case study design. The ways single Black mothers raise their sons to be successful academically and the procedures and practices taken by single Black mothers to keep them academically successful were the basis of the two research questions that guided this study (Robinson & Werblow).

Robinson and Werblow, (2012) concluded there were six practices used by single mothers that assisted them in raising academically successful sons. The six practices were: having knowledgeable resources, being a tactful motivator, being supportive of the

whole child, keeping in touch with him regularly, utilizing positive role models in the community, and addressing issues quickly and completely, all helped in grooming an academically successful son. Robinson and Werblow investigated and confirmed positive academic activity by Black males indicated that quality parenting by urban parents contributes to Black male school success.

Filer and Chang (2008) investigated what impact peer and parent encouragement had on the decision of 8th grade students from lower socioeconomic status (SES) backgrounds to enroll in early algebra. Children in general need the support and guidance from their parents in order to thrive and reach their full potential. According to Filer and Chang although there are many benefits of early algebra access, students from low income backgrounds still do not take advantage of algebra enrollment opportunities in large numbers prior to high school. The participant group for this quantitative study consisted of 3,288 students. The researchers collected data via survey which was then analyzed via multiple regression methodologies. Researchers concluded that peer and parent encouragement contributed greatly in the decision making process to take early algebra. There was also a positive correlation between SES, early algebra access, and mathematic achievement.

Filer and Chang (2008) investigated and confirmed that early algebra access prior to high school is correlated to future mathematics success for low SES 8th grade students. The researchers called for future research to investigate if math success is sustained in high school beyond algebra and into higher mathematics. According to a report published by the Center for Public Education (2009) students with involved parents earn high grades and test scores, enroll in higher level courses, attend school regularly, have better

social skills, and graduate and go on to post-secondary education. When parents/guardians are absent from the task of educating their students, behaviors counter to those mentioned above may occur which will further exacerbate the urban Black male's quest for math successes and a life out of poverty.

Negative Self-Efficacy

Nichols and White (2001) investigated the inner workings of adolescent peer groups in two high schools from the mid-Southern region of the United States. Nichols and White wanted to review the relationship between clique groups and student achievement of persons within the clique and the achievement of students not belonging to any peer networks in a low and regular track high school algebra class.

Nichols and White (2001) concluded that clique group associations could be used to predict achievement in both upper track classes and lower track algebra classes. The researchers of this study also suggested that academic achievement of group participants was a factor in the initial formation of the clique group suggesting that clique groups can impact positive student achievement. Nicholas and White completed a research study that investigated the impact cliques/clique groups had on student achievement. While major swings in student achievement levels were not visible among students within a clique group, early networking was visible in elementary grades indicating that high achieving students can also bridge friendships early in the learning process.

According to Jones, Irvin, and Kibe (2012) relationships developed by and among urban students were meaningful relationships. Specifically, the researchers investigated the impact that math self-concept and perceptions of their friend's math performance had on the math performance of African American youth. Jones et al. investigated and

confirmed that adolescent friendships can positively impact math performance of African American youth and when coupled with an inner belief of self-concept, math success is achievable. The researchers concluded that a higher perception of a friend's math performance and high self-concept were positively associated with math achievement in all geographical locations. Understanding the classroom dynamics of the urban classroom includes having knowledge of the relationships forged by students that ultimately impact achievement. When a teacher is aware of such relationships, strategic planning of lessons becomes essential when instructional strategies such as cooperative learning and cooperative grouping are utilized to support learning (Lin, 2006).

Problematic School Behavior

Caton (2012) investigated the impact that zero-tolerance programs had on the academic outcomes of Black males during their high school experience. The zero-tolerance program was designed to deter students from participating in highly undesirable behaviors in the school setting with harsh penalties for those who committed prohibited acts. The out of school time associated with the suspension all but guaranteed the academic failure of all Black males found guilty. The impact that security measures had on student learning, the availability of positive student/teacher relationships, the conditions of the disciplinary learning space on student learning, and the implementation of discipline practices on Black male students were areas central to the Canton study.

Caton (2012) concluded that zero-tolerance programs negatively impacted Black males disproportionately and encouraged academic disengagement. The researchers encouraged educators and administrators to provide teacher training in classroom management to end zero-tolerance practices. Caton's research on zero-tolerance

identified a disciplinary approach run astray that negatively impacts Black males and recommends the dismantling of such programs to increase future Black male school success.

The urban classroom is truly a difficult place to conduct learning in some cases. According to McCready and Soloway, 2010, teaching in the inner city is difficult for a variety of valid reasons. Urban students arrive to class operating often times below grade level with classroom behaviors that make teaching difficult for even the most seasoned teacher. “Many African American adolescents who enter high school with low achievement are at-risk for being perceived as defiant and uncooperative by their classroom teachers” (Gregory & Thompson 2010, p. 41).

Negative student behavior in the middle grades for many Black males creates lost time in the development of their mathematical identity. According to Lin et al. (2013), a connection between math difficulties and behavior issues is sustainable. Without a well-constructed mathematical foundation, algebra success is highly unlikely for urban Black males at the secondary level.

Montague, Enders, Cavendish, and Castro (2011) investigated whether the early predictors of possible emotional disorders and academic issues were valid for students as they progressed from middle to high school. They also suggested that if early predictors of future negative classroom behaviors can be consistently identified, appropriate interventions could be initiated and learning outcomes could be enhanced for a multitude of urban Black males with a history of poor classroom behavior.

Montague et al. (2011) believed that early intervention can result in positive behavior and academic outcomes throughout the educational experience. Moreover,

Montague et al. suggested that the early predictors of social behaviors and emotional behaviors were valid, meaning the predictions of future behavior issues and emotional issues were confirmed. Montague et al. also suggested a correlation exists between early predictor of emotional and behavioral occurrences and student achievement.

Lannie and McCurdy (2007) investigated the effectiveness of a behavioral management intervention strategy used to correct poor classroom behavior. Poor classroom behavior by urban Black males in the middle grades can be corrected prior to entry into high school and entry to high school algebra by implementing proper behavior management controls. The teacher's actions are deliberate, but the students view the teacher's actions as part of a game. The teacher used the students' desire to play as a way to get students to model good behavior while the teacher delivered instruction. The researchers qualified this study as being necessary because many new teachers lack the ability to manage student behavior in urban schools and leave the profession prior to getting proper training. Lannie and McCurdy concluded that the behavior intervention strategy was effective in creating a positive learning environment for African American students at the upper school level as well.

Preferred Learning Styles

Gadzella, Masten, and Huang (1999) conducted a study to determine if there were differences in the critical thinking skills and learning styles between Black students and Caucasian students. Gadzella et al. concluded that Caucasian students had a higher mean average than Black students on the critical thinking assessment's sub test. However, Gadzella et al. also revealed that the literature reviewed did not discuss much on the

comparison of critical thinking skill between Black students and Caucasian students, but did question if all students are being taught strategies on how to think critically.

Ozerem and Akkoyunlu (2015) conducted a study to determine the impact the learning environment designed with the students' learning style in mind played on student achievement in the area of mathematics. Ozerem and Akkoyunlu concluded that instructional arenas designed with the student learner's preferred learning style in mind did have a positive effect on student achievement. Specifically, the learning outcomes were enhanced for visual auditory learners, auditory-kinesthetic learners, and visual-auditory learners resulting in significantly higher post test scores. The students also indicated that the strategies used in this test setting could also be used in other academic areas to increase learning for assigned students.

Jackson-Allen and Christenberry (1994) conducted a study that compared learning styles preferences between low achieving Black males and High achieving Black males. The selection process was random and was based on student performance in core academic areas. The findings from the Jackson-Allen and Christenberry study yielded three findings. The first finding was that the high achieving African American males had preferences for verbal motivation. The second finding was that the high achieving African American males also were more motivated by their parents than were the low achieving African American males. The third finding was that the low achieving African American males preferred activities that required mobility rather than stationary individual learning activities likened to traditional learning approaches. Jackson-Allen and Christenberry concluded that low achieving and high achieving African American

males are more alike than not as both groups respond positively when their preferred learning style is utilized in their learning setting.

Wilson-Jones and Marlene (2004) conducted a study to investigate the academic success of African American males when cooperative learning activities were utilized in 3^{rd} – 6^{th} grade classrooms. All student participants were regular education students. A large portion of the students assessed reported that the course work completed during cooperative learning activities increased their desire to learn. "According to Hale-Benson, (as cited in Wilson-Jones and Marlene, p. 280) teachers of African American students must understand the role culture has on learning styles and adapt teaching styles to coincide with these learning styles.

According to Kunjufu (2001) African American males display a preference for 1 of 3 different learning styles. The preferred learning styles are 1. visual learner, 2. oral/auditory learner, and 3. tactile/kinesthetic learner. The visual leaner is further defined as (a) visual print and (b) visual picture. According to Kunjufu, printed assignments may work well for students with a preference for visual print assignments, but may not allow accurate assessment of the abilities of a student with a preferred learning style for visual picture.

According to Kunjufu (2001) Oral/auditory African American male learners either like to hear themselves speak (oral learners) or like to hear the lesson read to them (auditory). Kunjufu further suggested that students with a preference for auditory learning may also have reading deficiencies. The tactile learner demonstrates his understanding best when he can use his hands in the student work session and the kinesthetic learner demonstrates his learning best when he can stand and move about the room. Kunjufu

concluded that African American males are best supported when instruction is geared toward their preferred learning styles and if utilized correctly could also reduce the percentage of Black males assigned to special education.

Urban Math Teacher Preparation

In the United States, Black male students in urban schools are among the most vulnerable students in the public education system (Milner, Pabon, Woodson, & McGee, 2013). The issue of urban school districts having difficulty hiring and maintaining the employment of qualified teachers in the classroom has been well discussed in the literature. According to Jacob (2007) urban districts hire teachers who are less highly qualified than their suburban counterparts with respect to characteristics such as experience, educational background, and teaching certification.

McGrady and Reynolds (2013) investigated the validity of White teachers having negative perceptions of Black students' academic performance that ultimately resulted in the assignment of grades to students by use of nonacademic measures. Often time new teachers and some veteran teachers struggle with classroom management and distribute grades to Black male students for positive behavior rather than academic achievement (McGrady & Reynolds).

According to McGrady and Reynolds (2013) Black students are placed in disadvantaged academic situations by White teachers frequently because schools and teachers welcome middle-class standards. According to McGrady and Reynolds, Black students become frustrated by the reprimands received for non-compliance and give up positive behavior management and their quest for academic excellence. McGrady and Reynolds investigated and confirmed instances where White teachers do carry negative

perceptions into the grading practices of those Black students assigned to their class for instruction.

Parents and students arrive to the start of school each year with expectations of a school year filled with many learning opportunities. Teachers too arrive to school with expectations for students. Many studies have been completed which concluded teacher expectations directly contribute to student achievement (Jimenez-Morales, & Lopez-Zafra, 2013; Jones, Miron, & Kelaher-Young 2012; and, Williams, 2014).

Espinoza, Areas da Luz Fontes, and Arms-Chavez (2014) investigated the ability of a group of teachers to evaluate student performance without bias after having been exposed to the incremental theory of intelligence, to maintain equal performance expectations for both males and females. The participant group consisted of 64 mathematics teachers from the Southwest portion of the United States. Teacher attributions of student performance in math after having been exposed to the theory of intelligence were thought to attribute math success to effort and math failure to a lack of effort.

Particular attention was given to the Espinoza et al. (2014) study because the focus of the study targeted teacher expectations and male academic performance in the core area of mathematics coupled with an introduction to the theory of intelligence. The theory of intelligence asks teachers to look at success in mathematics as effort- based and not as a fixed quality. The researchers also concluded that if teachers maintain different mathematical expectations for males and females at the high school level, future math success becomes questionable.

Espinoza, et al. (2014) investigated and confirmed evaluation biases among math teachers indicating the exposure to stimuli in the training sessions was not long lasting. Negative academic biases among algebra teachers assigned to deliver instruction to Black urban males at the middle school level all but ensures that Black males between 14-16 years of age will not have the mathematical foundation necessary for algebra success at the secondary level.

Perceived Racial Inadequacies in Urban Education

Hargrove and Seay (2011) investigated the barriers that prevented Black males from entering gifted instructional programs in South Carolina public schools. The purpose of the study was to determine if the barriers were rooted in school related issues or non-school related issues. Data was collected via surveys from 370 teachers and analyzed via Chi-square analysis. Chi-square is a statistical measure to check goodness of fit (Leedy and Ormand, 2013). Total group perceptions of barriers, perceptions of barriers by minority and White teachers, and perceptions of barriers by teachers exposed to professional development were the basis of the three research questions that guided this study.

Hargrove and Seay (2011) investigated and confirmed the existence of barriers contributing to low participation of Black males in gifted programs and recommend teachers training and a revised process for student selection. The researchers of this study concluded that White teachers identified non-school related barriers, minority teachers identified both non-school and school related barriers, and teachers who received professional development identified poor home environment and use of non-standard English as the major barriers to Black male participation in the gifted program.

Sanders (1997) investigated those variables that contributed to the academic success of African American students in spite of racism and discrimination. The researcher suggested that many African American students have detached from the educational process because they are tired of the racism and continuous inequality of the American education system. Sanders concluded many students do perform well academically in spite of social barriers designed to derail their academic gains. The researcher concluded that racial bias and awareness among students exist on three levels. The levels are minimization, mid-level, and higher level. The same finding suggested that those students with a higher awareness level for racism often challenge themselves in ways that contribute to their continued academic success. Sanders investigated and confirmed a level of awareness that allows students to function in a manner that leads toward academic success in spite of barriers being purposely placed to derail student achievement.

Lee (2012) investigated the relationship between per pupil funding and student achievement on standardized assessments and found funding gaps that contributed to unequal learning opportunities and outcomes for minority students. The study was conducted because funding for student supports was not readily available and because many states put pressure on schools to close the achievement gap between Black students and White students without providing adequate funding to meet the suggested learning outcomes.

Lee (2012) reviewed the financial contributions to schools from their respective states via student expenditures and analyzed the financial contributions by cost function analysis methods. Lee identified large gaps in the funding of education for minority

students in predominantly low-income districts when compared to funding from predominantly White schools in neighboring communities. Lee suggested that if academic performance of minority students is to increase and the achievement gap closed, law makers must take a realistic look at funding disparities and commit to a full change in the dissemination of scarce financial resources.

At Risk

Troubling on many fronts is the classification of Black males labeled as being "at risk" for a multitude of reasons. According to Livingston and Nahimana (2006) Black males are tagged with the "at risk" label because of the likelihood of early school failure, delinquency, lack of employment, negative interaction with the criminal system, fatherlessness, poverty, racism, violent crime, and placement into the k-12 special education track. However, according to Pittman and Zeldman as cited in Livingston and Nahimana "Black males do not develop their identities in any single environment. Rather, the development of the young Black males evolves in a context of people, places, and institutions that impact and form their ecological context" (p. 210).

When the factors associated with the labeling of the Black males as "at risk" is viewed from an ecological viewpoint as suggested by Livingston & Nahimana (see figure 1) the propensity for success by the urban Black male in any phase of life becomes extremely challenging. According to Livingston & Nahimana, each aspect of life for the urban male is intimately related to other aspects of his life (figure 1). When these nuisances in the life of the urban male are allowed to fester and go uncorrected, success in life becomes illusive.

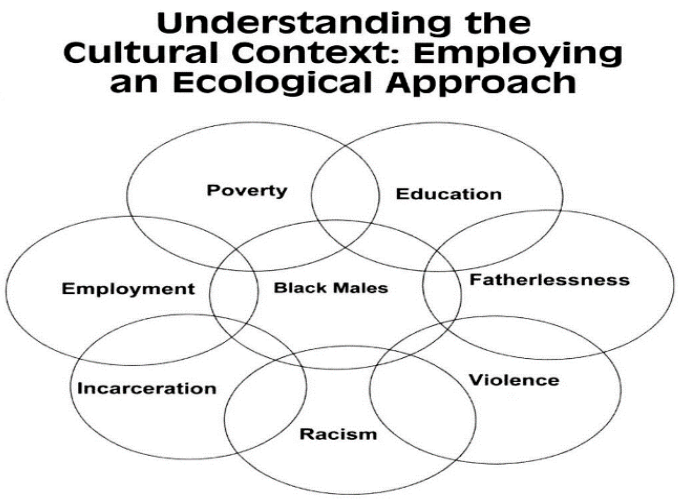


Figure 1. Factors associated with labeling urban Black males.

Currently and within the past decade, Black males in grades K-12 are disproportionally retained in grades for a multitude of reasons that, if left uncorrected, could all serve as early predictors of early school dropout (Rodney, Crafter, Rodney, & Mupier 1999). In the United States, though the Black male graduation rate has slightly increased from 51% to 59% nationally, Black males continue to drop out of school at a rate significantly more startling than that of any other ethnic group by both age and gender (Schott Foundation for Public Education, 2015).

Steward, Hill, Neil, Pritchett, and Wabaunsee (2008) investigated the validity of the grades received by Black students. Some believe that grades given by teachers for course work that are recorded on the official transcript do not equate to the scores these same students receive on standardized tests. Additionally, some believe that the grades delivered do not reflect academic performance of an urban student but rather that student's behavior and class readiness. The authors concluded that grades are the result of multiple measures and may not always reflect academic ability.

Steward et al (2008) investigated and confirmed that grades are the result of many factors. Furthermore, grades reflected on transcripts may not always reflect the success a student has achieved. Furthermore, according to Steward et al, when teachers record inaccurate erroneous scores associated with a student's true abilities, the student is automatically set on a disastrous course of school failure.

McGee (2013) investigated the risk and protective factors associated with Black males who attended urban high schools. Many Black males are labeled at risk simply because they attend urban schools in environments where factors have negatively impacted the forward progress of those who dwell in such environments. McGee concluded that academically successful Black males dwelling in urban environments do create strategies that allow them to move in multiple circles in an effort to complete established goals. Additionally, the researcher also confirmed successful Black males attending high school create coping mechanisms to achieve success.

Many urban Black males find themselves assigned to alternative schools designed to address factors such as social inabilities, behavioral inabilities, and learning disabilities (Wilkerson, Afacan, Perzigian, Justin, & Lequia, 2016). Such schools operate with the understanding that achievement is expected for all assigned students. To determine if such schools are positively impacting Black urban males, Beken, Williams, Combs, and Slate (2009) investigated the academic performance of at-risk students in traditional schools in Texas and the academic performance of at-risk students assigned to alternative schools in Texas to determine the performance levels of each group. The researchers qualified this study as necessary because data needed to be collected on school effectiveness between the two types of schools noted above.

Beken et al. (2009) concluded that the standardized math and English assessment scores were higher at the traditional school than at the alternative school. The performance of at-risk students at the two schools also indicated scores from the traditional school outpaced scores from the alternative school indicating that not all students labeled at-risk have the same needs. The researcher recommended that the definition of at-risk be changed and categorized by the factors that better described the academic and psychosocial needs of the students assigned to alternative high schools.

Conclusion

If urban students are to improve their mathematics performances, then math must be made relevant and interesting to them (Muhammad, 2003). In this area, it would appear that we have and continue to fail our Black males because their performance scores overwhelmingly indicate such. The other key aspect of urban education that must be understood by teachers is that the delivery of instruction must match the learning styles of the students in the classroom (Kunjufu, 2011).

When students express an academic need for instructional support, the question of who is paying should never inhibit effective interventions. According to Ahram et al., (n.d) there are systemic issues in urban education. Ahram et. al. suggest that many urban students have their true learning deficiencies go uncorrected due to gaps in funding, poor attendance, and the like, thus inevitably negatively impacting future academic success in the core area of mathematics.

Summary

According to the literature reviewed, success in 9th grade high school algebra for African American males 14-16yrs of age is associated with many factors including but not limited to early math mastery, proper behavior in the classroom, and active parent

participation. Algebra success is not present simply because more time is allotted to algebra instruction. Moreover, extended algebra instruction at the high school level has negatively impacted the algebra performance of students not targeted for the form of math intervention delivered. Additionally, positive math self-efficacy could lead toward 9th grade algebra success and occurs in the early years of math literacy attainment individually or in the form of a clique group. The literature reviewed also indicated that identification of learning styles has the potential to enhance the academic outcomes for Black male students in all areas of instruction.

In Chapter III, the processes taken to complete this current study will be presented. Chapter III will also include, a discussion on the methodology utilized, measurement tools utilized, research participants, processes undertaken to collect and secure data, and the limitation of the study.

CHAPTER III

METHODOLOGY

Introduction

At the high school level, Black males between the ages of 14-16 years are failing high school Algebra I at unacceptable levels. Statistically speaking, Black males as a sub-group continue to score near or at the bottom on most standardized assessments starting as early as 4th grade and the poor performance continues into high school (Schott Foundation for Public Education, 2015). In 1990, the mathematical performance of 8th grade Black males placed them at the bottom of the performance list when performance was grouped by ethnicity. Twenty-five years later the performance scores in 2015 were almost identical.

The achievement gap of 8th grade Black males by cohort and in percentile points displays performance patterns indicative that the 8th grade Black male has been in need of mathematical support for many years (see table 4). Specifically, on the 1990 NAEP assessment, 8th grade African American males as a cohort scored 37 percentile points below 8th grade Asian males, 32 percentile points below 8th grade White males, and 20 percentile points lower than 8th grade Hispanic males. When 8th African American males were assessed again 25 years later on the same assessment, the results indicated that the African American still placed last among the same 8th grade ethnicities by sex. The African American 8th grade male now performed 46 percentile points lower than the 8th

grade Asian male, still 32 percentile points lower than the 9th grade White male, and 10 percentile points lower than the 8th grade Hispanic male.

Table 4.

8th Grade Black Male NAEP Performance Scores from 1990 and 2015.

	1990	Black male achievement gap	2015	Black male achievement gap
Black	188	-------	260	--------
Hispanic	201	+20	270	+10
White	220	+32	292	+32
Asian	225	+37	306	+46

The current study was conducted to contribute to the literature on urban Black male algebra performance at the high school level and to address three research Questions. First, the current study sought to identify if any early predictors of Algebra I failure existed when the Preferred Learning Styles of the research participants and Algebra I success were analyzed. Next, the current study sought to determine if a correlation or relationship existed between Math Self-Efficacy and Algebra I success when the two variables were analyzed. Finally, the current study sought to identify the existence of any correlations or relationships, if any existed, when the Preferred Learning Styles, Math Self-Efficacy, and the standardized test performance scores of research participants was analyzed between urban Black males 14-16 years of age who passed high school Algebra I and those urban Black males 14-16 years of age who failed high school Algebra I during the first semester of the 2016-2017 school year. Chapter III will serve as an exhaustive review of the methodological processes undertaken for the completion of this study.

Three specific research questions were the focus of the current study:

1. What differences exist, if any, in the Preferred Learning Styles between those urban Black males 14-16 years of age who passed Algebra I first semester and those urban Black males 14-16 years of age who failed Algebra I first semester of the 2016-2017 school year?

2. What differences exist, if any, in the Math Self-Efficacy among urban Black males 14-16 years of age who passed Algebra I first semester and urban Black males 14-16 years of age who failed Algebra I first semester of the 2016-2017 school year?

3. What Algebra I failure predictors exist, if any, between the Preferred Learning Styles, Math Self-Efficacy scores, and the standardized test performance scores of urban Black males 14-16 years of age who passed Algebra I first semester and urban Black males who failed Algebra I first semester of the 2016-2017 school year?

Research Design

The research design used to answer the three research questions was qualitative. This design was selected because the research participants were not randomly selected. Instead, the research participants of this current study were invited to participate in the current study only if they represented the desired requirements set forth by this researcher. According to Leedy and Ormrod (2013) this approach to conducting a research study is acceptable when the intent of the researcher is to measure the relationship between variables in a statistical way.

The data collection process was constructed in a manner that was both manageable, non-intrusive, and included three processes for data collection completion. The first step was to collect data relevant to the research participants' preferred learning styles. The

second step was to collect data relevant to the research participants' mathematics self-efficacy. The third and final step was to collect data on each student's standardized test performance. There were two measurement tools used to collect data utilized in the current study: The Preferred Learning Style Inventory and The Math Self-Efficacy Inventory. The building administration from the high school where the study was conducted provided high school standardized test performance data that were used later in the analytical phase of the current study. The data collected to address research questions 1. and research question 2. was organized via SPSS analytics. An independent - test was used to analyze the data collected to answer research question 3.

The variables being measured were the dependent variables of the preferred learning style, math self efficacy, and standardized test performance. After all data were collected, the participants were divided into two groups. Group one consisted of 31 research participants who passed Algebra I first semester of the 2016-2017 school year. Group two consisted of 11 research participants who failed Algebra I first semester of the 2016-2017 school year.

Participants

The research participants for the study all attended the same high school in the same urban school district located in the Midwestern portion of the United States. The participants for this study were all 9th grade urban Black male students who were enrolled in a high school Algebra I course during the first semester of the 2016-2017 school year. Permission to conduct this current study was granted by the senior administrator in this urban school district with necessary data supports provided by the school principal. Each research participant was enrolled for the first time in the course and were all between 14-

16 years of age. The 9th grade class was composed of 245 9th grade students. There were a total of 115 Black males enrolled in high school Algebra I at the school during the first semester of the 2016-2017 school year.

A letter discussing the intent of the study, an invitation to participate letter, and a parent consent form with a sealable return envelope were prepared and distributed to 100 Black males in 9th grade Algebra I via the three teachers assigned to teach Algebra I during the 2016-2017 school year. A window of three weeks was allowed to collect completed consent forms signed by parents from prospective participants. Exactly 100 participant forms were disseminated with 42 students returning completed documentation for participation in the current study.

Data Collection

Data collection for the current study was completed in three phases via three different data collection methodologies. For the collection of data required to answer the first research question—what differences exist, if any, in the Preferred Learning Styles between those urban Black males 14-16 years of age who passed Algebra I first semester and those urban Black males 14-16 years of age who failed Algebra I first semester of the 2016-2017 school year, research participants completed a Preferred Learning Styles inventory measurement tool (Bixler, 2016). The Preferred Learning Style Inventory tool is designed to measure the preferred learning modalities of the assessment taker. The Preferred Learning Style Inventory measurement tool utilized was a 24 item Likert scale tool. Internal coefficients for this particular tool are not available due to this tool's infancy. According to Dunn, Dunn, and Price (2009) similar measurement tools such as the Learning Styles Inventory by Price Systems Inc. have yielded internal coefficients of

.55-.88 with 10-day test retest score of .929. Research participants were divided into two groups for data comparison. Group one was composed of 31 research participants who passed high school Algebra I during the first semester of the 2016-2017 school year. Group two was composed of 11 research participants who failed Algebra I first semester of the 2016-2017 school year.

The Preferred Learning Style Measurement tool was administered to research participants on the school's premises toward the later part of the school day. Each participant's name was checked upon entry into the school's general assembly room and verified for participation by this researcher. After the verification process, this researcher distributed pencils and thereafter was introduced to the research participants. The full participant group received verbal instruction on how to complete the untimed measurement with a brief session allotted to answer any questions brought forward by research participants.

Each student was then issued the Preferred Learning Style measurement tool that was placed on each writing surface face down with verbal directions to wait for additional directions. All participants started the assessment at the same time and were directed to place pencils down and turn the measurement tool face down upon completion. When the last participant completed the Preferred Learning Style inventory measurement, all documents were collected and placed into a secure box for later coding and analysis by this researcher.

The data collection process required to answer the second research question—what differences exist, if any, in the Math Self-Efficacy among urban Black males 14-16 years of age who passed Algebra I first semester and urban Black males 14-16 years of

age who failed Algebra I first semester of the 2016-2017 school year, was completed via the research participants completing the Mathematics Self-Efficacy measurement tool (Betz & Hackett, 1993). The measurement was administered on the premises of the school toward the end of the school day. The Mathematics Self-Efficacy measurement tool utilized was an 18 item Likert scale tool that measures self-perception of mathematical skill sets. This tool had an internal reliability rating of .96 and a test retest coefficient of .94.

Research participants were divided into two groups for data comparison. Group one was composed of 31 research participants who passed high school Algebra I during the first semester of the 2016-2017 school year. Group two was composed of 11 research participants who failed Algebra I first semester of the 2016-2017 school year.

After this researcher collected measurement tool #1, the Mathematics Self-Efficacy tool was disseminated to the 42 research participants face down on their writing surface. Verbal directions were delivered to the research participants and a short amount of time was allotted for questions brought forward by the research participants. After providing directions to the research participants relative to the tool at hand, all research participants received directions to start the assessment. When the last participant indicated he had completed the measurement tool, all measurement tools were collected and placed into a secure box for later coding and analysis by this researcher.

To answer the third and final research question—what Algebra I failure predictors exist, if any, between the Preferred Learning Styles, Math Self-Efficacy scores, and the standardized test performance scores of urban Black males 14-16 years of age who passed Algebra I first semester and urban Black males who failed Algebra I first semester

of the 2016-2017 school year, data were collected and forwarded to this researcher by school personnel. School personnel were asked to retrieve the final standardized test scores taken collectively by the research participants; which was their 8th grade M-Step math scores from their 2015-2016 state assessment in mathematics. The final M-Step score was coded and categorized into a pass/fail variable to be later analyzed by this researcher. The participants were then being separated into two groups. Group one was composed of 31 research participants who passed high school Algebra I first semester of the 2016-2017 school year. Group two was composed of 11 research participants who failed Algebra I first semester of the 2006-2017 school year.

Analytical Methods

To obtain the actual Preferred Learning Style of each research participant, their responses were entered into an online tool by this researcher that produced one of three Preferred Learning Styles depending on the responses entered by the research participant. The Preferred Learning Styles generated were 1, auditory learner, 2. visual learner, or 3. tactile learner.

To analyze the data retrieved from the measurement tool, each participant's Preferred Learning Style was coded and entered into a data base for analysis. The data collected to answer research question one were analyzed via Chi Square analysis within SPSS analytical software. According to Robson (2011) the Chi Square analysis approach is appropriate when the existence of a relationship between variables is sought. The Chi Square approach was also selected because the research question called for the comparison of the preferred learning styles of two groups of research participants and the data collected to address this question was nominal in nature. Group one consisted of 31

participants who passed Algebra I first semester of the 2016-2017 school year. Group two consisted of 11 participants who failed Algebra I first semester of the 2016-2017 school year.

To obtain the actual Math-Self Efficacy score of the research participants, each item response from the measurement tool was entered into an online data base so that a raw score could be generated. The raw scores were then coded and entered into the Math-Self Efficacy scale score data base for later data analysis. The data collected to answer research question two were analyzed via Chi Square analysis within SPSS analytical software. As noted in Robson (2011) the Chi Square analysis approach is acceptable when the existence of a relationship is sought between two variables. Chi Square was also selected to analyze data collected with regard to research question #2 because the research question called for the comparison of the Math Self-Efficacy scores of two groups of research participants and the data collected to address this question were nominal in nature. Group one consisted of 31 research participants who passed Algebra I first semester of the 2016-2017 school year. Group two consisted of 11 research participants who failed Algebra Ifirst semester of the 2016-201school year.

To determine if any relationships existed between the Preferred Learning Styles, the Math Self-Efficacy, and Standardized test scores of urban Black males who passed Algebra I during the first semester of the 2016-2017 school year and urban Black males who failed Algebra I first semester of the 2016-2017 school year, a data base within SPSS analytical software was created. Within the SPSS data set were the coded Preferred Learning Styles of the research participants, the coded Mathematics Self-Efficacy scores of the research participants, and the coded standardized test scores of the research

participants. The data collected were analyzed within SPSS via an independent *t*-test. According to Robson (2011) the *t*-test analysis approach is a common approach used to compare the means of two groups. These data sets were then separated into two groups. Group one represented the 31 research participants who passed high school Algebra I during the first semester of the 2016-2017 school year. Group two represented the 11 research participants who failed Algebra I during the first semester of the 2016-2017 school year. Specifically, the variables analyzed were the preferred learning styles, math self-efficacy, and the standardized test performance scores of research participants.

Limitations

The final sample size of the research participant group, the non-use of technology in the participant data collection process itself, and the absence of additional time to conduct data collection from the research participants were all identified as possible limitations to the current study.

The current study occurred in a district where the total population of possible research participants was not very large and thus was viewed as a limitation of this study. The ability to include increased numbers of research participants in any study can always strengthen the results of the study. The total number of possible participants was 100 with 42 true samples returning the completed documents necessary for participation in the current study. The phenomenon surrounding high school Algebra I failure among urban Black male 14-16 years of age can be identified in the standardized mathematical scores of this population (Schott Foundation For Public Education, 2015). Conducting the study in a district with a higher number of possible research participants would be more desirable.

All data collected for analysis in the current study were completed via pen to paper activities. At no time was this population allowed to interact with technology. According to Li, Snow, and White (2015) a generation of youth have gravitated towards regular usage of technology into their lives, and technology has become an important component of teen culture. Today's teen then is very comfortable utilizing technology in their day to day affairs to complete simple tasks, to retrieve information from the world wide web, and to even complete academic tasks assigned by their classroom teacher. It is possible that if the data collection process deployed in the current study utilized technology to gather necessary data from its targeted population, an increased number of participants may have submitted the required completed forms for study participation.

The absence of necessary time to complete the data collection process was also deemed a limitation to the current study. In the Midwestern portion of the United States where this study was conducted, most schools start the school year in September with final semester grades for all courses due in mid-January of the following year. Data collection for this current study started in November of 2016. Most schools are sensitive to the time away from learning experienced by their students and thus to have students complete two measurements in a single sitting may have been exhausting to some research participants causing them to opt out of participating in this current study.

Summary

The current study was conducted to identify early predictors of high school Algebra I failure, contribute to the literature concerning the algebra performance of the urban Black male and to answer the aforementioned three research questions. The literature on the mathematics performance of urban Black males 14-16 years of age has

indicated this population of America's future requires immediate and sustained academic intervention.

Data collected to address the research questions were collected via three methodologies which included research participant raw scores from 1, The Preferred Learning Measurement tool, 2. the Self-Efficacy Measurement tool, and 3. the standardized test scores of the research participants. For analysis purposes, the research participants were divided into two groups. Group one consisted of 31 research participants who passed Algebra I during the first semester of the 2016-2017 school year. Group two consisted of 11 research participants who failed Algebra I during the first semester of the 2016-2017 school year. In Chapter IV, a discussion of the findings will be presented, followed by conclusions drawn from the current study as well as possible future implications and recommendations.

Chapter IV

FINDINGS AND CONCLUSIONS

Introduction

The academic future of the urban Black male is destined to be a repeat of the lack luster performance demonstrated over the past two decades. These performance projections will continue to manifest in vivid detail as a result of the minimal correctional efforts currently being devoted to the repeated academic failures of the urban Black male. The math failures can be identified as he matriculates through middle school mathematics and in particular high school algebra. Performance deficiency for the Black male can be seen as early as the 4th grade via the cohort performance data available via NAEP mathematics assessments from 2012, 2008, and 2004. Figure 2. below details the mathematics performance of the 4th grade Black male cohort when compared to the cohort performance of 4th grade White males on the NAEP assessment from 2012, 2008, and 2004. In each of the testing cycles presented, 4th grade White males as a cohort scored more than 20 scale points higher than their 4th grade cohort Black male peers.

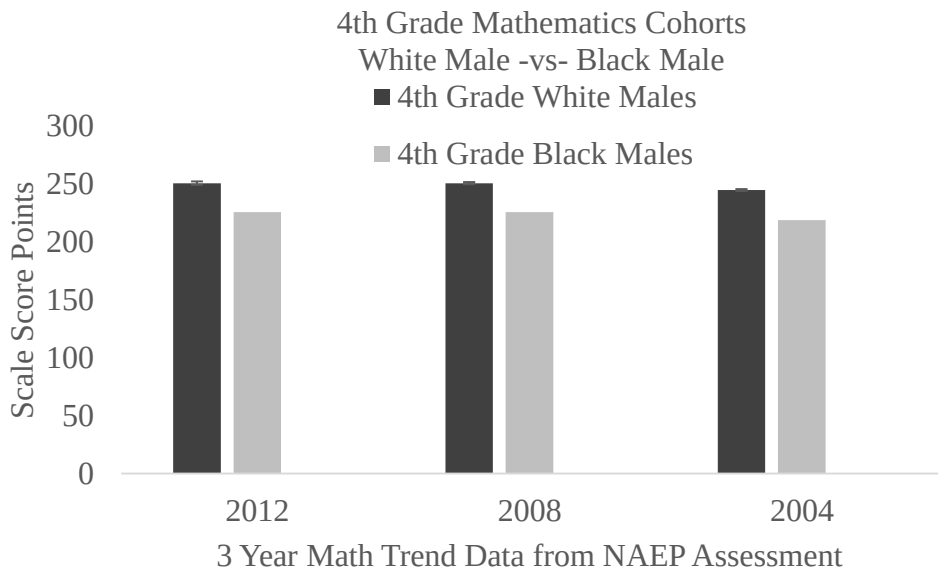


Figure 2. 4th Grade Math Cohort Performance by Ethnicity for 2012, 2008, and 2004.

The unacceptable mathematical performance can be identified in elementary mathematical performance in the three-year standardized trend data from the administrations of the last three NAEP assessments. The negative phenomena of Black male mathematical standardized test performance unfortunately continues into high school impacting the Black male student well past high school Algebra I. Specifically, cohort data from the 11th grade NAEP assessment in mathematics suggest that Black male performance scores are more exacerbated in the 11th grade. Figure 3. details the 11th grade Black male cohort performance on the NAEP for the 2012, 2008, and 2004 assessment cycles. In the last three NAEP assessments, Black males scored 30 scale points lower than their White males cohort peers.

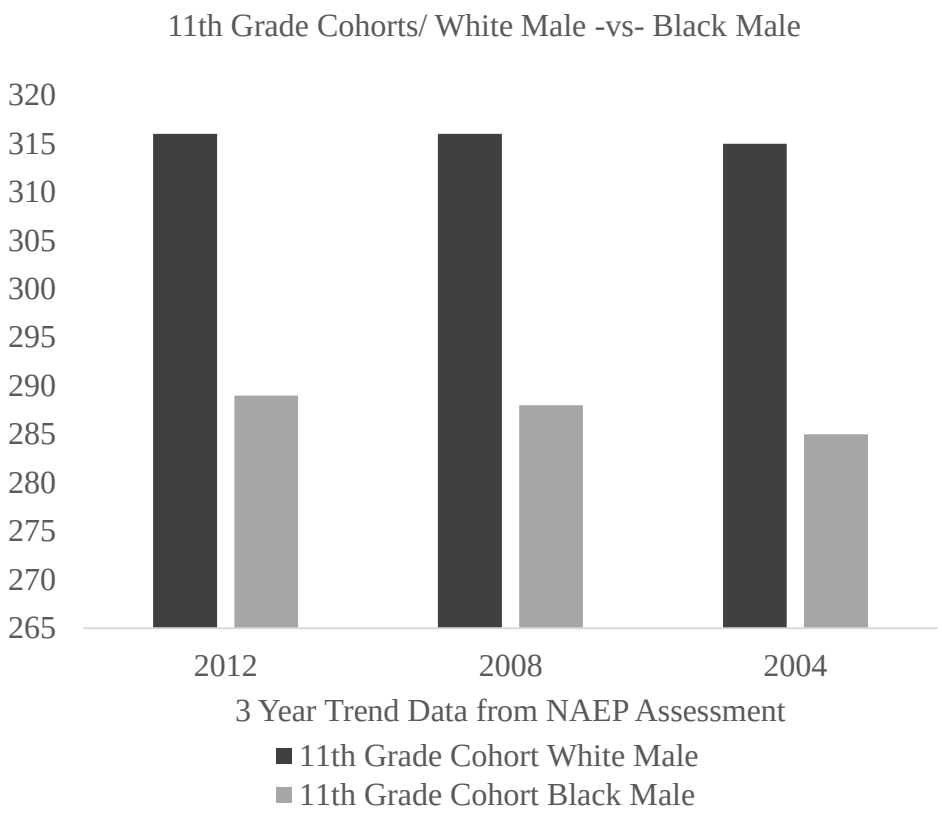


Figure 3. 11th grade math performance by ethnicity for 2012, 2008, and 2004

Absent any specific intervention to address the inferior mathematical performance of the Black male in k-12 education, this population of America's youth will continue its unacceptable performance. Statistically speaking, Black males as a sub-group continue to score near the bottom on most standardized assessments starting as early as 4th grade and the performance continues into high school (NCES 2012).

The current study was conducted for several reasons and with specific intent to contribute to the literature on urban 9th grade Black male algebra performance at the high school level. The current study also sought to identify if any early predictors of Algebra I failure existed when individual learning styles and Algebra I success were analyzed, math self-efficacy and Algebra I success were analyzed, and if a relationship existed between standardized test performance of urban Black males 14-16 years of age who passed high

school Algebra I and urban Black males 14-16 years of age who failed high school Algebra I during the 1st semester of the 2016-2017 school year.

The mathematical performance of the urban Black male is a tragedy that does not have to continue. Rather, with intentional efforts from policy makers, educators, researchers, parents, students, and community members, a collaboration effort equipped to enhance the mathematical performance patterns of the urban Black male can be achieved. This collaboration effort becomes the catalyst for change for the urban Black male 14-16 years of age in his quest for math success.

The findings from this current study are intended to serve as the platform from which future research studies start to create research designs to identify correlations and relationships aimed at identifying those barriers that contribute to the negative performance of the urban Black male 14-16 years of age. If early predictors to poor mathematics performance can be identified for the urban Black male 14-16 years of age, enhanced academic can be developed to support the urban Black male in his quest for Algebra I success. To identify the existence of any such predictors in this current study, the researcher focused on the following three research questions:

1. What differences exist, if any, in the Preferred Learning Styles between those urban Black males 14-16 years of age who passed Algebra I first semester and those urban Black males 14-16 years of age who failed Algebra I first semester of the 2016-2017 school year?

2. What differences exist, if any, in the Math Self-Efficacy among urban Black males 14-16 years of age who passed Algebra I first semester and urban Black males 14-16 years of age who failed Algebra I first semester of the 2016-2017 school year?

3. What Algebra I failure predictors exist, if any, between the Preferred Learning Styles, Math Self-Efficacy scores, and the standardized test performance scores of urban Black males 14-16 years of age who passed Algebra I first semester and urban Black males who failed Algebra I first semester of the 2016-2017 school year?

Findings

What differences exist, if any, in the Preferred Learning Styles between those urban Black males 14-16 years of age who passed Algebra I first semester and those urban Black males 14-16 years of age who failed Algebra I first semester of the 2016-2017 school year?

The research findings used to adequately address research question one resulted from the 42 research participants completing the 24 item Preferred Learning Style Likert scale inventory tool. The Learning Style Inventory tool measures the preferred learning modalities of the assessment taker. The dependent variable analyzed was the Preferred Learning Style of urban Black males 14-16 years of age. The two independent variables analyzed were 1. urban Black males who passed Algebra I first semester of the 2016-2017 school year, and 2. urban Black males who failed Algebra I first semester of the 2016-2017 school year.

After conducting the data analysis process for research question one, the researcher identified no statistically significant relationships between the preferred learning styles of urban Black males 14-16 years of age who passed high school Algebra I 1st semester of the 2016-2017 school year and urban Black males 14-16 years of age who failed high school Algebra I during the first semester of the 2016-2017 school year. The data reported from the SPSS Chi Square analysis was (χ^2 (4, N= 41), p = .498). The

results identified from the analysis of data associated with research question #1 are in alignment with the research results from the Battalio (2009) study. Battalio too used a Learning Styles Inventory tool to collect data on 120 research participants enrolled in a technical communications course. Battalio concluded the success of the students academically was related to desired learning formats and not specific learning styles.

What differences exist, if any, in the Math Self-Efficacy among urban Black males 14-16 years of age who passed Algebra I first semester and urban Black males 14-16 years of age who failed Algebra I first semester of the 2016-2017 school year?

The research findings used to adequately address research question #2 resulted from the 42 research participants completing the 18 item Mathematics Self-Efficacy Likert scale inventory tool. The Self-Efficacy measurement tool measures self-perceptions of mathematical skill sets. The dependent variable being analyzed was the math self-efficacy scores of urban Black males 14-16 years of age. The independent variables analyzed were urban Black males who passes Algebra I 1st semester of the 2016-2017 school year and urban Black males who failed Algebra I 1st semester of the 2016-2017 school year.

After conducting the Chi Square data analysis process for research question #2, the researcher identified no statistically significant relationships between the math self-efficacy scores of urban Black males 14-16 years of age who passed Algebra I 1st semester of the 2016-2017 school year and urban Black males who failed Algebra I 1st semester of the 2016-2017 school year. (χ^2 (30, N =42) =, p = .312) represented the data reported from the Chi Square analysis.

Athough no statistically significant relationship was identified between the math-self efficacy scores of urban Black males who passed Algebra I 1st semester of the 2016-2017 school year and urban Black males who failed Algebra I first semester of the 2016-2017 school year, the math-self efficacy scores provide other important correlations. Specifically, the math-self efficacy scores from the 42 research participants ranged from 2.6 to 8.6 on the Math-Self Efficacy Percentile Equivalents chart. Moreover, over half of the research participants achieved a self-efficacy score indicative of low self-perceptions of mathematical abilities. Liu (2009) identified math-self efficacy to be the best predictor of math performance in his study of 15-year-old students from Hong Kong and the United States.

What Algebra I failure predictors exist, if any, between the Preferred Learning Styles, Math Self-Efficacy scores, and the standardized test performance scores of urban Black males 14-16 years of age who passed Algebra I first semester and urban Black males who failed Algebra I first semester of the 2016-2017 school year?

The research findings used to adequately address research question #3 resulted from the standardized test data from the 8th grade M-Step state mandated assessment of the 42 research participants. After conducting the data analysis process for research question three, this researcher identified no significant findings between the preferred learning style, math self-efficacy, or standardized test performance of research participants who passed high school Algebra I and participants who failed high school Algebra I. The results from the *t*-tests were $t(35) = .19$, $p = .56$, $t(34) = .21$, $p = .248$, and $t(37) = .01$, $p = .858$ respectively.

Conclusions

Based on the results of the data analyzed in this current study, this researcher concluded the following: 1. specific limitations of this study contributed to the less than informative data results derived from this current study, 2. A relationship does not exist between the Learning Styles of Urban Black males who passed Algebra I during the first semester of the 2016-2017 school year and the Learning Styles of urban black males who failed high school Algebra I during the first semester of the 2016-2017 school year. Additionally, 3. a relationship does not exist between the math self-efficacy of urban Black males 14-16 years of age who passed high school Algebra I during the first semester of the 2016-2017 school year and urban Black males who failed high school Algebra I during the first semester of the 2016-2017 school year, 4. student standardized test performance data does not significantly correlate to high school Algebra I success for urban Black males 14-16 years of age who passed high school Algebra I first semester of the 2016-2017 school year and urban Black males who failed high school Algebra I during the first semester of the 2016-2017 school year . Finally, 5. the researcher of this current study concluded the framework of the research design used in this study is in need of restructuring.

The research design utilized in this current study was not adequate for a study investigating the negative phenomena surrounding the poor mathematical performance of the urban Black males 14-16 years of age with regard to high school Algebra I success. In Chapter II of this current study, a litany of research detailed the presence of a negative phenomenon impeding the forward academic progress of urban Black males in the area of high school Algebra I success (Davis, 2014, Kafele, 2012. Whiting 2006).

The research design of this current study was quantitative. After reviewing the data derived from this current study, this researcher further concluded that a research design that is more qualitative than quantitative may be able to add to the research literature on the phenomena currently impeding the academic progress of the urban male 14-16 years of age with regard to algebra success. According to Robson (2011), qualitative research designs have little use for numerical data or statistical analysis, have a need to understand the phenomena in their setting, allows the design of the research to emerge as the research is carried out, is flexible, the generalizability of the findings is not a major concern, situations are described from the perspective of those involved, and research takes place in its natural setting.

Implications and Recommendations

This current study attempted to identify 1. early predictors of Algebra I failure 2. the existence of correlations and/or relationships among the learning styles of urban Black males as an early predictor of high school Algebra I success, 3. correlations and/or relationships among the math self-efficacy scores of urban Black males and high school Algebra I success, and 4. correlations and relationships among the learning styles, math self-efficacy, and standardized test scores of urban Black males and high school Algebra I success. Based on the data analysis results from this current study as they relate to the points noted above, a relationship between the preferred learning styles of 9th grade urban Black male students who passed high school Algebra I and those urban Black males who failed high school Algebra I does not exist. Additionally, a relationship does not exist between the 9th grade mathematical self-efficacy scores of urban Black males who passed high school Algebra I and the urban Black males who failed Algebra I during the first

semester of the 2016-2017 school year. Furthermore, a relationship or correlation between 9th grade urban Black male learning styles, 9th grade urban Black male mathematics self-efficacy, and 9th grade urban Black male standardized test performance does not exist. Hence, for the size of the participant groups used in this current study, the implications from this current study suggest that the learning styles, the mathematics self-efficacy scores, and combo analysis of learning styles, math self-efficacy, and standardized test scores of urban Black males 14-16 years of age are not suitable variables to serve as predictors of high school Algebra I success.

While the analysis of data from this current study did not bring into focus any relationships to expound upon and address urban Black male high school Algebra I failure, a true first investigative step into the negative mathematical phenomena impeding the mathematical progress for urban Black males 14-16 years of age has been established. The platform to build upon with future research in the area of Algebra I success for urban Black males 14-16 years of age has been established so that future research does not repeat unnecessary steps.

Current research suggest that the transition from middle school mathematics to algebra is difficult (Egodawatte, 2009). Literature reviewed in chapter II suggest that urban Black males continue to disproportionally fail mathematics courses in our urban school settings (Sommers et al., 2008). Future research studies in the area of high school Algebra I success for urban Black males 14-16 years of age are needed if the algebra performance of this population is to be positively enhanced.

Further implications surround the inability of the urban Black male student to achieve high school Algebra I success and has been inexcusable occurrence that has been

allowed to exist for almost 30 years and continues in present day. The subpar mathematical performance of the urban Black male was noted years before in the writings of Kunjufu (1982) and he specifically stated the shift in mathematics performance started as early as 4th grade for Black males. Thus, tens of thousands of urban Black males have matriculated through elementary school, middle school, and high school having demonstrated wide scale mathematics deficiencies. This oversight has set the stage for tens of thousands of urban Black males to graduate from high school ill equipped for careers in the STEM field and a life associated with middle class living. The urban Black male has demonstrated through the standardized testing data that he and his peers are not algebra ready and continue to do so in current day.

Data from the National Center for Educational Statistics from 1990 thru 2015 also details the dismal performances of the urban Black male without any legislative plan to correct the negative mathematics presentation patterns of this population. In this current study approximately 50% of the research participants as a cohort achieved a math self-efficacy score below the 60th percentile suggesting that they too have little faith in their own mathematical abilities.

If mathematics self-efficacy is a reliable predictor of future mathematics performance as suggested by Liu (2009) then the math-self efficacy score of every urban Black male is relevant to his future mathematics success. The math self-efficacy scores of all urban Black males should be commonly known among urban math teachers for proper pedagogy development.

The future of the urban Black male and his quest for algebra success is currently uncertain. The ramifications of the mathematical neglect endured by tens of thousands of

urban Black males over the past three decades continues to create unfair situations for the urban Black male. If the urban Black male 14-16 years of age is to ever achieve algebra success it will be due to the pledge of researchers committed to the academic rebirth of the urban Black male student.

The following are recommendations for future researchers to consider when studying the phenomena surrounding 9th grade urban Black male high school Algebra I failure. The current condition of the urban Black male has its beginnings starting as early as 4th grade (Kunjufu, 1982). Thereafter, the mathematical failing performance of the urban Black male is well documented in most states with a sizeable population of school age urban Black males (Davis, 2014Dillihunt & Tyler, 2006; The Schott Foundation for Public Education, 2015) to detail a few. Therefore, any statement concerning the negative standardized test scores of the urban Black male 5th grade through 12th grade should be accepted as verified researched occurrences. Removing the need to research and document the deficient mathematical performance of the urban Black male 14-16 years of age will allow future researchers to spend more time on identifying possible relationships and correlations pertaining to future research than adding more research to a phenomenon that has been adequately well discussed in the research literature.

A recommendation that future researchers conduct studies that are both quasi-quantitative and quasi-qualitative is offered so that an increased amount of data that is extensively qualitative in nature can be captured as well as collecting supplementary data that is extensively quantitative in nature. The quasi-quantitative researcher should seek the support of an entire urban district to obtain approval to conduct a quasi-quantitative study on the mathematical performance of the district's urban Black male population.

The participant group should include no less than 2000 urban Black males in grades 5th - 9th while excluding those urban Black males with documented learning disabilities and documented mathematical disabilities.

Future research designs should focus on the recorded interviews of the research participants. The rationale behind this approach is as simplistic as a sick patient telling the doctor of their ailing symptoms. The doctor listens to the sick patient and asks the patient a few questions as well. The doctor then prescribes medication to the patient and monitors their recovery until they are property healed. Using this approach to address the failing mathematical phenomena that is ailing far too many urban Black males is a step toward true resolution of the occurrence. To have a conversation with a few hundred urban Black males about their likes and dislikes concerning mathematics from 4th grade through 9th grade Algebra I would be invaluable to the development of mathematical pedagogy designed to improve urban Black male mathematical outcomes.

REFERENCES

Academic Intervention. (2016). *Psychologydictionary.org.* retrieved from URL http://psychologydictionary.org/academic-intervention

Adeyemi, A. (2012). Effect of peer and self-assessment on male and female self-efficacy and self-autonomy in learning of mathematics. (2012). Gender & Behavior, 10(1), 4492-4508

Ahram, R., Stembridge, A., Fergus, E., & Noguera, P. (n.d.). Framing urban school challenges: The problems to examine when implementing response to intervention. Retrieved from http://www.rtinetwork.org/learn/diversity/urban-school-challenges

Archibald, D., Glutting, J., & Qian, X. (2009). Getting into honors or not: An analysis of the relative influences of grades, test scores, and race on track placement in a comprehensive high school. . *American Secondary Education, 37*(2), 65-81.

Ballon, E. G. (2008). Racial differences in high school math track assignment. *Journal of Latinos and Education, 7*(4), 272-287. http://dx.doi.org/10.1080/15348430802143428

Battalio, J. (2009). Success in distance education: Do learning styles and multiple formats matter? American Journal of Distance Education, 23 (2), 71-87.

Beken, J. A., Williams, J., Combs, J. P., & Slate, J. R. (2009). At-risk students at traditional and academic alternative school settings: Differences in math and English performance Indicators. *Florida Journal of Educational Administration & Policy*, *3*(1), 49-61. Retrieved from http://education.ufl.edu/fjeap/

Betz, N. E., & Hackett, G. (1993). *Mathematics Self-Efficacy Scale*. Menlo Park, CA: Mind Garden.

Bixler, B. (2016). Learning style inventory. Retrieved from http://www.personal.psu.edu/bxb11/LSI/LSI.htm

Booth, J. L., Barbieri, C., Eyer, F., & Pare-Blagoev, E. J. (2014). Persistent and pernicious errors in algebraic problem solving. *Journal of Problem Solving*, *7*(1), 10-23. http://dx.doi.org/10.7771/1932-6246.1161

Blanchett, W. J., Mumford, V., & Beachum, F. (2005). Urban school failure and disproportionality in a post-brown era: Benign neglect of the constitutional Rights of students of color. *Remedial and Special Education*. *05*(26), 70-81, http://dx.doi.org/10.1177/07419325050260020201

Booth, J. L., Barbieri, C., Eyer, F., & Pare-Blagoev, E. J. (2014). Persistent and pernicious errors in algebraic problem solving. *Journal of Problem Solving*, *7*(1), 10-23. http://dx.doi.org/10.7771/1932-6246.1161

Boykin, W., Noguera, P., & Association for Supervision and Curriculum, (2011). C*reating the opportunity to learn: Moving from research to practice too close the achievement gap*. Alexandria, VA: ASCD

Braun, H., Chapman, L., & Vezzu, S. (2010). The Black-White achievement gap revisited. *Education Policy Analysis Archives, 18*(21), 1-99. http://dx.doi.org/10.14507/epaa.v18n21.2010

Braun, H. I., Wang, A., Jenkins, F., & Weinbaum, E. (2006). The Black-White achievement gap: Do state policies matter? *Education Policy Analysis Archives*, *14*(8), 1-110. http://dx.doi.org/10.14507/epaa.v14n8.2006

Caton, M. T. (2012). Black male perspectives on their educational experiences in high school. *Urban Education, 47*(6), 1055-1085.

Cha, S. (2015). Exploring disparities in taking high level math courses in public high schools. *KEDI Journal of Educational Policy, 12*(1), 3-17.

Clarke, J. W. (1996). Black-on-black violence. *Society, 33*(5), 46-50. http://dx.doi.org/10.1007/bf02693114

Cleveland, K. P. (2011). *Teaching boys who struggle in school: Strategies that turn underachievers into successful learners*. Cleveland, OH: ASCD

Crumpton, H. E., & Gregory, A. (2011). "I'm not learning": The role of academic relevancy for low-achieving students. *Journal of Educational Research, 104*(1), 42-53. http://dx/doi.org/10.1080/00220670903567398

Davis, J. (2014). The mathematical experiences of Black males in a predominantly Black urban middle school and community. *International Journal of Education in Mathematics, Science And Technology*, *2*(3), 206-222.

Davis, J. E. (2003). Early schooling and academic achievement of African American males. *Urban Education, 38*(5), 515-537. http://dx.doi.org/10.1177/0042085903256220

Dillihunt, M. L., & Tyler, K. M. (2006). Examining the effects of multiple intelligence instruction on math performance. *Journal of Urban Learning, Teaching, and Research*, 2, 131-150.

Dunn, R. S., Dunn, K. J., & Price, G. E. (1979). *Learning style inventory*. Lawrence, KS: Price Systems.Learning Style Inventory

Duran, M., Höft, M., Lawson, D. B., Medjahed, B., & Orady, E. A. (2014). Urban High School Students' IT/STEM Learning: Findings from a Collaborative Inquiry- and Design-Based Afterschool Program. *Journal Of Science Education And Technology*, *23*(1), 116-137.

Durodoye, B., & Hildreth, B. (1995). Learning styles and the African American student. *Education, 116*(2), 241-248. Retrieved from https://login.proxy.olivet.edu/login?url=http://search.proquest.com.proxy.olivet.edu/docview/196424585?accountid=12974

Dyce, C. M. (2013). Disappearing into the unknown: The state of black male achievement in American public schools. *Multicultural Perspectives*, *15*(3), 165-167. http://dx.doi.org/10.1080/15210960.2013.809307

Egodawatte, G. (2009). Is algebra really difficult for all students? *Acta Didactica Napocensia*, *2*(4), 101-106.

Espinoza, P., Areas da Luz Fontes, A. B., & Arms-Chavez, C. J. (2014). Attributional gender bias: Teachers' ability and effort explanations for students' math performance. *Social Psychology of Education: An International Journal*, *17*(1), 105-126. http://dx.doi.org/10.1007/s11218-013-9226-6

Eunsook, H., Sas, M., & Sas, J. C. (2006). Test-taking strategies of high and low mathematics achievers. *Journal of Educational Research, 99*(3), 144-155. http://dx.doi.org/10.3200/joer.99.3.144-155

Filer, K. L., & Chang, M. (2008). Peer and parent encouragement of early algebra enrollment and mathematics achievement. *Middle Grades Research Journal*, *3*(1), 23-34. Retrieved from http://www.infoagepub.com/middle-grades-research-journal.html

Gabriel, T. (2010). Proficiency of black students is found to be far lower than expected. *The New York Times*, *9*.

Gadzella, B. M., Masten, W. G., & Huang, J. (1999). Differences between African American and Caucasian students on critical thinking and learning style. *College Student Journal*, *33*(4), 538-542.

Gardner, H. (1999). *Intelligence reframed: Multiple intelligences for the 21st century*, New York, NY.

Green, R. L., & Wright, D. L. (1991). *African-American Males: A Demographic Study and Analysis.* Battle Creek, MI: Kellogg Foundation.

Grandy, J. (1998). Persistence in science of high-ability minority students: Results of a longitudinal study. Journal of Higher Education, 69(6), 589-620.

Gregory, A. & Thompson, A. (2010). African American high school students and variability in behavior across classrooms. *Journal of Community Psychology, 38*(3), 396-402.

Hargrove, B. H., & Seay, S. E. (2011). School teacher perceptions of barriers that limit the participation of African American males in public school gifted programs. *Journal for the Education of the Gifted*, *34*(3), 434-467. http://dx.doi.org/10.1177/016235321103400304

Harper, S. R., & Davis, C. I. (2012). They (don't) care about education: A counter narrative on Black male students' responses to inequitable schooling. *Educational Foundations*, *26*(1-2), 103-120. Retrieved from: https://works.bepress.com/sharper/44/

Hebert, T. P. (1998). Gifted Black males in an urban high school: Factors that influence achievement and underachievement. *Journal for The Education Of The Gifted*, *21*(4), 385-414.

Hedges, L. V., & Nowell, A. (1999). Changes in the Black-White gap in achievement test scores. *Sociology of Education*, *72*(2), 111-135. http://dx.doi.org/10.2307/2673179

Hilgendrf, A. (2012). Through a limiting lens: Comparing student, parent, and teacher perspectives of African American boys' support for school. *School Community Journal*, *22*(2), 111-130.

Irvine, J. (1990). *Black students and school failure polices, practices, and prescriptions*. London, England: Praeger.

Jackson-Allen, J., & Christenberry, N. (1994). *Leaning style preferences of low – and high – achieving young African American males*. (Report No. 143). Nashville, TN. Mid-South Research Association.

Jackson, B. T., & Hilliard, A. (2013). Too many boys are failing in American schools: What can we do about it? *Contemporary Issues in Education Research, 6*(3), 311. http://dx.doi.org/10.19030/cier.v6i3.7901

Jacob, B. A. (2007). The challenges of staffing urban schools with effective teachers. *Future of Children*, *17*(1), 129-153.

Jairrels, V. (2009). *African Americans and Standardized Test.* Chicago, IL: African American Images.

Jensen, A. R. (1980). *Bias in mental testing*. New York, NY: Freepress

Jimenez-Morales, M. I., & Lopez-Zafra, E. (2013). The impact of students' perceived emotional intelligence, social attitudes and teacher expectations on academic performance. *Electronic Journal of Research in Educational Psychology*, *11*(1), 75-98.

Jones, J. N., Miron, G., & Kelaher-Young, A. J. (2012). The Kalamazoo Promise and Perceived Changes in Teacher Beliefs, Expectations, and Behaviors. *Journal Of Educational Research*, *105*(1), 36-51.

Jones, M. H., Irvin, M. J., & Kibe, G. W. (2012). Does geographic setting alter the roles of academically supportive factors? African American adolescents' friendships, math self-concept, and math performance. *Journal of Negro Education, 81*(4), 319-337. http://www.journalnegroed.org/

Jordan, W. J., & Cooper, R. (2003). High school reform and Black male students: Limits and possibilities of policy and practice. *Urban Education*, *38*(2), 196-216. http://dx.doi.org/10.1177/0042085902250485

Kafele, B. K. (2012). Empowering young Black males. *Educational Leadership*, *70*(2), 67-70.

Keefe, J. W., Monk, J. S., & National Association of Secondary School Principals, R. V. (1986). *Learning Style Profile: Examiner's Manual*.

Kelly, S. (2009). The Black-White gap in mathematics course taking. *Sociology of Education*, *82*(1), 47-69.

Keefe, J. W. (2001). Assessment of Learning Style Variables: The NASSP task force model. *Theory Into Practice*, *24*(2), 138-44. http://dx.doi.org/10.1080/00405848509543162

Kennedy, W. A., van de Riet, V., & White, J. C. (1963). A normative sample of intelligence and achievement of negro elementary school children in the southeastern united states. *Monographs of the Society for Research in Child Development*, *28*(6), 1–112. http://doi.org/10.2307/1165738

Kunjufu J (1982). *Countering the conspiracy to destroy black boys*. Chicago: African American Images

Kunjufu, J. (2001). *State of Emergency: We must save African American males*. Chicago: African American Images

Kunjufu, J. (2011). *Understanding Black male learning styles.* Chicago, IL: African American Images.

Lannie, A. L., & McCurdy, B. L. (2007). Preventing disruptive behavior in the urban classroom: Effects of the good behavior game on student and teacher behavior. *Education & Treatment of Children*, *30*(1), 85-98.

Lee, J. (2012). Educational equity and adequacy for disadvantaged minority students: School and teacher resource gaps toward national mathematics proficiency standard. *Journal of Educational Research*, *105*(1), 64-75. http://dx.doi.org/10.1080/00220671.2010.519409

Leedy, P. D., & Ormrod, J. E. (2005). *Practical research*. Pearson Custom.

Li, J., Snow, C. E., & White, C. (2015). Teen culture, technology and literacy instruction: urban adolescent students' perspectives.

Lin, E. (2006). Cooperative learning in the science classroom. *Science Teacher*, *73(*5), 34-39.

Lin, Y., Morgan, P. L., Hillemeier, M., Cook, M., Maczuga, S., & Farkas, G. (2013). Reading, mathematics, and behavioral difficulties interrelate: Evidence from a cross-lagged panel design and population-based sample of US upper elementary students. *Behavioral Disorders*, *38*(4), 212-227.

Liu, O. L. (2009). An Investigation of Factors Affecting Gender Differences in Standardized Math Performance: Results from U.S. and Hong Kong 15 Year Olds. *International Journal Of Testing*, *9*(3), 215-237

Livingston, J. N., & Nahimana, C. (2006). Problem child or problem context: An ecological approach to young black males. *Reclaiming Children and Youth, 14*(4), 209-214.

Madland, D., & Bunker, N. (2011). The Middle Class Is Key to a Better-Educated Nation: A Stronger Middle Class Is Associated with Better Educational Outcomes. *Center for American Progress*.

Mayfield, K. H., & Glenn, I. M. (2008). An evaluation of interventions to facilitate algebra problem solving. *Journal of Behavioral Education*, *17*(3), 278-302. http://dx.doi.org/10.1007/s10864-008-9068-z

McCombs, B. L. (2000). Reducing the achievement gap. *Society*, *37*(5), 29-36. http://dx.doi.org/10.1007/s12115-000-1034-x

McCready, L. T., & Soloway, G. B. (2010). Teachers' perceptions of challenging student behaviors in model inner city schools. *Emotional & Behavioral Difficulties*, *15*(2), 111-123.

McGee, E. (2013). Threatened and placed at risk: High achieving African American males in urban high schools. *Urban Review 45*(4), 448-471. http://dx.doi.org/10.1007/s11256-013-0265-2

McGee, E. O. (2013). Threatened and placed at risk: High achieving African American males in urban high schools. *Urban Review: Issues and Ideas in Public Education*, *45*(4), 448-471. http://dx.doi.org/10.1007/s11256-013-0265-2.

McGrady, P. B., & Reynolds, J. R. (2013). Racial mismatch in the classroom: Beyond Black-White differences. *Sociology of Education*, *86*(1), 3-17. http://dx.doi.org10.1177/0038040712444857.

McKinley, J. H., & ASCD. (2010). *Raising Black Students' Achievement through Culturally Responsive Teaching*. Alexandria, VA: ASCD.

McKown, C. (2013). Social equity theory and racial-ethnic achievement gaps. *Child Development*, *84*(4), 1120-1136. http://dx.doi.org/10.1111/cdev.12033

Milner, H. R., Pabon, A., Woodson, A., & McGee, E. (2013). Teacher education and black male students in the United States. *REMIE Multidisciplinary Journal of Educational Research, 3*(3), 235-265

Montague, M., Enders, C., Cavendish, W., & Castro, M. (2011). Academic and behavioral trajectories for at-risk adolescents in urban schools. *Behavioral Disorders*, *36*(2), 141-156. Retrieved from http://www.jstor.org/stable/43153531

Muhammad, S. (2003). *How to teach math to Black students*. Chicago IL: African American Images.

National Education Association. (2009). Research spotlight on parental involvement in education. *NEA Reviews of the Research on Best Practices in Education*, 1-5.

National Center for Educational Statistics (2012). Long term trends. Retrieved from https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2009479

Nichols, J. D., & White, J. (2001). Impact of peer networks on achievement of high school algebra students. *Journal of Educational Research*, *94*(5), 267-73. http://dx.doi.org/10.1080/00220670109598762

Nomi, T., & Allensworth, E. M. (2013). Sorting and supporting: Why double-dose algebra led to better test scores but more course failures. *American Educational Research Journal*, *50*(4), 756-788. http://dx.doi.org/10.3102/0002831212469997

Novotná, J., & Hoch, M. (2008). How structure sense for algebraic expressions or equations is related to structure sense for abstract algebra. *Mathematics Education Research Journal, 20*(2), 93-104.

Osborne, R. T., McGurk, F. C., & Shuey, A. M. (1982). *The testing of Negro intelligence* (Vol. 2). Foundation for Human Understanding (GA).

Ozerem, A., & Akkoyunlu, B. (2015). Learning environments designed according to learning styles and its effects on mathematics achievement. *Uurasian Journal of Educational Research*, *61*, 61-80.

Palumbo, A., & Kramer-Vida, L. (2012). An academic curriculum will close the academic achievement gap. *Clearing House: A Journal Of Educational Strategies, Issues And Ideas*, *85*(3), 117-121. http://dx.doi.org/10.1080/00098655.2012.655345

Peters-Burton, E. E., Lynch, S. J., Behrend, T. S., & Means, B. B. (2014). Inclusive STEM High School Design: 10 critical components. *Theory into Practice*, *53*(1), 64-71.

Riegle-Crumb, C., & Grodsky, E. (2010). Racial-ethnic differences at the intersection of math course-taking and achievement. *Sociology of Education*, *83*(3), 248-270. http://dx.doi.org/10.1177/0038040710375689

Riegle-Crumb, C., Moore, C., & Ramos-Wada, A. (2011). Who wants to have a career in science or math? Exploring adolescents' future aspirations by gender and race/ethnicity. *Science Education*, *95*(3), 458-476. http://dx.doi.org/10.1002/sce.20431

Robinson, Q. L., & Werblow, J. (2012). Beating the odds: How single black mothers influence the educational success of their sons enrolled in failing schools. *American Secondary Education*, *40*(2), 52-66. Retrieved from https://www.ashland.edu/coe/about-college/american-secondary-education-journal

Robson, C. (2011). *Real world research*. Chichester, England: Wiley

Rodney, L. W., Crafter, B., Rodney, H. E., & Mupier, R. M. (1999). Variables contributing to grade retention among African American adolescent males. *Journal of Educational Research, 92*(3), 185-190. http://dx.doi.org/10.1080/00220679909597594

Salkind, N. J. (2012). *Exploring research*. Upper Saddle River, NJ: Pearson Educational.

Sanders, M. G. (1997). Overcoming obstacles: Academic achievement as a response to racism and discrimination. *Journal of Negro Education, 66*(1), 83-93. http://dx.doi.org/10.2307/2967253.

Sadowski, M. (2006). The school readiness gap. *Harvard Education Letter, 22*(4), 1-2.

Schott foundation for public education; Schott foundation report: Gap between black and white male high school graduation rates still widening. (2015). *Education Business Weekly*, 94.

Snipes, J., & Finkelstein, N. (2015). Opening a Gateway to College Access: Algebra at the Right Time. (Research Brief). *Regional Educational Laboratory West*.

Sommers, C., Owens, D. & Pilawsky, M. (2008). Individual and social factors to urban African American adolescents' school performance. *High School Journal, 91*(3), 1-11.

Spade, J. Z., Columba, L., & Vanfossen, B. E. (1997). Tracking in mathematics and science: Courses and course-selection procedures. *Sociology of Education, 70*(2), 108-127.

Steele, M. (2010). High school students with learning disabilities: Mathematics instruction, study skills, and high stakes test. *American Secondary Education, 38*(3), 21-27. Steward, R. J., Hill, M. F., Neil, D. M., Pritchett, T., & Wabaunsee, A. (2008). What Does GPA in an Urban High School Actually Mean? *Educational Considerations*, *36*(1), 11-16.

Steward, R. J., Hill, M. F., Neil, D. M., Pritchett, T., & Wabaunsee, A. S. N. (2008). What Does GPA in an Urban High School Actually Mean? *Educational Considerations*, *36*(1), 4.

Stinson, D. W. (2008). Negotiating sociocultural discourses: The counter-storytelling of academically (and mathematically) successful African American male students. *American Educational Research Journal*, *45*(4), 975-1010.

Strayhorn, T. L. (2015). Factors influencing black males' preparation for college and success in STEM majors: A mixed methods study. *Western Journal of Black Studies*, *39*(1), 45-63.

Thompson, G. L., & Allen, T. G. (2012). Four effects of the high-stakes testing movement on African American K-12 students. *The Journal of Negro Education, 81*(3), 218-227, 301-302.

Thompson, L., & Davis, J. (2013). The meaning high-achieving African-American males in an urban high school ascribe to mathematics. *Urban Review: Issues And Ideas In Public Education*, *45*(4), 490-517. http://dx.doi.org/10.1007/s11256-013-0267-0

Wadlington, E., & Wadlington, P. L. (2008). Helping Students with Mathematical Disabilities to Succeed. *Preventing School Failure*, *53*(1), 2-7. http://dx.doi.org/10.3200/psfl.53.1.2-7

Whiting, G. W. (2006). From at risk to at promise: Developing scholar identities among black males. *Journal of Advanced Academics*, *17*(4), 222-229, 285

Wilkerson, K., Afacan, K., Perzigian, A., Justin, W., & Lequia, J. (2016). Behavior-focused alternative schools: Impact on student outcomes. *Behavioral Disorders*, *41*(2), 81-94.

Williams, C. B. (2014). Expecting the Best: The Essential Lesson for Teachers. *Odyssey: New Directions in Deaf Education*, *15*, 30-34.

Wilson-Jones, L., & Marlene, C. C. (2004). Cooperative learning on academic achievement in elementary African American males. *Journal of Instructional Psychology*, *31*(4), 280-283.

Woolley, M. E., Strutchens, M. E., Gilbert, Sanders, M. G. (1997). Overcoming obstacles: Academic achievement as a response to racism and discrimination. *Journal of Negro Education*, *66*(1), 83-93. http://dx.doi.org/10.2307/2967253

Woolley, M. E., Strutchens, M., Gilbert, M. C., & Martin, W. G. (2010). Mathematics success of black middle school students: Direct and indirect effects of teacher expectations and reform practices. *Negro Educational Review*, *61*(1-4), 41.

Zientek, L. R., Younes, R., Nimon, K., Mittag, K. C., & Taylor, S. (2013). Fractions as a foundation for algebra within a sample of prospective teachers. *Research in the Schools*, *20*(1), 76-95.

Appendix A

Measurement Tools

Learning Style Inventory

Questions	Seldom	Sometimes	Often
1. I can remember more about a subject through the lecture method with information, explanations and discussion.	0	0	0
2. I prefer information to be presented the use of visual aids.	0	0	0
3. I like to write things down or to take notes for visual review.	0	0	0
4. I prefer to make posters, physical models, or actual practice and some activities in class.	0	0	0
5. I require explanations of diagrams, graphs, or visual directions.	0	0	0
6. I enjoy working with my hands or making things.	0	0	0
7. I am skillful with and enjoy developing and making graphs and charts.	0	0	0
8. I can tell if sounds match when presented with pairs of sounds.	0	0	0
9. I remember best by writing things down several times.	0	0	0
10. I can understand and follow directions on maps.	0	0	0
11. I do better at academic subjects by listening to lectures and tapes as opposed to reading a textbook.	0	0	0
12. I play with coins or keys in pockets.	0	0	0
13. I learn to spell better by repeating the words out loud than by writing the word on papers.	0	0	0
14. I can better understand a news article by reading about it in the paper than by listening to the radio.	0	0	0
15. I chew gum, smoke, or snack during studies.	0	0	0
16. I feel the best way to remember is to picture it in your head.	0	0	0

Questions	Seldom	Sometimes	Often
17. I learn spelling by tracing the letters with my fingers.	0	0	0
18. I would rather listen to a good lecture or speech than read about the same material in a textbook.	0	0	0
19. I am good at working and solving jigsaw puzzles and mazes.	0	0	0
20. I play with objects in hands during learning period.	0	0	0
21. I remember more by listening to the news on the radio rather than reading about it in the newspaper.	0	0	0
22. I obtain information on an interesting subject by reading relevant materials.	0	0	0
23. I feel very comfortable touching others, hugging, handshaking, etc.	0	0	0
24. I follow oral directions better than written ones.	0	0	0

There are two parts to this instrument: Part I and Part II.
Please read all instructions and respond carefully and completely.

Score: _____

Please provide the following information:

Name or I.D._____

Date_____Age_____Gender (*Please Circle*): F M

Part I: Everyday Math Tasks

Please indicate how much confidence you have that you could successfully accomplish each of these tasks by circling the number according to the following 10-point confidence scale.

Confidence Scale:

No Confidence at all		Very little Confidence		Some Confidence		Much Confidence		Complete Confidence	
0	1	2	3	4	5	6	7	8	9

Example: How much confidence do you have that you could successfully:

91. Multiply two large numbers in your head..... 0 1 2 3 4 5 6 7 8 9

If your response on the 10-point continuum was #5, "Some Confidence", you would circle the number 5 next to question #91 like so:.

91. Multiply two large numbers in your head..... 0 1 2 3 4 (5) 6 7 8 9

Now turn to the next page and begin Part I. Be sure to answer every item.

Name or I.D._____

Part I

No Confidence at all Very little Confidence Some Confidence Much Confidence Complete Confidence

0 1 2 3 4 5 6 7 8 9

How much confidence do you have that you could successfully:

1. Add two large numbers (e.g., 5379 + 62543) in your head.....	0	1	2	3	4	5	6	7	8	9
2. Determine the amount of sales tax on a clothing purchase.....	0	1	2	3	4	5	6	7	8	9
3. Figure out how much material to buy in order to make curtains.....	0	1	2	3	4	5	6	7	8	9
4. Determine how much interest you will end up paying on a $675 loan over 2 years at 14 3/4% interest.....	0	1	2	3	4	5	6	7	8	9
5. Multiply and divide using a calculator.....	0	1	2	3	4	5	6	7	8	9
6. Compute your car's gas mileage.....	0	1	2	3	4	5	6	7	8	9
7. Calculate recipe quantities for a dinner for 3 when the original recipe is for 12 people.....	0	1	2	3	4	5	6	7	8	9
8. Balance your checkbook without a mistake.	0	1	2	3	4	5	6	7	8	9
9. Understand how much interest you will earn on your savings account in 6 months, and how that interest is computed.....	0	1	2	3	4	5	6	7	8	9

Go on to next page.

Name or I.D._____

Part I (Cont.)

No Confidence at all Very little Confidence Some Confidence Much Confidence Complete Confidence

0 1 2 3 4 5 6 7 8 9

How much confidence do you have that you could successfully:

10. Figure out how long it will take to travel from Columbus to Chicago driving at 55 mph.....	0	1	2	3	4	5	6	7	8	9
11. Set up a monthly budget for yourself taking into account how much money you earn, bills to pay, personal expenses, etc.....	0	1	2	3	4	5	6	7	8	9
12. Compute your income taxes for the year.	0	1	2	3	4	5	6	7	8	9
13. Understand a graph accompanying an article on business profits.	0	1	2	3	4	5	6	7	8	9
14. Figure out how much you would save if there is a 15% mark-down on an item you wish to buy.	0	1	2	3	4	5	6	7	8	9
15. Estimate your grocery bill in your head as you pick up items.	0	1	2	3	4	5	6	7	8	9
16. Figure out which of 2 summer jobs is the better offer: one with a higher salary but no benefits; the other with a lower salary but with room, board, and travel expenses included.	0	1	2	3	4	5	6	7	8	9
17. Figure out the tip on your part of a dinner bill total split 8 ways.	0	1	2	3	4	5	6	7	8	9
18. Figure out how much lumber you need to buy in order to build a set of bookshelves.	0	1	2	3	4	5	6	7	8	9

Go on to Part II.

Name or I.D._____

Part II: Math Courses

Please rate the following college courses according to how much confidence you have that you could complete the course with a final grade of "A" or "B". Circle your answer according to the 10-point scale below:

No Confidence at all Very little Confidence Some Confidence Much Confidence Complete Confidence

0 1 2 3 4 5 6 7 8 9

19. Basic College Math	0	1	2	3	4	5	6	7	8	9
20. Economics	0	1	2	3	4	5	6	7	8	9
21. Statistics	0	1	2	3	4	5	6	7	8	9
22. Physiology	0	1	2	3	4	5	6	7	8	9
23. Calculus	0	1	2	3	4	5	6	7	8	9
24. Business Administration	0	1	2	3	4	5	6	7	8	9
25. Algebra II	0	1	2	3	4	5	6	7	8	9
26. Philosophy	0	1	2	3	4	5	6	7	8	9
27. Geometry	0	1	2	3	4	5	6	7	8	9
28. Computer Science	0	1	2	3	4	5	6	7	8	9
29. Accounting	0	1	2	3	4	5	6	7	8	9
30. Zoology	0	1	2	3	4	5	6	7	8	9
31. Algebra I	0	1	2	3	4	5	6	7	8	9
32. Trigonometry	0	1	2	3	4	5	6	7	8	9
33. Advanced Calculus	0	1	2	3	4	5	6	7	8	9
34. Biochemistry	0	1	2	3	4	5	6	7	8	9

You have now completed the Mathematic

Appendix B

Informed Consent

Study Information Letter for Parent/Guardian

October 24, 2016

Dear Parent/Guardian,

I am writing to inform you of a study being conducted at River Rouge High School. Your student is being asked to participate in a study as an anonymous participant. The study is designed to identify early identification of Black male students in need of Algebra Imath supports.

I have enclosed an **informed a consent** form which further discusses the study and the benefits to the student participant. I ask that your review the informed consent form, sign the informant consent form, and return the form to the high school office located on the second floor (**Return to Ms. B. White, 2nd floor office secretary)**.

At the end of the session, student will be offered a light snack consisting of pizza and soda as a way of saying thank you for participating in the study.

Thanking you in advance,

Roy D. Harris

Ed.D Candidate and Student Researcher

Appendix C

Permissions

National Center for Education Statistics Data Usage Release

Permission to Replicate Information

Unless stated otherwise, all information on the U.S. Department of Education's NCES website at http://nces.ed.gov is in the public domain and may be reproduced, published, linked to, or otherwise used without NCES' permission.

Table 1. Cohort Performance of 4th & 8th Grade Males by Ethnicity 1990, 2013, 2015

Table 2. 4th & 8th Grade Math Performance on NAEP 1990, 2013, 2015

Table 3. 4th & 8th Grade Math Performance by Ethnicity & Sex for 1990, 2013, 2015

Table 4. 8th Grade Male NAEP Performance Scores from 1990, & 2015

CYC-Net Permission

Figure 1. Factors Associated with Labeling Urban Black Males.

Welcome to CYC-Net

Whether you are a professional or a student in a modern First World city, or a care worker in a remote Third World countryside, access to this valuable collection of material is unrestricted. Our site is, and always has been, entirely free.