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Differences in Algebra I End-of-Course Exam Performance of African-American Girls as a Function of Their Economic Status: A Texas, Multiyear Analysis

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Cover Page Footnote

This article is part of Dr. LaTonia Amerson's doctoral dissertation, under the supervision of Dr. Cynthia Martinez-Garcia.

Differences in the Performance of African American Boys on the Algebra I End-of-Course Exam by Their Economic Status: A Statewide, Multiyear Investigation

Federal legislation mandates such as The Elementary and Secondary Education Act of 1965, The No Child Left Behind Act of 2001, and the Every Student Succeeds Act of 2015 have placed an emphasis on student performance, school progress, and closing the achievement gaps of students, including African American students and other student groups. However, many students do not meet the achievement standards despite these federal mandates continue to not meet achievement standards. Specifically, the mathematics achievement for students living in poverty has been and remains problematic. Given the numerous research studies about the relationship between mathematics achievement and economic stability, it is imperative that educational leaders, education agencies, and policymakers generate and implement interventions to help students overcome mathematics achievement barriers. Previous researchers (e.g., David & Marchant, 2015; Wang et al., 2013) have stated that students from low income families are at risk for many social and academic disadvantages.

According to the National Center for Children in Poverty (2018), 41% of children in the United States were in low income families in 2018. Being a member of a low-income family is more likely for African American and Hispanic children than it is for White and Asian children. In 2018, 61% of African American children were classified as poor, and 59% of Hispanic children were classified as poor (National Center for Children in Poverty 2018). This percentage is considerably higher than the percentages of Asian and White children who were classified as poor, as both of these groups had only 28% of their children living in low income families (National Center for Children in Poverty, 2018). The National School Boards Association (2020) reported that nearly 33% of African American students live in poverty, compared with 10% of White students. More than one-fourth, 27%, of African American students live in households where the highest level of education attained by either parent was a bachelor's or higher degree, compared with substantially higher percentages for Asian students, 69%, and for White students, 53%. Although decreases have been documented in the dropout rates for all demographic groups, the dropout rates for Hispanic and African American students remain higher than for White students. The Hispanic dropout rate decreased from 16.6% to 7.7%, whereas the African American dropout rate decreased from 10.3% to 5.6%, and the White dropout rate decreased from 5.3% to 4.1% (National Center for Education Statistics, 2021). Specific to this article, nearly 8 out of 100 African American males dropped out of school according to the most recently published data from the National Center for Education Statistics (2021).

In poorer neighborhoods where a disproportionate number of Black teenagers live, Black students tend to have a lower percentage of graduation rates than White students (Lynch, 2017). In high poverty schools, they suffer from deficient supplies, materials, opportunities to learn, and deteriorating physical facilities, which diminish student engagement and performance (Hudley, 2013). Pruitt et al. (2019) conducted a longitudinal study from 2009 to 2013 to examine the effects of economic inequality on the academic achievement of African-American males. The study involved 23,000 African-American males in 944 different high schools who were disproportionately poor and living below the poverty line. They ran a multilinear regression to predict academic achievement based on poverty level and race. These

researchers concluded that African-American males living in poor neighborhoods had few resources for learning which fostered low academic achievement. Consequently, African-American males in poor families had lower academic achievement than White males. Additionally, African-American males who lived in impoverished neighborhood environments attended deteriorating schools which affected their academic achievement. According to their findings, no relationship was present between the race of a student and their academic achievement, indicating that race alone is not a factor but when coupled with poverty, detrimental effects on academic achievement exist (Pruitt et al., 2019).

The findings of the aforementioned researchers were supported in similar studies. Rothstein (2013) documented that in low-income neighborhoods, the residents are of low socioeconomic status, and African American students in these neighborhoods have lower graduation rates compared to their White peers. He said that schools in these low income communities have few educational specialists and resources, such as advanced placement classes, limited extracurricular opportunities, and dilapidated physical environments. Walsh and Theodorakakis (2017) discovered that income inequality has caused a growth in educational inequality. Growing poverty rates have led to the widening of the achievement between students of color and their peers because family income has an effect on the educational opportunities that are available to children. Children and teenagers in low-income families often have less access to educational opportunities, such as educational programs both within and outside of school, which affect their academic achievement. The findings presented in the studies are especially relevant when considering postsecondary opportunities for life and beyond for African American boys, specifically in math related fields.

According to the (National Center for Education Statistics, 2019), only 36% of African American male students completed a bachelor's degree within six years. African American males who graduated high school were not prepared for the rigors of college coursework. Although many college outcomes are substantially influenced by successful Algebra II completion (Gaertner et al., 2013), many high-minority schools do not offer advanced mathematics courses. Consequently, African American students are not able to garner the academic skills necessary to enter and succeed in college (Bryant, 2015). Several researchers (e.g., Morgan & Amerikaner, 2018; Scott et al., 2016; The Education Trust, 2014) have documented that many Black families with lower income levels are served by under-funded and under-performing public schools. Lower funding levels for schools with the highest percentages of African American students typically results in diminished educational opportunities (Patrick et al., 2020; The Education Trust, 2014) which include lack of access to advanced high school coursework.

According to McGee (2013), the academic achievement of African American males is a complex and multilayered issue. The failure of Algebra I mathematics at the high school level often has led to a lower curriculum track assignment for the African American male student. 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. Poorly performing African American male students who are assigned to a lower curriculum track will not have access to rigorous instruction or 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 African American male

high school students from a higher education and a multitude of quality of life opportunities that would be beneficial to both African American males entering adulthood.

Paschall et al. (2018) contended that the intersectionality of multiple student demographics (e.g., economic status, gender, or ethnicity/race) should be addressed when performing analyses on educational equity. The intersection of poverty and ethnicity/race are factors that should be considered when it comes to student academic needs. Though most researchers (e.g., Harris, 2018; McGown, 2016) have focused on the effects of these student demographic characteristics separately, Paschall et al. (2018) analyzed the mathematics and reading achievement of students based on interactions between poverty and ethnicity/race. Their data was indicative of substantial gaps in achievement scores by the economic status of students of color.

An investigation was conducted by Harris (2018) to examine the early indicators of Algebra I failure among African American males in an urban school during the 2016-2017 school year. The total school enrollment consisted of 1,264 students. Of the total sampled students, 365 were assigned to Grade 9, and 141 students were identified as Black males between the ages of 14-16 years of age. According to the data, 32 of the 141 African American male students failed the first semester of Grade 9 Algebra I and received a final grade of 59% or below which equates to course failure represented by a single letter grade of F. He used pertinent data during his analysis that consisted of a review of Grade 8 math final grades, Grade 8 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 grades. Harris (2018) suggested in his recommendations that future researchers include a qualitative approach whereby a conversation with urban African American males about their likes and dislikes concerning mathematics from Grade 4 through Grade 9 Algebra I would be invaluable to the development of mathematical pedagogy designed to improve urban African American male mathematical outcomes.

In a nationwide study, Kuhfeld et al. (2018) examined the reading and mathematics achievement of students based on their race/ethnicity and poverty status. They established that White students in poverty outperformed both African American and Hispanic students who were in poverty in reading and mathematics. The gaps between these groups of students widened from school entry to age 15. Kuhfeld et al. (2018) also documented that White students in poverty performed similarly to African American students and Hispanic students who were not economically disadvantaged. Their findings were consistent with other researchers (e.g., Fryer & Levitt, 2006; Lee & Burkham, 2002; McDonough, 2015) that students of color enter school with academic gaps that persist or grow as children progress through school. Also, Kuhfeld et al. (2018) contended that poverty plays a role in delineating racial/ethnic gaps but does not sufficiently explain the gaps by itself.

Texas was one of the states with the highest dropout rates for high school students. From 2013 to 2017, the state dropout rate was 7.1% (National Center for Education Statistics, 2020c). Of that percentage, African American males dropped out at a higher rate of 8.8% when compared to African American girls at 4.3% % (National Center for Education Statistics, 2021). With respect to household income, 11.1% of students from low-income homes dropped out of high school in Texas. With respect to the possible effects of poverty on mathematics performance, Davenport and Slate (2019) analyzed the degree to which differences were

present in the Texas state-mandated Mathematics assessment performance of Texas Grade 3 students by their economic status (i.e., Not Poor, Moderately Poor, and Extremely Poor) by comparing three mathematics measures: Approaches Grade Level, Meets Grade Level, and Masters Grade Level performance standards. Grade 3 students who were Not Poor (i.e., not economically disadvantaged) had the highest percentages of students who met the Grade Level standards. Grade 3 students in the Moderately Poor group (i.e., qualified for the reduced-price lunch program) had the second highest percentages of students who met the Grade Level standards. Noteworthy, Grade 3 students in the Extremely Poor group (i.e., qualified for the free lunch program) had the lowest percentages of students who met the Grade Level standards. As such, a clear stair-step effect (Carpenter et al., 2006) was present at each Grade Level standard, with respect to economic status. The highest passing rates were consistently present for students who were not in poverty; the next best passing rates were present for students who were eligible for the reduced-price lunch program; and the lowest passing rates were present for students who were eligible for the free lunch program.

In the aforementioned study, the focus was on students in lower grades. In a recent Texas statewide analysis, Alford-Stephens (2016) examined data on the Texas state-mandated mathematics assessment at the high school level to ascertain the extent to which differences were presented in the mathematics skills of African American boys in Texas high schools by their economic status (i.e., Not Poor, Moderately Poor, and Extremely Poor). In her study, statistically significant differences were established in the 10 mathematics skills tested from the 2004-2005 through the 2011-2012 school years. For the 2004-2005 through the 2006-2007 school years, African American boys who were Extremely Poor (i.e., qualified for the free lunch program) performed more poorly than African American boys who were Moderately Poor (i.e., qualified for the reduced-price lunch program) and more poorly than African American boys who were Not Poor (i.e., not economically disadvantaged) in all 10 mathematics skills (Alford-Stephens, 2016). As in the aforementioned study, a clear stair-step effect (Carpenter et al., 2006) was present at each Grade Level standard, with respect to economic status. The highest passing rates were consistently present for students who were not in poverty; the next best passing rates were present for students who were eligible for the reduced-price lunch program; and the lowest passing rates were present for students who were eligible for the free lunch program.

After an extensive and intensive review of the existing literature, no published research articles could be located in which Algebra I End-of-Course exam data from the STAAR Mathematics assessment had been analyzed determine the extent to which economic status is related African American boys' performance in mathematics. With respect to this study, Algebra I End-of-Course exam data from the STAAR Mathematics assessment was examined with respect to the degree economic status is linked to African American boys' performance in mathematics.

The U.S. graduation rates from public high schools are especially low for boys, 83%, and are even lower for African American boys, 64% (National Center for Education Statistics, 2020c). For African American boys, poverty can be the barrier that impedes academic and life-long success (Gardner & Miranda, 2001). Many African American boys living in poverty are not prepared for the expectations of the academic setting; consequently, these students lack the numeracy and literacy skills needed to be academically successful. Several researchers (e.g.,

Alford-Stephens & Slate, 2015; Noguera, 2012) have documented that poverty can place children at an even greater risk of being academically unsuccessful. However, all students are expected to meet the established state achievement standards despite personal struggles and financial limitations regardless of their economic status. High school students in Texas are required to take and pass, a total of five high stakes standardized tests to meet their graduation requirements. According to the Texas Education Agency (2019b), three of these tests are administered to first year high school students; one of which is the Algebra I End-of-Course exam.

The purpose of this study was to determine the degree to which differences were present in mathematics achievement as a function of the economic status of African American boys. Data from the State of Texas Assessments of Academic Readiness (STAAR) Algebra I End-of-Course examination were analyzed to determine the extent to which differences existed in the mathematics performance of African American boys by their economic status. Through this 3-year analysis of Texas statewide data, the degree to which trends were present in three Grade Level standards in these two economic groups was determined. The following overarching research question were addressed in this study: What is the difference in the Algebra I End-of-Course exam performance for African American boys as a function of economic status? Specific sub questions under this overarching research question was: (a) What is the difference in the Algebra I End-of-Course Approaches Grade Level performance by the economic status of African American boys?; (b)What is the difference in the Algebra I End-of-Course Meets Grade Level performance by the economic status of African American boys?; (c) What is the difference in the Algebra I End-of-Course Masters Grade Level performance by the economic status of African American boys?; and (d) What trend is present in the Algebra I End-of-Course exam performance by the economic status of African American boys across the 2016-2017 school year through the 2018-2019 school year? The first three research questions were answered separately by each school year, whereas the fourth research question involved data across all three school years.

Method

For this multi-year investigation, a causal-comparative research design was present (Johnson & Christensen, 2020). The independent variable of economic status was fixed, and the dependent variables of student mathematics performance had previously occurred. In this study, archival data was acquired from the Texas Education Agency Public Education Information Management System and were analyzed to determine the degree to which differences were present in mathematics performance for Texas African American boys as a function of their economic status. Two economic status groups were present: (a) Poor and (b) Not Poor. The dependent variables in this study were student performance levels on the STAAR Algebra I End-of-Course exam (i.e., Approaches Grade Level, Meets Grade Level, Masters Grade Level) for the 2016-2017 through the 2018-2019 school years for African American boys. In 2020, the spring STAAR tests were canceled due to the pandemic. In 2021, the Commissioner of Education gave families the option to send their child to school to test if families had no health or safety concerns. This allowance from the Commissioner resulted in a decrease in student participation as compared to typical years. Consequently, data was not obtained for the pandemic year.

Participants in this study were African American boys who met the criteria for the economically disadvantaged subgroup and had completed the Algebra I End-of-Course exam. For this End-of-Course exam, the labels for the performance categories were Approaches Grade Level, Meets Grade Level, and Masters Grade Level. Texas Education Agency (2015) has defined economically disadvantaged as "a student who is eligible for free or reduced-priced meals under the national School Lunch and Child Nutrition Program" (para. 5). The achievement data for this study was obtained through a Public Information Request to the Texas Education Agency's Public Education Information Management System. Data was then imported into the Statistical Package for Social Sciences software program for analysis.

The Texas Education Agency (2017) suggested that performance in the Approaches Grade Level category indicates that students are likely to succeed in the next grade or course with targeted academic intervention. Students in this category generally demonstrate the ability to apply the assessed knowledge and skills in familiar contexts (Texas Education Agency, 2017). If students perform in the Meets Grade Level category, this performance indicates they have a high likelihood of success in the next grade or course but may still need some short-term, targeted academic intervention. Students in this category generally demonstrate the ability to think critically and apply the assessed knowledge and skills in familiar contexts (Texas Education Agency, 2017). Student performance in the Masters Grade Level category indicates that students are expected to succeed in the next grade or course with little or no academic intervention. Students in this category demonstrate the ability to think critically and apply the assessed knowledge and skills in varied contexts, both familiar and unfamiliar (Texas Education Agency, 2017).

Sample sizes varied for each of the three school years of data that were obtained. With respect to the 2016-2017 school year, data for 24,134 African American boys were present. Of this total, 17,762 African American boys were economically disadvantaged. This figure represented almost 74% of the sample of African American boys in this school year who were living in poverty. Regarding the 2017-2018 school year, data for 22,603 African American boys were present. Of this total, 16,971 African American boys were economically disadvantaged. This figure indicated that 75% of the sample of African American boys in this school year were living in poverty. Concerning the 2018-2019 school year, data for 20,464 African American boys were present. Of this total, 15,223 African American boys were economically disadvantaged. This figure represented over 74% of the sample of African American boys in this school year who were living in poverty. Table 1 contains the descriptive statistics for sample sizes for the three school years.

Table 1

Frequencies and Percentages of STAAR Algebra I End-of-Course Approaches Grade Level Performance Standard of African American Boys by Their Economic Status for All Three School Year

School Year and Economic Status	*n* and %age of Total
2016-2017	
Not Poor	(*n* = 6,372) 26.4%
Poor	(*n* = 17,762) 73.6
2017-2018	
Not Poor	(*n* = 5,632) 24.9%
Poor	(*n* = 16,972) 75.1%
2018-2019	
Not Poor	(*n* = 5,241) 25.6%
Poor	(*n* = 15,223) 74.4%

Results

To ascertain whether differences were present in STAAR Algebra I End-of-Course exam performance (i.e., Did Not Meet, Met) at the Approaches Grade Level, Meets Grade Level, and Masters Grade Level standards by level of poverty (i.e., Poor and Not Poor) for African American boys for the 2016-2017, 2017-2018, and 2018-2019 school years, Pearson chi-square analyses were conducted. This statistical procedure was viewed as the optimal statistical procedure to use because frequency data was present for STAAR Algebra I End-of-Course exam performance, Grade Level standard, and for economic status. When the independent variables and dependent variables are categorical in nature, Pearson chi-squares are an appropriate inferential statistical procedure (Slate & Rojas-LeBouef, 2011). Given the statewide sample that was obtained, the available sample size per cell was more than five. Accordingly, the assumptions for using Pearson chi-square procedures were met.

Approaches Grade Level Analyses Across All Three School Years

For the first research question on the STAAR Algebra I End-of-Course exam performance at the Approaches Grade Level standard for the 2016-2017 school year, the result was statistically significant, $\chi^2(1) = 866.14$, $p < .001$. The effect size for this finding, Cramer's V, was small, .19 (Cohen, 1988). As revealed in Table 2, a statistically significantly higher percentage of African American boys who were Not Poor, more than 21 percentage points, met the STAAR Algebra I End-of-Course exam Approaches Grade Level standard than did African American boys who were Poor.

Table 2

Frequencies and Percentages of STAAR Algebra I End-of-Course Approaches Grade Level Performance Standard of African American Boys by Their Economic Status for All Three School Years

School Year and Economic Status	Did Not Meet *n* and %age of Total	Met *n* and %age of Total
2016-2017		
Not Poor	(*n* = 2,011) 31.6%	(*n* = 4,361) 68.4%
Poor	(*n* = 9,417) 53%	(*n* = 8,345) 47%
2017-2018		
Not Poor	(*n* = 1,603) 28.5%	(*n* = 4,029) 71.5%
Poor	(*n* = 8,176) 48.2%	(*n* = 8,795) 51.8%
2018-2019		
Not Poor	(*n* = 1,461) 27.9%	(*n* = 3,780) 72.1%
Poor	(*n* = 7,021) 46.1%	(*n* = 8,202) 53.9%

With respect to the 2017-2018 school year, the Pearson chi-square revealed the presence of a statistically significant difference, $\chi^2(1) = 669.52$, $p < .001$, Cramer's V, was small, .17 (Cohen, 1988). As delineated in Table 2, a statistically significantly higher percentage of African American boys who were Not Poor, more than 19 percentage points higher, met the STAAR Algebra I End-of-Course exam Approaches Grade Level standard than did African American boys who were Poor. Concerning the 2018-2019 school year, a statistically significant difference was yielded, $\chi^2(1) = 534.75$, $p < .001$, small effect size, Cramer's V = .16 (Cohen, 1988). A statistically significantly higher percentage of African American boys who were Not Poor, more than 18 percentage points higher, met the STAAR Algebra I End-of-Course exam Approaches Grade Level standard than did African American boys who were Poor. Descriptive statistics for this analysis are contained in Table 2.

Meets Grade Level Analyses Across All Three School Years

Regarding the 2016-2017 school year for the STAAR Algebra I End-of-Course Meets Grade Level standard, a statistically significant result was yielded, $\chi^2(1) = 926.37$, $p < .001$, small effect size, Cramer's V = .20 (Cohen, 1988). A statistically significantly higher percentage of African American boys who were Not Poor, more than 18 percentage points higher, met the STAAR Algebra I End-of-Course Meets Grade Level standard than did African American boys who were Poor. Table 3 contains the descriptive statistics for this analysis.

Table 3

Frequencies and Percentages of STAAR Algebra I End-of-Course Meets Grade Level Performance Standard of African American Boys by Their Economic Status for All Three School Years

School Year and Economic Status	Did Not Meet *n* and %age of Total	Met *n* and %age of Total
2016-2017		
Not Poor	(*n* = 4,059) 63.7%	(*n* = 2,313) 36.3%
Poor	(*n* = 14,617) 82.3%	(*n* = 3,145) 17.7%
2017-2018		
Not Poor	(*n* = 3,291) 58.4%	(*n* = 2,341) 41.6%
Poor	(*n* = 13,514) 79.6%	(*n* = 3,457) 20.4%
2018-2019		
Not poor	(*n* = 2,843) 54.2%	(*n* = 2,398) 45.8%
Poor	(*n* = 11,310) 74.3%	(*n* = 3,913) 25.7%

With respect to the 2017-2018 school year, the result was statistically significant, $\chi^2(1) = 996.16$, $p < .001$, small effect size, Cramer's V = .21 (Cohen, 1988). A statistically significantly higher percentage of African American boys who were Not Poor, more than 21 percentage points higher, met the STAAR Algebra I End-of-Course Meets Grade Level standard than did African American boys who were Poor. Delineated in Table 3 are the descriptive statistics for this analysis. Concerning the 2018-2019 school year, a statistically significant difference was yielded, $\chi^2(1) = 734.84$, $p < .001$, small effect size, Cramer's V = .19 (Cohen, 1988). A statistically significantly higher percentage of African American boys who were Not Poor, more than 20 percentage points higher, met the STAAR Algebra I End-of-Course exam Meets Grade Level standard than did African American boys who were Poor. Descriptive statistics for this analysis are contained in Table 3.

Masters Grade Level Analyses Across All Three School Years

For the third research question on the STAAR Algebra I End-of-Course exam performance at the Masters Grade Level standard, a statistically significant result was yielded, $\chi^2(1) = 767.64$, $p = .001$, Cramer's V, small effect size, .18 (Cohen, 1988). As presented in Table 4, a higher percentage of African American boys who were Not Poor, less than 10 percentage points higher, met the STAAR Algebra I End-of-Course exam Masters Grade Level standard than did African American boys who were Poor in the 2016-2017 school year.

Table 4

Frequencies and Percentages of STAAR Algebra I End-of-Course Masters Grade Level Performance Standard of African American Boys by Their Economic Status for All Three School Years

School Year and Economic Status	Did Not Meet *n* and %age of Total	Met *n* and %age of Total
2016-2017		
Not Poor	(*n* = 5,425) 85.1%	(*n* = 947) 14.9%
Poor	(*n* = 16,977) 95.6%	(*n* = 785) 4.4%
2017-2018		
Not Poor	(*n* = 4,548) 80.8%	(*n* = 1,084) 19.2%
Poor	(*n* = 15,820) 93.2%	(*n* = 1,151) 6.8%
2018-2019		
Not Poor	(*n* = 3,987) 76.1%	(*n* = 1,254) 23.9%
Poor	(*n* = 13,772) 90.5%	(*n* = 1,451) 9.5%

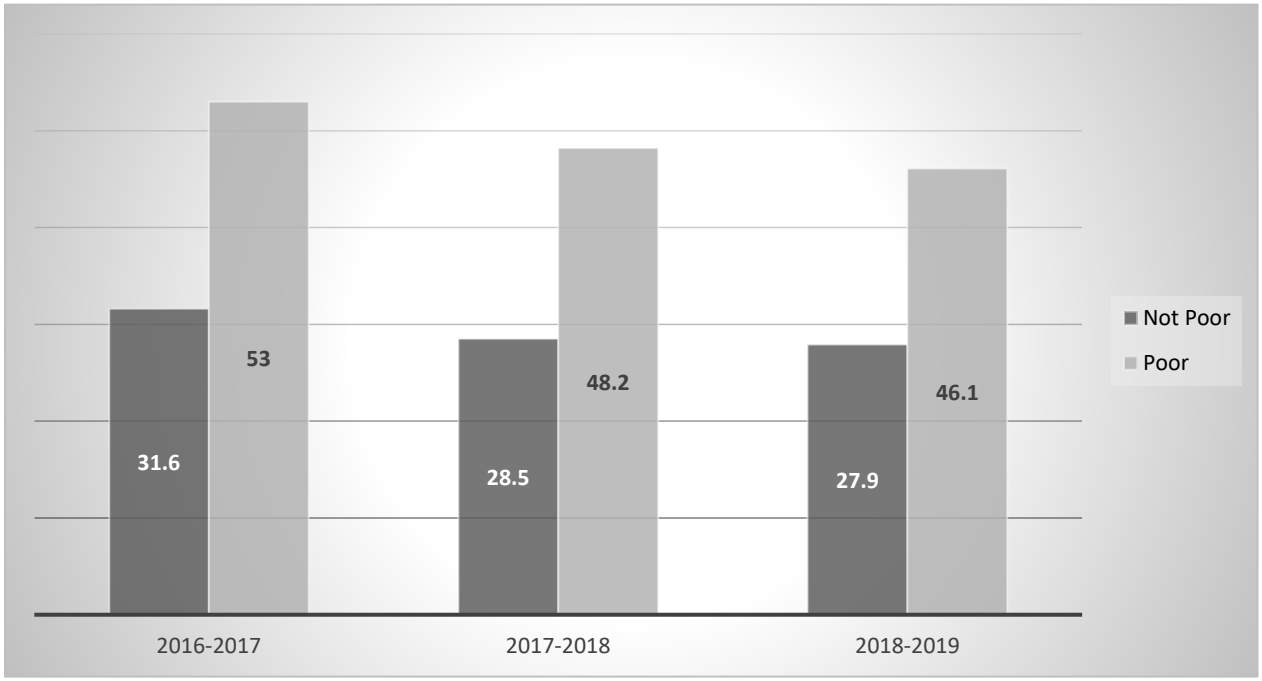
Concerning the 2017-2018 school year, a statistically significant difference was yielded, $\chi^2(1) = 737.39$, $p < .001$. The effect size for this finding, Cramer's V, was small, .18 (Cohen, 1988). As revealed in Table 4, a statistically significantly higher percentage of African American boys who were Not Poor, more than 12 percentage points higher, met the STAAR Algebra I End-of-Course exam Masters Grade Level standard than did African American boys who were Poor. With respect to the 2018-2019 school year, the Pearson chi-square yielded the presence of a statistically significant difference, $\chi^2(1) = 704.29$, $p < .001$, small effect size, Cramer's V = .19 (Cohen, 1988). A statistically significantly higher percentage of African American boys who were Not Poor, more than 14 percentage points higher, met the STAAR Algebra I End-of-Course exam Masters Grade Level standard than did African American boys who were Poor. Delineated in Table 4 are the descriptive statistics for this analysis.

Algebra I End-of-Exam Course Performance Across All Three School Years

In regard to the Approaches Grade Level standard, African American boys who were Not Poor outperformed African American boys who were Poor in all three school years. The percentages of African American boys who were Not Poor and African American boys who were Poor who met the Approaches Grade Level standard consistently increased each school year. Regarding African American boys who were Not Poor, 68.4% met the Approaches Grade Level standard in the 2016-2017 school year, 71.5% met the approaches Grade Level standard in the 2017-2018 school year, and 72.1% met the Approaches Grade Level standard in the 2018-2019 school year. In reference to African American boys who were Poor, 47% met the Approaches Grade Level standard in 2016-2017, 51.8% met the Approaches Grade Level standard in the 2017-2018 school year, and 53.9% met the Approaches Grade Level standard in the 2018-2019 school year. The percentages of African American boys who were Not Poor and African American boys who were Poor who did not meet this Grade Level standard are depicted in Figure 1.

Figure 1

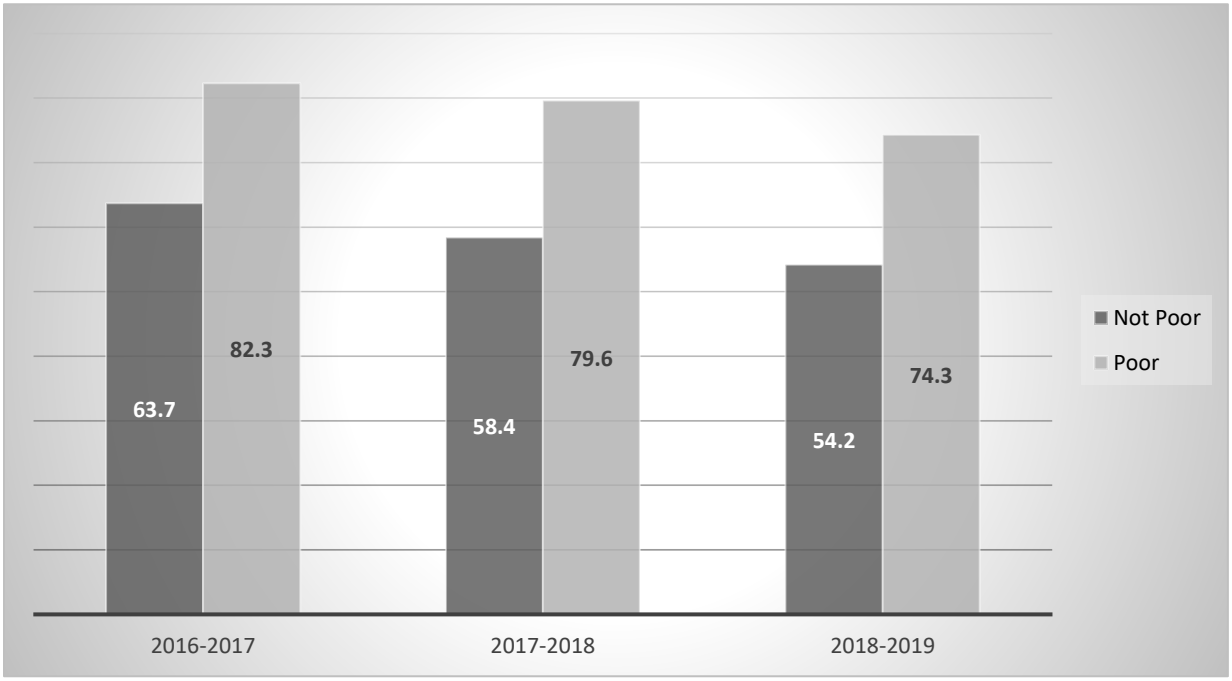
Percentages of African American Boys by Their Economic Status Who Did Not Meet the Algebra I End-of-Course Approaches Grade Level Performance Standard for All Three School Years



With respect to the Meets Grade Level standard, African American boys who were Not Poor consistently outperformed African American boys who were Poor in all three school years. Similar to the Approaches Grade Level standard, African American boys in both poverty levels, Not Poor and Poor, increased in performance after each school year. In the 2016-2017 school year, 36.3% of African American boys who were Not Poor met the Meets Grade Level standard. In the 2017-2018 school year, 41.6% of African American boys who were Not Poor met the Meets Grade Level standard. In the 2018-2019 school year, 45.8% of African American boys who were Not Poor met the Meets Grade Level standard. In the 2016-2017 school year, 20.4 % of African American boys who were Poor met the Meets Grade Level Standard. In the 2017-2018 school year, 17.7% of African American boys who were Poor met the Meets Grade Level standard. In the 2018-2019, 25.7% of African American boys who were Poor met the Meets Grade Level standard. Portrayed in Figure 2 are the percentages African American boys who were Not Poor and African American boys who were Poor who did not meet this Grade Level standard for this analysis.

Figure 2

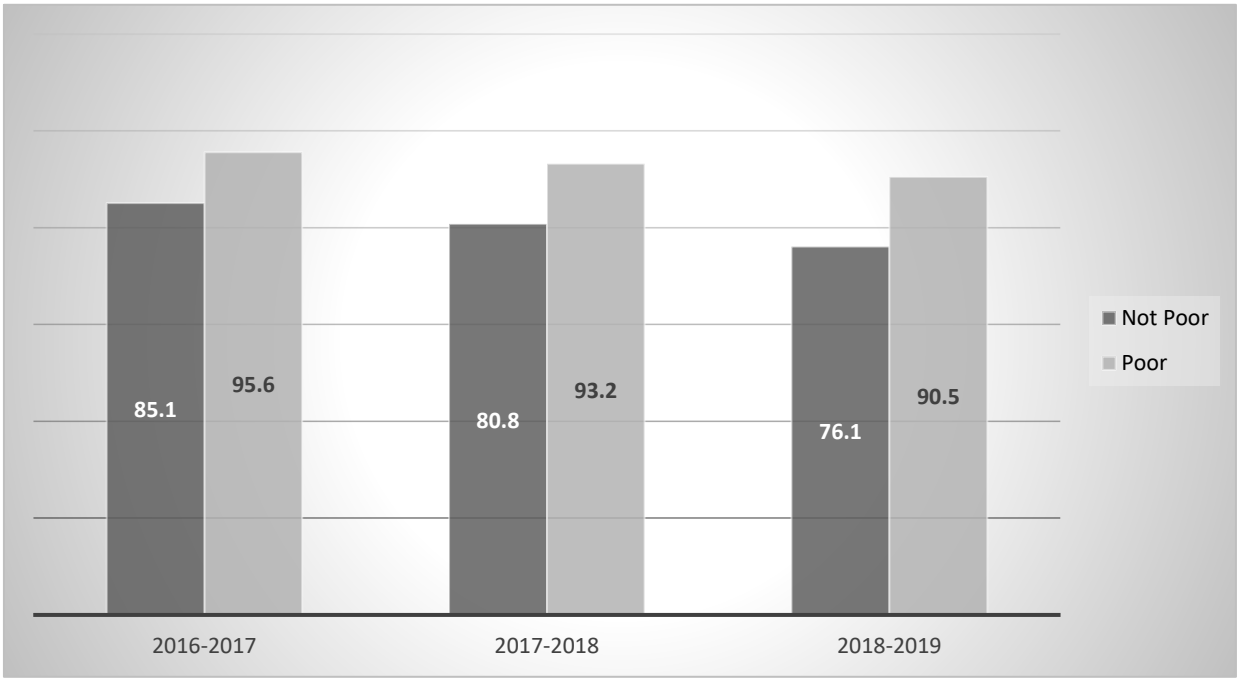
Percentages of African American Boys by Their Economic Status Who Did Not Meet the Algebra I End-of-Course Meets Grade Level Performance Standard for All Three School Years



In regard to the Masters Grade Level standard, African American boys who were Not Poor consistently outperformed African American boys who were Poor in the 2016-2017, 2017-2018, and 2018-2019 school years. Statistically significant results were present for this Grade Level standard in all three school years. Readers should note the high percentages of African American boys who were Poor who did not meet this Grade Level standard. In reference to African American boys who were Poor, 95.6% did not meet the Masters Grade Level standard in 2016-2017. In the 2017-2018 school year, 93.2% of African American boys who were Poor did not meet the Masters Grade Level standard. In the 2018-2019 school year, 90.5% of African American boys did not meet the Masters Grade Level standard. Depicted in Figure 3 are the percentages African American boys who were Not Poor and African American boys who were Poor who did not meet this Grade Level standard for this analysis.

Figure 3

Percentages of African American Boys by Their Economic Status Who Did Not Meet the Algebra I End-of-Course Masters Grade Level Performance Standard for All Three School Years



Discussion

The performance of African American boys who were Not Poor and African American boys who were Poor on the Algebra I End-of-Course Grade Level performance was addressed in this multiyear investigation. The three Grade Level standards that were investigated were: Approaches Grade Level, Meets Grade Level, and Masters Grade Level. Based on the results of this empirical investigation, statistically significant differences were present between African American boys who were Not Poor and African American boys who were Poor for all Grade Level standards.

With respect to the Algebra I End-of-Course exam, statistically significant differences were present in all Grade Level standards for the 2016-2017, 2017-2018, and 2018-2019 school years. African American boys who were Not Poor outperformed African American boys who were Poor in all of the Grade Level standards that yielded statistically significant results. Of concern in performance for all Grade Level standards is that almost one-half of African American boys who were Poor did not meet any Grade Level standard.

In this empirical investigation, African American boys who were Not Poor performed statistically significantly higher than African American boys who were Poor in all three of the statistical analyses that were conducted. These results are congruent with the existing research literature. In Texas state-wide study, Alford-Stephens (2016) examined data on the Texas state-mandated mathematics assessment at the high school level to ascertain the extent to which differences were presented in the mathematics skills of African American boys in Texas high schools by their economic status (i.e., Not Poor, Moderately Poor, and Extremely Poor). Findings were the highest passing rates were consistently present for students who were not in

poverty whereby students who were Extremely Poor had the lowest passing rates. The results of this investigation also align with Walsh and Theodorakakis (2017) who determined that income inequality has caused a growth in educational inequality. They suggested that growing poverty rates have led to the widening of the achievement between students of color and their peers because family income has an effect on the educational opportunities that are available to children. Findings from this multiyear statewide investigation are also commensurate with the extant research literature that poverty has detrimental effects on student achievement in mathematics (Davenport & Slate, 2019; Taylor & Slate, 2022).

Implications for Policy and Practice

Based on the results of this multi-year investigation, several implications for policy and practice exist. In regard to policy, due to the gap in the mathematics performance between students who are not in poverty and for students in poverty across the state, policymakers should continue funding educational programs and advocating for students who are Poor as well as other at-risk student groups.

In terms of practice, teachers and district level educators are encouraged to implement intervention strategies focused on African American students and closing of the educational gaps for those students who are Poor. In addition, advocacy for advanced mathematics courses offered to students in poverty should be highly encouraged for districts serving large number of African American students. With this action, schools and districts are promoting general awareness of the consistent gaps between African American students, poor students, other student groups, and their peers.

Recommendations for Future Research

Based on the results of this empirical, multiyear study, several recommendations for future investigations can be made. First, because only data on Grade 9 students were analyzed herein, researchers are recommended to replicate this study in other Grade Level exams to ascertain the degree to which results delineated herein might be generalizable to students in other Grade Levels. Second, only data from the State of Texas were analyzed in this article. As such, researchers are encouraged to extend this study to other states to determine whether the findings described might be generalizable to African American boys in other states who are Not Poor and Poor. Third, because data on only the Algebra I exam was examined in this investigation, researchers are encouraged to analyze data in English, Biology, and U.S. History. Fourth, African American boys who were Not Poor and Poor were the only student demographics whose data was analyzed. Hence, researchers should consider analyzing performance of other student populations such as at-risk and students in special education. Lastly, researchers should examine the extent to which results in this investigation would be generalizable based on demographic characteristics such as ethnicity/race (i.e., Hispanic and White).

Conclusion

In this article, differences in the performance of African American boys as a function of their economic status on the Texas state-mandated End-of-Course exam in Algebra I were examined. Specifically addressed was the degree to which African American boys who were Not

Poor and African American boys who were Poor differed in their performance on three Grade Level performance measures: Approaches Grade Level, Meets Grade Level, and Masters Grade Level in the 2016-2017, 2017-2018, and 2018-2019 school years. Inferential statistical analyses revealed that African American boys who were Not Poor had statistically significantly better STAAR Algebra I End-of-Course exam performance than African American boys who were Poor in all three school years.

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