DO BRAZILIAN STUDENTS PERFORM BETTER IN PRIVATE SCHOOLS?: A COMPARATIVE ANALYSIS OF STUDENT ACHIEVEMENT IN PUBLIC AND PRIVATE SCHOOLS BY RACE AND SOCIOECONOMIC STATUS FROM 2003 TO 2017

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INTERNATIONAL EDUCATION POLICY ANALYSIS

The Do Brazilian Students Perform Better in Private Schools?: A Comparative Analysis of Student Achievement in Public and Private Schools by Race and Socioeconomic Status from 2003 to 2017

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Abstract

This study aims to estimate performance inequalities between public and private school students; as well as White and Black students attending both types of networks, controlling for socioeconomic status, race, gender and other individual characteristics. Using math scores from SAEB between 2003 and 2017, I estimate that the performance gap between private and public school students became narrowed and eventually became statistically not significant in 2017. Further, while the White-Black performance gap also became statistically non-significant by 2017 for private school students, it barealy changed at all for public school students between 2003 and 2017.

Keywords: SAEB, Prova Brazil, Achievement Gap, Performance Gap, Large-Scale Standardized Test, Public and Private Education, Black-White Performance Gap, White-Black Performance Gap, Brazil

1. Introduction

Lower-income students fare worse than higher-income students in countries where standardized tests have been consistently administered (OECD, 2019; NCES, 2021). Although international large-scale and repeated learning tests are relatively new, their results have made visible, on a global level, learning differentials based on socioeconomic factors found on national levels, at least since the Coleman report (Coleman et al., 1966).

The reasons for this persistent achievement gap are complex, and its magnitude depends on numerous factors, such as the degree of income inequality; the existence of racial and ethnic segregation in a given society, in addition to or intertwined with socioeconomic segregation; and the ways in which schooling resources are distributed for students belonging to different groups. The correlation between socioeconomic status (SES), race/ethnicity, and academic achievement have been assessed repeatedly: a comprehensive meta-analysis found a strong correlation between SES and learning (White, 1982), and another one, performed using the same methodology 23 years later, found a still significant, yet smaller, average correlation (Sirin,2005), and Jencks and Phillips (1998) investigated Black-White differences in the U.S. for the past half-century.

Because most of the SES-based and racial/ethnic learning gaps are already in place before kindergarten (Fryer and Levitt, 2005) and arise from pupils' family background, it is relevant to investigate the nexus between macroeconomic indicators such as income inequality, racial differences in poverty, unemployment, and growth, and academic achievement differentials. Further, because schools can maintain, reinforce, or reduce learning gaps established at the beginning of formal schooling, trends in achievement gaps may be understood as indicators of how equitable a given school or school network is (Carnoy et al., 2022). School

systems that reduce the achievement gap between Black and White students throughout their school years may be considered more equitable than ones that retain or increase the gap.

Carnoy et al. (2022) investigated the questions of whether and how the trend in the achievement gap was affected by variations in socioeconomic indicators. Using detailed data from the Brazilian national standardized exam, they found that the effects of social class inequality on public school 5th-grade student achievement increased significantly in the 2007–2017 period, even when controlling for student characteristics such as race/ethnicity, age-in-grade, and gender. For 9th graders, the effects are much smaller and not significant. However, Carnoy et al. (2022) only investigated test results for students enrolled in public schools, excluding those who attended private schools

Because a high percentage of high-SES students attend private schools (INEP, 2021), and students in private schools score higher on the national standardized test on average than their peers in public schools, analyzing only data from public school students almost certainly biases their estimates of the SES-based achievement gap downward. Ignoring the performance of private school students, who perform better and have higher SES on average, is likely to underestimate the income-based achievement gap.

This paper explores the relationship between socioeconomic status, race, and trends in the achievement gap for students across public and private schools in Brazil between 2003 and 2017. First, it assess how variations in the achievement gap between high- and low-SES students in private and public schools correlate to students' socioeconomic and non-socioeconomic characteristics, such as gender and race. Then, it analyze how the performance, adjusted for SES, differs for Black and White students across private and public school systems.

2. Background

2.1. Economic and educational Brazilian indicators

According to the latest national census survey, Brazil has a population of approximately 214 million, of which 83% live in urban areas (Instituto Brasileiro de Geografia e Estatística, 2011). There are 38 cities with more than 500,000 people and 245 with populations ranging from 100,001 to 500,000 (Instituto Brasileiro de Geografia e Estatística, 2011). Regarding race/ethnicity, 43% of Brazilians identify as White, 10.3% as Black (*preto*), and 45.33% as Brown. The Brazilian census bureau lets individuals choose one of the following categories in its surveys: Black (*preto*), Brown, White, Asian, and Native Brazilian. In its analysis, it often groups Black and Brown individuals under the category *negro*, which also means Black in Portuguese. In this paper, I use Black for *preto*, and Black and Brown for *negro*.

Brazil has maintained high levels of income inequality for centuries (Bucciferro, 2017), frequently ranking among the most unequal nations in the world (Chancel et al., 2022), with the top 10% of individuals capturing 59% of total national income, while the bottom half of the population earning only around 10%. This level of income inequality is higher than in the U.S., where the top 10% takes 45% of national income, and in China, where the top 10% takes 42% of national income.

There are also marked labor income disparities between Black and White workers. In 2015, Black workers earned 42% less than their White peers (Salata, 2020). Albeit slowly, the ratio of White to Black workers' earnings fell from 2.0 in 1995 to 1.64 in 2015. Even within the same level of education, White and non-White workers earn significantly different returns. For men and women without formal instruction or with incomplete elementary education, White workers earn R$ 9.2 an hour, while Black and Brown workers earn R$ 7.3 (Instituto Brasileiro

de Geografia e Estatística, 2022). For those with a 4-year university degree, White workers earned R$ 34.4 in 2021, while Brown workers earned R$ 24.8, and Black workers R$ 22.9.

In 2021, 82% of students in Brazil attended public schools for 1st through 9th grades, with 18% attending private schools (Instituto Nacional de Estudos e Pesquisas Anísio Teixeira, 2021). For the same year, 87.4% of Brazilian high school students attended public schools, whereas 12.6% were enrolled in private schools (Instituto Nacional de Estudos e Pesquisas Anísio Teixeira, 2021).

2.2. Racial/ethnic inequalities in education in Brazil

Whereas illiteracy rates in Brazil dropped from 82.3% of the population in 1872 (Marchelli, 2021) to 6.6% in 2021 (Pesquisa Nacional por Amostra de Domicílios Contínua Trimestral, 2021), racial/ethnic disparities have not been eliminated: in 2021, the illiteracy rate for White individuals 15 years old or older is 3.6%, while it is 8.9% for Black and Brown individuals (Instituto Brasileiro de Geografia e Estatística, 2022). White individuals average 8.8 years of formal education, while Black and Brown individuals total 7.2 years. Further, while 63.7% of White adolescents are enrolled in public or private secondary grades, only 49.3 of Black and Brown teenagers attend high schools (Instituto Nacional de Estudos e Pesquisas Anísio Teixeira, 2021). For tertiary education, the gap between Black and White individuals is even starker: while 18.3% of Black youth were enrolled in college in 2021, 36.1% of White youths were (Instituto Nacional de Estudos e Pesquisas Anísio Teixeira, 2021).

3. Review of related literature

Ongoing discrepancies in academic performance linked to students' personal or contextual characteristics continue to pose a significant challenge across and within school systems (OECD, 2020). Although the extent and rate of change of these achievement gaps vary

across student categories, they persist as a prominent feature. Although improvements in standardized test scores indicate overall progress among students compared to previous cohorts, achievement gaps expose the disparities in academic performance across different student populations, indicating educational inequality within educational systems (Carnoy et al., 2022).

Hanushek et al. (2019) see a slight decrease in educational achievement disparity in the U.S. based on socioeconomic status (SES) since the early 1960s, with gaps in math, reading, and science for student cohorts born between 1961 and 2001 narrowing by 0.05 standard deviations per decade between the highest and lowest quartile of the SES distribution. In a different – but not contradictory – direction, Reardon (2011) estimates that the gap in student achievement from the highest and lowest deciles of the SES distribution is 30% to 40% larger for children born in 2001 than for those born in 1986, suggesting a possible connection to the increase in income inequality between very high- and very low-income American parents in the same period.

Adding the race-based achievement gap to the analysis, Matheny et al. (2023) describe how, while racial achievement gaps narrowed between 2009 and 2019, and the gap between students on free or reduced-price lunch and their higher-income peers remained stable, the disparity between students in the highest and lowest decile of the SES distribution widened.

As there are relevant achievement gaps across different categories within public schools, it is also worth investigating disparities in performance across public and private schools, as the different educational systems may exacerbate or ameliorate education inequities differently. Somers et al. (2004) use public-private learning gaps to measure the effectiveness of Latin American private schools in the 1980s and 1990s. After controlling for personal characteristics and peer effects, the average achievement gap between private and public schools in 10 Latin American countries (Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican

Republic, Honduras, Mexico, Paraguay, Peru, and Venezuela) is zero. However, there is some variance around this mean, typically between -0.2 and 0.2 standard deviations.

Using data from the 2018 PISA, OECD (2020) corroborates Somers et al. (2014) in finding that the difference between the performance of public and private school students is not statistically significant. While raw scores show an advantage for private school students in reading for more than 90% of the countries analyzed – among which Brazil sees the highest difference in the dataset and South Korea the lowest – those differences disappear once students' and schools' socioeconomic profiles are considered.

In the analysis of differences in school achievement by gender, race/ethnicity, and income, it is crucial to take into account that a share of gaps between demographics – and sometimes their entirety – are already in place even before kindergarten. Even before children start their school life, there are differences in cognitive abilities across groups of pupils (Fryer and Levitt, 2005). Further, investigating how much cognitive abilities – measured by way of standardized tests – predict wages across time, Murnane et al. (1995) find an increase in the correlation between scores and earnings from the late 1970s to the mid-1980s, which indicates an escalation in the importance of cognitive outcomes as determinants of wages.

Studies that measure achievement indicators from kindergarten onward generally use data from the Early Childhood Longitudinal Study (ECLS), which records information about children's knowledge, abilities, and development from birth through 5th grade. Using this dataset, Fryer and Levitt (2005) assert that socioeconomic factors are responsible for 85% of the White-Black math differential and the entirety of the reading differential at the start of kindergarten. Nonetheless, Black students in their sample have higher reading scores, on average, than their White peers with similar socioeconomic characteristics. However,

socioeconomic factors explain only around 60% of the math and reading Black-White differentials by third grade. These findings attest that socioeconomic factors primarily explain the Black-White differentials in cognitive skills before the beginning of institutional and formal learning but do not explain the widening of the Black-White differential as children advance through elementary school (Reardon et al., 2015).

The Black-White measured learning differential appears to increase throughout pupils' school life – notably from 1st to 5th grade – in ways that cannot be accounted for by students' personal and contextual characteristics. This phenomenon suggests that schooling affects the expansion of the differential (Reardon et al., 2015). For Hispanic-White and Asian-White score differentials, though, socioeconomic variables account for virtually the entirety of the gaps (Reardon, 2011).

Achievement gaps in Brazil

From the early 1990s to the late 2000s, Brazil saw a reduction in racial gaps regarding access to public education: the Black-White enrollment gap diminished drastically from 1989 to 2009 (INEP, 2021). Whereas in 1996, enrollment rates for Black students at age seven were approximately 68% for boys, rates grew to 94.5% by 2010.

Getting into schooldoes not necessarily mean staying in it. Over the same period, Black children became more likely to enter school but not more likely to finish primary basic education than Whites (Madeira and Rangel, 2014). In 2010, the high-school completion rate for White students was 63%, while it was 46% for Black students (INEP, 2021). For the same year, in the state of São Paulo, the country's most populous, 78% of White students completed high school, whereas 64% of Black students did so (INEP, 2021).

Madeira and Rangel (2014) analyze standardized test results for the state of São Paulo. They find a significant Black-White achievement gap: tests of difference in means indicate gaps of 0.34 (5th grade) and 0.29 (9th grade) standard deviations, respectively, favoring White students. Differences in socioeconomic characteristics and the school environment account for about 55% of the raw racial gap, especially in initial grades. Black students still receive lower scores in mathematics tests than Whites of identical backgrounds by 10% of a standard deviation.

Most studies on Brazilian trends (Madeira and Rangel, 2014; Simões and Sabates, 2014; Botelho et al., 2015; Alves et al., 2016; Becker and Arends-Kuenning, 2020; Carnoy et al., 2022) focus on public school networks data, both because around 80% of pupils go to public schools and because the data for public networks is more granular. As a disproportionate share of high-SES students are enrolled in private schools, studies aiming at measuring the income-based gap that use only data from public schools may be downwardly biasing their estimates, thus failing to capture the full magnitude of inequality.

4. Research questions

This paper analyzes trends in raw and adjusted scores for 5th-year students enrolled in both public and private schools in Brazil across all states and the Federal District. It explores the following research questions:

1. What are the trends in performance, adjusted for SES, for public and private school students, and what is the behavior of the private-public performance gap?
2. What are the trends for the performance gaps in SES-adjusted scores between White and Black students in private and public schools?

5. Data & methods

This paper uses data from *Prova Brasil,* a standardized test that is one of the exams of SAEB, the Brazilian Basic Education Evaluation System. Specifically, it uses 5th-grade data for the math exam and the accompanying student survey, in which students answer questions related to personal and socioeconomic characteristics, like possession of household items, race, gender, family characteristics, and so on. *Prova Brasil* is conducted every other year. This paper uses data for six iterations: 2003, 2005, 2011, 2013, 2015, and 2017. While the sample of public school students includes all eligible 5th- and 9th-grade students, the private school sample is a randomly selected and representative sample of schools.

This paper has two main components. First, it regresses students' math scores on a student SES variable, a school SES variable, race and gender indicator variables, interaction terms for race and gender indicators, and controls (student age, age of school entry, rurality). This regression is run for three samples: the entire sample, a sample composed only of White students, and a sample composed of only Black students. For each of these three samples, coefficients are estimated for all students, for a subsample of the top 20% SES students, and another with the bottom 20% SES students.

The second part of the methodology selects a stylized sample of students and uses the means of each variable within this stylized cohort for each of the sample and subsample coefficients to estimate an adjusted version of the raw math score. This study aims to determine an adjusted score that excludes its SES and race correlations by selecting a fixed cohort and using the averaged data from that cohort for each sample's OLS coefficients. For the full sample, the stylized cohort assumes the mean values of the 2017 public school student cohort. For the White- and Black-students-only samples, the stylized cohort assumes the mean values of the

2017 public school White students' cohort. The variable means from the White students' sample are used as the stylized cohort for both the White-students-only and Black-students-only samples, making them comparable by filtering out differences in mean student characteristics.

5.1. Selecting socioeconomic variables

In order to arrive at a socioeconomic index, I use the possession of household items as proxies for income level, as the survey does not ask the student to estimate the family's income or their parents' jobs. To select the most relevant variables, that is, those that explain most of the variation among the sample, I use principal component analysis (Carnoy et al., 2022). Table 1 lists the variables used for constructing the PCA.

(Table 1)

Calculating the PCA for the samples of public and private school students generates an immediately comparable index for all students, with the downside of ignoring differences in costs of living across different states. Because this study concentrates on observing the effects of differences in income on academic performance, calculating one PCA for every state, ranking them, creating a distribution, and then merging the samples from every state back into a single sample is the preferred strategy. Table 2 lists the variables that are used to estimate the model.

(Table 2)

6. Findings

The first subsection addresses findings for the full sample of students, whereas the second subsection analyses differences in raw and adjusted scores across subsamples of White and Black students only.

6.1. Full sample

6.1.1. Regression outputs

Table 3 shows the results of the OLS models for the full sample of public school students for the years in the time series of the study: 2003, 2002, 2011, 2013, 2015, and 2017. Student SES percentile coefficients measure the correlation between a student's socioeconomic status and score. In 2003, in column 1, a variation in individual SES from the very bottom to the very top of the SES distribution, all else equal, would correlate to a math score 6.08 points higher. In contrast, the same variation would be associated with a score increase of 15.46 points in 2017, column 6. The coefficients for student SES percentile are significant at the 1% level for all years. Table 4, column 7, shows that the mean math raw test score for the full sample in 2003 was 172.11, and the mean student SES percentile was 0.41. Column 12 also shows that the means of the same variables for public school students in 2017 were219.53 and 0.53, respectively.

(Table 3)

(Table 4)

For private school students, as shown in Table 5, column 13, a variation from 0 to 1 in the student SES percentile in 2003 is associated with an increase in math score of 4.83 points, whereas the coefficient for the same variable is 12.71 in 2017, as column 18 shows. All coefficients for student SES percentile are significant at the 1% level for private school students.

(Table 5)

The variable mean school SES indicates how much a variation in average school SES, all else equal, correlates with variations in an individual student score. Table 3, column 2, shows that, in 2005, if a public school went from the lowest to the highest rung of school SES, all else equal, their students' scores would be associated with an increase of 5.92 in math scores. The

coefficients for mean school SES are significant at the 1% level for all years in the series. Table 4, column 8, shows that the average mean school SES in 2005 for public school students was 5.39, and Table 6, column 23, shows that it was 8.86 for private school students for the same year.

For private school students, Table 5, column 16, shows that a one-point increase in mean school SES correlates with an increase of 8.92 math score points. The coefficients for the mean school SES variable are significant at the 1% level for every year in the series.

Table 3 also includes dummy variables for each race/ethnicity included in the survey and interaction terms of each race/ethnicity variable and the gender variable (coded as male on the regressions). All else equal, being a male student is correlated with a higher math score for both public and private school students. Table 3, column 2 shows a coefficient of 2.08 in 2005, the lowest in the series for public school students, whereas Table 5, column 16, show that the coefficient for male in the private school students sample was -13.50 in 2013. Table 3, column 5 shows that being male, in 2015, is associated with a 4.01 increase in math scores, the highest value in the series for public school students. For the same variable and year, Table 5, column 17, shows a coefficient of -13.38. The estimations for the male coefficients for both public and private school students, shown in Table 3, are significant at the 1% level for every year in the series.

Tables 3 and 5 show that, out of the race/ethnicity indicator variables, Black is associated with the largest negative coefficients for both the public and private school datasets. These coefficients are statistically significant for public and private school students every year. Being Brown rather than White is associated with higher scores in three different years (2003, 2015, and 2017) and lower scores in 2011, all on a 1% level of statistical significance, for the public

school students. For the private school students, the Brown indicator variable is associated with lower scores in two separate years (2003 and 2011) at a 1% significance level and lower scores for another two years (2005 and 2013) at a 5% significance level.

Table 3 and Table 5 also show the slopes for the terms interacting gender and race/ethnicity variables. Table 3 shows that the interaction term with the most statistically significant iterations for public school students is for Brown female students. Columns 3 through 6 show how being Brown and female is associated, at the 1% significance level, with lower scores than White females, the models' default. Table 4 shows that, for private school students, the interaction term associated with Brown females is generally negative, but not statistically significant for the years in the series. Table 3, column 5 shows the only year for the public students' sample in which the interaction term associated with Black females, relative to White female students, is associated with an increase in 0.90 points in math score at the 1% significance level. Table 5 shows how the interaction term for the private student dataset is not statistically significant for the series. The only other interaction term that shows statistical significance for the public students' dataset is that associated with female Asian students, who, as seen in Table 3, columns 1, 3, 4, and 5, have a disadvantage in scores relative to their White female peers, at significance levels varying from 1% to 10%.

Table 3 and Table 5 also include fixed-effect terms for each Brazilian state plus the Federal District, a variable indicating the student's age, their age of school entry, and a dummy variable indicating if the school is located in a rural area.

6.1.2. Raw and adjusted scores

The second part of this project adjusts raw standardized math test scores to estimate scores net of the effects of the observables included in this study. Part of the overall advantage

private school students have over public school students is that they have, on average, greater advantages as identified by the independent variables, such as, in the case of the models used herein, individual and school SES, rate of preschool attendance, rate of adequate age for grade, etc.

This study uses OLS regressions with state-fixed effects to estimate the correlations of observables and different samples and subsamples. Then, in order to filter out differences in observables, such as those between SES levels across public (Table 4) and private (Table 6) school students, I select the means of the public-school-sample variables (Table 4, column 12) for use as a stylized cohort. Then, I "plug" the same 2017 public school students' means onto the coefficients generated by the regressions for every year, thus estimating how the same group of students would perform every year, for every sample and subsample, based on the coefficient estimated for each specification's regression. Because there were no underlying differences in observables to begin with, I can assert that the differences in performance measured by adjusted scores arise only from differences in the return for each dependent variable and not from differences in students' variables.

Figure 1 shows the trends in raw and adjusted scores for public and private school students in the *Prova Brasil* series between 2003 and 2017. The scores for 2007 and 2009, and for all figures in this paper, are interpolations inferred from the raw and adjusted trends between 2005 and 2011. Figure 1 shows that raw and adjusted scores for private school students are higher than raw scores for public school students for every year in the series. On the other hand, while adjusted scores are higher for private school students from 2003 through 2013, the adjusted scores for public school students overtake those of private school students in 2015 and 2017. Figure 2 shows the trends in the raw and adjusted private-public performance gap. While

the raw private-public gap goes from approximately 50 in 2003 to approximately 30 in 2017, the gap in adjusted scores goes from 13 in 2013 to -6.23 in 2017. Because the gap is set as private student scores minus public student scores, a positive value expresses an advantage of private school students' performance over their public school peers, and negative values denote an advantage of public school students over their private school peers.

(Figure 1)

(Figure 2)

Tables 7 and 9 show the OLS coefficients for subsamples solely with students in the first quintile of SES distribution for public and private school students. Table 8 and Table 10 show the variables' means for students in the bottom 20% SES distribution. In particular, Table 8, column 36 shows the means used to establish the bottom 20% stylized cohort for this subsample. Figure 3 shows the raw and adjusted scores trends for public and private school students in the first quintile of SES distribution. As can be seen in Figure 4, the raw private-public performance gap is slightly smaller than the one for the full sample, seen in Figure 2, the adjusted private-public gap follows the same trend of becoming negative in 2015 and 2017, that is, of adjusted scores becoming higher for public than for private in 2015 and 2017.

(Table 7)

(Table 8)

(Table 9)

(Table 10)

(Figure 3)

(Figure 4)

Tables 11 and 13 show the OLS coefficients for subsamples from the fifth quintile of SES distribution, for public and private school students. Tables 12 and 14 show the variables' means for the top 20% SES public and private school students, respectively. Figure 5 shows top 20% SES public and private school students' raw and adjusted scores trends. Figure 6 shows the private-public performance gap for the top 20% SES students, which follow similar trends to those of the full sample, and for the bottom 20% SES subsample of the adjusted scores of public school students overtaking those of their private school peers by 2015.

(Table 11)

(Table 12)

(Table 13)

(Table 14)

(Figure 5)

(Figure 6)

6.2. White student sample

Table 15 and Table 16 report the OLS coefficients for the sample of only White students from both private and public schools. Tables 17 and 18 show the variables' means for each subgroup. For this subsample, we use the variable means of White students attending public schools in the 2017 cohort as our stylized group. Figure 7 shows the trends for raw and adjusted scores for White private and public school students. As for the full sample (Figure 1), Figure 7 shows the adjusted scores for White public school students overtaking those of their private school peers in 2015 and 2017. Figure 8 shows the raw and adjusted performance gap between White private and public school students. While the difference in raw scores dropped from 50.48

to 30 in 2017, the private-public gap in adjusted scores becomes negative by 2015, recording a higher adjusted score for White public school students.

(Table 15)

(Table 16)

(Table 17)

(Table 18)

(Figure 7)

(Figure 8)

6.3. Black student sample

Table 19 and Table 20 report the OLS coefficients for the sample of only Black students at private and public schools. Table 21 and Table 22 show the variables' means for each subgroup. We also use the variable means of White public school students in the 2017 cohort as our stylized group for this subsample to make it comparable to the White students' sample. Figure 9 shows the trends for raw and adjusted scores for Black students. As in the full sample and the White student subsample, the actual scores for Black private school students are higher than those of Black public school students, though the adjusted scores for both private and public school students converge towards 2015 and 2017. Figure 10 shows the public-private performance gap for Black students. While the public-private gap in raw scores varied little from 2003 to 2017, the adjusted score became slightly negative in 2015 and 2017, when the performance of Black public students in the subsample overtakes that of their private peers, repeating the trend seen in the full sample and the White student sample.

(Table 19)

(Table 20)

(Table 21)

(Table 22)

(Figure 9)

(Figure 10)

6.4. White-Black performance gap

Figure 11 shows the gap in academic performance between White and Black students at both private and public schools as measured by both raw and adjusted scores. From 2003 to 2017, the raw White-Black performance gap converges to approximately 30 points, showing that the difference in standardized math scores between White and Black students is roughly the same for private and public school students. Controlling for socioeconomic status and the additional models' controls, adjusted scores show that the White-Black gap among private school students increases from 0.95 to 4.23 points between 2015 and 2017. In contrast, the gap is approximately 30 for public school students in 2017. By the start of the series in 2003, the White-Black gap in adjusted scores was approximately the same for both private and public school students, between 16.70 and 19.90. By 2017, the White-Black gap in adjusted scores is reduced to almost null for private school students, where the same gap in adjusted scores for public school students goes from 16.70 to 16.82, approximately the same level. Figure 11 shows that, whereas the White-Black achievement inequality decreased substantially from 2003 through 2017 for private school students, the equivalent gap for public school students barely budged.

(Figure 11)

7. Discussion

Higher SES students tend to outperform lower SES students in national (Reardon et al., 2015) and international standardized tests (OECD, 2019). It is often the case that private school

students have, on average, higher SES than their public school peers, which makes comparisons in raw scores between private and public unfruitful. By adjusting scores based on SES, race, and other observables, this paper allows for a clearer view of inequalities across public and private school students, particularly the trends in performance gaps between White and Black students.

For the entire sample of students, including White, Black, Brown, Asian, and Indigenous students, while private school students stay ahead of public school students in raw scores, public school students show superior academic performance in terms of adjusted scores relative to their private school peers in 2015 and 2017, the last year of the series. Contrary to the widespread perception that private schools serving the wealthier are much better than their public counterparts, the same trend of public school students overtaking the adjusted achievement of private school students is reproduced for a sample composed only of students in the highest SES quintile. The same trend exists for those students in the lowest SES quintile. These trends align Brazil with a large group of countries where the difference between the performance of public and private school students is either low or not statistically significant, like the United States and the average of all OECD countries (OECD, 2020).

There are several reasons why performance gaps may narrow or widen. In the case of the data analyzed in this paper, while the raw and adjusted performance of public school students grew steadily and slowly from 2003 through 2017, it was the adjusted score of private school students that experienced the biggest shift, assuming a downward trend from 2013 to 2017, to the point that it became lower than the adjusted score for public students. The differences in adjusted scores by the end of the series are not large enough to ascertain that it is statistically different from 0. However, the absence of difference itself, which has not happened since the start of the series, in 2003, is relevant.

From the early 2000s to the late 2010s, the private school sector went from teaching 10% of total enrollments to 18% of enrollments. Although not inordinate – Chile, Hungary, and Turkey saw larger growth in their private sector – it does represent a near doubling of the sector (OECD, 2020). During the 2010s, Brazil went through a recession, possibly increasing the preference for public-sector teaching jobs – positions afford tenure from the very start of the career. The labor market for teachers may have made it harder to hire high-quality professionals, which potentially impacted the quality of the education provided in the private sector. It could also be the case that, as they expanded, private schools had less leverage in cream-skimming higher-performing students that could or did attend public schools at some point.

The trends of the adjusted scores of public school students overtaking those of their private school counterparts are also true for subsamples of White and Black students. While this may sound obvious, it is not, as the majority of Brazilian students identify as Brown. The difference between the two samples is that the advantage of public school students eventually becomes higher for White students than for their Black peers.

Although every subsample of this study illustrates how the differences in adjusted scores between private and public school students became negligible by the later years of the series, this information does not reveal much about the performance gap between White and Black students within the same kind of network. The adjusted White-Black gap for private schools fell to approximately zero between 2003 and 2017; that is, controlling for SES and other observables, White students and Black students do equally well, on average, in private schools. This owes to a slight improvement in Black private school students' adjusted scores, and a similarly small decrease in White private school student's adjusted scores. However, for public school students' adjusted scores, virtually nothing changed from 2003 to 2017. The same extant inequalities in

2003 between White and Black students in public schools stayed on the very same level in 2017, which shows that, even when controlling for SES and other observables, there is an enduring difference between the performance of White and Black school students that cannot be explained by the models used in this paper.

This enduring difference may be explained, even if partially, by differences in resource allocation that are potentially correlated with race. It could be the case, for instance, that classrooms and schools with larger relative proportions of Black students tend to receive less experienced or lower-quality teachers or school administrators. Besides issues of resource allocation that may or may not have racist motivations, there are many other possible ways that this difference could be attributable to racism. Soares and Delgado (2016) showed how teachers tend to grade Black students lower on non-standardized tests than their White peers relative to their scores in standardized tests of the same subjects. There is also a large body of literature showing how stereotype threats may harm the performance of Black students, even if they disagree with the racial stereotypes in question (Steele and Aronson, 1995). Further, Black Brazilian citizens are exposed to more environmental stresses than their non-Black peers of similar income levels, such that there are multiple ways through which these conditions might harm the academic performance of Black relative to White students. Nevertheless, with the current analysis, it is unclear why this difference should endure only in public education, despite the private education sector's expansion and loss of performance from 2003 to 2017.

7.1. Limitations and Future Research

Despite working with extensive datasets, it is not possible to infer causality from this paper's findings. Experimental approaches to measuring causal effects of private and public schools are arduous to realize. When they are done, it is usually on a small scale, not affording a

solid case for generalizability. Value-added approaches integrating longitudinal observations for cohorts of students that studied in private and public schools and a matching methodology could present interesting measurement opportunities.

Further, the different models used in this study do not incorporate variables related to how resources may be variously allocated towards classrooms and schools with different shares of Black and White students, such as indicators of teacher quality and other school resources.

Incorporating variables related to school resource allocation, such as teacher characteristics, may add explanatory power to this paper's models. Expanding the analysis to 5th-year language results and 9th-year math and language results may also illuminate differences that are not visible by looking only at 5th-year math scores, as this paper does.

7.2. Policy recommendations

The findings of this paper, particularly the enduring White-Black performance gap in adjusted scores for public school students, reinforces the case that further research must be done to better understand the different components of the White-Black performance gap. While a share of it may arise from inequalities that lie outside the scope of education policy, there is evidence in the literature (Soares and Delgado, 2016) that part of the performance gap results from school-level dynamics.

It is vital to improve, or design from scratch and implement, policies related to the allocation of educational resources within districts and within schools. Policies that regulate the allocation of teachers within a district's school are often opaque or non-existent, which may reinforce the dynamics of classrooms with lower SES students receiving fewer resources from the district. A well-known case of such inequality-reinforcing distribution is when less experienced teachers, many times recent hires, are allocated to classrooms that are "harder" to

teach, while the contrary should be happening – that is, more experienced and higher quality students should be allocated with priority to classrooms with fewer resources in order to ameliorate inequalities within school districts.

While policies for allocating teachers tend to be opaque, regulations for allocating students in classrooms within a school tend to be non-existent, which, depending on how school staff decides to deal with the issue, could reinforce the clustering of higher-performing students in classrooms, with the consequent clustering of lower-performing students in other classrooms. Because academic performance, socioeconomic status, and race are intertwined in complex ways, the accumulation of unregulated resource allocation processes might explain part of the enduring Black-White performance gap. It is crucial that resource allocation processes that have been left "under the radar" become the target of institutional attention, lest they perpetuate or even increase educational inequalities in general as well as those based on race in particular.

Part of the race-based academic gap in public schools, as shown by Soares and Delgado (2016), is caused by racism, either deliberate or not. Dealing with it requires a comprehensive strategy, from federal regulation to district-level practices, such as teacher training aimed at combatting race-based inequalities. Also, the close monitoring the dynamic of inequalities in academic performance, be it through portfolio evaluation, non-standardized and standardized tests' results – both raw and adjusted by SES – should provide robust subsidies in designing pedagogical strategies to address and eventually eliminate such gaps.

Finally, one of the essential results of this paper, that is, the nullification of the private-public performance gap, was driven mainly by a loss in performance, measured by adjusted scores, by private school students. As such, it would be effective if INEP, the institute responsible for designing and implementing *Prova Brasil*, the standardized test on which the

entirety of this paper's research has been based, divulged the results for private schools with the same level of disclosure that it applies to public schools. While families of public school students can check their sons' and daughters' school performance throughout the years for 5th, 9th, and 12th grades, families of private school students cannot access the equivalent information for their children's school. The reason for not divulging the results for private schools is that, in contrast to public schools, only a sample of private schools completes the exam each time it is offered. Divulging the school-level data for every private school unit would require collecting it in the first place. Having reached almost 20% of enrollments for basic education, though, it is important to acknowledge the necessity of students, parents, teachers, and school administrators to have a rigorous and trustworthy assessment of private school students' performance.

7.3.

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Tables and Figures

Table 1

Home articles used in the construction of an index of SES through principal component analysis.

Variable	Definition
Bedrooms	Number of bedrooms in student's house
Bathrooms	Number of bathrooms in student's house
Cars	Number of cars in student's house
Computer	Number of computers in student's house
Fridge	Number of fridges in student's house
T.V.	Number of televisions in student's house
Washing machine	Number of washing machines in student's house

Table 2

Dependent and independent variables, and their definitions

Variable	Definition
Dependent Variables	
Prova Brasil Score in Mathematics Exam	Continuous measure of student score in mathematics standardized test
Independent Variables	
Student SES Percentile	Percentile rank generated from PCA of student possession of household items.
Mean School SES	Average SES of students within school in discrete deciles.
Student Age	Number of years individual student deviates from the appropriate age for 5th grade.
Male	Binary variable indicating gender.
Black	Binary variable indicating if student identifies as Black.
Brown	Binary variable indicating if student identifies as Brown.
White	Binary variable indicating if student identifies as White.
Asian	Binary variable indicating if student identifies as Asian-Brazilian.
Indigenous	Binary variable indicating if student identifies as Indigenous.
Control Variables	
Student Age	Number of years individual student deviates from the appropriate age for 5th grade.
Rural	Binary variable indicating rurality.
Age of School Entry	Indicates how early student started formal schooling.

Table 3

Regression outputs for public school students' sample, all SES

	1	2	3	4	5	6
VARIABLES	full sample 2003	full sample 2005	full sample 2011	full sample 2013	full sample 2015	full sample 2017
Student SES Percentile	6.084***	6.759***	10.515***	16.247***	15.151***	15.461***
	(0.824)	(0.968)	(0.114)	(0.129)	(0.112)	(0.114)
Mean School SES	4.935***	5.919***	6.162***	5.540***	5.277***	6.425***
	(0.176)	(0.225)	(0.030)	(0.033)	(0.031)	(0.031)
Male	3.793***	2.082***	3.407***	2.686***	4.008***	3.367***
	(0.658)	(0.808)	(0.108)	(0.128)	(0.117)	(0.113)
Black	-9.755***	-10.708***	-13.249***	-11.588***	-10.360***	-14.858***
	(0.933)	(1.017)	(0.149)	(0.180)	(0.161)	(0.155)
Brown	1.753***	0.187	-1.946***	-0.053	0.483***	0.403***
	(0.632)	(0.767)	(0.099)	(0.121)	(0.106)	(0.106)
Asian	0.112	-1.630	-1.831***	-1.323***	0.531*	-6.896***
	(1.770)	(2.093)	(0.293)	(0.323)	(0.286)	(0.280)
Indigenous	-1.770	-2.944	-2.919***	-3.999***	-0.727**	-3.463***
	(1.448)	(1.986)	(0.322)	(0.349)	(0.304)	(0.274)
Female#Black	-0.119	-1.208	-0.255	-0.364	0.231	0.901***
	(1.329)	(1.466)	(0.221)	(0.263)	(0.233)	(0.225)
Female#Brown	-1.552*	-1.139	-0.600***	-0.723***	-0.761***	-0.662***
	(0.880)	(1.062)	(0.139)	(0.168)	(0.148)	(0.145)
Female#Asian	-4.633*	-3.294	-2.133***	-1.372***	-0.959**	0.000
	(2.482)	(2.870)	(0.399)	(0.448)	(0.400)	(0.392)
Female#Indigenous	1.627	-1.651	-2.436***	-0.181	-0.731*	-0.243

	(2.045)	(2.813)	(0.442)	(0.482)	(0.419)	(0.390)
Rural	-2.105**	2.841***	0.276**	-1.262***	0.193	-0.966***
	(0.825)	(0.919)	(0.120)	(0.146)	(0.125)	(0.108)
Student Age	-4.143***	-4.121***	-4.986***	-7.845***	-6.243***	-7.009***
	(0.150)	(0.179)	(0.028)	(0.037)	(0.034)	(0.035)
Age of School Entry	-	-2.068***	-0.465***	-2.370***	-2.475***	-2.141***
		(0.245)	(0.033)	(0.044)	(0.038)	(0.036)
Constant	173.108***	173.318***	208.283***	219.711***	222.985***	225.741***
	(1.742)	(2.557)	(0.315)	(0.329)	(0.305)	(0.294)
Observations	32,554	25,859	1,884,500	1,446,382	1,558,205	1,649,761
R-squared	0.185	0.195	0.184	0.207	0.193	0.215
State FE	YES	YES	YES	YES	YES	YES

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4

Variables' means for public school students' sample, all SES.

	7	8	9	10	11	12
Variable	Mean full sample 2003	Mean full sample 2005	Mean full sample 2011	Mean full sample 2013	Mean full sample 2015	Mean full sample 2017
Math Score	172.11	175.40	206.29	207.28	216.13	219.53
Student SES Percentile	0.41	0.49	0.49	0.52	0.53	0.53
Mean School SES	4.73	5.39	5.44	5.71	5.77	5.76
Rural	1.07	1.98	1.10	1.10	1.10	1.14
Student Age	3.97	5.62	5.22	3.92	3.92	3.89
Age of School Entry	2.00	3.81	3.54	1.88	1.85	1.87
Male	0.51	0.50	0.51	0.51	0.51	0.51
Black	0.12	0.14	0.11	0.11	0.11	0.12
Brown	0.45	0.46	0.51	0.49	0.52	0.49
Asian	0.03	0.03	0.03	0.03	0.03	0.03
Indigenous	0.04	0.03	0.02	0.03	0.03	0.03
White	0.36	0.35	0.34	0.34	0.32	0.33

Table 5

Regression outputs for private school students' sample, all SES.

	13	14	15	16	17	18
VARIABLES	full sample 2003	full sample 2005	full sample 2011	full sample 2013	full sample 2015	full sample 2017
Student SES Percentile	4.829***	6.470***	6.269***	10.948***	11.753***	12.710***
	(1.829)	(2.047)	(1.318)	(1.188)	(1.383)	(1.746)
Mean School SES	8.936***	9.397***	8.697***	8.923***	11.120***	10.377***
	(0.340)	(0.408)	(0.358)	(0.374)	(0.364)	(0.445)
Male	-16.870***	-20.861***	-16.413***	-13.505***	-13.384***	-16.575***
	(2.627)	(2.499)	(1.597)	(1.617)	(1.691)	(2.093)
Black	-4.963***	-2.891**	-3.171***	-1.822**	-0.744	-2.354**
	(1.120)	(1.233)	(0.754)	(0.757)	(0.793)	(0.931)
Brown	0.017	5.081	-11.265***	-3.317	-5.571***	-6.095**
	(2.850)	(3.151)	(2.243)	(2.090)	(2.071)	(2.596)
Asian	-11.133***	-6.510**	4.275*	-0.171	4.083*	-4.029
	(2.562)	(3.189)	(2.450)	(2.183)	(2.144)	(2.540)
Indigenous	-1.658	2.045	-0.679	-0.012	1.400	1.012
	(3.791)	(3.701)	(2.462)	(2.403)	(2.502)	(3.104)
Female#Black	1.357	1.940	-0.603	-0.375	-0.626	-0.249
	(1.563)	(1.700)	(1.047)	(1.046)	(1.098)	(1.270)
Female#Brown	2.139	2.403	3.954	-2.872	1.668	7.312**
	(4.089)	(4.362)	(3.126)	(2.896)	(2.873)	(3.647)
Female#Asian	8.376**	-1.397	-6.789**	-1.709	-5.293*	-5.688
	(3.549)	(4.654)	(3.463)	(3.074)	(3.005)	(3.465)

Female#Indigenous	8.824***	7.530***	5.616***	4.718***	6.042***	7.624***
	(1.007)	(1.151)	(0.704)	(0.709)	(0.796)	(0.912)
Rural	6.956	-6.913	-4.267**	1.675	2.926	-0.197
	(5.038)	(4.486)	(1.745)	(2.230)	(1.838)	(1.878)
Student Age	-7.567***	-5.367***	-4.801***	-5.501***	-5.341***	-4.947***
	(0.509)	(0.527)	(0.367)	(0.396)	(0.403)	(0.498)
Age of School Entry		-2.643***	-3.362***	-4.696***	-5.742***	-3.956***
		(0.558)	(0.299)	(0.314)	(0.317)	(0.337)
Constant	171.738***	204.117***	236.800***	213.873***	173.197***	183.171***
	(6.356)	(9.996)	(4.375)	(4.635)	(4.414)	(5.209)
Observations	12,777	11,237	28,070	30,581	25,361	17,911
R-squared	0.203	0.201	0.178	0.181	0.194	0.181
State FE	YES	YES	YES	YES	YES	YES

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6

Regression outputs for private school students' sample, all SES.

	19	20	21	22	23	24
Variable	Mean full sample 2003	Mean full sample 2005	Mean full sample 2011	Mean full sample 2013	Mean full sample 2015	Mean full sample 2017
Math Score	220.87	223.37	250.59	248.88	243.78	250.24
Student SES Percentile	0.77	0.79	0.81	0.85	0.86	0.87
Mean School SES	8.10	8.18	8.59	8.87	8.86	8.97
Rural	1.01	1.99	1.03	1.02	1.02	1.03
Student Age	3.15	5.12	4.97	3.39	3.43	3.45
Age of School Entry	2.00	3.28	3.43	1.65	1.64	1.70
Male	0.51	0.50	0.51	0.50	0.51	0.51
Black	0.04	0.05	0.05	0.05	0.05	0.04
Brown	0.37	0.40	0.41	0.41	0.46	0.46
Asian	0.03	0.04	0.03	0.03	0.04	0.03
Indigenous	0.05	0.03	0.02	0.03	0.03	0.03
White	0.52	0.48	0.50	0.48	0.42	0.43

Table 7

Regression outputs for public school students' sample,bottom 20% SES

	25	26	27	28	29	30
VARIABLES	Bottom 20% SES 2003	Bottom 20% SES 2005	Bottom 20% SES 2011	Bottom 20% SES 2013	Bottom 20% SES 2015	Bottom 20% SES 2017
Student SES Percentile	20.044**	32.281***	30.965***	34.778***	27.933***	40.404***
	(9.204)	(10.247)	(1.270)	(1.612)	(1.321)	(1.389)
Mean School SES	3.472***	3.260***	4.617***	4.777***	4.181***	5.167***
	(0.349)	(0.442)	(0.065)	(0.073)	(0.067)	(0.070)
Male	-1.065	2.427	1.976***	-0.178	1.229***	1.362***
	(1.419)	(1.808)	(0.252)	(0.314)	(0.281)	(0.287)
Black	-6.026***	-8.731***	-9.369***	-9.243***	-6.807***	-12.745***
	(1.803)	(2.046)	(0.321)	(0.407)	(0.346)	(0.350)
Brown	4.768***	-0.108	1.008***	2.428***	3.540***	2.734***
	(1.315)	(1.685)	(0.230)	(0.294)	(0.254)	(0.264)
Asian	-1.147	-6.229	-0.215	1.180	4.525***	-6.568***
	(3.845)	(4.745)	(0.626)	(0.746)	(0.648)	(0.683)
Indigenous	1.485	-1.740	-3.513***	-2.729***	1.251*	-1.560**
	(2.916)	(4.135)	(0.748)	(0.876)	(0.728)	(0.637)
Female#Black	-2.753	-0.308	-0.729	-1.650***	-0.851*	0.997**
	(2.466)	(2.869)	(0.460)	(0.580)	(0.494)	(0.499)
Female#Brown	-6.142***	-1.463	-0.935***	-1.199***	-1.481***	-0.693*
	(1.795)	(2.273)	(0.313)	(0.401)	(0.350)	(0.361)
Female#Asian	0.550	5.856	-2.141**	-3.736***	-2.198**	-0.107
	(5.261)	(6.416)	(0.835)	(1.016)	(0.893)	(0.944)

Female#Indigenous	-3.941	-4.391	-1.592	-0.410	-3.007***	0.553
	(3.894)	(5.819)	(0.997)	(1.177)	(0.983)	(0.894)
Rural	-1.956	3.504**	-1.050***	-2.367***	-0.483*	-2.498***
	(1.269)	(1.520)	(0.228)	(0.321)	(0.272)	(0.254)
Student Age	-2.517***	-1.791***	-3.891***	-6.722***	-4.999***	-5.770***
	(0.260)	(0.322)	(0.056)	(0.081)	(0.071)	(0.076)
Age of School Entry		-1.320***	-0.138**	-1.493***	-1.803***	-1.674***
		(0.480)	(0.069)	(0.098)	(0.084)	(0.085)
Constant	162.576***	162.306***	204.712***	214.609***	219.913***	224.071***
	(3.399)	(4.617)	(0.659)	(0.737)	(0.668)	(0.674)
Observations	7,670	5,674	387,663	273,932	296,771	289,749
R-squared	0.132	0.121	0.140	0.145	0.133	0.172
State FE	YES	YES	YES	YES	YES	YES

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8

Variables' means for public school students' sample, bottom 20% SES.

	31	32	33	34	35	36
Variable	Mean Bottom 20% 2003	Mean Bottom 20% 2005	Mean Bottom 20% 2011	Mean Bottom 20% 2013	Mean Bottom 20% 2015	Mean Bottom 20% 2017
Math Score	162.01	163.86	198.17	199.33	207.60	210.28
Student SES Percentile	0.08	0.08	0.10	0.10	0.11	0.10
Mean School SES	3.81	4.13	4.72	4.88	5.08	5.03
Rural	1.14	1.86	1.16	1.14	1.14	1.18
Student Age	4.41	6.04	5.65	4.03	4.05	4.01
Age of School Entry	2.00	4.04	3.76	1.97	1.93	1.94
Male	0.48	0.47	0.48	0.49	0.49	0.50
Black	0.15	0.18	0.13	0.13	0.14	0.15
Brown	0.49	0.48	0.53	0.49	0.52	0.49
Asian	0.02	0.02	0.03	0.03	0.03	0.03
Indigenous	0.05	0.03	0.02	0.03	0.03	0.03
White	0.30	0.29	0.29	0.31	0.29	0.29

Table 9

Regression outputs for private school students' sample, bottom 20% SES.

	37	38	39	40	41	42
VARIABLES	Bottom 20% SES 2003	Bottom 20% SES 2005	Bottom 20% SES 2011	Bottom 20% SES 2013	Bottom 20% SES 2015	Bottom 20% SES 2017
Student SES Percentile	78.238	107.672*	47.597	2.574	18.471	45.577
	(58.095)	(57.971)	(36.320)	(34.303)	(37.635)	(54.506)
Mean School SES	4.467***	3.168	8.052***	10.222***	8.027***	11.746***
	(1.420)	(1.984)	(1.978)	(1.631)	(2.031)	(2.483)
Male	-16.886	-10.373	-0.308	-16.885*	-0.203	2.880
	(11.168)	(11.232)	(8.386)	(9.970)	(10.111)	(13.731)
Black	-13.962**	0.499	1.346	10.437**	11.956*	10.387
	(6.667)	(7.754)	(5.629)	(5.234)	(7.111)	(9.275)
Brown	-26.357	0.450	-31.374*	-2.041	10.346	-39.717
	(18.518)	(22.932)	(18.409)	(12.540)	(16.201)	(25.627)
Asian	-22.344	-8.372	15.741	6.207	-11.394	37.946*
	(14.654)	(20.485)	(20.456)	(17.266)	(18.379)	(22.761)
Indigenous	-3.506	3.223	-5.134	3.498	-10.099	12.143
	(15.299)	(16.815)	(11.928)	(12.797)	(13.722)	(24.806)
Female#Black	21.491**	-2.648	-5.770	-16.485**	2.879	4.829
	(10.034)	(11.250)	(7.572)	(7.131)	(9.288)	(12.329)
Female#Brown	69.942**	-43.096	18.728	-14.827	3.671	78.188**
	(28.311)	(31.455)	(24.050)	(17.827)	(21.964)	(35.227)
Female#Asian	46.840**	4.055	-22.531	9.956	-14.645	-46.971
	(19.852)	(28.741)	(30.133)	(23.939)	(28.662)	(30.709)

Female#Indigenous	22.298***	2.996	-4.633	-4.546	4.498	0.424
	(7.230)	(8.173)	(5.578)	(5.209)	(7.194)	(9.160)
Rural	3.375	-28.438**	8.602	15.240	17.866**	-3.331
	(15.658)	(13.147)	(9.076)	(9.311)	(8.650)	(11.604)
Student Age	-9.572***	-4.914*	-2.092	-7.502***	-6.263**	-5.377
	(2.101)	(2.590)	(1.952)	(2.235)	(2.566)	(3.602)
Age of School Entry		-5.714*	-1.439	-0.703	-8.148***	-6.156**
		(3.029)	(1.900)	(2.000)	(2.239)	(2.991)
Constant	174.488***	286.513***	206.886***	198.393***	184.005***	177.073***
	(29.136)	(35.434)	(23.974)	(22.254)	(25.896)	(32.608)
Observations	340	301	628	725	427	232
R-squared	0.416	0.311	0.302	0.329	0.214	0.330
State FE	YES	YES	YES	YES	YES	YES

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10

Variables' means for private school students' sample, bottom 20% SES.

	43	44	45	46	47	48
Variable	Mean Bottom 20% 2003	Mean Bottom 20% 2005	Mean Bottom 20% 2011	Mean Bottom 20% 2013	Mean Bottom 20% 2015	Mean Bottom 20% 2017
Math Score	198.96	198.12	240.57	240.61	223.66	226.71
Student SES Percentile	0.10	0.11	0.12	0.12	0.11	0.12
Mean School SES	6.01	6.52	7.27	7.47	7.52	7.58
Rural	1.03	1.96	1.08	1.08	1.10	1.10
Student Age	3.46	5.34	5.50	3.65	3.66	3.61
Age of School Entry	2.00	3.51	3.76	1.92	1.92	1.95
Male	0.54	0.53	0.45	0.49	0.46	0.52
Black	0.11	0.12	0.11	0.09	0.13	0.09
Brown	0.42	0.43	0.47	0.45	0.48	0.48
Asian	0.03	0.03	0.02	0.04	0.04	0.03
Indigenous	0.06	0.04	0.01	0.02	0.03	0.03
White	0.39	0.38	0.38	0.40	0.33	0.37

Table 11

Regression outputs for public school students' sample, top 20% SES.

	49	50	51	52	53	54
VARIABLES	TOP 20% SES 2003	TOP 20% SES 2005	TOP 20% SES 2011	Top 20% SES 2013	Top 20% SES 2015	Top 20% SES 2017
Student SES Percentile	3.416	-10.841	-0.305	21.562***	20.779***	20.182***
	(14.589)	(14.466)	(1.197)	(0.895)	(0.781)	(0.820)
Mean School SES	7.988***	7.538***	7.890***	6.329***	6.172***	7.348***
	(0.506)	(0.594)	(0.064)	(0.060)	(0.057)	(0.059)
Male	6.453***	2.412	4.671***	3.985***	5.776***	5.115***
	(1.806)	(2.027)	(0.216)	(0.210)	(0.195)	(0.193)
Black	-13.128***	-15.459***	-16.129***	-14.632***	-14.320***	-18.153***
	(3.369)	(3.224)	(0.330)	(0.345)	(0.314)	(0.319)
Brown	0.046	-2.301	-4.106***	-2.335***	-1.835***	-1.612***
	(1.888)	(2.065)	(0.203)	(0.207)	(0.184)	(0.191)
Asian	6.122	-1.736	-5.155***	-4.774***	-2.472***	-7.768***
	(4.677)	(4.859)	(0.616)	(0.582)	(0.525)	(0.528)
Indigenous	-10.881**	-10.357*	-3.178***	-4.273***	-1.821***	-6.338***
	(4.449)	(5.500)	(0.639)	(0.611)	(0.540)	(0.526)
Female#Black	1.896	3.521	-0.453	-1.289**	0.921**	0.768
	(5.152)	(4.798)	(0.517)	(0.521)	(0.467)	(0.468)
Female#Brown	-0.704	-1.085	-0.708**	-1.517***	-0.672***	-0.963***

	(2.708)	(2.931)	(0.294)	(0.293)	(0.260)	(0.264)
Female#Asian	-14.455**	-11.321	-1.199	-1.052	-0.019	1.311*
	(6.709)	(7.250)	(0.861)	(0.823)	(0.735)	(0.747)
Female#Indigenous	9.971	-6.378	-1.134	-0.661	-0.113	0.269
	(6.533)	(8.074)	(0.904)	(0.868)	(0.756)	(0.748)
Rural	-10.222**	7.893**	-0.515	-0.515	0.682**	-0.831***
	(3.991)	(3.999)	(0.336)	(0.344)	(0.291)	(0.248)
Student Age	-7.436***	-6.618***	-6.283***	-9.543***	-7.844***	-8.275***
	(0.578)	(0.610)	(0.064)	(0.076)	(0.070)	(0.074)
Age of School Entry		-3.169***	-0.889***	-3.121***	-3.224***	-2.667***
		(0.764)	(0.074)	(0.081)	(0.072)	(0.070)
Constant	184.802***	193.281***	219.290***	218.148***	219.934***	221.636***
	(14.327)	(17.215)	(1.276)	(1.028)	(0.917)	(0.937)
Observations	3,776	3,669	409,354	444,804	482,741	458,980
R-squared	0.272	0.282	0.208	0.192	0.181	0.207
State FE	YES	YES	YES	YES	YES	YES

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 12

Variables' means for public school students' sample, top 20% SES.

	55	56	57	58	59	60
Variable	Mean Top 20% 2003	Mean Top 20% 2005	Mean Top 20% 2011	Mean Top 20% 2013	Mean Top 20% 2015	Mean Top 20% 2017
Math Score	186.71	187.86	215.07	222.52	228.89	232.41
Student SES Percentile	0.91	0.95	0.90	0.90	0.90	0.91
Mean School SES	5.93	7.16	6.07	6.41	6.35	6.34
Rural	1.03	2.19	1.05	1.04	1.05	1.07
Student Age	3.51	4.96	5.64	3.75	3.79	3.79
Age of School Entry	2.00	3.61	3.69	1.80	1.78	1.79
Male	0.53	0.53	0.55	0.53	0.52	0.52
Black	0.07	0.07	0.09	0.09	0.08	0.09
Brown	0.38	0.42	0.47	0.45	0.48	0.45
Asian	0.04	0.03	0.03	0.03	0.03	0.03
Indigenous	0.04	0.02	0.02	0.03	0.03	0.03
White	0.48	0.45	0.39	0.41	0.38	0.40

Table 13

Regression outputs for private school students' sample, top 20% SES.

	61	62	63	64	65	66
VARIABLES	TOP 20% SES 2003	TOP 20% SES 2005	TOP 20% SES 2011	Top 20% SES 2013	Top 20% SES 2015	Top 20% SES 2017
Student SES Percentile	22.341**	2.531	16.965***	29.925***	42.527***	37.139***
	(10.290)	(11.812)	(5.704)	(4.428)	(4.976)	(5.856)
Mean School SES	10.781***	11.968***	9.785***	10.018***	13.003***	12.613***
	(0.559)	(0.636)	(0.487)	(0.497)	(0.471)	(0.564)
Male	-18.720***	-22.668***	-16.057***	-13.436***	-12.720***	-16.385***
	(4.123)	(3.877)	(2.108)	(1.966)	(2.077)	(2.583)
Black	-4.899***	-3.471**	-3.128***	-2.193**	-1.520*	-2.863***
	(1.485)	(1.670)	(0.923)	(0.861)	(0.910)	(1.065)
Brown	-0.697	4.414	-11.249***	-3.814	-6.895***	-5.668*
	(3.517)	(4.391)	(2.769)	(2.466)	(2.434)	(3.110)
Asian	-11.362***	-9.220**	5.657**	-1.107	4.158*	-4.872
	(3.482)	(4.302)	(2.857)	(2.501)	(2.400)	(3.010)
Indigenous	-5.678	3.518	-2.754	-0.890	-0.726	1.731
	(6.461)	(6.218)	(3.339)	(2.972)	(3.152)	(3.897)
Female#Black	1.608	1.020	-0.804	-0.193	-0.967	-0.875
	(2.114)	(2.329)	(1.293)	(1.196)	(1.264)	(1.451)
Female#Brown	3.252	1.217	2.810	-0.336	1.766	6.065
	(5.123)	(5.949)	(3.877)	(3.398)	(3.425)	(4.282)
Female#Asian	7.264	-0.765	-9.828**	-2.214	-5.047	-4.641
	(4.818)	(6.375)	(4.065)	(3.513)	(3.419)	(4.140)

Female#Indigenous	8.981***	7.170***	5.664***	5.463***	6.682***	7.464***
	(1.254)	(1.450)	(0.858)	(0.792)	(0.901)	(1.021)
Rural	21.390**	-4.674	-3.698	-0.614	1.267	-2.227
	(10.500)	(9.429)	(2.446)	(3.167)	(2.576)	(2.473)
Student Age	-7.742***	-4.386***	-5.222***	-5.282***	-5.474***	-4.490***
	(0.756)	(0.788)	(0.470)	(0.471)	(0.486)	(0.597)
Age of School Entry		-2.632***	-3.786***	-4.849***	-6.014***	-4.098***
		(0.812)	(0.373)	(0.366)	(0.375)	(0.393)
Constant	126.770***	174.780***	220.063***	187.856***	129.039***	139.022***
	(14.499)	(23.223)	(7.195)	(6.873)	(6.881)	(7.986)
Observations	7,608	6,293	18,230	23,047	18,852	13,440
R-squared	0.144	0.166	0.165	0.167	0.181	0.173
State FE	YES	YES	YES	YES	YES	YES

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 14

Variables' means for private school students' sample, top 20% SES.

	67	68	69	70	71	72
Variable	Mean Top 20% 2003	Mean Top 20% 2005	Mean Top 20% 2011	Mean Top 20% 2013	Mean Top 20% 2015	Mean Top 20% 2017
Math Score	230.04	234.11	251.76	252.17	248.19	254.03
Student SES Percentile	0.93	0.98	0.93	0.96	0.96	0.96
Mean School SES	8.68	8.93	8.88	9.03	9.06	9.16
Rural	1.00	2.00	1.02	1.01	1.01	1.02
Student Age	3.09	5.08	5.04	3.36	3.40	3.43
Age of School Entry	2.00	3.23	3.45	1.61	1.61	1.67
Male	0.52	0.51	0.52	0.51	0.51	0.51
Black	0.02	0.03	0.04	0.04	0.04	0.03
Brown	0.32	0.35	0.40	0.40	0.45	0.45
Asian	0.04	0.04	0.03	0.03	0.03	0.03
Indigenous	0.04	0.03	0.02	0.03	0.03	0.03
White	0.58	0.55	0.51	0.50	0.44	0.46

Table 15

Regression outputs for private school students' sample, all SES, White students.

	73	74	75	76	77	78
VARIABLES	full sample 2003	full sample 2005	full sample 2011	full sample 2013	full sample 2015	full sample 2017
Student SES Percentile	4.576*	9.781***	7.930***	11.453***	14.191***	16.103***
	(2.701)	(3.046)	(1.923)	(1.720)	(2.202)	(2.698)
Mean School SES	8.917***	9.938***	7.958***	9.669***	12.659***	12.014***
	(0.520)	(0.626)	(0.530)	(0.566)	(0.590)	(0.684)
Male	8.801***	7.609***	5.630***	4.685***	6.079***	7.678***
	(1.024)	(1.158)	(0.706)	(0.710)	(0.798)	(0.907)
Rural	7.537	-6.340	-6.224**	6.698*	1.837	-2.791
	(7.514)	(7.333)	(2.730)	(3.695)	(3.184)	(3.307)
Student Age	-6.924***	-4.901***	-5.090***	-5.071***	-4.432***	-4.968***
	(0.770)	(0.809)	(0.551)	(0.594)	(0.645)	(0.782)
Age of School Entry		-2.792***	-3.212***	-4.642***	-6.358***	-3.831***
		(0.817)	(0.440)	(0.464)	(0.498)	(0.524)
Constant	171.199***	192.042***	244.982***	201.431***	157.472***	169.541***
	(9.378)	(16.174)	(6.444)	(7.007)	(7.027)	(7.974)
Observations	6,593	5,370	13,989	14,827	10,700	7,798
R-squared	0.166	0.205	0.144	0.165	0.202	0.180

State FE	YES	YES	YES	YES	YES	YES

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 16

Regression outputs for public school students' sample, all SES, White students.

	79	80	81	82	83	84
VARIABLES	full sample 2003	full sample 2005	full sample 2011	full sample 2013	full sample 2015	full sample 2017
Student SES Percentile	7.515***	9.270***	15.418***	20.162***	18.973***	19.201***
	(1.363)	(1.675)	(0.202)	(0.218)	(0.198)	(0.196)
Mean School SES	5.133***	6.047***	6.698***	5.797***	5.719***	6.661***
	(0.294)	(0.397)	(0.053)	(0.057)	(0.055)	(0.054)
Male	3.850***	2.112**	3.600***	2.892***	4.164***	3.589***
	(0.683)	(0.856)	(0.112)	(0.132)	(0.120)	(0.115)
	(1.334)	(1.520)	(0.229)	(0.273)	(0.243)	(0.204)
Student Age	-5.014***	-4.838***	-5.906***	-8.869***	-6.929***	-7.741***
	(0.270)	(0.350)	(0.054)	(0.071)	(0.066)	(0.067)
Age of School Entry		-2.310***	-0.574***	-2.581***	-3.059***	-2.572***
		(0.460)	(0.061)	(0.078)	(0.071)	(0.066)
Constant	178.060***	179.468***	209.332***	220.529***	221.578***	225.566***
	(2.817)	(4.357)	(0.569)	(0.575)	(0.550)	(0.514)
Observations	11,734	8,678	636,674	498,712	495,480	544,964
R-squared	0.214	0.219	0.194	0.217	0.204	0.215
State FE	YES	YES	YES	YES	YES	YES

Table 17

Variables' means for private school students' sample, all SES, White students.

Table 17

PUBLIC (WHITE ONLY)

Variable	85 Mean full sample 2003	86 Mean full sample 2005	87 Mean full sample 2011	88 Mean full sample 2013	89 Mean full sample 2015	90 Mean full sample 2017
Math Score	227.31	230.33	259.52	258.32	251.25	259.05
Student SES Percentile	0.80	0.83	0.81	0.86	0.87	0.88
Mean School SES	8.10	8.18	8.59	8.87	8.86	8.97
Rural	1.01	1.99	1.02	1.01	1.02	1.02
Student Age	3.11	5.09	5.31	3.37	3.39	3.42
Age of School Entry	2.00	3.27	3.59	1.62	1.61	1.65
Male	0.51	0.49	0.51	0.51	0.51	0.50

Table 18

Variables' means for public school students' sample, all SES, White students.

	91	92	93	94	95	96
Variable	Mean full sample 2003	Mean full sample 2005	Mean full sample 2011	Mean full sample 2013	Mean full sample 2015	Mean full sample 2017
Math Score	176.83	182.02	215.79	218.51	224.27	229.06
Student SES Percentile	0.45	0.53	0.54	0.56	0.57	0.57
Mean School SES	4.73	5.39	5.44	5.71	5.77	5.76
Rural	1.08	2.00	1.08	1.08	1.08	1.11
Student Age	3.78	5.39	5.63	3.76	3.81	3.77
Age of School Entry	2.00	3.79	3.79	1.86	1.84	1.84
Male	0.50	0.50	0.51	0.51	0.51	0.51

Table 19

Regression outputs for private school students' sample, all SES, Black students.

	97	98	99	100	101	102
VARIABLES	full sample 2003	full sample 2005	full sample 2011	full sample 2013	full sample 2015	full sample 2017
Student SES Percentile	-4.875	6.344	0.279	12.504**	14.525***	8.396
	(8.047)	(8.116)	(5.427)	(5.002)	(5.242)	(7.429)
Mean School SES	7.081***	7.442***	6.181***	6.183***	7.628***	8.862***
	(1.510)	(1.615)	(1.709)	(1.567)	(1.455)	(1.982)
Male	12.772***	6.466*	5.629**	4.920**	5.580**	7.231**
	(3.764)	(3.618)	(2.462)	(2.373)	(2.322)	(3.019)
Rural	-3.975	-19.072	-8.982	2.906	11.433	-9.412
	(18.931)	(12.767)	(7.252)	(7.384)	(7.325)	(7.923)
Student Age	-7.669***	-6.913***	-3.194**	-7.803***	-6.581***	-5.784***
	(1.898)	(1.955)	(1.381)	(1.604)	(1.500)	(2.074)
Age of School Entry		-4.278**	-4.710***	-5.468***	-4.230***	-6.128***
		(2.174)	(1.363)	(1.388)	(1.324)	(1.580)
Constant	172.092***	241.559***	245.632***	226.985***	175.603***	204.276***
	(27.855)	(30.060)	(19.383)	(18.364)	(17.621)	(24.212)
Observations	502	584	1,283	1,431	1,215	745
R-squared	0.203	0.172	0.192	0.159	0.174	0.175
State FE	YES	YES	YES	YES	YES	YES

Table 20

Regression outputs for public school students' sample, all SES, Black students.

	103	104	105	106	107	108
VARIABLES	full sample 2003	full sample 2005	full sample 2011	full sample 2013	full sample 2015	full sample 2017
Student SES Percentile	3.823	2.763	5.646***	12.175***	10.814***	11.122***
	(2.388)	(2.439)	(0.326)	(0.381)	(0.329)	(0.332)
Mean School SES	4.065***	4.655***	5.168***	5.023***	4.219***	5.755***
	(0.511)	(0.568)	(0.089)	(0.099)	(0.093)	(0.093)
Male	3.576***	3.263***	3.581***	2.719***	3.482***	2.125***
	(1.083)	(1.131)	(0.183)	(0.220)	(0.193)	(0.188)
Rural	-2.050	-0.331	-1.282***	-3.061***	-1.697***	-2.351***
	(2.269)	(2.319)	(0.339)	(0.404)	(0.345)	(0.293)
Student Age	-2.724***	-3.210***	-3.572***	-5.987***	-4.613***	-5.353***
	(0.383)	(0.403)	(0.071)	(0.095)	(0.087)	(0.084)
Age of School Entry		-2.067***	-0.306***	-2.292***	-1.928***	-1.864***
		(0.544)	(0.088)	(0.118)	(0.104)	(0.098)
Constant	151.426***	161.713***	189.721***	201.894***	211.596***	208.579***
	(4.650)	(6.448)	(0.867)	(0.919)	(0.836)	(0.791)
Observations	3,804	3,800	200,780	157,820	166,979	183,753
R-squared	0.120	0.125	0.125	0.154	0.126	0.155
State FE	YES	YES	YES	YES	YES	YES

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 21

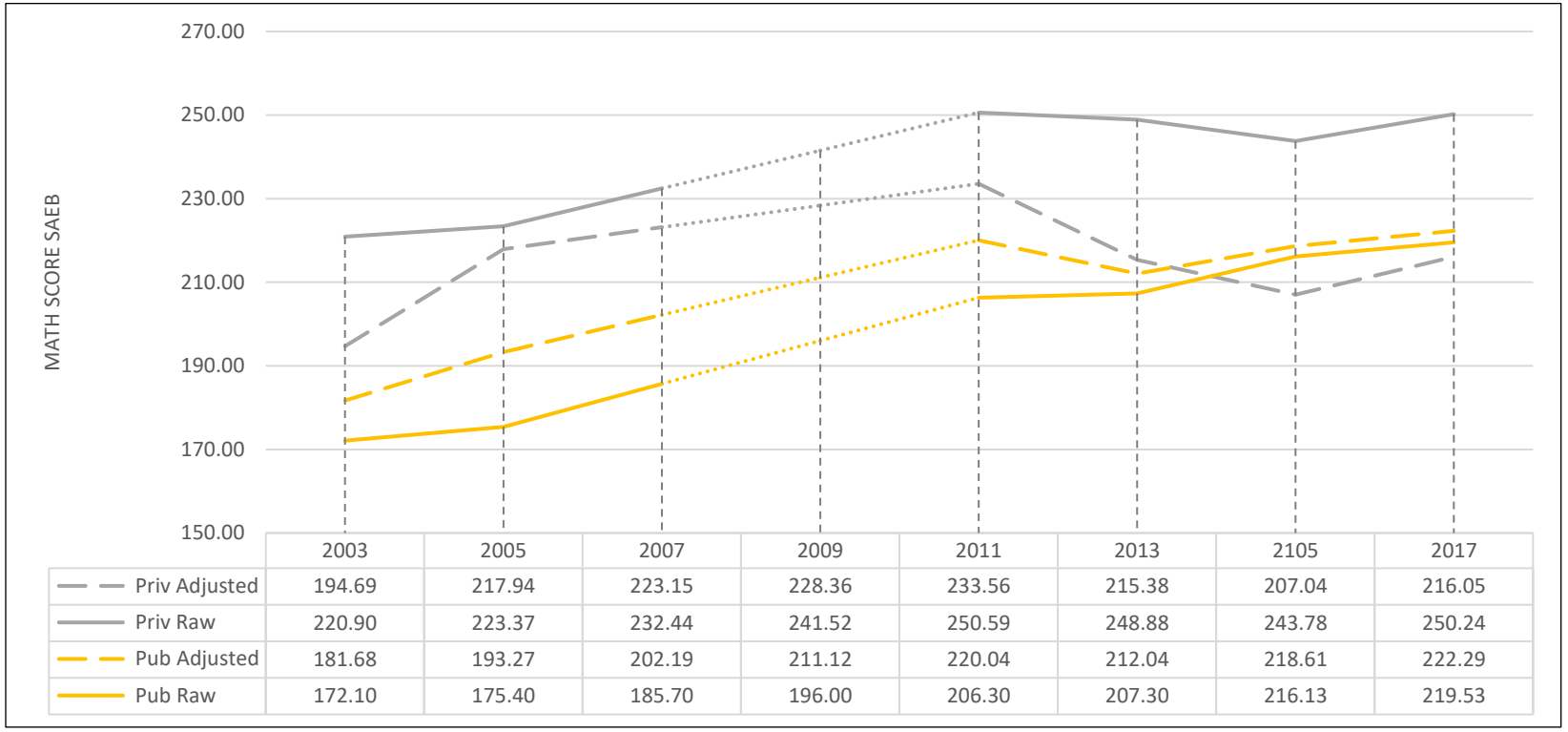
Variables' means for private school students' sample, all SES, Black students.

	109	110	111	112	113	114
Variable	Mean full sample 2003	Mean full sample 2005	Mean full sample 2011	Mean full sample 2013	Mean full sample 2015	Mean full sample 2017
Math Score	192.90	196.39	232.01	231.45	223.80	228.29
Student SES Percentile	0.62	0.68	0.74	0.78	0.77	0.79
Mean School SES	8.10	8.18	8.59	8.87	8.86	8.97
Rural	1.01	1.98	1.04	1.03	1.03	1.04
Student Age	3.39	5.33	5.47	3.55	3.56	3.56
Age of School Entry	2.00	3.37	3.64	1.67	1.68	1.80
Male	0.53	0.56	0.59	0.56	0.56	0.57

Table 22

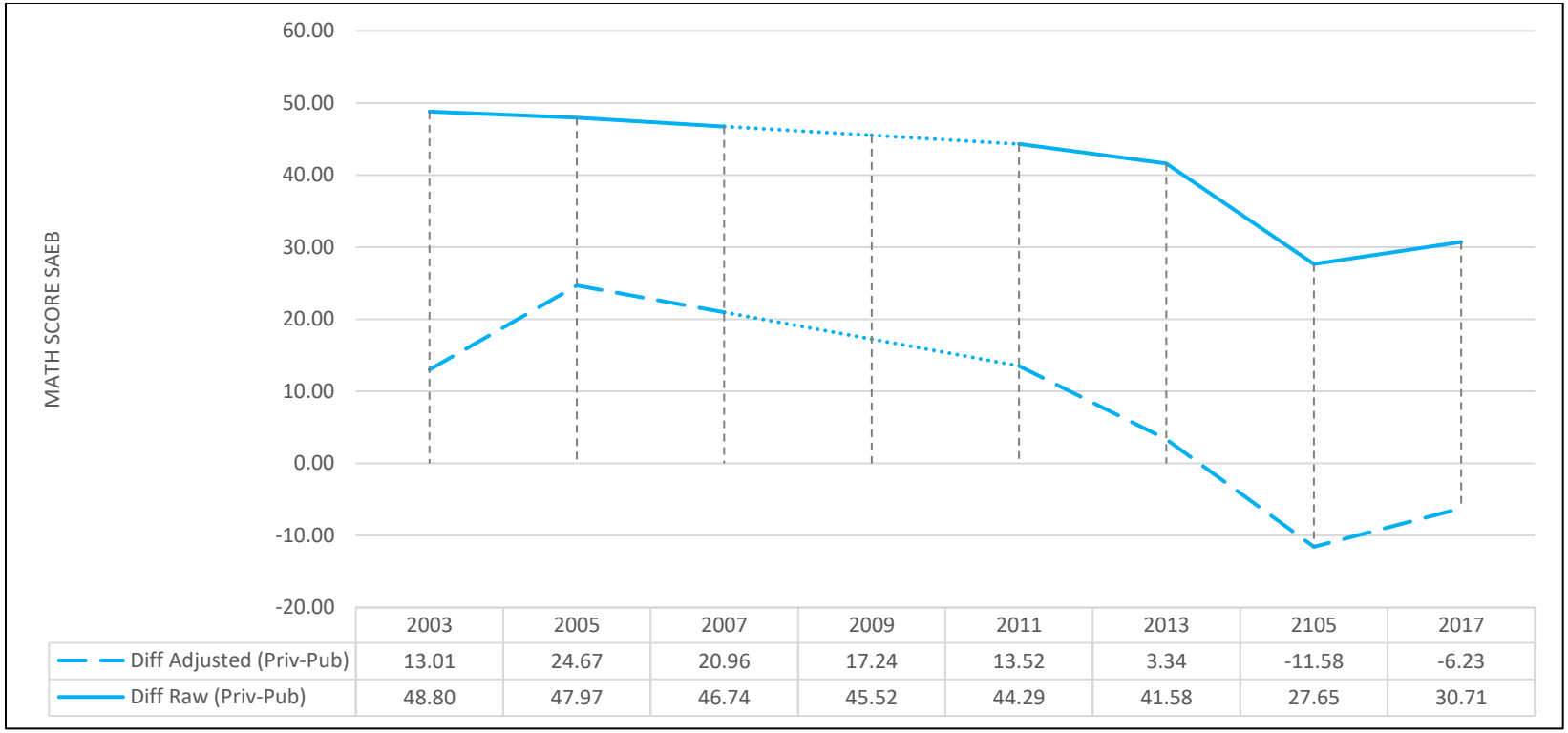
Variables' means for private school students' sample, all SES, Black students.

Variable	115 Mean full sample 2003	116 Mean full sample 2005	117 Mean full sample 2011	118 Mean full sample 2013	119 Mean full sample 2015	120 Mean full sample 2017
Math Score	159.34	161.99	194.17	195.54	204.12	201.54
Student SES Percentile	0.35	0.42	0.47	0.48	0.48	0.48
Mean School SES	4.73	5.39	5.44	5.71	5.77	5.76
Rural	1.07	1.92	1.10	1.10	1.10	1.15
Student Age	4.27	6.09	6.03	4.16	4.15	4.12
Age of School Entry	2.00	3.93	3.81	1.89	1.86	1.90
Male	0.53	0.55	0.57	0.56	0.55	0.55



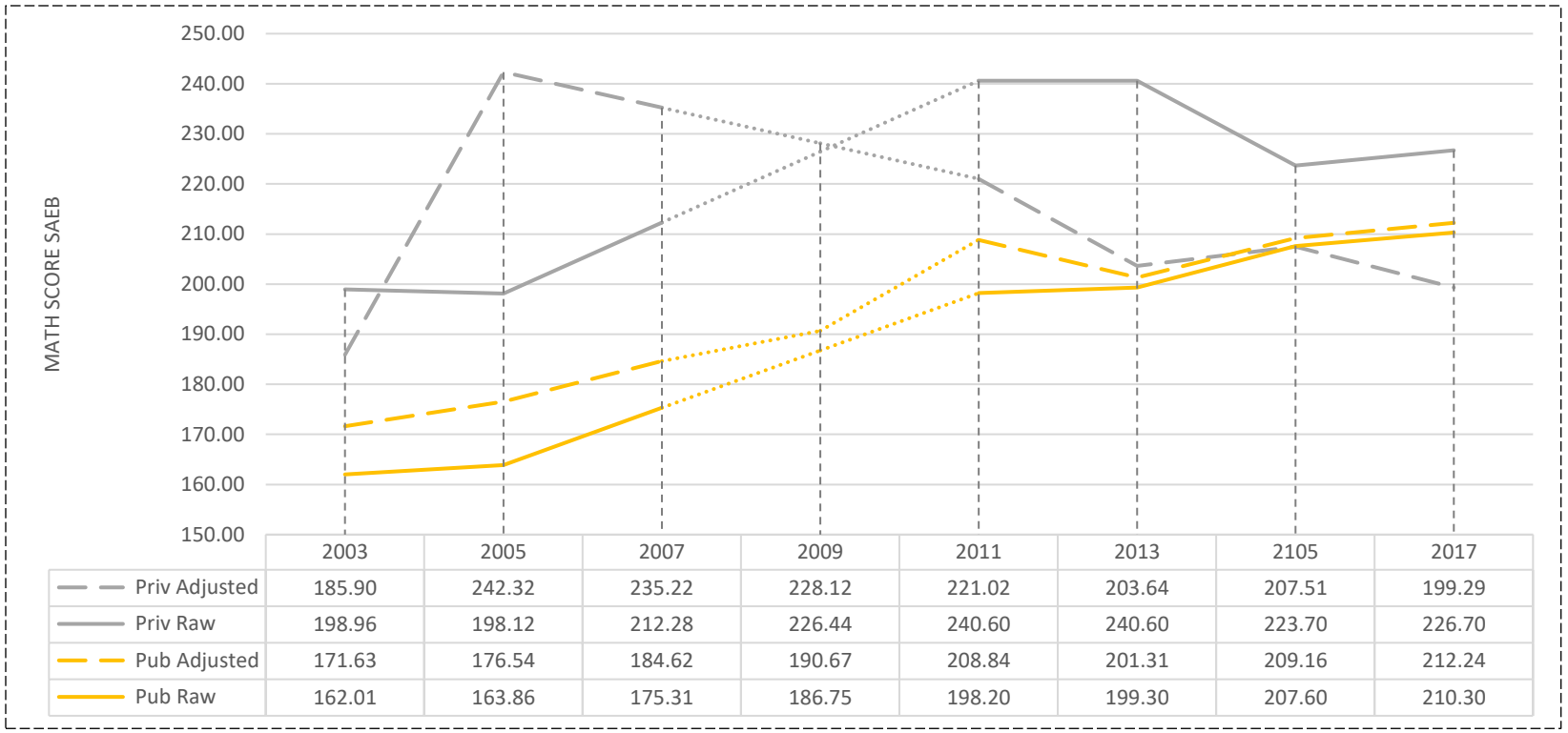
	2003	2005	2007	2009	2011	2013	2105	2017
Priv Adjusted	194.69	217.94	223.15	228.36	233.56	215.38	207.04	216.05
Priv Raw	220.90	223.37	232.44	241.52	250.59	248.88	243.78	250.24
Pub Adjusted	181.68	193.27	202.19	211.12	220.04	212.04	218.61	222.29
Pub Raw	172.10	175.40	185.70	196.00	206.30	207.30	216.13	219.53

Fig. 1. Raw and adjusted scores for full sample, private and public school students, all SES.



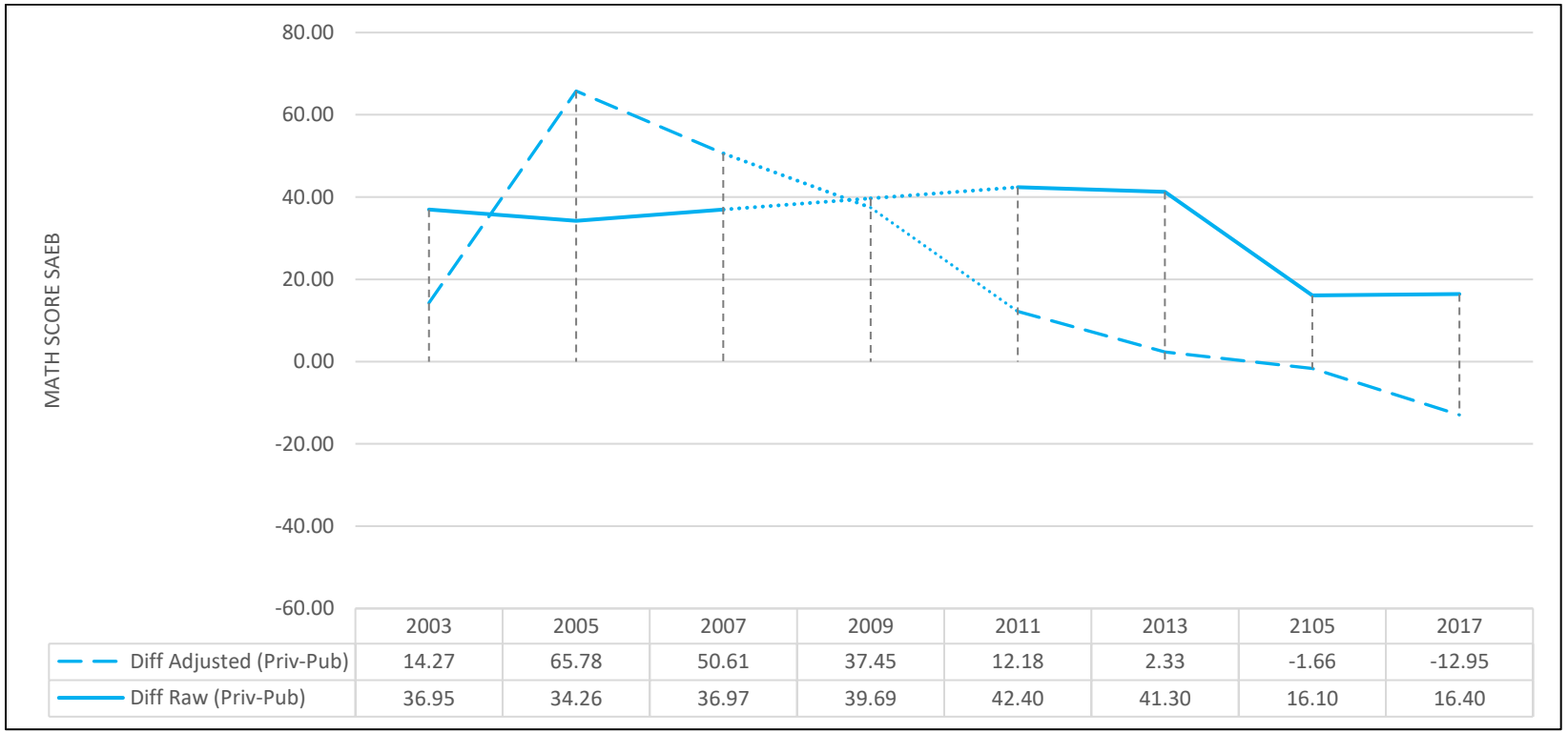
	2003	2005	2007	2009	2011	2013	2105	2017
Diff Adjusted (Priv-Pub)	13.01	24.67	20.96	17.24	13.52	3.34	-11.58	-6.23
Diff Raw (Priv-Pub)	48.80	47.97	46.74	45.52	44.29	41.58	27.65	30.71

Fig. 2. Differences in raw and adjusted scores across private and public school students, full sample, all SES.



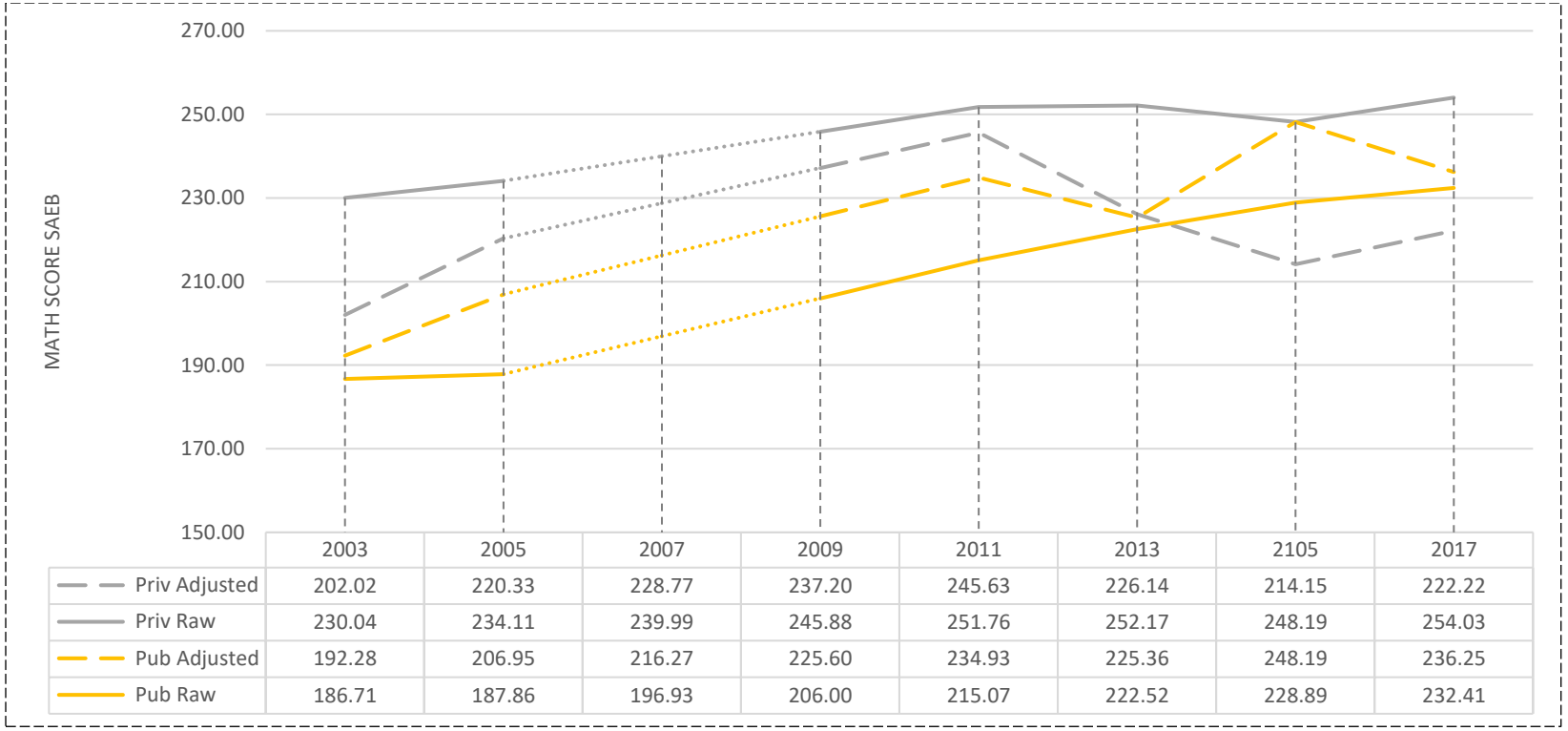
	2003	2005	2007	2009	2011	2013	2105	2017
Priv Adjusted	185.90	242.32	235.22	228.12	221.02	203.64	207.51	199.29
Priv Raw	198.96	198.12	212.28	226.44	240.60	240.60	223.70	226.70
Pub Adjusted	171.63	176.54	184.62	190.67	208.84	201.31	209.16	212.24
Pub Raw	162.01	163.86	175.31	186.75	198.20	199.30	207.60	210.30

Fig. 3. Raw and adjusted scores for full sample, private and public school students, bottom 20% SES.



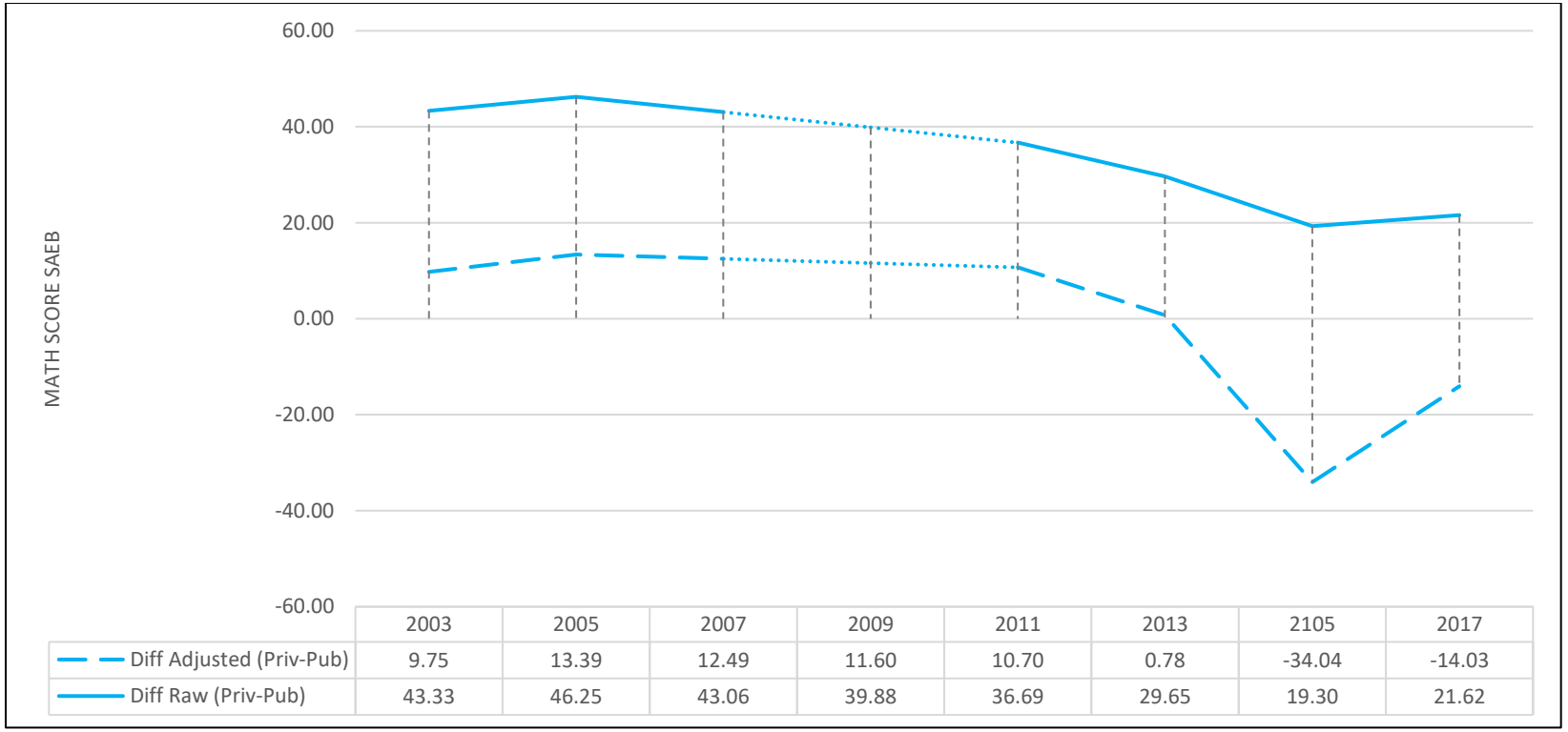
	2003	2005	2007	2009	2011	2013	2105	2017
Diff Adjusted (Priv-Pub)	14.27	65.78	50.61	37.45	12.18	2.33	-1.66	-12.95
Diff Raw (Priv-Pub)	36.95	34.26	36.97	39.69	42.40	41.30	16.10	16.40

Fig. 4. Differences in raw and adjusted scores across private and public school students, full sample, bottom 20% SES.



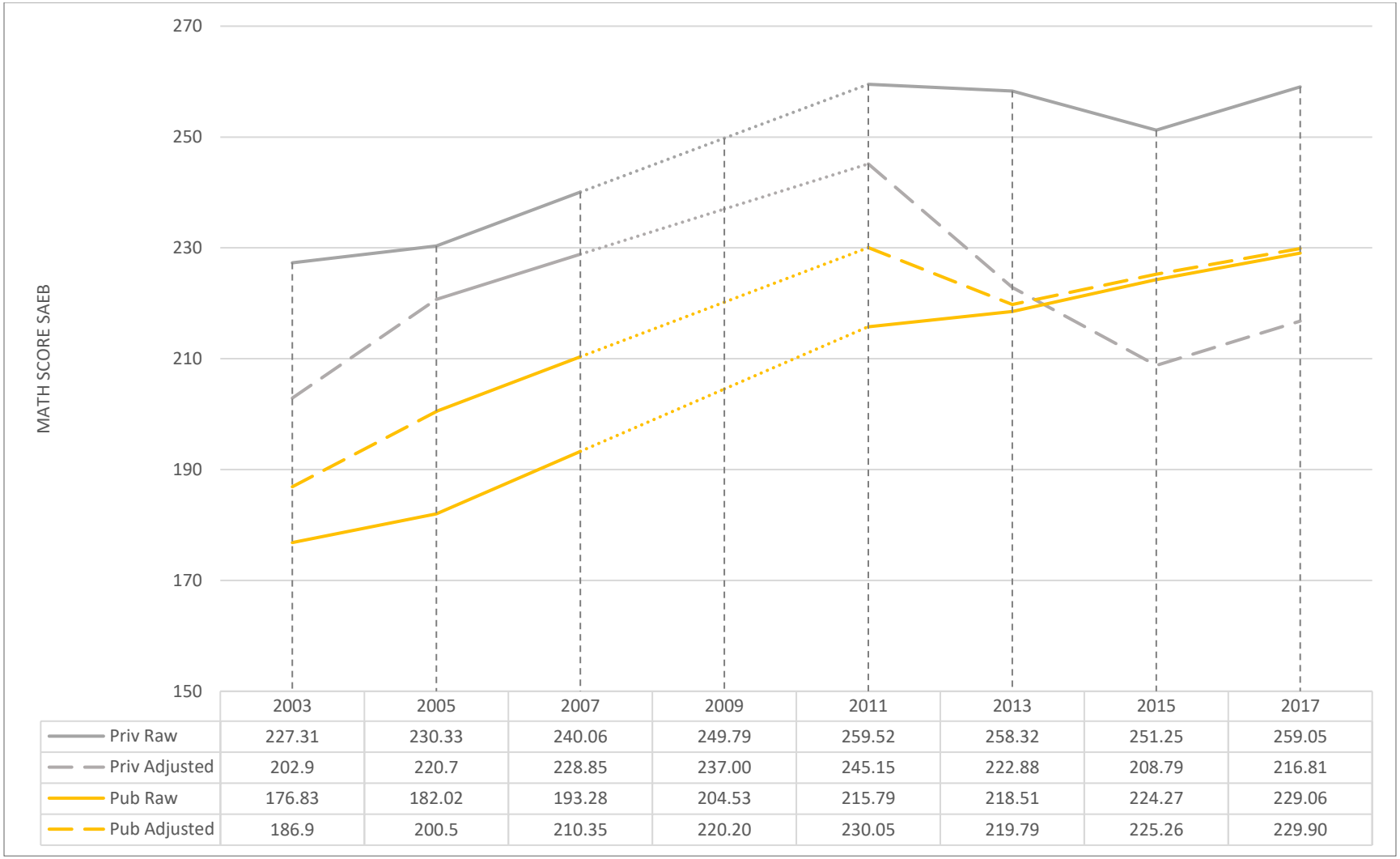
	2003	2005	2007	2009	2011	2013	2105	2017
Priv Adjusted	202.02	220.33	228.77	237.20	245.63	226.14	214.15	222.22
Priv Raw	230.04	234.11	239.99	245.88	251.76	252.17	248.19	254.03
Pub Adjusted	192.28	206.95	216.27	225.60	234.93	225.36	248.19	236.25
Pub Raw	186.71	187.86	196.93	206.00	215.07	222.52	228.89	232.41

Fig. 5. Raw and adjusted scores for full sample, private and public school students, top 20% SES.



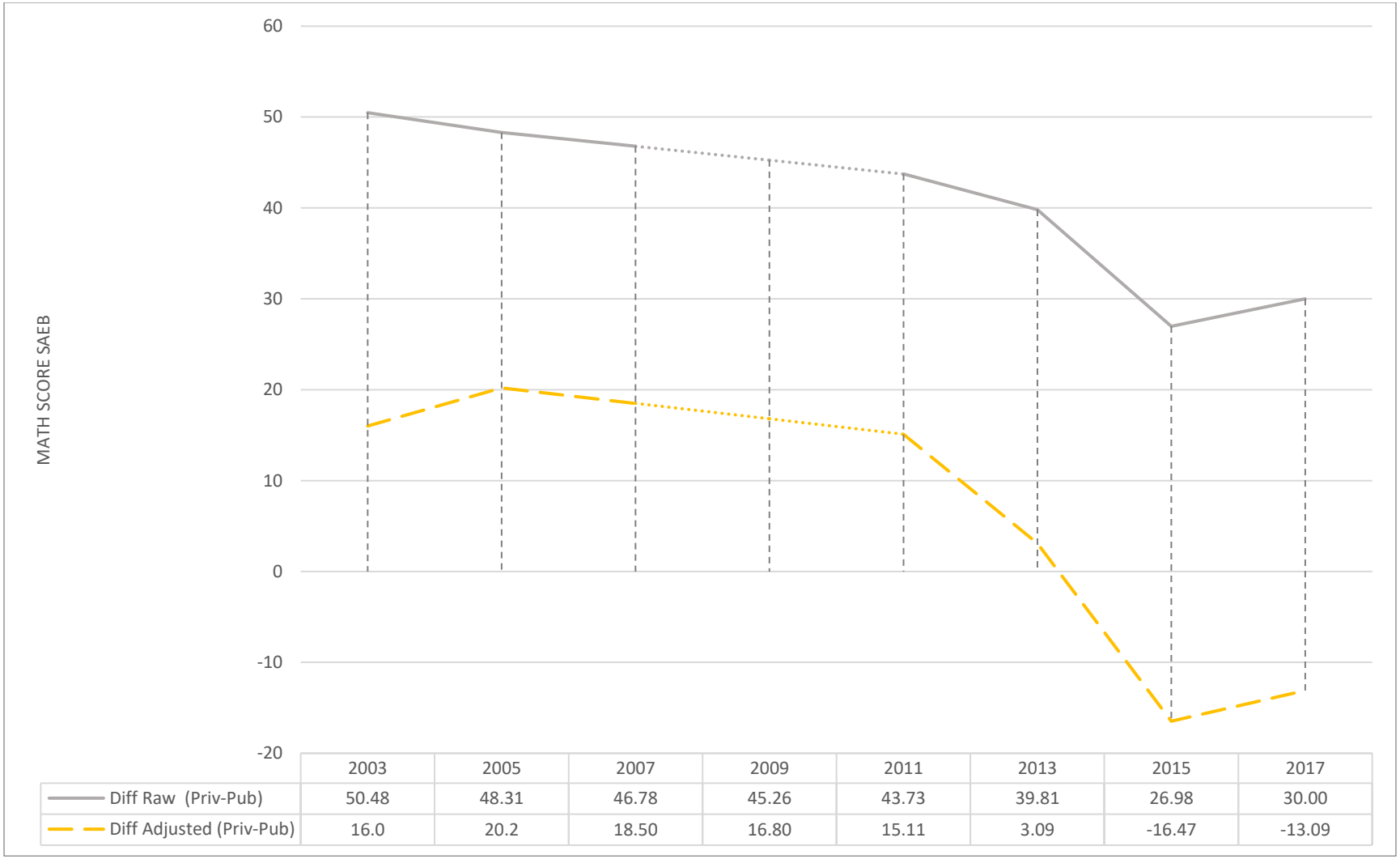
	2003	2005	2007	2009	2011	2013	2105	2017
Diff Adjusted (Priv-Pub)	9.75	13.39	12.49	11.60	10.70	0.78	-34.04	-14.03
Diff Raw (Priv-Pub)	43.33	46.25	43.06	39.88	36.69	29.65	19.30	21.62

Fig. 6. Differences in raw and adjusted scores across private and public school students, full sample, 20% SES.



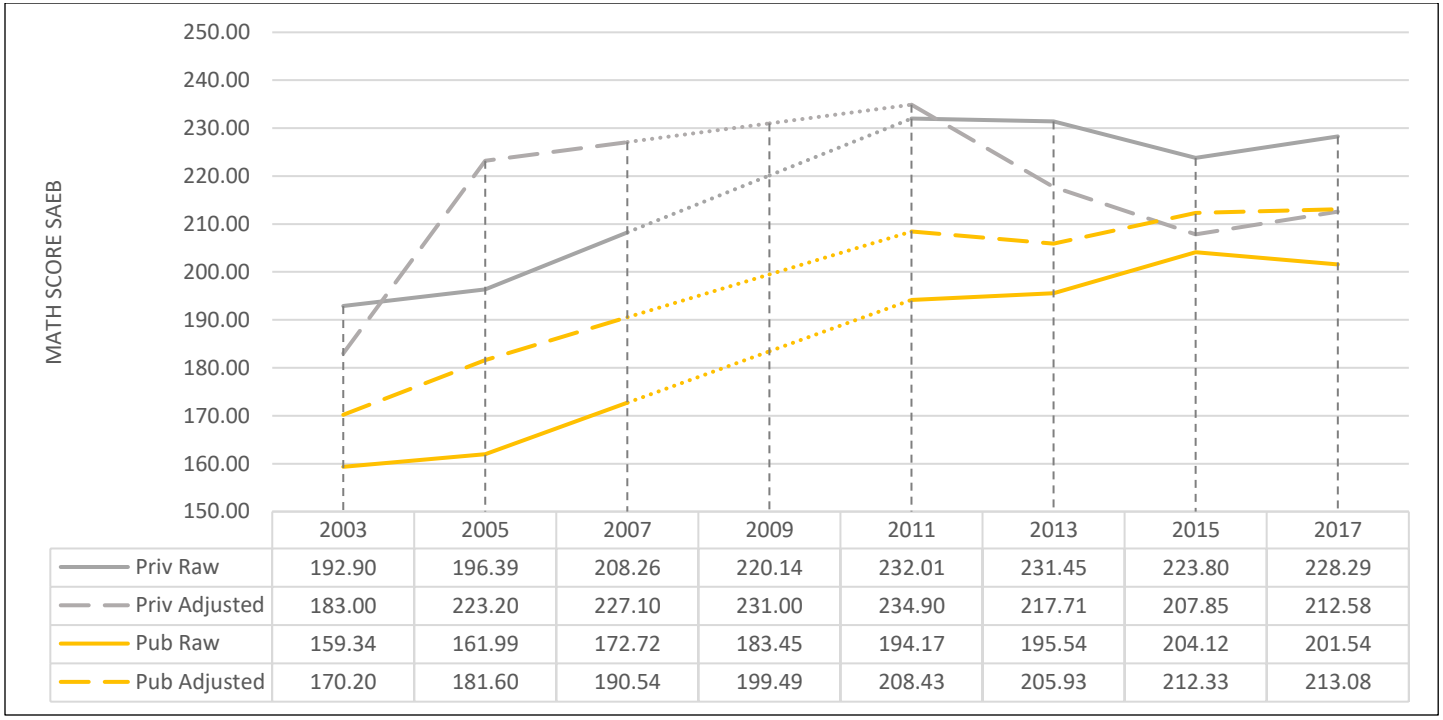
	2003	2005	2007	2009	2011	2013	2015	2017
Priv Raw	227.31	230.33	240.06	249.79	259.52	258.32	251.25	259.05
Priv Adjusted	202.9	220.7	228.85	237.00	245.15	222.88	208.79	216.81
Pub Raw	176.83	182.02	193.28	204.53	215.79	218.51	224.27	229.06
Pub Adjusted	186.9	200.5	210.35	220.20	230.05	219.79	225.26	229.90

Fig. 7. Raw and adjusted scores, private and public school students, White students, all SES.



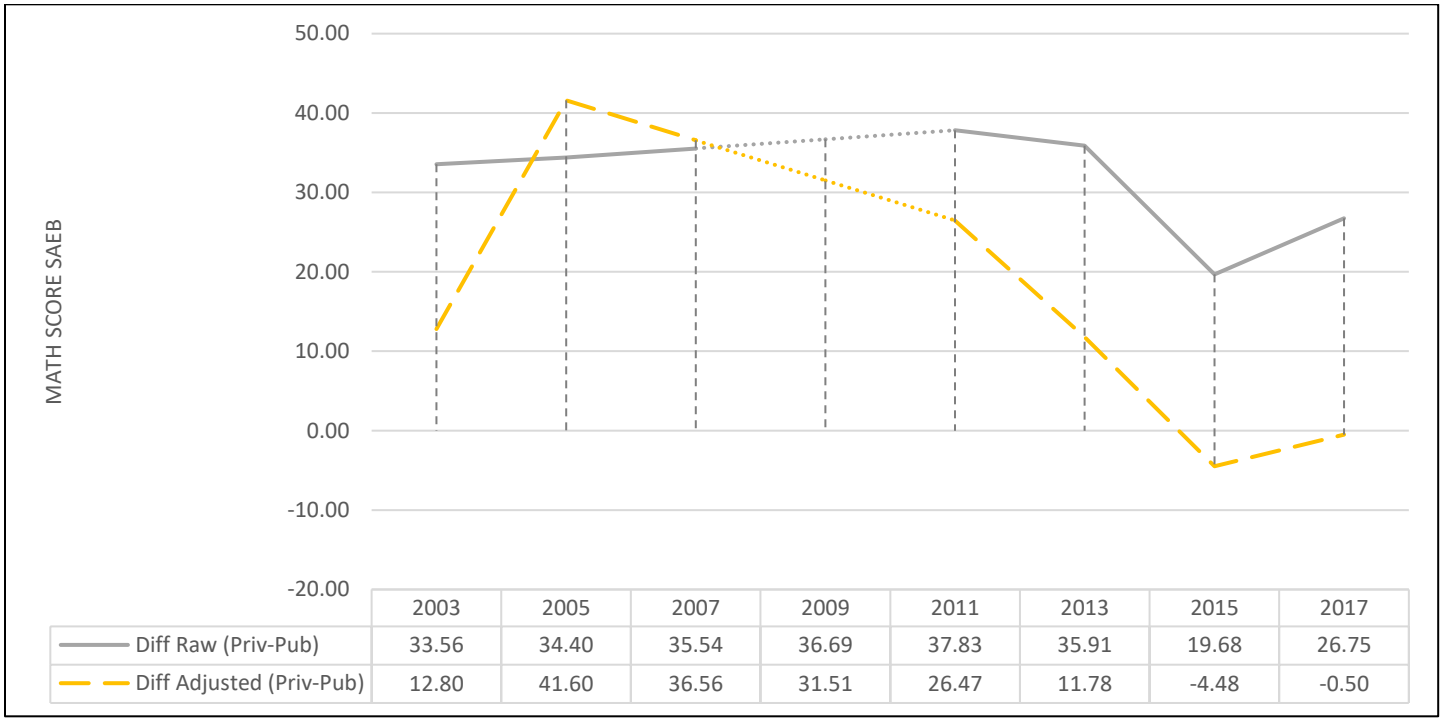
	2003	2005	2007	2009	2011	2013	2015	2017
Diff Raw (Priv-Pub)	50.48	48.31	46.78	45.26	43.73	39.81	26.98	30.00
Diff Adjusted (Priv-Pub)	16.0	20.2	18.50	16.80	15.11	3.09	-16.47	-13.09

Fig. 8. Differences in raw and adjusted scores across private and public school students, White students, all SES.



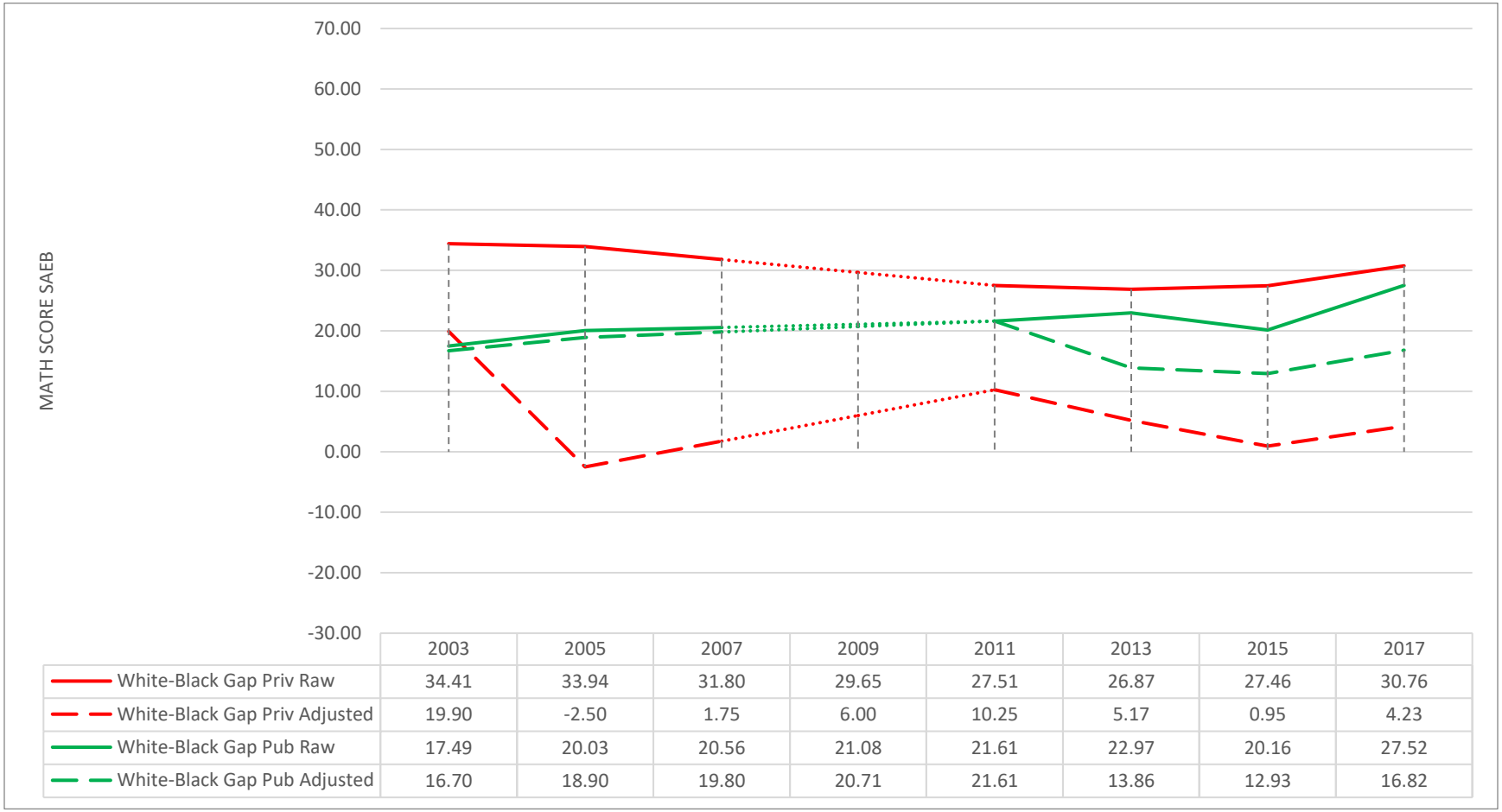
	2003	2005	2007	2009	2011	2013	2015	2017
Priv Raw	192.90	196.39	208.26	220.14	232.01	231.45	223.80	228.29
Priv Adjusted	183.00	223.20	227.10	231.00	234.90	217.71	207.85	212.58
Pub Raw	159.34	161.99	172.72	183.45	194.17	195.54	204.12	201.54
Pub Adjusted	170.20	181.60	190.54	199.49	208.43	205.93	212.33	213.08

Fig. 9. Raw and adjusted scores, private and public school students, Black students, all SES.



	2003	2005	2007	2009	2011	2013	2015	2017
Diff Raw (Priv-Pub)	33.56	34.40	35.54	36.69	37.83	35.91	19.68	26.75
Diff Adjusted (Priv-Pub)	12.80	41.60	36.56	31.51	26.47	11.78	-4.48	-0.50

Fig. 10. Differences in raw and adjusted scores across private and public school students, Black students, all SES.



	2003	2005	2007	2009	2011	2013	2015	2017
White-Black Gap Priv Raw	34.41	33.94	31.80	29.65	27.51	26.87	27.46	30.76
White-Black Gap Priv Adjusted	19.90	-2.50	1.75	6.00	10.25	5.17	0.95	4.23
White-Black Gap Pub Raw	17.49	20.03	20.56	21.08	21.61	22.97	20.16	27.52
White-Black Gap Pub Adjusted	16.70	18.90	19.80	20.71	21.61	13.86	12.93	16.82

Fig. 11. White-Black performance gap - public, private - all SES