Separate and Unequal Under One Roof: How the Legacy of Racialized Tracking Perpetuates Within-School Segregation

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In this article, we use administrative data from three cohorts of North Carolina public high school students to examine the effects of within-school segregation on the propensity of academically eligible black high school students to take advanced math courses. Our identification strategy takes advantage of cohort-to-cohort variation in the share of eleventh and twelfth grade black students enrolled in advanced math courses when a cohort first enters a school in the ninth grade. We find that a 1 point increase in the percentage of black eleventh and twelfth graders in advanced math courses increases the likelihood that an academically eligible black student will take an advanced math course before they graduate by 22 percentage points in racially diverse schools. Effects are larger for black males.

Keywords: racial segregation, education, inequality, achievement gaps

Nearly 125 years after the *Plessy v. Ferguson* Supreme Court decision of 1896, which affirmed "separate but equal" public facilities by race, American public schools remain segregated.[1] This segregation persists in spite of decades of efforts aimed at integration after the *Brown v. Board of Education* Supreme Court decision of 1954.[2] In this article, we argue that ongoing within-school segregation at the high school level is linked to the legacy of racialized tracking born from the resistance to the desegregation of schools by race.

In the immediate aftermath of the *Brown* decision, schools mobilized to install policies and

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1. *Plessy v. Ferguson*, 163 U.S. 547 (1896).

2. *Brown v. Board of Education of Topeka*, 347 U.S. 483 (1954).

practices that both purposely and inadvertently upheld the status quo of "separate but equal" schooling cemented by *Plessy*. One of these policies was the creation of magnet schools that were designed to attract students from white middle-class families to predominantly black inner-city school districts by offering enriched education experiences housed inside schools that were physically located in inner cities. The legacy of magnet schools, however, was to perpetuate within-school segregation where white middle-class students are mostly situated in classes with advanced and enriched curricula and minority students and those navigating poverty are mostly situated in standard or remedial classes (West 1994).

During the 2015–2016 academic year (the most recent year for which data are available), black students made up 15.4 percent of the U.S. public school student population, but were only 9.4 percent of students taking advanced placement (AP) courses.[3] Black students were underrepresented in AP courses in every U.S. state where black students made up at least 5 percent of the student population (Office for Civil Rights 2018). These data paint a picture of an educational landscape in which black and white students experience separate and unequal education experiences even when they are housed in the same school building.[4]

A portion of the underrepresentation of black students in AP classes can be explained by differences in prior academic preparation (Conger, Long, and Iatarola 2009). However, even after accounting for academic preparation, a racial divide in AP course-taking persists (Klopfenstein 2004). Why are academically prepared black students not enrolling in AP courses?

The sociologist Karolyn Tyson puts forth two plausible explanations—fear of failure and fear of being isolated from same-race peers (Tyson, Darity, and Castellino 2005; Tyson 2011). Conceptually, if a black student in the ninth grade arrives on their high school campus and observes a stark racial contrast in AP course enrollment, they may be less likely to enroll in AP courses, either because the lack of successful black AP course-taking role models in the upper grades contributes to their own fear of failure, or because the lack of black students in AP classes in the upper grades leads them to view AP courses as racially isolated spaces. In either case, a school with segregated courses may continue to have segregated courses even in the absence of explicit racialized tracking policies if the segregation of the upper grades makes those in lower grades less likely to take advanced courses when they reach the upper grades themselves. In this way, segregation begets segregation.

This article adds to the literature by testing this theory empirically using data from three cohorts of North Carolina high school students and a quasi-experimental quantitative estimation strategy. To our knowledge, no study to date uses detailed student-level data to examine past segregation as a determinant of black student AP course-taking. We focus specifically on AP math courses because the prerequisites for taking AP math courses are more likely to be standardized across schools and districts than the prerequisites for English, social science, foreign language, and science courses. This makes it easier to determine student eligibility for AP courses and thus easier to restrict the analysis to those students who are academically eligible to take the courses.

Our identification strategy takes advantage of cohort-to-cohort variation in the share of

3. The College Board administers the AP system. Students who take AP courses (which are offered in a wide variety of subjects) are taught an enriched curriculum and have the option to take a standardized AP exam at the end of the course. Depending on their exam performance, AP classes taken in high school can satisfy college credits and prerequisites at many colleges and universities.

4. Evidence on within-school segregation during the 1980s helped spur the detracking movements of the late 1980s and early 1990s (Oakes 2005); however, even after the concerted movement to eliminate rigid academic tracks in U.S. schools, within-school segregation has persisted and is shown to be greater in high schools and middle schools than in elementary schools, but less than measures of across-school segregation (Clotfelter, Ladd, and Vigdor 2003; Conger 2005; Kalogrides and Loeb 2013).

eleventh and twelfth grade black students enrolled in advanced math courses when a cohort first enters a school in the ninth grade. We use maximum likelihood estimation to predict a binary indicator of whether a student ever took advanced math courses during high school as a function of a prior-period share of students in those classes who are black, controlling for student characteristics. The cohort variation allows us to use a school fixed-effects model that accounts for any unobserved school characteristics that would otherwise confound cross-school estimates. We also estimate the model separately for subsets of schools that are racially diverse and schools that are predominantly black.

We find that a 1 percentage point increase in the share of black eleventh and twelfth graders in advanced math courses increases the likelihood that an academically eligible black ninth grade student will take an advanced math course before they graduate by 22 percentage points in racially diverse schools and 11 percentage points in predominantly black schools. Estimates are even larger when the sample is restricted to black male students.

BACKGROUND

At the high school level, within-school racial segregation often manifests as white and Asian students enrolling in advanced-level courses and black and Hispanic students in standard or remedial-level courses. Why do advanced placement courses matter? Evidence shows that students in advanced courses benefit from exposure to more highly trained and effective teachers, a greater likelihood of matriculation to a four-year college or university, and an increased access to beneficial social networks (Darity and Jolla 2009; Long, Conger, and Iatarola 2012; Oakes 2005; Smith, Hurwitz, and Avery 2017; Yonezawa, Wells, and Serna 2002). For underrepresented minority students, access to advanced math courses can result in improved long-term life outcomes such as earnings and income because math courses operate as a gateway into lucrative STEM career fields such as engineering and computer science (Chetty, Friedman, and Rockoff 2014). In light of these advantages, it is important to explain why black and Hispanic students are less likely to take advanced courses than their white and Asian counterparts.

Much of the disparity can be explained by differential preparation, which can lead to differential eligibility to enroll in advanced courses. For example, Dylan Conger, Mark Long, and Patrice Iatarola (2009) use data from two cohorts of Florida public high school students to show that the racial disparity in course-taking is eliminated after controlling for eighth grade test scores. However, others have demonstrated that a black-white gap in AP course-taking remains even after accounting for preparation (Klopfenstein 2004). This implies that even academically eligible black students are less likely to take AP courses than their white and Asian peers.

What explains the underenrollment of academically eligible black students in AP courses? Research seeking to answer this question has paralleled the literature on explanations for the persistent black-white test score gap where both structural and cultural arguments have been advanced. Structural arguments include the differential likelihood of teachers and academic counselors to encourage similarly qualified black versus white high school students to take advanced coursework and prepare for college (Archbald, Glutting, and Qian 2009; Darity and Jolla 2009; Francis, de Oliveira, and Dimmitt 2019; Gershenson, Holt, and Papageorge 2016; Oakes 2005); racial wealth disparities that lead to differences in access to resources that make AP courses less intimidating like outside tutoring (Diamond 2006); and lack of access to social circles where students and parents trade knowledge on the best courses to take (Coleman 1988; Hale 2001).

In contrast, those who make cultural arguments theorize that black students have less motivation or less of an academic orientation in part because they fear being accused of "acting white" by their black peers (Austen-Smith and Fryer 2005; Klopfenstein 2004; Fryer and Torelli 2010). This argument is typically undergirded by the oppositional culture theory (Fordham and Ogbu 1986; Ogbu 2008), which posits that black Americans, as involuntary minorities in the United States, perceive structural barri-

ers in society such as employment and wage discrimination as inhibiting their chances for successful life outcomes.[5] As a coping mechanism, black Americans then adopt an oppositional cultural stance, devaluing attitudes and behavior that typify the dominant culture such as studying hard, speaking properly, and dressing in a preppy style. Although many researchers have since tested and failed to find support for this theory, it continues to resurface as an explanation for differences in black and white academic outcomes (Cook and Ludwig 1998; Harris 2006; Noguera 2009; for a brief survey of studies that test the hypothesis, see Andrews and Swinton 2014).

Research by the sociologist Karolyn Tyson and coauthors sheds new light on the debate between cultural and structural explanations for black-white differences in AP course-taking (Tyson, Darity, and Castellino 2005; Tyson 2011). In an attempt to explain black student underrepresentation in AP math courses and to investigate the "acting white" hypothesis as a potential explanation, Tyson and her team interviewed and observed dozens of high-achieving black high school students in North Carolina. They find that black students are more likely to point to a fear of failure than a fear of peer rejection as a reason for not taking advanced courses.[6] That black students are or might be more likely to report feeling a fear of failure than other students has no basis. In fact, Kirsten Caraway and colleagues (2003) administered the *Generalized Fear of Failure* instrument to a sample of high school students from the southeast United States and find no differences in the fear of failure by race.

Tyson and her team also find that many white students were as likely as black students to say they faced peer rejection as a result of their academic achievements. Finally, they find that the "acting white" slur became salient only in school settings where the student composition was racially diverse and there was a clear historical pattern of racialized tracking. If the "acting white" phenomenon occurred, it was most likely to happen where a stark racial contrast could be observed—black students occupying general education courses and white (and Asian) students dominating advanced courses. When these two conditions were not met (that is, in predominantly black schools and in diverse schools with proportional racial representation in advanced courses), students did not report feeling any peer pressure to avoid taking advanced courses to deflect the "acting white" charge. Tyson therefore hypothesizes that negative cultural pressures arise only when adverse structural conditions, such as a historical pattern of racialized tracking, are present in schools.

This article tests empirically whether current racial divisions in advanced courses may perpetuate future racial divisions. Conceptually, we ask whether a black ninth grade student is more likely to take an advanced placement course if more black upper-class students are taking those courses. The presence of black upper-class students in AP courses may reduce the fear of failure that many of the students in Tyson's study pointed out. Their presence may also make AP courses seem like less racially isolated spaces. Our analysis will not enable us to distinguish between these two explanations; it will, however, provide evidence as to whether racial segregation within schools can self-perpetuate even in the absence of specific policies or actions by school administrators.

DATA AND METHODOLOGY

We conduct our analysis using North Carolina public school data housed at the North Carolina Education Research Data Center (NCERDC) at Duke University. The NCERDC data are particularly useful because they provide detailed

5. Signithia Fordham and John Ogbu distinguish between voluntary minorities who choose to come to the United States because that choice is better than their alternatives and involuntary minorities who were either historically enslaved (blacks) or occupied (American Indians).

6. Naihobe Gonzalez (2017) finds strong evidence in support of this argument. Using detailed student-level data from Oakland, California, high school students, she demonstrates through a regression discontinuity framework that students who received a positive signal that they have "AP Potential" written on their PSAT score report were more likely to enroll in an AP course than peers who had similar academic records but were just on the other side of the PSAT score cutoff for receiving the AP Potential signal.

Table 1. Student Demographics

	Number of Students	Percent of Sample
American Indian	3,238	1
Asian	4,874	2
Black	69,732	29
Hispanic	12,584	5
Multiracial	4,562	2
White	145,484	61
Female	122,071	51
Male	118,416	49
Parent education high school or less	100,297	43
Free or reduced-price lunch eligible	89,637	37
All students	240,487	—

Source: Authors' calculations based on NCERDC data.

information on the universe of North Carolina public school students that allows researchers to track students over time and across multiple levels, including student-level, course-level, and school-level files. Specifically, we follow three cohorts of public high school students who entered high school in the 2004–2005, 2005–2006, and 2006–2007 school years and were on track to graduate in the springs of 2008, 2009, and 2010.

We construct a student-level dataset containing student academic test scores, the timing and subject matter of courses taken, and demographic variables. We merge these student-level files with school-level files that include school characteristics and school demographic data that allow us to construct the school-level shares of black students taking AP courses. In total, our analysis is based on more than 240,000 students in more than five hundred schools from one hundred school districts. Sample demographics at the student and school levels are presented in tables 1 and 2 respectively.

White students make up 61 percent of the total sample, followed by black students at 29 percent.[7] Hispanic students, Asian students, American Indian students, and multiracial students make up the remainder of the sample, with none of those groups representing more than 5 percent of the sample individually. The sample is split evenly between male and female students. Regarding socioeconomic status, roughly 43 percent of the sample have parents whose highest level of education is a high school diploma and 37 percent are eligible for free or reduced-price lunch. Variation in sample demographics between cohorts is minimal. Demographics separated by cohort are presented in table A1.

Variation in school racial and socioeconomic makeup is considerable. Turning to table 2, the average school is composed of about 30 to 35 percent black students depending on cohort, however, that figure can vary from 0 to 100 percent across the sample. Similarly, the average school is composed of around 55 percent white students with a range from 0 to 99 percent. Free or reduced-price lunch eligible students make up between 40 to 50 percent of the average school depending on cohort, with a range from 0 to 99 percent.

7. These sample percentages are slightly different from the population of North Carolina public high school students because we are focusing on intact cohorts for whom we have records through twelfth grade. Given that black students have a higher dropout rate on average, the percentage of black students in our sample is lower than that in the high school population overall. Our sample closely mirrors the makeup of North Carolina high school graduates, which was composed of 62 percent white students and 29 percent black students in 2008.

Table 2. School-Level Demographic Composition

	N	Mean	SD	Min	Max
Cohort 1					
Percent American Indian	479	0.9	2.9	0.0	27.3
Percent Asian	479	1.8	2.8	0.0	25.1
Percent black	479	34.4	25.6	0.2	100.0
Percent Hispanic	479	7.2	6.5	0.0	41.7
Percent white	479	55.7	27.0	0.0	98.6
Percent free or reduced-price lunch eligible	364	41.2	17.7	0.0	85.6
Cohort 2					
Percent American Indian	495	1.0	3.1	0.0	28.3
Percent Asian	495	1.8	2.9	0.0	27.3
Percent black	495	34.6	25.6	0.2	98.4
Percent Hispanic	495	7.7	7.0	0.0	40.6
Percent white	495	54.9	27.3	0.0	98.3
Percent free or reduced-price lunch eligible	471	48.6	19.8	4.5	98.8
Cohort 3					
Percent American Indian	515	1.1	3.3	0.0	30.3
Percent Asian	515	1.9	3.0	0.0	26.1
Percent black	515	30.5	25.0	0.0	100.0
Percent Hispanic	515	8.9	7.6	0.0	43.9
Percent white	515	54.4	26.6	0.0	98.6
Percent free or reduced-price lunch eligible	515	47.8	21.8	0.0	96.8

Source: Authors' calculations based on NCERDC data.

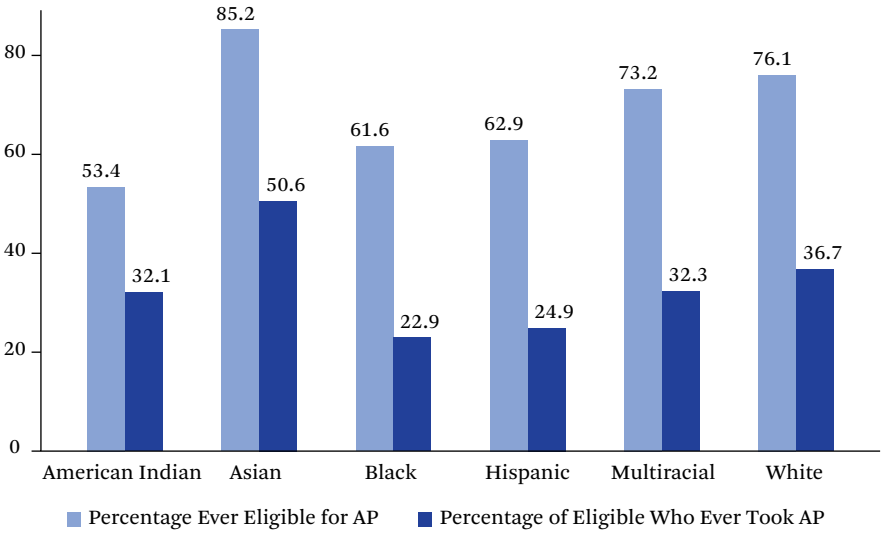
ADVANCED COURSE PARTICIPATION

For a student to be able to choose to take an AP course, they must be academically eligible. Thus, it would be ideal to restrict our analysis to students who are eligible. Our data, however, do not include eligibility indicators for students taking specific courses, presenting a challenge for our estimation strategy. For this reason, we focus specifically on AP math courses. The prerequisites for taking AP Calculus, for example, are more likely to be standardized across schools and districts than the prerequisites for English, social science, foreign language, and science courses because, in most schools, math is still taught sequentially. This sequential nature of math education makes it easier to create a proxy for student eligibility for AP math courses and thus easier to restrict the analysis to those students who are likely to be academically eligible to take the courses.

We define the following six math courses as advanced: AP Calculus (both AB and BC), AP Statistics, IB Math High Level, Discrete Math, and Probability & Statistics.[8] Although we cannot observe the exact prerequisites for all the schools in our sample, a typical prerequisite for

8. IB stands for International Baccalaureate, a nonprofit organization operating in more than one hundred countries to provide enriched academic coursework at the primary and secondary levels that focuses on preparation for a globalized world (see www.ibo.org). We include discrete math and probability and statistics as advanced courses, even though they are not specifically AP or IB courses, for two reasons. First, these courses teach advanced math concepts and require similar prerequisites to the AP and IB courses. Second, we discovered during our data analysis that most students actually take these courses only after they have taken an AP or IB course.

Figure 1. Student AP Math Eligibility



Source: Authors' calculations based on NCERDC data.

taking an advanced placement math course is completion of Algebra II. Like most prerequisites, some students who have not met the requirement may still be allowed to take advanced courses, and some students who appear to have met the prerequisite on paper may not be allowed to take the advanced course for reasons unknown to us as researchers. We feel confident, however, that an indication of whether a student has taken Algebra II is a strong proxy for eligibility. For example, among those students who first took an advanced math course in eleventh grade, 96.5 percent had taken Algebra II by the end of tenth grade and 99.7 percent had taken it the first semester of the eleventh grade (prior to taking their advanced math course). Among students who first took an advanced math course in the twelfth grade, 96 percent had taken Algebra II by the end of the eleventh grade and 99.7 percent in the first semester of twelfth grade (prior to taking their advanced math course). Thus, in our analysis, we consider a student as eligible for advanced math courses if they have taken Algebra II.

To account for the possibility that eligibility may also depend on a student's performance in the prior math classes (not just whether they completed the class), we weight each student observation on a linear transformation of their prior standardized test scores in Algebra, Algebra II, and Geometry such that students with higher scores receive more weight in our estimations.[9]

Based on our proxy for eligibility, the summary statistics in figure 1 reflect student eligibility status as of the beginning of twelfth grade and advanced course take-up by the end of twelfth grade by race and ethnicity. By the beginning of twelfth grade, 62 percent of black students and 63 percent of Hispanic students were eligible to take an advanced math course, but only 23 percent of those eligible black students and 25 percent of those eligible Hispanic students actually took an advanced math course.

Comparatively, 76 percent of white students and 85 percent of Asian students were eligible to take advanced math courses. Thirty-seven percent of eligible white students and 51 percent of eligible Asian students actually took an advanced math course. Restricting our analysis sample to black students who were eligible to take an advanced math course by their eleventh or twelfth grade years leaves us with approxi-

9. Our results are qualitatively similar whether we include or do not include the weighting mechanism. The weighted model produces smaller standard errors and more precise estimates and is therefore our preferred specification.

mately thirty thousand student-level observations.

EMPIRICAL STRATEGY

To estimate the effects of current within-school segregation on future within-school segregation, we predict a binary indicator of whether a student ever took at least one advanced math course during high school as a function of a prior-period share of students in those classes who are black, controlling for student characteristics and school fixed effects. Using a linear probability model, we predict the probability that student i in school j at time t took an advanced math course ($TookAdvanced_{ijt}$):

$$pr(TookAdvanced_{ijt} = 1) = \alpha + \beta ShareAP_{jt\text{-}1} + \Gamma X_i + \delta_c + \delta_j + \varepsilon_i . \quad (1)$$

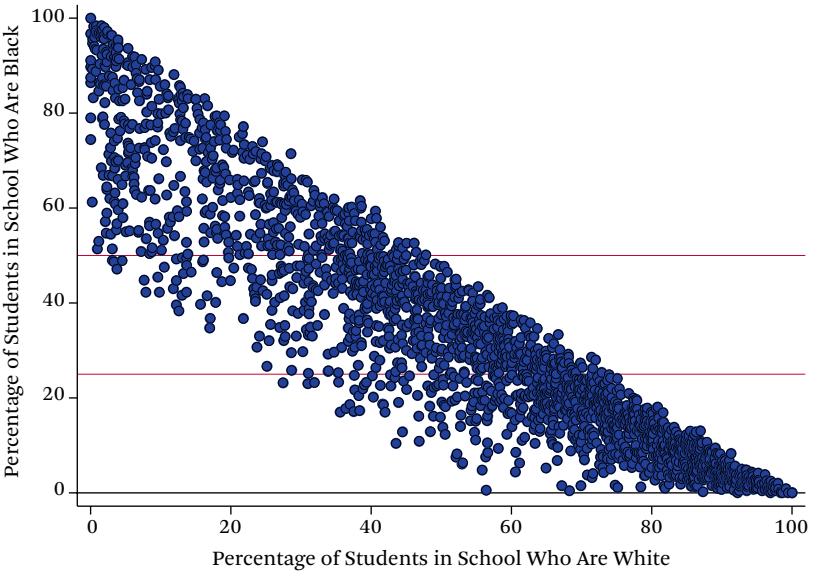
The variable $ShareAP_{jt\text{-}1}$ is a measure of the share of black students in AP courses in school j when student i arrived at the school in ninth grade, before the student himself or herself was typically eligible for advanced courses. This temporal difference is designed to capture the extent to which black students observe segregated classes in their school before they decide whether to take advanced courses. Studies of within-school segregation have often relied on segregation measures that are commonly used in the housing segregation literature such as the dissimilarity index, the isolation index, and the exposure index. (Clotfelter, Ladd, and Vigdor 2003; Conger 2005; Kalogrides and Loeb 2013). These measures, however, are limited in that they require the pairwise comparison of only two racial or ethnic groups, which is not ideal when examining segregation in a multiracial or multiethnic setting. For example, in a school that has a significant share of black, Hispanic, and white students, but the black and Hispanic students are segregated into lower-level classes, the binary black-nonblack segregation measures that have been used in these studies will not accurately reflect the extent to which black (or Hispanic) students are underrepresented in advanced courses. Black students will be in classes with Hispanic students (who are classified as nonblack) and the pairwise measure will count them as not being segregated from other nonblack students, even though both the black and Hispanic students are underrepresented in the advanced classes. In the current context, where we are concerned with black student representation in advanced courses, we use a simple share measure because it more accurately reflects the perceived presence of black students in those courses. It is also easier to interpret and captures the same information as the more complex measures once school-level shares are also controlled for as a covariate.

We control for observable student-level differences (X_i). These include eighth grade math and reading test scores, eighth grade participation in the academically and intellectually gifted program, parent education level, and free or reduced-price lunch eligibility. We take advantage of having three distinct cohorts of students by including school fixed effects (δ_j) that effectively control for unobservable differences between schools that do not vary over time. Thus, identification is based on within-school differences in the prior share of black students in AP math classes across the three cohorts. Finally, we control for which cohort a student belongs to (δ_c) in order to account for unobservable factors that may affect cohort-specific AP course participation such as a change in AP policy in a given year. Our coefficient of interest (β), will give us the effect of the eleventh and twelfth grade share of black students in AP math courses on the propensity of eligible ninth grade students ever to have taken an AP math course by the time they finish twelfth grade.[10]

We estimate each model separately by gender as well as separately for groups of schools

10. By including cohort and school fixed effects, we limit two major threats to the validity of our estimates, however, there could still be a concern that there are unobserved changes happening within schools, over time, other than the share of students in AP math courses who are black, that could bias our estimates. For example, a school could recruit a black AP math teacher, or an engaging principal who succeeds in encouraging more black students to take AP math courses. However, given that fewer than 14 percent of North Carolina public school teachers are black, and administrator turnover is not widespread in any given year, we do not believe

Figure 2. Racial Composition of Sample Schools



Source: Authors' calculations based on NCERDC data.

that are defined as racially diverse, and predominantly black. The precise definition of these school groupings is described in the next section.

SCHOOL RACIAL DIVERSITY GROUPINGS

Within-school segregation may affect black students differently depending on the racial composition of the school. In predominantly black schools, academically advanced black students may feel less racial isolation from taking advanced courses not only because the likelihood of more black students in advanced courses is greater, but also because more of their peer group members are enrolled in the school as a whole (Tyson, Darity, and Castellino 2005; Tyson 2011). Additionally, when racial homogeneity is greater, peer groups are more likely to be formed along dimensions other than race (Tatum 2003). Black students in racially diverse schools with a clear racial divide in classroom composition, however, may be the most vulnerable to racial isolation from taking advanced courses (Diette et al. 2021, this issue). For this reason, we estimate the model separately for racially diverse and for predominantly black schools.

We define predominantly black schools as those in which black students make up 50 percent or more of the student population, and racially diverse schools as those in which black students make up more than 25 percent but less than 50 percent.[11] We eliminate schools where black and white students combined make up less than 50 percent of the student population (fewer than 4 percent of schools in any given year). Figure 2 demonstrates these sample groupings graphically for schools in 2009 (the year the middle cohort was in twelfth grade). The groupings for other analysis years look similar.

these factors pose a serious threat to our identification strategy, which relies on more than five hundred schools and almost 250,000 students.

11. As part of our robustness checks, we vary the thresholds that determine whether a school is labeled racially diverse or predominantly black. Our main results are robust to the following two adjustments: decreasing the lower threshold of the share of black students in racially diverse schools from 25 percent to 15 percent, and increasing the threshold of the share of black students in predominantly black schools from 50 percent to 60 and 75 percent.

Table 3. School and Student Characteristics

	Racially Diverse		Predominantly Black	
	Mean	SD	Mean	SD
School percent black	37.5	7.3	67.8	13.3
[min, max]	[25, 50]		[50, 100]	
AP course percent black	15.9	12.0	38.7	24.0
[min, max]	[0, 100]		[0, 100]	
Number of AP math courses offered	9	14	4	8
[min, max]	[0, 108]		[0, 46]	

Source: Authors' calculations based on NCERDC data.

Table 3 presents summary statistics for the percent of students in a school who are black, the percent of AP course-takers in a school who are black, and the number of AP math courses offered in a school by the racial diversity of the school. In both racial diversity groupings, black students are underrepresented in AP math courses relative to their representation in the school overall. Racially diverse schools, however, offer significantly more AP math courses than predominantly black schools.

RESULTS

Our main results are presented in table 4. In this table, each cell represents the effect of the eleventh and twelfth grade share of black students in AP math courses on the propensity of eligible ninth grade students ever to have taken an AP math course by the time they finish twelfth grade. These values are obtained by estimating equation 1 separately for racially diverse schools and predominantly black schools. Each estimate includes student-level controls and school and cohort fixed effects. Robust standard errors are presented in parentheses.

Individual students can have independent likelihoods of taking an AP math course that are related to their academic preparation, socioeconomic status, race, and more. We estimate the marginal increase in the likelihood that an individual black freshman student would ever take an AP math course if the share of upper-class black students taking AP math courses increased. So, for example, in a racially diverse school, if a black freshman student was 40 percent likely based on their background characteristics to ever take an AP math course, then the estimate in the first row of column 1 of table 4 tells us that a 1 percentage point increase in the share of black eleventh and twelfth graders in AP math courses (for example, going from the mean share of 16 percent up to 17 percent) would increase the likelihood of that student ever taking an AP math course by about 22 percentage points—from 40 percent likely up to 62 percent likely.

The corresponding estimate in predominantly black schools represents an increased likelihood of AP math course participation of about 11 percentage points. The directions and relative magnitudes of these two estimates are what we would expect given our theoretical predictions. The effect is larger in racially diverse schools where a racial separation of students, with white students disproportionately represented in the advanced math courses, may be more salient.[12]

HETEROGENEOUS EFFECTS BY GENDER

We estimate our models separately by gender because both role modeling and avoidance of social isolation may fall along gender as well as

12. As a falsification check on our results, we estimate the effects of the share of AP math students who are black on the likelihood of a white student ever taking an AP math course (that is, we estimate equation 1 on the sample of white students in the cohort, but keep the independent variable of interest unchanged). In both racially diverse and predominantly black schools, the point estimates on β are not significantly different from 0 (0.0087 with a standard error of 0.0083 in racially diverse schools and 0.007 with a standard error of 0.0121 in predominantly black schools).

Table 4. Effects of Share of Black Students in AP Courses on Propensity of Eligible Black Students to Take an AP Course

	(1) All Black Students	(2) Black Female Students	(3) Black Male Students
Racially diverse schools	0.215***	0.234***	0.390***
	−0.013	(0.0219)	(0.0352)
Predominantly black schools	0.110***	0.106***	0.279***
	−0.00756	(0.0129)	(0.0212)

Source: Authors' analyses based on NCERDC data.
Note: Robust standard errors in parentheses. Student controls include eighth grade test scores, eighth grade AIG participation, parent education, and free or reduced-price lunch eligibility. Estimates include school and cohort fixed effects.
*p<.05; **p < .01; ***p < .001

racial lines (Dasgupta 2011). Thus it may not be enough that other black students are taking advanced courses, but it may be important that black male students see other black male students in advanced courses and black female students see other black female students in advanced courses. Column 2 in table 4 replicates the main results for a subsample of female students with the independent variable of interest changed to the share of black female eleventh and twelfth graders. Column 3 in table 4 replicates the main results for a subset of black male students.

A 1 percentage point increase in the share of black female students in the upper grades in AP math courses increases the likelihood of a black female ninth grader taking an AP math class by the time she graduates by 23 percentage points in racially diverse schools, and only 11 percentage points in predominantly black schools. A 1 percentage point increase in the share of black male students in the upper grades in AP math courses increases the likelihood of a black male freshman taking an AP math class by the time he graduates by 39 percentage points in racially diverse schools and 28 percentage points in predominantly black schools. The larger effect sizes for both males and females separately when compared with the combined results indicate that race-gender peer groups have more social power than race groups alone. The largest results are for black male students in racially diverse schools.

DISCUSSION

Empirically, we demonstrate that the racial composition of upper grade advanced math courses in high schools affects the propensity that black students in the lower grades will opt to take those classes at some point before they graduate. The empirical results are consistent with fear of racial isolation as an explanation for black student underenrollment in advanced courses. The results are also consistent with role modeling as an explanation. Black students may believe that they have a better chance of performing well in advanced classes if they see other black students in the upper grades taking those courses. The limitations of our data prevent us from distinguishing between racial isolation and role modeling as explanations for black student underenrollment. Both explanations, however, are produced by structural forces such as racialized tracking that produce a visible racial divide in courses with white students occupying the advanced courses.

The empirical results presented here are less consistent with cultural arguments such as the "acting white" hypothesis and Signithia Fordham and John Ogbu's (1986) oppositional culture theory. If an ingrained culture of oppositionality among black students led them to devalue schooling, we would not expect year-to-year variation in a school's black student representation in advanced courses to influence the propensity of younger black student cohorts to take those courses. Our results indicate that the propensity of black students to take advanced

courses is context specific—a direct contradiction to theories that presuppose that black students are culturally programmed or behaviorally inclined against positive educational investments.

Culturalists may argue that different school contexts can create different cultural landscapes. For example, some culturalists have argued that schools with higher concentrations of poor and minority students may generate more oppositionality because the lack of positive role models and diminished life outcomes create a culture of poverty (Wilson 2011).[13] Although this notion may explain variation in advanced course participation across schools, it does not explain the within-school variation we find.

For culturalists to argue that cultural and behavioral responses can be context specific, they must also then explain why concentrations of black students in advanced classes are higher to begin with in some schools than in others and in some years (within schools) than in others. Why does a critical mass even emerge in some schools that makes it possible to create a magnet effect for other black students to take the classes? We submit that the answer to this question is structural. Some schools have institutional practices and policies that have historically included or excluded black students from advanced classes. At a minimum, culturalists must subscribe to the idea that institutional structures have created the context-specific environments that give rise to school- and year-specific cultures for their theories to be consistent with the evidence presented here.

Our results have important policy implications. Once the initial crowding of white students into higher-level classes (and black students into lower-level classes) takes place, the process of maintaining the effects of racialized tracking becomes self-reinforcing. Moreover, no "natural" self-correcting mechanism reverses this trajectory. The introduction to this journal issue refers to *Plessy v. Ferguson* as the foundation on which "white supremacy was institutionalized and crystallized all over the country" (powell, Myers, and Gooden 2021). Nearly 125 years later, the institutionalization of white supremacy is still reflected in our schools. To address within-school segregation, it is not enough to simply eliminate overt practices of racialized tracking. The legacy of segregation can generate continued segregation even in the absence of tracking. It is also not enough to attempt to desegregate advanced courses in a singleton fashion. Instead, schools would benefit from a concerted short-term effort to increase black students' enrollment in advanced courses (this effort should be coupled with increased academic support for students who do enroll and may need additional support).

What policies can schools implement? One solution is to dismantle the advanced course system and provide enriched education for *all* students—providing additional support to those students who may need it. However, given the amount of political capital, human capital, and profit associated with the advanced course infrastructure, this solution is likely not politically feasible.

Barring a complete dismantling of the infrastructures of segregation, one thing schools can do is address institutional barriers-to-entry into advanced courses that are racially biased. Susan Yonezawa, Amy Wells, and Irene Serna (2002) describe hidden barriers such as counselors, teachers, and administrators distributing information about advanced courses unevenly by race and socioeconomic status or applying prerequisites (whether stated or hidden) to minority students but waiving them for white students. William Darity and Alicia Jolla (2009) describe school counselors who encourage or discourage students from taking advanced courses along racial lines. Dania Fran-

13. Even this argument, however, is debatable. Middle-class black students who have more direct contact with whites may experience more discrimination and racism than their less affluent peers (Cose 1995; Pattillo 2013; Shedd 2015). Further, a consequence of this discrimination is the realization that even though they have played by the rules and achieved education and status, they are still limited in their life outcomes because of their race. According to oppositional culture theory, middle-class black students could be as prone to oppositionality as black students from lower-income backgrounds.

cis, Angela de Oliveira, and Carey Dimmitt (2019) identify bias in the likelihood of school counselors to recommend black female students for advanced math courses. These barriers, sometimes hidden, sometimes overt, are additional obstacles to black students seeking to take advanced courses. Schools should be transparent in the information they disseminate. Decisions about who may take advanced courses should not funnel through only a few gatekeepers, but instead through multiple stakeholders, including parents, teachers, students, and other school professionals.

If schools can reduce these barriers, then given the empirical results in this study, the boost of enrollment for one cohort of students would encourage the next cohort of students to enroll and the next cohort after that. Thus, a short-term, concerted effort could lead to long-term benefits in terms of closing the advanced course participation gap and eliminating institutionalized segregation within our schools.

Table A1. Sample Demographics by Cohort

	Full Sample		Cohort 1		Cohort 2		Cohort 3	
	Number of Students	Percent of Sample	Number of Students	Percent of Sample	Number of Students	Percent of Sample	Number of Students	Percent of Sample
American Indian	3,238	1	974	1	1,110	1	1,154	1
Asian	4,874	2	1,533	2	1,610	2	1,731	2
Black	69,732	29	21,804	29	23,258	29	24,670	30
Hispanic	12,584	5	3,419	4	4,263	5	4,902	6
Multiracial	4,562	2	1,189	2	1,569	2	1,804	2
White	145,484	61	47,151	62	49,087	61	49,246	59
Female	122,071	51	38,547	51	41,112	51	42,412	51
Male	118,416	49	37,523	49	39,786	49	41,107	49
Parent high school or less	100,297	43	31,689	42	34,103	42	34,505	44
Free or reduced-price lunch eligible	89,637	37	26,852	35	30,914	38	31,871	38
All students	240,487	—	76,070	—	80,898	—	83,519	—

Source: Authors' calculations based on data from the NCERDC.

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