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Who Gets In? Examining Inequality in Eighth-Grade Algebra

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Abstract

Using data from a large urban district, this study investigated whether racial inequality in access to eighth-grade algebra is a reproduction of differences in prior opportunities to learn (as evidenced by grades, test scores, and level of prior mathematics course) or whether patterns reflect an increase in inequality such that racial differences in access remain when controlling for academic background. We considered how this varies by the racial composition of the school; further, we examined differences in access between both Black and Hispanic students and their White peers as well as differences between Black and Hispanic students. The results point to patterns of reproduction of inequality in racially integrated schools, with some evidence of increasing inequality in predominantly Hispanic schools.

Keywords

Eighth-grade algebra; Opportunity to learn; Race; School racial composition

Educational practitioners, policymakers, and researchers have long recognized the influence that high school course-taking has on educational as well as labor force outcomes (Adelman, 1999; Gamoran, 1987; W. Tyson, Lee, Borman, & Hanson, 2007). In recent years, interest has also been paid to middle school, where eighth-grade algebra has been identified as the gatekeeper to favorable outcomes in high school and beyond. Specifically, eighth-grade algebra completion predicts not only subsequent advanced mathematics course-taking (e.g., completing calculus in high school) but is also linked to a greater likelihood of enrolling in a 4-year college or university as well as an increased likelihood of pursuing a Science, Technology, Engineering, or Mathematics (STEM) major (Chen & Weko, 2009; Filer & Chang, 2008; Gamoran & Hannigan, 2000; Ma & Wilkins, 2007; Paul, 2005; Schneider, Swanson, & Riegle-Crumb, 1998; X. Wang, 2013).

As recognition of the benefits of early algebra course-taking has grown among educational policymakers as well as parents, there has been a nationwide surge in the percentage of students taking eighth-grade algebra (Stein, Kaufman, Sherman, & Hillen, 2011); according

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to Loveless (2016), the percentage of students taking algebra or higher in eighth grade has increased from 27% in 2000 to 48% in 2013. Unfortunately, these enrollment trends do not translate across all populations of student groups; it is well documented that Black and Hispanic students are underrepresented in eighth-grade algebra courses (Cogan, Schmidt, & Wiley, 2001; Gamoran & Hannigan, 2000; McCoy, 2005; Paul, 2005; Shakrani, 1996; Spielhagen, 2006a; Stein et al., 2011). As such, access to algebra in eighth grade is a critical instance of inequality of opportunity to learn, leading some scholars to refer to it as one of the most pressing civil rights issues of our time (Moses & Cobb, 2001).

However, although research has clearly established that Black and Hispanic youth are not taking eighth-grade algebra at rates comparable to those of their White peers, there is a lack of empirical research that investigates the extent to which racial inequality in access is essentially a reproduction of earlier patterns of inequality or whether race continues to predict students' chances of enrolling in this critical gatekeeper course when earlier differences are controlled for.[1] We argue that understanding when inequality is created or exacerbated is critical to disrupting it. Specifically, if unequal access to eighth-grade algebra is explained primarily by prior inequalities in opportunities to learn, this speaks to the need to focus concentrated attention and interventions at earlier points in students' mathematics trajectories. This is not, however, to suggest that differences in algebra access between groups are meritocratic or race neutral if explained by prior disparities but rather to draw attention to the ways in which racial differences in learning opportunities are constructed early in school and then subsequently used to structure and justify differential access to later opportunities. If, on the other hand, we find that disparities in access to eighth-grade algebra remain when controlling for earlier instances of inequality, this suggests that at this critical juncture at the end of middle school, disparities in opportunity to learn are actually increasing. We therefore build on the limited empirical work that has investigated whether inequality in access to eighth-grade algebra is largely a reproduction of earlier disparities in opportunities to learn between groups by taking a more comprehensive approach that considers levels of prior mathematics course-taking as well as mathematics grades and test scores (Bodovsky & Youn, 2012; Faulkner, Stiff, Marshall, Nietfeld, & Crossland, 2014; Spielhagen, 2006b).

More important, our study advances prior research in this area by considering whether and how the racial composition of the school has further implications for inequality in opportunity to learn. Recently, race scholars have called attention to the need for more mathematics education research that considers race across different levels, moving beyond a treatment of it as an individual category to consider race as a context and

[1]In this paper we consider Hispanic as well as Black (or African American) as racial categories. We are aware that Hispanic is often considered an ethnic category (see Parks & Schmeichel, 2012); at the same time, we recognize that Hispanic students in the United States are typically considered as a group without attention to their actual ethnic heritage or country of origin. Additionally, research that uses the term *race/ethnicity* when discussing differences in educational outcomes between groups typically considers White non-Hispanic students as the reference category and, therefore, from a substantive perspective, treats race and ethnicity as the same axis of stratification despite using two separate terms. Finally, in pointing to the social construction of race, scholars have argued that "non-Black people of color are racialized in the United States" (Dumas & ross, 2016, p. 425) and that there is a racial hierarchy that places Hispanic and Native American students as well as Black students in social positions that are subordinate to Whites (Martin, 2009). For these reasons, although we are respectful of other categorizations in the literature, we choose to use the term *race*. Finally, we note that we use the word *Hispanic* rather than *Latina/o* or *Latinx* to be consistent with the categories used in the district in which we collected data.

acknowledging that the meaning of racial categories can shift across spaces (Martin, 2009; Martin, Anderson, & Shah, 2017). For example, racialized narratives about who belongs in eighth-grade algebra might be quite different in schools with predominantly minority student populations than in schools with more racially heterogeneous populations. As national data indicate that the number of racially segregated schools is increasing (Orfield, Ee, Frankenberg, & Siegel-Hawley, 2016), it is both relevant and timely to examine how inequalities in patterns of access, as well as the extent to which such patterns are reproductions of earlier disparities, may diverge across schools with different racial contexts (Kelly, 2009).

Additionally, our paper contributes to the literature by examining both Black and Hispanic students' opportunities to learn algebra in eighth grade vis-à-vis their White peers, as well as examining potential differences in access between Black and Hispanic youth. While a racial hierarchy of presumed mathematics ability that privileges White students undoubtedly continues to exist, theorists further argue that race is relational because the position of individuals defined as belonging to a certain group is always defined relative to the position of another group and that the social meaning of racial categories may vary across contexts (Martin, 2009; Martin et al., 2017). As such, it is important not to assume that the educational experiences of Black and Hispanic youth are identical or comparable to one another or constant across school contexts. For example, within the context of a predominantly Hispanic school, the social and academic position and experiences of Black youth are likely different from those of Hispanic students. Our study therefore moves beyond the typical and limited focus on White students as the norm of reference to also investigate whether and within what context one minority group may have relatively more educational opportunities than another.

In this article, we address the following research question: To what extent do racial disparities in prior opportunities to learn (as evidenced by grades, test scores, and level of prior mathematics course) explain subsequent inequality in access to eighth-grade algebra in two different school contexts of racially integrated middle schools and predominantly Hispanic middle schools? To address this question, we consider differences in access between both Black and Hispanic students compared with their White peers as well as differences in access between Black and Hispanic students. Our empirical study provides an in-depth investigation of disparities in access to eighth-grade algebra using longitudinal data from a large, urban, low-income school district that exemplifies the local context in which vast numbers of youth in the United States experience education. Note that although the district is predominantly Hispanic, it also includes a relatively large percentage of Black youth, and as such, it provides a critical research opportunity to investigate patterns of access to this gatekeeper course for students from different racial groups.

Finally, we note that within the mathematics education research community, there is an important ongoing conversation about the hazards and limits of research focusing on disparities in educational outcomes between racial groups, often referred to as *gap-gazing* (Gutiérrez, 2008). We concur that some research within this vein is indeed problematic, particularly that which analyzes disparities at only one point in time and either implicitly or explicitly views race as an inherent attribute of an individual (Gutiérrez, 2008). However,

at the same time, we contend that there is value in quantitative work that explicitly acknowledges the social construction of racial categories and highlights gaps in educational opportunities between groups to counter deficit perspectives (Lubienski & Gutiérrez, 2008). As articulated by Martin, Anderson, and Shah (2017), studies using this type of quantitative lens can shed light on "factors that produce racial inequities in students' opportunities to learn on a broad, system-wide scale" (p. 615) and, in doing so, help advance the cause of social justice and racial equity; such is the goal of this paper.

Background

Conceptual Framework and Related Research

Our study is rooted in theoretical perspectives of racialized social systems that articulate that race is a social construction that is created and re-created through both institutional structures and everyday interactions and experiences and is not a biological characteristic of an individual (Bonilla-Silva, 2001; Martin, 2009). We note that racialized social systems are fundamentally unequal and hierarchical in nature, with Blacks and Hispanics in the United States occupying a subordinate position in this hierarchical system relative to Whites (Martin, 2009; Martin et al., 2017). Further, racialized social systems are upheld through racial ideology as racist stereotypes, beliefs, and expectations that center on the supposed innate inferiority of those in minority groups and are therefore used to justify inequality throughout the system (Martin, 2009).

Using this theoretical lens, our study acknowledges that educational institutions are part of the racialized social system in the United States as both the structure of schooling itself and the everyday interactions that occur between individuals that converge to (re)create the privilege of White students to the detriment of their Black and Hispanic peers (Martin, 2009). Regarding structure, evidence of racialized experiences can be found in the actual separation of students from different racial groups into different buildings. As mentioned earlier, there has been a steady increase in the number of racially segregated schools in the United States (Orfield et al., 2016). Schools with high concentrations of minority youth differ from other schools regarding not only the racial composition of the student body but also academic and financial resources. For example, elementary and middle schools that serve predominantly minority student populations, as compared with more racially integrated or predominantly White populations, have mathematics teachers with lower levels of academic qualifications and also tend to offer fewer advanced-level mathematics courses to students (Anderson & Tate, 2008).

Furthermore, even in schools that are more racially integrated in terms of the student body, the structure of educational opportunity is racialized (Anderson & Tate, 2008; Lucas, 1999; Mickelson, 2001; Oakes, 2005). Indeed, despite the optimism of many in the 1960s that creating more integrated schools would provide more equitable educational experiences for Black students relative to White students, research has clearly documented that minority students remain substantially disadvantaged relative to their White peers in integrated schools. For example, as early as elementary school, Black and Hispanic children are more likely than White children to be assigned to lower level mathematics courses and less likely to be assigned to advanced-level mathematics courses (Anderson & Tate, 2008). Because

of their differential placement, minority students are more likely than their majority White peers to receive low-quality mathematics instruction that focuses on memorization and drill rather than on the conceptual learning that occurs more often in advanced-level courses (Lubienski, 2002; Strutchens & Silver, 2000).

Differences in mathematics teacher quality also manifest as those with fewer qualifications are more likely to teach lower level classes (Clotfelter, Ladd, & Vigdor, 2007; Darling-Hammond, 2001; Hill & Lubienski, 2007; Tate, 2008). The possibility of "jumping up" a level to more advanced mathematics classes is very small, which is not surprising given differences in curriculum coverage, use of effective pedagogy, and availability of qualified teachers. Mickelson (2001) argues that this "second-generation segregation" essentially repackages racial segregation from one that occurs between schools to one that occurs within schools, highlighting how the problem of segregated schools remains relevant in contemporary times as well.

Further, racial ideology in the form of racist stereotypes and expectations of the inferior academic skills and abilities of Black and Hispanic youth, as well as biased expectations of competence presumed to apply to White students, is a primary catalyst in creating and justifying racialized structures of schooling and shapes the daily experiences and interactions between individuals in schools. In short, there is strong evidence that minority students are subjected to low expectations and biased assessments of their mathematics ability and performance from their teachers as well as from administrators beginning in the early stages of elementary school (Boaler, 1997; Gilliam, Maupin, Reyes, Accavitti, & Shic, 2016; Jussim, Eccles, & Madon, 1996; Papageorge, Gershenson, & Kang, 2016; Robinson-Cimpian, Lubienski, Ganley, & Copur-Gencturk, 2014). Research on stereotype threat documents the powerful, negative impact that racist societal beliefs about the intellectual ability of minority students can have on their subsequent performance, often in high-stakes situations such as testing (Osborne, 2001; Steele & Aronson, 1995), strongly contributing to early academic disparities.

Current Study

In this study, we focus on the critical issue of racial inequality in access to eighth-grade algebra and the role that academic background[2] plays in contributing to such inequality. As discussed above, Black and Hispanic students have different early learning opportunities and experiences in mathematics than their majority White peers, resulting in observably large disparities in grades, test scores, and representation in advanced mathematics courses during middle school. As such, we posit that any racial gaps observed at the end of seventh grade are socially constructed and the result of the racialized nature of students' mathematics experiences.

Building on this acknowledgment, we seek to address whether patterns of algebra enrollment across groups are primarily explained by these prior instances of inequality—or instead whether patterns reflect an increase in inequality of opportunities to learn such

[2]In this article, we use the terms *academic background* and *academic priors* interchangeably.

that even when academic background is taken into account, racial differences in access remain. If the former is true, this implies a process of social reproduction such that prior inequality is used to effectively maintain differences across groups. Drawing on the insights of race scholars, we contend that such patterns are often misleadingly viewed as evidence of a meritocracy (e.g., access to advanced courses is distributed to those who have earned it) when they speak more to the reality that early educational opportunities are distributed differently across racial groups, constructing and maintaining inequality rather than disrupting it (Bonilla-Silva, 2001; Martin, 2009). But if the latter proposition is true, that racial differences in access to eighth-grade algebra remain when controlling for academic background, this suggests an increase in inequality at this critical juncture. Put slightly differently from the lens of race as a social system, although prior differences are necessary, they may not be sufficient to maintain advantage for those at the top of the hierarchy, so additional factors may come into play to protect privilege. Biased beliefs about students' potential could contribute to teachers, counselors, or administrators discouraging minority youth from enrolling in this advanced course or failing to provide information to students and parents about the option to take the course and its related benefits; further, students themselves might hold real concerns about advanced courses as locations of daily experiences of discrimination and bias (Faulkner et al., 2014; Nasir & Vakil, 2017; Noguera & Wing, 2006; Oakes, 2005; K. Tyson, Darity, & Castellino, 2005).

Prior Research on Academic Background Predicting Access to Eighth-Grade Algebra

Surprisingly, very little empirical research has examined the extent to which prior instances of educational inequality explain racial disparities in eighth-grade algebra enrollment. The few studies that do address this offer limited evidence and mixed results, finding that disparities in access between Hispanic and White students may be explained by academic background whereas differences between Black and White students may not. For example, using data from a southeastern school district, Spielhagen (2006b) found that, when controlling for academic background, no differences in enrollment existed between Hispanic and White students, whereas White students were still 1.4 times as likely as Black students to be enrolled in eighth-grade algebra. Similarly, Bodovsky and Youn (2012), in their sample of students from the Early Childhood Longitudinal Study-Kindergarten Cohort (ECLS-K), found that Black youth, but not Hispanic youth, had a lower likelihood of enrollment in the course compared with their White peers. Faulkner, Stiff, Marshall, Nietfeld, and Crossland (2014), also using ECLS-K, found that Black students were less likely than White students to be placed in eighth-grade algebra when controlling for academic priors; the authors did not explore differences in access between White and Hispanic students, a common omission in much research (and one that we seek to address in this paper).[3]

Although these studies provide valuable insight into the possible role of academic background in re-creating racial disparities in enrollment, they are limited because of incomplete measures of academic priors. For instance, Bodovsky and Youn (2012) considered only test scores in their analyses, whereas Spielhagen (2006a) and Faulkner

[3]The underrepresentation of Hispanic youth in eighth-grade algebra has received relatively little attention, despite the fact that Hispanic students make up the fastest growing group in the student-age population (Fry & Lopez, 2012; Phakeng & Moschkovich, 2013).

et al. (2014) used mathematics test scores and teachers' assessment of student performance. However, as mentioned earlier, research on tracking has clearly established that students initially placed in advanced classes are likely to continue on that path, whereas those who have been placed in lower level classes are very unlikely to be able to jump into a higher level course (Lucas, 1999; Oakes, 2005). Thus, students who were in honors mathematics classes in seventh grade would be much more likely than their peers in regular classes to advance into eighth-grade algebra. In this study, to more fully investigate the role that inequality in academic background has in contributing to gaps in eighth-grade algebra enrollment, we utilize a more comprehensive definition of academic background that includes the level of the student's prior mathematics course (i.e., whether the student was in seventh-grade honors mathematics).

Considering Comparisons Across Racial Contexts and Racial Groups

Although prior research reveals relatively little about the extent to which academic background helps explain racial disparities in eighth-grade algebra enrollment, we know even less about the role that school racial composition may play in shaping these patterns. From an empirical perspective, this is a troubling oversight given that the steady increase in the number of racially segregated schools in the United States (Orfield et al., 2016) warrants that researchers should pay attention not only to inequality within integrated schools that are relatively diverse in their student composition but also to patterns within predominantly minority schools. Furthermore, from the theoretical lens of racialized social systems, scholars have pointed to the need for more research that considers race beyond the level of the individual to instead consider how race functions across different structural levels (e.g., classrooms, schools, and communities) and the resultant implications for inequality (Martin, 2009). Thus, it is important to consider not only structural inequality within schools (e.g., limited access of Black and Hispanic youth to a gatekeeper course) but also inequality across school structures (e.g., school segregation).

Indeed, it seems very likely that racialized educational experiences are not the same across schools with different racial compositions. For example, the salience of racial stereotypes about mathematics ability or teachers' biased assessments of minority students' performance may be more pronounced in integrated schools that have roughly comparable proportions of minority and White youth; in such schools, race may stand out as a main axis of distinction, resulting in particularly robust patterns of White privilege in access to eighth-grade algebra. Correspondingly, such stereotypes and expectations may have less traction in schools with predominantly minority student populations, and, therefore, such schools may have correspondingly more equitable patterns of access. Results from a study examining advanced mathematics course-taking at the end of high school are consistent with these ideas; the analyses found that racial inequality in classes such as calculus was explained by differences in prior academic preparation among students in predominantly minority schools but remained when controlling for prior academic preparation within racially integrated schools (Kelly, 2009). Building on the insights of this very limited literature on how mathematics experiences and outcomes for students from different racial groups vary across school racial contexts, we examined whether and how patterns of inequality in access to eighth-grade algebra might diverge across two distinct school racial contexts, integrated

middle schools and predominantly Hispanic middle schools, with a specific focus on the role of prior inequality in contributing to such patterns.

In doing so, we examined differences in access between both Black and Hispanic students compared with their White peers as well as differences in access between Black and Hispanic students. Because White students occupy a position of educational privilege compared to minority youth, they most often serve as the norm of reference in educational research. Again, from the lens of racialized social systems, we must recognize that race is relational, meaning that "a comprehensive understanding of the experiences of one racial group in mathematics depends on understanding the positionality of that group with respect to the positionality of other groups" (Martin et al., 2017, p. 627). Although both Black and Hispanic students share a position in the racial academic hierarchy that is subordinate to White students, this does not mean that their educational opportunities are otherwise identical or comparable. Therefore, beyond minority–White comparisons, it is relevant to consider whether there is evidence of unequal access to eighth-grade algebra between students from different racial minority groups. Doing so also highlights the empirical reality that there are a growing number of school districts characterized by a substantial representation of at least two minority groups; for instance, among the 20 largest school districts in the United States, the average percentage of Black and Hispanic youth is 31.7% and 38.4%, respectively (KewalRamani, Gilbertson, Fox, & Provasnik, 2007). Regarding the specific focus of our study, within the context of schools whose composition is predominantly Hispanic, Black students are in the position of being in the numerical minority in the local context of the school while they occupy a low social status position in the larger societal context. This calls to mind questions regarding what it may mean to be a "learner" and "doer of mathematics" in the context of being Black within a school context that is mostly Hispanic (Martin, 2009, p. 328). Our study attempted to make a modest contribution to this larger issue by specifically examining implications for access to eighth-grade algebra.

In sum, we sought to examine the extent to which racial disparities in prior opportunities to learn (as evidenced by grades, test scores, and level of prior mathematics course) may explain subsequent inequality in enrollment in eighth-grade algebra in two different school contexts: middle schools that are racially integrated and middle schools that are predominantly Hispanic. Further, we considered differences in access between both Black and Hispanic students compared to their White peers as well as potential differences in access between Black and Hispanic students. By doing so, we sought to provide new information about the complex ways in which opportunities to learn advanced mathematics content are racialized.

Data and Methods

Overview

For this study, we utilized data from students in a large and diverse urban school district in the southwestern United States. The district comprises nearly 300 schools from pre-K to 12th grade, serving approximately 200,000 students. The district is a good example of the growing number of districts around the country with a strong representation of at least two

minority groups. Specifically, the racial composition is approximately 62% Hispanic and 25% Black. As such, it provided an ideal opportunity to investigate patterns of educational inequality between different racial groups.

In terms of other characteristics, the district is about 25% Limited English Proficient (LEP) and more than 75% eligible for free or reduced lunch. Approximately 70% and 65% of students passed the state-administered achievement test in mathematics and reading, respectively, indicating passing rates that were slightly lower than the state averages (about 76% in mathematics and 73% in reading). Also, about 75% of students in the district graduated from high school, reflecting a graduation rate around 14 percentage points lower than the state average.

The research team collected data from middle school students in this district beginning in the 2009–2010 school year and culminating in the 2014–2015 school year when many of the students were high schoolers. Administrative data included academic transcripts and were provided by the school district. The team administered a very brief survey to students to capture some background information and included a few questions about students' educational intentions (e.g., plans to attend college). We based the analyses for this study on 10,489 students who were eighth graders during the 2010–2011 or 2011–2012 school year. We restricted our sample to students who are identified as White, Black, or Hispanic on their academic record provided by the school district; Asian students and students from other racial groups make up less than 4% of the student population and were therefore not included in these analyses.

To investigate the possible racial differences in likelihood of eighth-grade algebra enrollment across school contexts and the role of prior inequality in explaining such differences, we distinguished between students in middle schools classified as "integrated" and students in middle schools classified as "predominantly Hispanic." We defined an integrated middle school as one having no more than 60% of any one racial group and at least 20% of each of the numerical minority groups; we defined a predominantly Hispanic middle school as one that was more than 60% Hispanic. We note that most schools in the district fell into the predominantly Hispanic classification, whereas far fewer could be classified as integrated. Accordingly, our sample included data from five integrated middle schools (n = 3,125 students) and 15 predominantly Hispanic middle schools (n = 7,364 students). Integrated middle schools had a mean student enrollment that was somewhat higher than predominantly Hispanic schools (about 1,400 and 1,100, respectively).

Our analyses include descriptive results about the characteristics of students in each of these two school contexts, both overall and by race, as well as multilevel logistic regression models predicting algebra enrollment in each context, with student characteristics at Level 1 and school characteristics at Level 2. Analyses were conducted with StataMP Version 15 and utilized the *melogit* command, which is used for multilevel data where the outcome is dichotomous (StataCorp, 2017).

Variables

Our dependent variable was algebra enrollment in eighth grade, where 1 corresponded to enrollment in algebra and 0 corresponded to enrollment in a lower level course than algebra (e.g., prealgebra and basic math). Our measure of algebra enrollment was determined from student transcripts, which indicated the mathematics course taken in eighth grade. Our key independent variables were three measures of academic background from the students' seventh-grade year. They included *mathematics grade*, a standardized continuous measure of students' grade received in their seventh-grade mathematics class; *mathematics test*, a standardized version of students' seventh-grade mathematics test score on the state accountability exam; and *honors mathematics*, which was a dichotomous variable where 1 indicated that the seventh-grade mathematics course was an honors course and 0 indicated otherwise. All of these measures were taken from students' administrative records. As mentioned previously, we included all three of these measures so as to have a more thorough representation of academic priors leading into eighth-grade algebra enrollment than used in previous research studies.[4]

Because social class background has a strong association with both race and prior academic achievement, including proxy measures for this better enabled us to assess the specific contribution of students' race to their chances of enrolling in algebra. We therefore included a measure for *free or reduced lunch*, which was available through administrative records and coded as 1 if students were eligible for free or reduced lunch and 0 otherwise. The second measure was *books at home*, an ordinal variable created from a survey question asking students to estimate the number of books they have in their home, where 1 indicated the lowest response of "few (0 to 10)" and 4 represented the highest response of "enough to fill several bookcases (more than 100)." Books at home is often used as a proxy for social class in research studies using surveys from adolescents both nationally and internationally because it captures observable measures of family resources (Kastberg, Roey, Ferraro, Lemanski, & Erberber, 2013).

We also included several other student-level controls in our study. These included *female*, with a value of 1 for females and 0 for males, and LEP status, coded 1 if the student was categorized as LEP on his or her middle school transcript and 0 otherwise. Because our data were taken from two different cohorts, we also controlled for this using a dichotomous variable in our multivariate analyses. At the school level, we also controlled for *school size* and *school free or reduced lunch*, which captured the percentage of students eligible for free or reduced lunch for each middle school. We obtained these school-level measures from profile data available for each school through the state's education agency website.[5]

[4]We standardized both test score and grades so that they are on the same scale, which is similar to grand mean centering (except that the variable is now in standard deviation units). We chose not to center our third academic background measure, honors course-taking, because it is dichotomous and therefore has a meaningful zero.

[5]Missing data were imputed in Stata. Less than 2% of students were missing on mathematics grade and mathematics test, and about 14% were missing on the variable for books in the home.

Results

Descriptive Results Comparing Integrated Middle Schools and Predominantly Hispanic Middle Schools

To give a sense of how substantially these two school contexts differed in terms of characteristics of students they serve, Table 1 provides descriptive statistics on algebra enrollment, academic background, and our controls. As indicated in the table, all differences in means between students from integrated middle schools and predominantly Hispanic middle schools were statistically significant. Overall, students in integrated middle schools took eighth-grade algebra in larger numbers (36%) than their peers in predominantly Hispanic middle schools (23%). Students attending integrated middle schools had higher values on the academic background measures than their peers in predominantly Hispanic middle schools. For instance, students in integrated middle schools had mean mathematics grades that were one tenth of a standard deviation higher than the mean mathematics grades of their peers in predominantly Hispanic middle schools. Differences in mathematics test scores were quite pronounced given that they differed by almost one half of a standard deviation. Further, 70% of students in integrated middle schools took an honors mathematics course in seventh grade whereas only 43% of students in predominantly Hispanic middle schools did the same.

In addition, students within integrated middle schools appear to come from higher social class backgrounds as indicated by a lower percentage of students eligible for free or reduced lunch and a higher mean score on the books at home measure. Last, the difference between school contexts in the percentage of LEP students (i.e., 18% in integrated middle schools vs. 50% in predominantly Hispanic middle schools) demonstrates a stark difference in the percentage of students who may have been hindered from taking an advanced mathematics course such as eighth-grade algebra as a result of being previously classified as LEP (Callahan, Wilkinson, & Muller, 2010; J. Wang & Goldschmidt, 1999). Thus, Table 1 reveals that within the same school district, these two school contexts diverged considerably in terms of the academic and social background of the students who attend them.

We now consider the extent to which there were racial differences in algebra enrollment within each of these school types. Beginning first with integrated middle schools, Figure 1 reveals that White students in integrated middle schools were overrepresented in eighth-grade algebra whereas their Black and Hispanic peers were underrepresented. Specifically, White students were taking algebra at a rate more than twice that of their Black and Hispanic peers (61.3% of White students vs. 26.5% of Black students and 28.4% of Hispanic students). Thus, White students had a clear algebra course-taking advantage over Black and Hispanic students, whereas Hispanic students had a slight advantage (2 percentage points) relative to Black students. Similarly, in predominantly Hispanic middle schools (see Figure 2), we also found that White students had an advantage in algebra enrollment relative to their minority peers, and Hispanic students had a slight advantage over their Black peers. Specifically, White students were taking algebra at a rate that was about twice that of their minority peers (42.7% White students vs. 20.7% Black students

and 23.5% Hispanic students) and the Hispanic–Black enrollment rate differed by about 3 percentage points.

Examining Inequality Within School Types

We now examine whether and how the racial differences observed in algebra enrollment in both integrated and predominantly Hispanic middle schools were explained by students' academic background. For each school context, we begin with a descriptive look at racial differences in academic priors (as well as control variables) and subsequently move to the results of multilevel logistic regression analyses.[6]

Examining inequality in integrated middle schools.—Table 2 displays means for academic background variables as well as measures of social class and other control variables within integrated middle schools for each racial group. Overall, White students had higher values on the academic priors and came from higher social class backgrounds relative to their Black and Hispanic peers. For example, relative to their minority peers, White students scored more than one half of a pooled standard deviation higher on the standardized mathematics test and about 0.7 of a standard deviation higher on seventh-grade mathematics grade. Last, 89% of White students took an honors mathematics class in seventh grade compared to 62% of Black students and 63% of Hispanic students. As for social class background, whereas 69% of Black students and 84% of Hispanic students were eligible for free or reduced lunch, only 19% of White students were. Similarly, the mean value on the books at home variable was 3.3 for White students compared to 2.8 and 2.4 for Black and Hispanic students, respectively. Finally, 41% of Hispanic students were classified as LEP compared to only 3% and 1% of White and Black students, respectively. Comparisons of the two minority groups did not indicate a clear academic advantage of one group over another because Hispanic students had slightly higher mathematics test scores; Black students had slightly higher mathematics grades; and both groups had rates of honors mathematics enrollment that were equivalent. However, Black students came from higher social class backgrounds than their Hispanic peers. All of the differences above were statistically significant ($p < .05$).

Next we consider results from multilevel logistic regression models predicting the likelihood of enrollment in algebra. As seen in Table 3, the results are presented as odds ratios (ORs), which are relative measures of the effect that a one-unit increase of an independent variable has on the odds of enrollment in algebra when all other variables in the model are held constant. Furthermore, in the investigation of the likelihood of enrollment of one racial group relative to the reference group, ORs are easily interpretable. For example, if one is comparing Black students to White students, an OR of 1 indicates that the odds of enrollment for Black and White students are the same. An OR greater than 1 indicates that Black students have higher odds than White students, whereas an OR less than 1 indicates that Black students have lower odds than White students.[7]

[6]Our decision to run separate models for each school racial context is supported by results from pooled models (including all schools) confirming that there was statistically significant variance across schools in algebra enrollment and that race coefficients also varied significantly across schools. Additionally, adding school type as a dichotomous indicator led to a reduction in the residual variance in the outcome across schools.

Consistent with the descriptive results displayed in Figure 1, the results in Model 1 indicate that Black and Hispanic students were statistically significantly less likely to be enrolled in eighth-grade algebra than White students. Specifically, Black and Hispanic students had odds of enrollment that are 0.238 and 0.244 that of White students, respectively. In Model 2, we added measures of social class and family background as well as school characteristics. Not surprisingly, accounting for these measures reduced racial disparities in the likelihood of enrolling in algebra. However, although the Black and Hispanic ORs (relative to White) increased with the inclusion of these measures, they remained very low and statistically significant. Both free or reduced lunch eligibility and our second SES proxy, books at home, were statistically significant, with the former reducing the odds of enrollment whereas the latter increased the likelihood of enrollment. Being classified as LEP was associated with significantly lower odds of enrollment in eighth-grade algebra. Neither school size nor the school percentage of students eligible for free or reduced lunch significantly predicted likelihood of enrollment.

Last, in our full model, we added three measures of academic background to determine the extent to which racial disparities remain when we controlled for these key factors. Each measure had a strong and significant effect on likelihood of enrollment. Specifically, a one-standard-deviation increase in students' mathematics grades resulted in odds of enrollment that were 3.5 times greater; a one-standard-deviation increase in seventh-grade mathematics test score increased the odds of enrollment by a factor of 6. Furthermore, being in an honors class resulted in being 12.5 times more likely to be enrolled than not being in an honors class. With the inclusion of these variables, we found that the ORs of both Hispanic and Black students relative to their White peers were closer to 1 and no longer statistically significant. This indicated that within integrated middle schools, if there were no inequality in prior grades, test scores, and honors mathematics placement, Black and Hispanic youth would have had the same probability of enrolling in eighth-grade algebra as that of their White peers.[8] Additionally, we note that the ORs for both Black and Hispanic youth relative to White youth look very similar in this final model. Consistent with our interest in considering potential differences between students from different minority groups, we conducted follow-up tests (i.e., switch the contrast group to Hispanic instead of White), which confirmed that there was no significant difference in the likelihood of enrollment between Black and Hispanic youth in integrated middle schools (OR = 1.02, $p > .05$).

If viewed without a critical lens, these results could be perceived positively given that there are no disparities in enrollment between White and minority youth once differences in prior academic preparation are considered. However, we very strongly caution against such an interpretation; as seen in Table 1, differences between White students and their

[7]Additionally, to test whether racial disparities in algebra course-taking might vary by gender, in exploratory analyses, we also included interaction terms in our models for both school types; none were statistically significant. Also, pooled models (including all schools) with interactions between race and school type revealed race patterns in access (when controlling for academic background) consistent with those in separate models by school type.

[8]In exploratory models, to assess the contribution of the three academic background indicators, we sequentially removed each one, reran our models, and observed whether there was a change in the ORs for Black and Hispanic students relative to their White peers. Excluding grade, test score, or honors mathematics placement resulted in smaller and statistically significant ($p < .05$) ORs for both Black and Hispanic students, indicating that each group would be less likely to be enrolled in eighth-grade algebra relative to their White peers without consideration of all three indicators. Additionally, model fit statistics (i.e., AIC and BIC) indicate that this final model best fits the data. Furthermore, we tested for but did not find evidence of multicollinearity.

minority peers on all three measures of preparation were very pronounced, indicating that it is not at all common for Black and Hispanic youth in our sample to have the academic background of the typical White student. Further descriptive analyses reveal that only 13% of Hispanic students and 10% of Black students were in seventh-grade honors mathematics, had test scores as high (or higher) than the average White student, and had grades as high (or higher) than the average White student. Thus, the evidence suggests that strong patterns of educational inequality in seventh grade were subsequently reproduced in eighth-grade algebra enrollment.

Examining inequality in predominantly Hispanic middle schools.—We now turn to examine inequality within predominantly Hispanic middle schools, which made up the main school type within this district. Table 4 displays means by racial group for the background variables. As is the case in integrated middle schools, White students had higher means on academic background as well as social class background variables than their Black and Hispanic peers. Although these mean differences were statistically significant ($p < .05$), we note that they were not as large in magnitude as was evident in integrated middle schools (as seen in Table 2). For example, White students had mathematics grades that were about one third of a pooled standard deviation higher than those of their minority peers. White students' mathematics test scores were about one quarter of a standard deviation higher than those of their Hispanic peers and almost one half of a standard deviation higher than those of their Black peers. Furthermore, a larger percentage of White students took an honors mathematics class in seventh grade compared to their minority peers (67% vs. 41% Black students and 43% Hispanic students).

In addition, a large percentage of all students, regardless of race, were eligible for free or reduced lunch. However, more than 90% of minority students were eligible whereas about 82% of White students were. White students also had a higher mean on the books at home measure— 2.8 compared to Black and Hispanic students at 2.2 and 1.9, respectively. When considering comparisons of the two minority groups, we found that Black students had lower levels of academic performance than their Hispanic peers; however, Black students were comparatively higher than their Hispanic peers on the proxies for social class background. Finally, as in integrated middle schools, Hispanic students had the largest proportion of students classified as LEP at 57.5%, whereas only 2.1% of White students and 2.2% of Black students were classified as such.

We now consider whether the differences in academic background seen in Table 4 explain subsequent racial disparities in algebra enrollment. Thus, in Table 5 we present the results of logistic regression models predicting the likelihood of enrollment of White and Black students relative to Hispanic students given that Hispanic students represent the numerical majority in this context. The baseline multilevel model essentially replicates the descriptive results discussed above but adjusts for clustering within schools. Compared to Hispanic students, White students had a higher likelihood of algebra enrollment; we note, however, that this difference was not statistically significant. Black students, on the other hand, were statistically significantly less likely to be enrolled than their Hispanic peers (OR = 0.772, $p < .01$). Changing the reference category to White students revealed that Black students were also at a significant disadvantage in enrollment relative to their White peers.

Model 2 adjusts for social class and family background as well as school characteristics. The OR for Black students remained statistically significant and actually decreased somewhat such that Black students were even less likely to enroll in algebra than their Hispanic peers. This appears to be driven by the fact that, relative to Hispanic students, Black students had higher values on indicators of social class background (which positively predicts enrollment) and were less likely to be classified as LEP (which reduces the likelihood of enrolling in algebra). We also found that school size and school percentage of free- and reduced-lunch-eligible students were both statistically significant predictors of enrollment.

Last, in the full model, we added our three measures of academic background. We find that, similar to the trend for integrated middle schools, grades, test scores, and prior honors mathematics course-taking each positively and significantly predicted the likelihood of enrollment. However, Black students remained significantly less likely than Hispanic students to enroll in eighth-grade algebra (OR = 0.742, $p < .05$). Indeed, the ORs in Model 3 capturing this comparison appear virtually the same as the baseline model. To further illustrate these patterns of inequality, we calculated the predicted probability of enrollment in algebra for White, Black, and Hispanic students on the basis of the results in Model 3 with all variables in the model at the mean (or mode). Although White and Hispanic students both had a predicted probability of enrollment of approximately 0.2, Black students trailed behind their peers with a predicted probability of about 0.1.

Discussion

At a time when overall rates of enrollment in eighth-grade algebra continue to rise, the continued underrepresentation of minority youth in this gatekeeper class that opens subsequent educational doors for students (e.g., calculus in high school as well as college matriculation in general) is a critical instance of educational inequality that requires further examination. Our quantitative study aims to contribute to research on this topic by building on the insights of race scholars to better understand when and where inequality is re-created and exacerbated. Specifically, rooted in theories of racialized social systems that articulate how race is a social construct that exists across levels rather than an inherent attribute of an individual (Bonilla-Silva, 2001; Martin, 2009), we anticipated that racialized educational experiences may differ across schools with varying racial compositions, and therefore we considered how this may have implications for patterns of inequality in algebra access between groups. Further, in recognizing that within racialized social systems, racial positions are relational, our study moves past a sole consideration of White as a reference group to consider potential differences in opportunities to access eighth-grade algebra between Black and Hispanic students. Thus, in this paper, we sought to answer the following question: To what extent do racial disparities in previous academic opportunities explain inequality in enrollment in eighth-grade algebra in two different school contexts of racially integrated middle schools and predominantly Hispanic middle schools? In addressing this question, we considered differences between Black and Hispanic students compared to their White peers (the typical comparisons in much quantitative research on racial inequality) as well as differences in access between Black and Hispanic students.

Before we discuss the results of our multivariate regression analyses, we note some of our descriptive results. Consistent with theories of racialized social systems, we see evidence of the racialized structure of education across different levels (Martin, 2009); racial inequality in the opportunity to learn algebra in eighth grade is found both across school contexts (e.g., school racial segregation) and within schools (e.g., "second generation segregation"; Mickelson, 2001). For example, our descriptive results reveal greater availability of eighth-grade algebra courses in integrated middle schools compared to predominantly Hispanic middle schools as indicated by the overall higher rates of enrollment in the former (see Table 1). These racially integrated middle schools appear to be a context that is more advantaged than the predominantly Hispanic middle schools that make up most of the district (e.g., see the differences in social class background and academic priors); however, even within this context, marked racial inequality in access to eighth-grade algebra exists.

As we turn to address our main research question, our results reveal that patterns of racial inequality diverge across the two school racial contexts considered. First, within integrated middle schools, a strong pattern of social reproduction occurs such that prior inequality effectively maintains subsequent differences across racial groups. As mentioned above, within these integrated middle schools, at the baseline, Black and Hispanic students are underrepresented in eighth-grade algebra whereas their White peers are overrepresented; social class background accounts for a small amount of such differences. However, accounting for differences in academic priors, including previous honors mathematics course-taking, grades, and test scores, explained the remaining White advantage in eighth-grade algebra. Thus, our findings suggest that students from different racial groups who are similar in academic (as well as social class) background have equal chances of getting into algebra in the integrated middle schools. Drawing on the insights of race scholars, we argue that racial ideologies such as egalitarianism often lead researchers and policymakers to mistakenly view such patterns as evidence that schools and their processes are fair and meritocratic, and, importantly, not racist (Bonilla-Silva, 2001; Martin, 2009). Such a myopic view ignores the reality that the stark differences in seventh-grade academic priors (see Table 2) are the result of the racialized nature of mathematics education wherein Black and Hispanic students have markedly different learning opportunities and experiences in mathematics than White students, with these earlier disparities themselves at least partly the result of previous instances of implicit (or perhaps explicit) bias on the part of teachers and administrators and, relatedly, minority students' exposure to and experiences with racial stereotypes in the classroom (Gilliam et al., 2016; Papageorge et al., 2016). Additionally, we looked for but did not find evidence of differences in access between minority groups in integrated middle schools; thus, within this racial context, Black and Hispanic students appear to occupy a similarly subordinate position of access relative to their White peers. Therefore, our results clearly show that earlier instances of White advantage are reproduced such that efforts to increase equitable access to eighth-grade algebra must directly address racialized opportunities to learn mathematics earlier in middle school and even further back into elementary school.

However, as we consider inequality within predominantly Hispanic middle schools, our analyses also reveal instances where schools not only reproduce patterns of academic inequality via eighth-grade algebra patterns but exacerbate them. Within this racial context

where Hispanics are the majority of students, we do not find robust evidence of increasing White privilege in terms of access to eighth-grade algebra (see Table 5). However, we find that Black students in this context are significantly less likely to enroll in eighth-grade algebra than their Hispanic peers, and this disparity remained virtually unchanged even in the final model when Hispanic students' relative advantage on both prior mathematics grades and test scores was considered. Thus, the lower representation of Black students relative to Hispanic peers in this key gatekeeper course suggests that inequality is not just being reproduced in this context but is increasing. These results have important implications for discussions of the racial hierarchy in mathematics, which is often discussed in terms of Black and Hispanic students collectively occupying a low-status position subordinate to White students (Martin, 2009). Our results suggest that there are instances where one minority group is subordinate to the other in terms of opportunity to learn. The Black students in our sample belong to a racial minority group in the national context but also occupy a school context (predominantly Hispanic) that is composed primarily of students from a racial minority group to which they do not belong. As such, these students could be viewed as occupying a minority status in two different ways. Although our study is limited in its capacity to unpack the racialized processes behind this particular finding, it focuses needed attention on how the meaning of racial categories, and the related experiences of those students assigned to such categories, is not static or inherent but rather constructed and negotiated with "particular meanings in a given context" (Martin et al., 2017, p. 627).

Limitations and Directions for Future Research

We recognize that our study is restricted to one district in the southwest United States and thus is surely unique in some ways; nonetheless, many school districts across the United Sates have substantial representations of at least two racial minority groups (KewalRamani et al., 2007). We strongly recommend that the mathematics education research community continue with this line of inquiry, including conducting more quantitative research that documents how patterns vary across different groups between different contexts, thereby providing powerful empirical evidence of the social construction of racial inequality. Additionally, there is a need for more qualitative research that directly captures the voices and experiences of students (and teachers and administrators) in these different contexts, thereby providing a deeper analysis of the construction of race and of racialized outcomes. Indeed, we are not able to consider heterogeneity in how students choose to racially identify and are instead reliant on the broad racial categories used by the district. Further, our data do not include any information on teachers' racial identify, which may be particularly relevant in unpacking the experiences of Black students within predominantly Hispanic schools, for example, if teachers are also more likely to be Hispanic. We also note that although we are able to examine patterns of enrollment, we cannot speak to the quality of the mathematics instruction within classrooms. Some research suggests that curriculum and pedagogy within predominantly minority schools may not be very academically rigorous because of the lower qualifications of the teachers as well as biased assessments of what their students may be capable of learning (Clotfelter et al., 2007). Therefore, although we are able to investigate inequality in access to algebra, there are further disparities within and across classrooms that research needs to continue to examine.

In addition, more research is needed on the views and attitudes of Black and Hispanic students regarding such courses. Prior qualitative research reveals that, not surprisingly, minority youth are well aware of the racialized nature of education, including the unequal opportunities to learn that exist both between and within schools and the stereotypes and biased expectations that permeate their classrooms (Nasir & Shah, 2011; K. Tyson et al., 2005). With regard to the topic of this study, future work that addresses students' own views of inequitable access to eighth-grade algebra and their daily experiences within different school contexts could further unpack the results presented here, as could interviews with teachers and administrators. For example, although our analyses revealed that, within integrated middle schools, prior educational disparities between groups are reproduced in terms of access to algebra, we do not know the specific mechanisms behind this process. Are Hispanic and Black students with lower grades and no previous enrollment in honors mathematics systemically excluded from eighth-grade algebra via formally articulated procedural rules, or are they more subtly discouraged by teachers who hold biased assessments of students' abilities to succeed in the course? Regarding our results for predominantly Hispanic middle schools, we are also unable to identity the mechanisms involved; for example, are racialized narratives about the presumed academic inferiority of Black students highly salient in such contexts—and are such narratives articulated by both students and their teachers? Interrogating the prevailing racial ideologies within and across schools regarding who "deserves" access to this gatekeeper course would also provide insights into the construction and maintenance of racial inequality.

Conclusion

In conclusion, algebra is foundational to powerful mathematical concepts, and providing all students early access to it can promote "critical ways of viewing the world so that they might become empowered citizens" (Lubienski & Gutiérrez, 2008, p. 367). Thus, inequality in access to this course could have lasting effects not only on students' academic trajectories in high school and college but also on their lives outside of the school walls. Although some researchers have rightly argued for the need for more research that moves beyond a focus on gaps in educational outcomes between different groups (e.g., Gutiérrez, 2008), we contend that there is more to be learned about inequality in the opportunity to learn advanced mathematical content. Rooted in the recognition that race is socially constructed and that, consequently, school structures and students' daily experiences within them are racialized (Martin et al., 2017), our quantitative analyses contribute evidence consistent with the notion that racialized opportunities to learn algebra in eighth grade are contextually dependent and constructed by schools. We argue that studies that examine disparities between groups can thus contribute to combatting deficit perspectives of racial differences and, in doing so, further advance the cause of equity.

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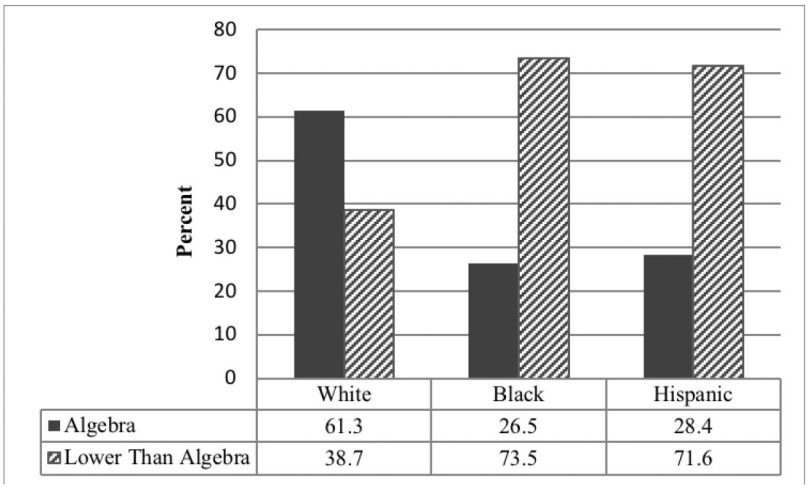

Figure 1.
Eighth-grade algebra enrollment by race for students in integrated middle schools.

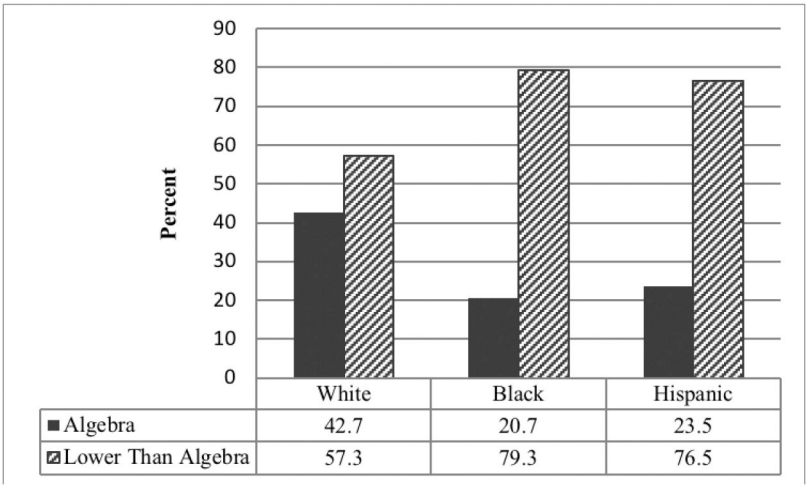

Figure 2.
Eighth-grade algebra enrollment by race for students in predominantly Hispanic middle schools.

Table 1

Descriptive Statistics: Means and Proportions by School Type

	Integrated middle schools	Predominantly Hispanic middle schools
Eighth-grade algebra	0.36***	0.23
Students' race		
White	0.28	0.02
Black	0.31	0.12
Hispanic	0.41	0.84
Seventh-grade academic background		
Mathematics test score (standardized)	0.29*** (0.99)	−0.12 (0.98)
Mathematics grade (standardized)	0.07*** (1.04)	−0.03 (0.98)
Honors mathematics	0.70***	0.43
Controls		
Free or reduced lunch	0.61***	0.97
Books at home	2.78*** (0.99)	1.95 (0.93)
Female	0.53	0.51
LEP	0.18***	0.50
N (school)	5	15
N (students)	3,125	7,364

Note. Asterisks indicate statistically significant differences between integrated and predominantly Hispanic middle schools. Standard deviations are in parentheses.

*** $p < .001$.

** $p < .01$.

* $p < .05$.

Table 2

Descriptive Statistics: Means and Proportions by Race for Students in Integrated Middle Schools

	White	Black	Hispanic
Seventh-grade academic background			
Mathematics test score (standardized)	0.73^{BH} (0.99)	0.03^{WH} (0.88)	0.18^{WB} (0.97)
Mathematics grade (standardized)	0.54^{BH} (0.98)	-0.07^{WH} (0.89)	-0.15^{WB} (1.08)
Honors mathematics	0.89^{BH}	0.62^{W}	0.63^{W}
Controls			
Free or reduced lunch	0.19^{BH}	0.69^{WH}	0.84^{WB}
Books at home	3.30^{BH} (0.83)	2.80^{WH} (0.92)	2.40^{WB} (0.99)
Female	0.48^{BH}	0.56W	0.53^{W}
LEP	0.03^{BH}	0.01^{WH}	0.41^{WB}
N (students)	858	973	1,294

Note. B, H, and W indicate that the mean is statistically significantly different from the mean for Black students, Hispanic students, and White students, respectively ($p < .05$). Standard deviations are in parentheses.

Table 3

ORs From Multilevel Logistic Regression Analyses Predicting Algebra Enrollment Among Students in Integrated Middle Schools

	Model 1	Model 2	Model 3
Race (ref = White)			
Hispanic	0.244*** (0.024)	0.580*** (0.070)	0.779 (0.140)
Black	0.238*** (0.025)	0.354*** (0.041)	0.793 (0.134)
Seventh-grade academic background			
Mathematics grade			3.599*** (0.330)
Mathematics test			5.704*** (0.596)
Honors mathematics			12.450*** (2.861)
Student-level controls			
Free or reduced lunch		0.609*** (0.060)	0.706* (0.102)
Books at home		1.582*** (0.075)	1.340*** (0.091)
Female		0.996 (0.082)	0.826 (0.100)
LEP		0.521*** (0.071)	0.782 (0.155)
Cohort		0.740*** (0.066)	0.329*** (0.043)
School-level controls			
School size		1.000 (0.000)	1.000* (0.000)
School % free or reduced lunch		1.013 (0.018)	1.091*** (0.017)
Constant	1.498* (0.245)	0.279 (0.262)	0.002*** (0.001)

Note. N = 3,125 students and 5 schools. Standard errors are in parentheses. Results are from random effects models performed with StataMP *melogit* commands with students at Level 1 and schools at Level 2.

*** $p < .001$.

** $p < .01$.

* $p < .05$.

Table 4

Descriptive Statistics: Means and Proportions by Race for Students in Predominantly Hispanic Middle Schools

	White	Black	Hispanic
Seventh-grade academic background			
Mathematics test score(standardized)	0.13^{BH} (0.93)	-0.30^{WH} (0.91)	-0.10^{WB} (0.99)
Mathematics grade (standardized)	0.29^{BH} (0.90)	-0.09^{WH} (0.96)	-0.02^{WB} (0.99)
Honors mathematics	0.67^{BH}	0.41^{W}	0.43^{W}
Controls			
Free or reduced lunch	0.82^{BH}	0.93^{WH}	0.98^{WB}
Books at home	2.80^{BH} (0.98)	2.20^{WH} (0.97)	1.90^{WB} (0.90)
Female	0.51	0.52	0.50
LEP	0.02^{H}	0.02^{H}	0.58^{WB}
N (students)	96	958	6,310

Note. B, H, and W indicate that the mean is statistically significantly different from the mean for Black, Hispanic, and White students, respectively ($p < .05$). Standard deviations are in parentheses.

Table 5

ORs From Multilevel Logistic Regression Analyses Predicting Algebra Enrollment Among Students in Predominantly Hispanic Middle Schools

	Model 1	Model 2	Model 3
Race (ref = Hispanic)			
White	1.314 (0.304)	0.872 (0.208)	0.923 (0.317)
Black	0.772 ** (0.075)	0.575 *** (0.061)	0.742 * (0.112)
Seventh-grade academic background			
Mathematics grade			2.585 *** (0.168)
Mathematics test score			5.659 *** (0.419)
Honors mathematics			8.242 *** (0.942)
Student-level controls			
Free or reduced lunch		0.821 (0.136)	1.092 (0.267)
Books at home		1.265 *** (0.040)	1.083 (0.050)
Female		0.986 (0.058)	0.988 (0.083)
LEP		0.693 *** (0.045)	0.799 * (0.073)
Cohort		3.608 *** (0.692)	8.836 *** (2.500)
School-level controls			
School size		0.998 ** (0.001)	0.998 (0.001)
School % free or reduced lunch		1.141 *** (0.026)	1.237 *** (0.041)
Constant	0.305 *** (0.054)	0.000 *** (0.000)	0.000 *** (0.000)

Note. N = 7,364. Standard errors are in parentheses. Results are from random effects models performed with StataMP *melogit* commands with students at Level 1 and schools at Level 2.

*** $p < .001$.

** $p < .01$.

* $p < .05$.