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Impact of In-School Suspension on Black Girls' Math Course-Taking in High School

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Abstract: Black girls are more likely to receive in-school suspension (ISS) in comparison to their non-Black peers. However, research on the effect of in-school suspension on students' academic achievement, specifically math achievement of Black girls, is still very limited. Mathematics is an important foundational component of science, technology, and engineering fields, which are domains in which Black girls are underrepresented. Using the nationally representative Educational Longitudinal Study of 2002 (ELS:2002), this study explores the relationship between in-school suspension and the highest math course completed in a multi-level analysis of 860 Black female participants from 320 high schools. Our findings revealed that in-school suspension was associated with lower mathematics course-taking. Implications for policy, practice, and research are discussed.

Keywords: black girls; math course-taking; in-school suspension; STEM; high school



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1. Introduction

Diversifying the science, technology, engineering, and mathematics (STEM) workforce has been a priority in the United States for several decades. Public and private corporations have invested immensely in increasing the STEM readiness of gendered and racialized populations. Despite these efforts, persistent inequities remain with little progress. Thus, the STEM workforce does not reflect the nation's demographics. African Americans are underrepresented, with only 6.4% having careers in STEM fields (Landivar 2013), and their underrepresentation has not changed much in the last 14 years (Bidwel 2015; National Science Foundation 2017). Women, too, are underrepresented in STEM. Although women make up 48% of the total U.S. labor force, they account for only 24% of the STEM workforce (Landivar 2013). Representing only two percent of the STEM workforce, Black and Latina women are the least represented in the country's STEM workforce (National Science Foundation 2017). Similarly, women of color receive the smallest percentage of bachelor's degrees across all STEM fields (Black 2.9% and Latina 3.6%) (NCES National Center for Education Statistics).

Despite enhanced efforts and investments in STEM education, U.S. students still underperform in math, an academic subject that is foundational to all STEM fields, relative to those in other industrialized countries (PISA) (Barshay 2016). These underperformances are greatest for students of color (NCES National Center for Education Statistics), particularly for Black girls, as they have the lowest mathematics performance (NCES National Center for Education Statistics). Until recently, research has mostly focused on individual-level factors such as students' interests (Beyers 2011; Kilpatrick et al. 2001; McLeod 1992) and the content of STEM curriculum (PCAST President's Council of Advisors on Science and

Technology) as the sources of these shortcomings. Recent studies have found school context and school social controls (such as in-school and out-of-school suspensions) to also be contributing factors in these shortcomings, especially for racialized and gendered students (Ibrahim and Johnson 2020; Jabbari and Johnson 2020a, 2020b).

Research on the impact of in-school suspension on student outcomes is still minimal and, so far, has produced mixed and inconclusive results. Although the recent work of NWLC has opened the discussions on the effects of in-school and out-of-school suspension on Black girls' school experiences, their research on academic outcomes (NWLC 2018). Additionally, despite the higher in-school suspension (Patrick et al. 2020) of Black girls, there is little research, if any, that seeks to understand how *in-school suspension* impacts academics. To address this void in knowledge, we utilized a nationally representative sample of high school students from the Educational Longitudinal Study (ELS) of 2002 to explore the impact of in-school suspension on Black girls' math course-taking pipeline, a key subject in student preparation for STEM majors. This study aims to examine how in-school suspension has an impact on Black girls' high school math course-taking and whether there is an effect after controlling for individual and other school-level variables.

2. Literature Review

In-School Suspension. According to the U.S. Department of Education Office for Civil Rights (Civil Rights Data Collection 2014), in-school suspension removes a child from her classroom for a specified period under direct supervision from school staff or administrators. Nationally, Black girls are five times more likely to be suspended than White and Latina female students (NWLC 2018). Black students are more likely to receive in-school suspension than out-of-school suspension (Cholewa et al. 2018). In addition, Black girls are more likely to receive more in-school suspension than White girls across grades 4 to 11 (Slate et al. 2016). These disparities have been linked to Black girls' racialized and gendered status (Annamma et al. 2019; Crenshaw et al. 2015; Green 2021). However, a dearth of research has examined the effects of in-school suspension on the learning outcomes of Black students, especially Black girls. An exception is Cholewa et al. (2018) and Ibrahim and Johnson (2020), who found in a nationally representative sample of high school students that among Blacks, in-school suspension was associated with lower GPAs and lower mathematics achievement. Lastly, Noltemeyer et al. (2015) conducted a meta-analytic review of the impact of suspension. They found that out-of-school suspension was more strongly associated with achievement outcomes in comparison to in-school suspension. However, in-school suspension negatively impacted achievement outcomes.

To date, there have also been mixed findings of the effect of in-school suspension versus out-of-school suspension on achievement outcomes. The purpose of in-school suspension is to punish problem behavior that disrupts the learning of students and or peers in the classroom setting and to promote positive behavior (Blomberg 2003). Nevertheless, because the application of in-school suspension varies considerably, the benefits of in-school suspension demonstrate inconsistent findings. For instance, Turpin and Hardin (1997) examined the impact of in-school suspension on rural high school students. They found that the applicability of in-school suspension did not reduce the number of out-of-school suspensions. Jabbari and Johnson (2020a, 2020b) found that a high number of suspensions, whether in-school or out-of-school, was associated with lower mathematics achievement and college attendance. Other studies have found that in-school suspension significantly reduced drug-related offenses (Morrison et al. 2001). Additionally, in some studies, in-school and out-of-school suspension were combined, noting the cumulative effect of suspension on academic achievement (Jabbari and Johnson 2020a; Mizel et al. 2016; Morris and Perry 2016), and found significant disparities between students across race/ethnicity and social class—with an overrepresentation in African American students and those from low-income and urban school settings (Jabbari and Johnson 2020a). Our study builds on this scholarship by examining the impact of in-school suspension on the mathematics course-taking pipeline among Black girls.

In the current study, we seek to understand whether in-school suspension is a promotive or inhibitive factor in Black girls' mathematics course-taking. There is a dearth of research that has documented how in-school suspension impacts learning. It is also clear from the research literature that out-of-school suspension has a negative impact on achievement and learning outcomes (Bell and Puckett 2020)—suggesting in-school suspension as an alternative. Although in-school suspension is an alternative to out-of-school suspension, to be effective, in-school suspension must be implemented in an equitable way (Blomberg 2003; Vanderslice 1999). Smith and Harper (2015) also underscored the importance of examining in-school suspension and its effects on learning. Thus, our study seeks to address this gap by examining how in-school suspension impacts the mathematics course-taking pipeline among Black girls.

3. Guiding Framework

The current study is framed by both intersectionality theory and the Integrative Model for the Developmental Competencies of Minority Children (García-Coll et al. 1996). An outgrowth of Black feminist theory, intersectionality recognizes that Black girls' experience is more fully understood when viewed through the lens of multiple systems of oppression, primarily those of race, gender, and social class (Collins 1990; Crenshaw 1991). The Integrative Model for the Developmental Competencies of Minority Children holds that the contexts in which these intersecting identities are socially located should be considered. We therefore hypothesize that since Black girls comprise at least two marginalized identities—female and Black—the effects of gendered racism will be salient in school settings (Thomas et al. 2008), denoting promotive and inhibitive experiences and behavioral responses to those experiences. As such, school settings can serve as promotive and or inhibitive environments that can impact developmental competencies. Because Black girls are overrepresented in school discipline and suspensions, these experiences might impact the mathematics course-taking pipeline. More specifically, based on the social positioning of Black girls (e.g., race and gender), these settings can affect learning. Because of the higher rate of disciplinary infractions and suspensions (Morris 2016) for Black girls, it is vital to increase their representation in STEM sciences. Thus, in building on this work, we utilized García-Coll et al.'s (1996) integrative model to examine the gendered and racialized experiences of Black girls' (social position) mathematics learning and in-school suspension (promotive and inhibitive environment) on mathematics course-taking.

Blake et al. (2011) examined school disciplinary infractions among urban Black girls. The results revealed that Black girls were disciplined more often for defiance and fighting compared to their Latina and White female peers. Because of the higher rates of disciplinary infractions and in-school discipline that Black girls receive compared to their non-Black peers, this is a vital area of research in increasing the representation in STEM sciences and examining the experiences of Black girls. Blake et al.'s (2011) findings were supported in a more recent study conducted by the NWLC (2018), which revealed that suspension tends to target Black girls more than any other racial gendered group. Their report argued that in-school suspension promotes race and sex discrimination and threatens students' long-term achievement, especially minoritized students. For Black girls, of course, living at the intersection of damaging race- and sex-based stereotypes, in-school discipline might add a burden.

4. Current Study

Black girls are overrepresented in suspension (Blake et al. 2011; NWLC 2018; Wun 2016). It has been documented that Black girls receive inequitable treatment in the classroom (Wun 2016) and some of the highest suspension rates in the U.S. (Morris 2016). Black girls and women are also underrepresented in STEM careers (National Science Foundation 2017). Nevertheless, few studies to date have examined how in-school suspension can impact being on a mathematics pipeline. An exception is Ibrahim and Johnson (2020) who found that among a nationally representative sample of racially and ethnically diverse

adolescents in the U.S., suspension (i.e., in-school and out-of-school) negatively impacted mathematics achievement, with students of color being more likely to be suspended. This study builds on this work by examining suspension, specifically in-school suspension, using an intersectional approach (race and gender) to understand Black girls' experiences in U.S. schools. In the present study, we focus on how the school environment contributes to the mathematics course-taking pipeline or inhibits participation in mathematics course-taking. We hypothesize that in-school suspension may have relevance to Black girls due to the intersecting forms of marginalization they experience within schools. They are one of the subpopulations of society that is most underrepresented in STEM fields. Therefore, using these points as foundational, this study intends to fill in this void by investigating the relationship between in-school suspension and the math course-taking pipeline for Black girls using nationally representative data. This research aims to explore the following question:

Is there an association between in-school suspension and Black girls' math course-taking?

5. Methods

The data used in this study were drawn from the Educational Longitudinal Study of 2002's (ELS:2002) restricted-use data file, which is a nationally representative study of 10th graders from public, private, and charter schools in the U.S. and provided by the National Center for Education Statistics (NCES). The ELS:2002 study includes information from parents, students, teachers, and administrators at four time points: 10th grade, 12th grade (2004), two years postsecondary (2006), and six years later (2012). The ELS:2002 survey employed a two-stage stratified random sampling of 750 schools with approximately 25 students selected from each school sampled. The full sample consisted of 16,200 students with 48% female respondents ($n = 7720$). This study used data from the 10th-grade (ELS:2002) student survey. Data from student's high school transcripts, provided one year after graduation (2005), were also utilized in this study. After missing data (i.e., no high school transcripts) were considered and the female participants were selected, our sample size was finalized at 860 Black female participants from 320 schools. We employed multiple imputations using chained equations (MICE) to retain missing data for our independent variables and the appropriate survey weights developed by the data distributors to compensate for uneven probabilities of being selected in the sample design and to adjust for attrition.

5.1. Outcome

Mathematics course-taking pipeline. The math course-taking pipeline indicates the highest math course for which the student received non-zero credit and was created from NCES students' high school transcripts the year after they were expected to graduate. It ranged from 1, indicating "No Math Taken", to 8, indicating that a student reached the level of A.P. Calculus. Its distribution can be found in Table 1. The overall *math course-taking pipeline* for the Black girls in the sample was 5.13 (SD = 1.44), which was slightly above the Algebra II/Trigonometry level, which occurred most frequently in these data.

Table 1. Distribution of highest level of math completed (math course-taking pipeline).

FIRMAPIP	Math Course-Taking Pipeline		
	1—No Math	20	3%
	2—Non-Academic (Basic Arithmetic)	20	3%
	3—Low Academic (Pre-Algebra)	40	6%
	4—Middle Academic (Algebra I/Geometry)	210	29%
	5—Middle Academic II (Algebra II/Trigonometry)	250	35%
	6—Advanced I (Pre-Calculus/Probability and Statistics)	190	26%
	7—Advanced II (Calculus)	100	14%
	8—Advanced III (A.P. Calculus)	50	7%
	Total sample size	880	

Note: N is higher due to rounding required by NCES. SOURCE: U.S. Department of Education, Education Longitudinal Study (ELS:2002), “Student Questionnaire”, “First Follow-Up High School Transcript”, and “External Source School-Level Data”, 2002–2005.

5.2. Independent Variables

In-school suspension. To examine in-school suspension, one item was used from the ELS:2002 base year student survey. Students were asked, “How many times did the following things happen to you in the first semester or term of this school year?” Students responded to the following: “I was put on in-school suspension”. Item responses ranged from 1 = never to 5 = 10 or more times.

5.3. Demographic and Background Variables

The students’ 10th-grade standardized test mathematics scores and the students’ mathematics self-efficacy (e.g., I am confident that I can do an excellent job on math tests; 5 items) were included as control variables at the student level. Mathematics self-efficacy has been standardized and weighted by the NCES through principal factor analysis. The scale ranged from 1 = almost never to 4 = almost always. Cronbach’s alpha was 0.93.

Socioeconomic status (SES), a composite variable developed by the NCES based on five equally weighted and standardized (by the data distributor) components—father’s/guardian’s education, mother’s/guardian’s education, family income, father’s/guardian’s occupation, and mother’s/guardian’s occupation—was controlled for.

Additionally, students’ perceptions of the school environment being fair was assessed with a composite variable developed by the NCES based on five items (e.g., “The punishment for breaking school rules is the same no matter who you are”). The scale ranged from 1 = strongly disagree to 4 = strongly agree. Cronbach’s alpha was 0.70.

At the school level, we considered the percentage of minority students and the percentage of students receiving free/reduced-price lunch as key characteristics of the school context. The relationship between students and teachers was also considered since teachers are primary in determining in-school suspension. The variable *teacher–student relationships* (e.g., students getting along with teachers) is the student’s perception of the relationship with their teachers, with higher values representing positive student–teacher relationships. The scale comprised 5 items and ranged from 1 = strongly disagree to 4 = strongly agree. Cronbach’s alpha was 0.73. This variable has been standardized and weighted by the data distributor through principal factor analysis. Tables 2–4 show the descriptive and correlation information of these variables.

Table 2. Means and standard deviations.

Variable	Mean (S.D.)	
	Unweighted	Weighted
N	860	204,030
BYS24E In-school suspension	1.23 (0.56)	1.23 (0.53)
BYSRULES Fairness/enforcement of rules	2.77 (0.54)	2.77 (0.53)
F1RMAPIP Math course-taking pipeline	5.13 (1.44)	5.01 (1.45)
BYSES1 Socio-economic status	−0.22 (0.67)	−0.27 (0.64)
DYMATIZE Mathematics self-efficacy	−0.06 (0.79)	−0.06 (0.78)
SCHTSTSREL Teacher–student relationships	−0.06 (0.66)	−0.10 (0.68)
BYTXMSTD Standardized test math score	43.85 (8.36)	43.25 (8.28)
BYA21 % 10th graders receiving free/reduced-price lunch (restricted)	36.39 (29.47)	38.36 (27.21)
CP02PMIN Percent minority—2001/02 CCD/PSS (restricted)	58.40 (30.66)	61.09 (28.42)

Note: Variable means with standard deviation are in parentheses. SOURCE: U.S. Department of Education, Education Longitudinal Study (ELS:2002), “Student Questionnaire”, “First Follow-Up High School Transcript”, and “External Source School-Level Data”, 2002–2005.

Table 3. Pearson correlations between student-level fixed effects.

	1	2	3	4
1. SES				
2. Math self-efficacy	0.05			
3. 10th grade test scores	0.29 ***	0.23 ***		
4. In-school suspension	−0.09 **	−0.07 *	−0.15 ***	
5. Rule enforcement/fairness	−0.07 *	0.16 ***	−0.06	−0.08 *

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; SOURCE: U.S. Department of Education, Education Longitudinal Study (ELS:2002), “Student Questionnaire”, “First Follow-Up High School Transcript”, and “External Source School-Level Data”, 2002–2005.

Table 4. Pearson correlations between school-level fixed effects.

	1	2
1. Percent minority		
2. Teacher–student relationships	−0.12 ***	
3. Percentage of free/reduced-price lunch	0.53 ***	−0.03 *

Note: * $p < 0.05$, *** $p < 0.001$. SOURCE: U.S. Department of Education, Education Longitudinal Study (ELS:2002), “Student Questionnaire”, “First Follow-Up High School Transcript”, and “External Source School-Level Data”, 2002–2005.

6. Data Analysis

The nested structure of the data, with students (Level 1) contained within schools (Level 2), led to an analysis utilizing a multi-level regression technique, hierarchical generalized linear modeling (HGLM), that estimates effects on both levels. The statistical software R (version 3.6.2, R Core Team 2019) with generalized linear modeling lme4 (Bates et al. 2015) was used to estimate fixed and random effects. We were therefore able to understand both within-school and between-school variations in math course-taking.

The models were designed to examine how in-school suspension for Black girls was associated with *math course-taking*. The analysis was sequentially modeled in a way to examine groups of covariates and their effects separately. Three models were used, with the first model (null model) containing only the overall mean and variance estimates for Level 1 and Level 2. The second model included Level 1 variables (in-school suspension, fairness of rules, SES, mathematics self-efficacy, and 10th-grade math test scores). Model 3 contained the Level 2 variables percentage of free/reduced-price lunch, teacher–student relationships, and percent minority in the school. The fully specified Level 1 model was in the form:

$$HighestMathCourse_{ij} = \beta_{0j} + Rules_{1j}x_1 + InSchoolSusp_{2j}x_2 + SES_{3j}x_3 + MathSE_{4j}x_4 + TestScore_{5j}x_5 + PctFreeReduced_{6j}x_6 + TeacherStudentRelationships_{7j}x_7 + PctMinority_{8j}x_8 + \varepsilon_{ij}$$

With β_0 as the Level 1 intercept, x_i 's representing the model estimates for the corresponding variable, and i and j representing the i th student and j th school, respectively. The random intercept Level 2 model was in the form $\beta_{0j} = \gamma_{00} + U_{0j}$, with γ_{00} representing the Level 2 intercept, x_i 's representing the model estimates for the corresponding variable, and j representing the j th school.

7. Results

For Black girls (Table 5), at the student level (Model 2), in-school suspension was associated with lower mathematics course-taking ($B = -0.34$, $SE = 0.09$, $p < 0.001$). Tenth-grade standardized test mathematics scores ($B = 0.07$, $SE = 0.01$, $p < 0.001$) were predictive of higher mathematics course-taking. In Model 3, school level, the addition of some school demographic characteristics (percent minority, percentage of free/reduced-price lunch, and teacher–student relationships) was associated with mathematics course-taking. The findings indicated that in-school suspension ($B = -0.33$, $SE = 0.10$, $p < 0.001$) was associated with lower mathematics course-taking. Mathematics self-efficacy was associated with higher mathematics course-taking ($B = 0.13$, $SE = 0.06$, $p < 0.05$). Tenth-grade standardized test mathematics scores ($B = 0.07$, $SE = 0.01$, $p < 0.001$) and teacher–student relationships ($B = 0.26$, $SE = 0.08$, $p < 0.010$) were associated with higher mathematics course-taking. Additionally, percentage of free and/or reduced-price lunch ($B = -0.01$, $SE = 0.01$, $p < 0.010$) was associated with lower mathematics course-taking. The fully specified model (Model 3) for these data accounted for over 38% of the variance of math course-taking when considering variance at the school and student levels.

Table 5. Multi-level and hierarchical regression estimates for the course-taking pipeline.

	Parameter	Model 1 (Null)	Model 2	Model 3	
	Fixed effects: student level (Level 1)	B (S.E.)	B (S.E.)	B (S.E.)	
	Intercept	5.125 (0.061) ***	5.123 (0.062) ***	5.113 (0.061) ***	
	In-school suspension		−0.340 (0.090) ***	−0.339 (0.090) ***	
	Socio-economic status (SES)		0.132 (0.085)	0.131 (0.085)	
	Mathematics self-efficacy		0.130 (0.067)	0.134 (0.067) *	
	10th-grade standardized test math score		0.072 (0.007) ***	0.073 (0.007) ***	
	Rules (enforcement/ fairness)		−0.133 (0.098)	−0.132 (0.098)	
	Fixed effects: school level (Level 2)				
	Percentage of free/reduced-price lunch			−0.006 (0.002) **	
	Teacher–student relationships			0.260 (0.083) **	
	Percent minority			0.002 (0.002)	
	Variance components				
	Intercept (Level 2) variance (τ_{00})	0.405 (0.64)	0.575 (0.759)	0.409 (0.714)	
	Within-school (Level 1) variance (σ^2)	1.685 (1.30)	1.308 (1.144)	1.311 (1.145)	
Model fit	R-squared (fixed effects only)		0.114	0.140	
	R-squared (fixed and random effects)	0.194	0.385	0.381	
	Chi-square (df)		140.0 (5) ***	16.3 (3) ***	
	AIC	3051	2921	2911	
	BIC	3065	2959	2963	
	logLik	−1522	−1452	−1444	
	Deviance	3045	2905	2888	
	df.resid	860	855	852	
		n			
		(observations)	860	860	860
	n (schools)	320	320	320	

Note: fixed effects—slope estimates followed by standard error in parentheses. Random effects—variance (standard deviation). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; SOURCE: U.S. Department of Education, Education Longitudinal Study (ELS:2002), “Student Questionnaire”, “First Follow-Up High School Transcript”, and “External Source School-Level Data”, 2002–2005.

8. Discussion

This study explored the impact of in-school suspension on math course-taking for Black high school girls. The study assumed that in-school suspension might have unintended consequences for Black girls. More specifically, we wanted to understand whether in-school suspension was associated with mathematics course-taking. The study was motivated by the recent “*Let Her Learn*” report from the National Women’s Law Center, which exposed problems and biases in the District of Columbia public schools’ school discipline. Using intersectionality (Collins 1990; Crenshaw 1991) and the integrative model for the developmental competencies of minority children as guiding frameworks (García-Coll et al. 1996), we assessed the relationship of in-school suspension within school settings and the impact on Black girls’ math course-taking pipeline. Our findings also contribute to the dearth of research in understanding whether reports of in-school suspension impact learning.

8.1. Black Girls and In-School Suspension

Moreover, suspensions targeting Black girls (Blake et al. 2011; NWLC 2018) will have detrimental effects not only psychologically (Butler-Barnes et al. 2019), but also academically. Of more concern is the crucial instruction time Black girls miss because of suspension. Studies have shown that girls, specifically Black girls, have been suspended from school because of their clothes and hairstyles (NWLC 2018). The impact of suspensions on academic and math achievement is also well documented among students of color (Ibrahim and Johnson 2020; Jabbari and Johnson 2020a, 2020b; Morris and Perry 2016; Skiba and Rausch 2004). In the current study, we found that in-school suspension was associated with Black girls reporting lower mathematics course-taking. Therefore, drawing from the current and previous studies, in-school suspension hurts Black girls’ math learning in high school, reducing their readiness for STEM majors in postsecondary education, as math is a foundational subject in any STEM major. In moving forward, it is imperative to understand Black girls’ perceptions of in-school suspension. Based on the unfair treatment due to their racial and gender status (Annamma et al. 2019; Crenshaw et al. 2015), finding out whether in-school suspension is distributed equitably (if at all) would increase our understanding of ensuring equitable disciplinary strategies (Vanderslice 1999).

Furthermore, it is important to understand how in-school suspension is applied in school settings. For instance, research has found that in-school suspension varies depending on the application that the school endorses. These applications usually fall into three dimensions: punitive, academic, and therapeutic (Morris and Howard 2003). More specifically, punitive in-school discipline consists of student referrals, stringent rules, and isolation from other students and staff. Academic in-school suspension consists of assessments of learning and individualized academic instruction with assistance from teachers and staff. Therapeutic in-school discipline consists of counseling and a focus on helping students develop problem-solving skills (Morris and Howard 2003). Collectively, educators advocate for individualized and therapeutic in-school suspension (Anyon et al. 2014). For instance, Anyon et al. (2014) found that restorative in-school suspension (e.g., group dialogues, therapeutic intervention, and individualized attention) was protective for students. However, our study did not examine how it was applied by administration, staff, or teachers. Consistent with previous literature, the application is essential, as not all forms of in-school suspension are equitable (Anyon et al. 2014; Short and Noblit 1985). Moving forward, it is important to understand the type of in-school suspension that is applied. This research contributes to the dearth of research on understanding the impact of in-school suspension on mathematics course-taking among Black girls. Overall, student and academic engagement during in-school suspension are imperative.

8.2. Black Girls, Teacher–Student Relationships, and Social Class

When considering student-level characteristics, Black girls who have higher test scores and who report healthier relationships with their teachers are more likely to be on a mathe-

mathematics pipeline. These findings corroborate literature that has noted the impact of previous mathematics performance and mathematics course-taking (Froiland and Davison 2016). Our findings suggest the importance of nurturing a STEM identity for Black girls and the need to be proactive in supporting Black girls' value to and interest in STEM, identifying their competence and abilities and understanding how they view themselves as STEM learners. These findings indeed support the larger body of scholarship in the importance of nurturing Black girls' identity by creating spaces that acknowledge their intersectional experiences (Anderson 2020; Young et al. 2017). For instance, Anderson (2020) found that changing stakeholders' perceptions about Black girls is one way to promote equity—this also includes teachers' support for taking honors and A.P. courses. More importantly, teachers are essential for Black girls' mathematics identity and recommendation for mathematics course-taking (Campbell 2012; Young et al. 2017). Moving forward, enhancing opportunities for Black girls involves providing access to equitable experiences within the classroom. These efforts may result in narrowing the STEM gap.

Lastly, Black girls attending schools with higher percentages of students who qualified for free and reduced-price lunch were associated with lower mathematics course-taking. Our findings bring attention to the importance of exposure and opportunity for low-income minoritized youth. Conger et al. (2009) examined the intersections of race, poverty, and advanced course-taking and found that providing opportunities for youth from disadvantaged backgrounds is beneficial in accessing advanced course-taking. These exposure opportunities also increase the likelihood of college access for youth from minoritized and disadvantaged backgrounds (Long et al. 2012). This is especially important for the Black girls in our study. We examined the intersections of race, class, and gendered experiences (on in-school suspension) and the impact on advanced mathematics course-taking. Our findings underscore the importance of utilizing culturally appropriate frameworks, such as that by García-Coll et al. (1996), and intersectionality (Collins 1990; Crenshaw 1991) to understand Black girls' experiences within the classroom. The social positioning of Black girls' lived experiences impacts their advanced mathematics course-taking and has implications for developing a STEM identity and addressing the STEM gap.

In conclusion, the current study contributes to the gap in the literature by examining how in-school suspension impacts the learning opportunities of a nationally representative sample of Black girls. Our findings note the harmful impact of in-school suspension on mathematics learning and opportunities and the critical role of social class, teacher–student relationships, and mathematics academic performance. These findings underscore the need to promote equitable learning and access opportunities for Black girls.

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