In Which Schools Does Police Presence Most Exacerbate Racial Differentials in Arrest?

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This study looks at racial disproportionalities in student arrests, particularly with school police presence. This study extends Homer and Fisher's (2020) work, which finds higher arrest rates and stronger effects of police presence for Black than White students across schools, by investigating school racial compositions and context factors that are associated with the strongest relationships between police presence and higher arrest rates of Black than White students. Results show the largest within-school arrest rate differences between Black and White students in high schools with officers and that schools with lower Black student enrollment percentages show larger Black-White student arrest gaps.

Keywords: school-to-prison-pipeline, student arrests, school discipline

INTRODUCTION

As a response to rising crime rates in the 1980s and 90s, tough-on-crime policies for school infractions became widespread, with increased use of metal detectors, drug sweeps, surveillance cameras, and on-site police officers (Hirschfield, 2018). These policy changes have evoked concerns about the criminalization of students through school discipline, the rise of the School-to-Prison Pipeline (SPP), and intensifying disproportionate incarceration of nonwhite males (Theriot, 2009; Owens, 2017; Sykes et al., 2015). Exposure to punitive school discipline has lasting consequences for students. Research demonstrates that school expulsion or involvement with the criminal justice system during K-12 is a strong predictor of later criminal activity and incarceration (Cueller & Markowitz, 2015; Deming, 2011; Hirschfield, 2018), and is associated with lower lifetime educational attainment and earnings (Geller, 2018; Weisburst, 2019), as well as negative outcomes for spouses and children (Western & Wildeman, 2009). It is also a burden on taxpayers: the total annual cost associated with incarceration per inmate alone averaged $33,274 in 2015 for 45 states that provided data (representing 1.29 million of the 1.33 million total people incarcerated in all 50 state prison systems) (Mai & Subramanian, 2017). The consequences have been particularly devastating for communities and individuals of color. For example, Legewie & Fagan (2019) show that aggressive policing reduces the academic performance of Black boys, placing them at risk of educational failure and discontinuation. Thus, the costs to both the individual and society are immense. While many aspects of school context might exacerbate the SPP, the presence of police in school has been identified as a key contributor.

Although we have learned that police in schools increase student arrest rates (Owens, 2017; Weisburst, 2019) thereby contributing to the SPP, we do not know what other school characteristics are involved, either by directly increasing the SPP, or by altering the effect of police in schools on the SPP. Further information about which such school characteristics are related to the SPP would help improve future policy recommendations, making it possible to focus attention and resources to schools that are more susceptible to funneling students into the SPP. Increased knowledge of school background characteristics that are related to higher arrest rates and the extent to which they are relevant to arrest rates also serve in understanding how much room there is for discretionary factors such as racial bias to influence such decisions and outcomes that impact students.

Similar research is already widespread in other areas of school discipline such as suspensions and expulsions that are related to the SPP. For example, the discipline gap is an issue that has gained heightened interest with data from the U.S. Department of Education's Civil Rights Data Collection (CRDC) showing in the 2015–2016 school year, Black students were three times more likely to receive an out-of-school suspension compared with White students. Attempts to explain such discipline gaps can be found from studies such as that of Beck and Muschkin (2012) who find that racial differences in socioeconomic status and demographic characteristics (i.e., students' parental education and free lunch status) explain 26% of the difference in rates of disciplinary infraction. Most of the differences in student discipline remain unexplained and may be at least partially due to discretionary factors such as teacher bias. Such school characteristic research would be all the more valuable in regard to student arrests as they are directly related to students' involvement with the criminal justice system. This study seeks to fill such voids in the student arrest literature and investigate school background characteristics that are related to higher arrest rates along with how police presence is associated with arrest rates for Black and White students.

BACKGROUND

Arrests are at the extreme of school discipline outcomes and are relatively rare compared to other forms of discipline. Nonetheless, there are racial disproportionalities in their usage as is notable with other types of less severe exclusionary discipline such as suspensions. We look to theories in the literature and past research to draw hypotheses regarding Black and White student arrests, racial disproportionality in student arrests, and school characteristics related to such arrests.

Scholars have theorized and investigated a number of different explanations for racial disparities in school arrests. However, most focus more on a macro level perspective and exert less attention on school factors contributing to these disproportionalities. One explanation that anchors on such macro level factors is that regarding the lasting effects of racial segregation in schools. Massey and Denton (1993) discuss how in the post-slavery era, continued anti-Black discrimination led to the extreme housing segregation of Blacks with extreme concentrations of poverty, and this was reflected in school segregation. Recently, Reardon and authors (2019) attributed the association of school segregation with achievement gaps to racial differences in school poverty. They explain that such racial segregation in schools is harmful as racial minority students become concentrated in high-poverty schools which are, on average, less effective compared to lower-poverty schools. This concentration of racial minority students into less effective high-poverty schools could potentially assist in explaining the Black-White student arrest gap.

Although controversial and as such, contested by many, theories such as oppositional culture or teacher discrimination have also been used in attempts to explain the higher disciplinary and arrest rates of Black compared to White students. Oppositional culture theory states that a minority group's historical relationship to the dominant group plays a central role in the formation of their beliefs on society. Specifically, Fordham and Ogbu (1986) use oppositional culture to explain the Black student experience in America: "School learning is therefore consciously or unconsciously perceived as a *subtractive process*: a minority who learns successfully in school or who follows the standard practices of the school is perceived as becoming acculturated into the white American cultural frame of reference at the expense of the minorities' cultural frame of reference and collective welfare" (pp. 182-83, emphasis in original). Kochman (1983) describes in detail how such oppositional culture among Black students can be manifested in the

classroom context. For example, public debate expressed by Black students is classified as "high-keyed"—"animated, interpersonal, and confrontational"—while that of White students is classified as "relatively low-keyed"—"dispassionate, impersonal, and non-challenging" (Kochman, 1983, p. 18).

Teacher bias has also been identified as a potential explanation for Black (and possibly Hispanic) student outcome gaps. Using survey methods, Okonofua and Eberhardt (2015) find that when teachers are randomly assigned student behavioral scenarios with names suggestive of a student's race, teachers requested more severe punishments for Black than for White students. Studies that investigate Gifted and Talented classes demonstrate that before students are even tested for classification, teachers are less likely to refer Black students for screening (Elhoweris, 2008; Ford et al., 2008; McBee, 2006) and assessors give students with Black-sounding names lower scores on intelligence tests for GT placement relative to students with non-Black-sounding names (Fields, 2004). A recent study has demonstrated the importance of school personnel as greater racial and ethnic contact among district school board members was associated with a lower likelihood of punishing students more severely and a lower likelihood of punishment across all racial groups (Hughes et al., 2017). The study demonstrates the potentially moderating effect of intergroup contact between Black, White, and Hispanic school personnel such as school board members on school suspensions.

While such studies investigate potential relationships between racial disparities in student outcomes and teacher bias, other studies demonstrate the relationship between federal grants for hiring law enforcement officers in schools and negative outcomes for students. Using Department of Justice hiring grant information, Owens (2017) finds that there is an increase in arrests when school resource officers come into schools—each officer hired per 10,000 residents corresponds with approximately 0.213 additional charges filed for in-school crimes per 10,000 minors each school year. Similarly, Weisburst (2019) finds that in Texas, federal grants for school police increased middle school discipline rates by six percent and that exposure to a three-year federal grant for school police was associated with a 2.5 percent decrease in high school graduation. Based on such previous research, the next question that occurs is what happens to students of different racial groups when police officers are present in schools.

Recently, Homer and Fisher (H&F; 2020) investigated differences in student arrest rates between different student racial groups using data collected by the Office of Civil Rights of the U.S. Department of Education (USDOE) in 2013-14. These data, known as the Civil Rights Data Collection (CRDC), include information on every school in the United States. The CRDC reports the number of student arrests as the total number of students who received a school-related arrest. The CRDC refers to school-related arrests as "an arrest of a student for any activity conducted on school grounds, during off-campus school activities (including while taking school transportation), or due to a referral by any school official" (U.S. Department of Education, 2018).

H&F used these linked data to measure the relationship between the presence of a police officer in a school and student arrest rates, separately for race/ethnic and gender groups. Comparing schools with and without police presence using propensity score matching, H&F found that police presence increases arrest rates and does so more strongly for Black than for White or Hispanic students, suggesting that police in the school play a significant role in the disproportionately high arrest rates experienced by Black students.

The current study extends H&F's study of police in schools by analyzing separately according to school education levels (elementary, middle, and high school) and other characteristics. Building on H&F's results that Black students experience higher arrest rates compared to White students, this study aims to test for additional school characteristics that could assist in understanding schools at heightened risk of such disproportionalities in student arrests. As there is limited research regarding background characteristics related to student arrest rates, this study contributes to the literature by providing descriptive information regarding such school characteristics using the same cross-sectional 2013-14 school year data set as H&F. The study draws upon past literature on student discipline gaps and other student outcomes to derive hypotheses.

While H&F did not utilize information on the grade spans served by schools, it seemed important to include such information as past research has found that primary (elementary) schools have significantly lower rates of school discipline (and police placement) than middle or high schools (Kupchik & Ward,

2014). As such, we predict that middle and high schools will have higher student arrest rates of both Black and White students compared to primary (elementary) schools. There can be various reasons as to why middle or high schools have higher rates of school discipline. A potential explanation is that students of older age are at a developmental period during which they are more prone to be involved in misconduct. Studies of criminal activity by age consistently find that offense rates begin to rise in preadolescence or early adolescence, reach a peak in late adolescence, and fall through young adulthood (Farrington, 1986; National Research Council, 1986). A longitudinal study of a representative sample from high-risk neighborhoods in Denver also found a growth in the self-reported prevalence of serious violence from age 10 through late adolescence (Kelley et al., 1997).

Moral panic can also serve as a potential explanation as to why middle or high schools exhibit more school discipline compared to primary (elementary) schools. Cohen (1972) describes moral panic as a "defined threat to societal values" that occurs on the form of a person, identifiable group of people, condition, or even (p. 9). Welch et al. (2002) explain that arousal of public concern, inflated language to portray the group blamed for the crime, and exaggerated fear in proportion to potential threat feed into moral panic. Past literature has demonstrated that nonwhite and low-income youth are often viewed and described as threatening, undisciplined, and pathological (Springhall, 1998; Walsh, 2020).

This study also looks to further delve into socioeconomic factors as research has drawn significant relationships between economic disadvantage and criminalized school discipline policies such as suspension, expulsion, and police referrals and arrests (Ramey, 2015; Irwin et al., 2013; Kupchik & Ward 2014; Welch & Payne; 2010, 2012). Christle et al. (2004) explain that low socioeconomic status (SES) is associated with a variety of risk factors including physical health (undernourishment and frequent illness) and mental health (low cognitive ability and academic delay) and that adult biases regarding students from low socioeconomic backgrounds can also lead to increased school discipline. As past research exhibits the relationship between low socioeconomic status and increased school discipline, we hypothesize that higher rates of free and reduced priced lunch in schools will predict higher student arrest rates for both Black and White students. As Christle et al. (2004) discuss bias towards students from low SES backgrounds as a potential mechanism, we predict that police presence in schools with higher percentages of students qualifying for free and reduced-price lunch will be more strongly related to increased student arrest rates than in schools with a lower percentage of low-income students.

Relationships between school size, locale, and arrest rates are also worth investigating as past studies have reported that large and typically urban high schools are more disorderly than small and typically rural ones (Haller, 1992; Fowler & Walberg, 1991; Gabarino, 1978; Gottfredson, 1985; McPartland & McDill, 1977; National Institute of Education, 1978). A potential explanation for this phenomenon is Barker's responsibility theory (Barker & Gump, 1964), which suggests that when there are fewer individuals in a setting, there is great pressure for them to take on responsibility. Barker and Gump (1964) find that students in small groups participate in more curricular and extracurricular activities, which in turn leads to a higher level of social integration and consequently to better student behavior. More recently, Welsh et al. (2000) find that school size has a moderate indirect effect on school disorder through school stability. We predict that as school size increases, it could be potentially more difficult to maintain order, leading to increased student arrests. We also predict that as a school's locale becomes more populated (urban compared to rural), student arrests will also increase.

This study also seeks to investigate the relationship between the proportion of Black students in schools and student arrests as past studies have found that schools with higher proportions of minorities are more punitive toward these students (Payne & Welch, 2010, 2015; Welch & Payne, 2010, 2012, 2018). The racial threat hypothesis is often used to explain such findings. It states that when the relative size of a racial minority group increases, members of the majority group perceive this as an increased threat (Blalock, 1967). The hypothesis states that in response to such threat, the majority group will intensify social control to maintain dominant standing. Contrary to such past studies, a recent study demonstrates that teachers working in counties with higher percentages of Black students showed lower levels of implicit bias (Chin et al., 2020). The authors explain that this can be due to teachers with lower bias preferring to work in counties with more Black students and/or that working in schools with more Black students leads to lower

bias. They also find larger racial disparities in test scores and suspensions in counties with stronger implicit and explicit pro-white/anti-Black bias among teachers. As there is mixed past literature regarding the relationship between Black student proportions in schools and punitive measures towards Black students, this will be a point of particular interest in this study—in particular, whether Black students. Thus, based on the past literature, we will address the following research questions with directional hypotheses:

Research Question 1: *Do Homer and Fisher's results of higher arrest rates for Black students continue to be found when differentiated by school levels?*

Hypothesis 1: *I hypothesize that Homer and Fisher's results of higher arrest rates for Black students will continue to be found when differentiated by school grade levels.*

Research Question 2: *Which school characteristics predict higher student arrest rates? In particular, how does the relationship between police presence in schools and student arrest rates change when considering school characteristic variables?*

Hypothesis 2: *I hypothesize that arrests for both White and Black students will be highest in high schools relative to middle and elementary schools. I also hypothesize that Black arrests will be higher than White arrests regardless of school level. I hypothesize that low SES schools (schools with higher proportions of students qualifying for free and reduced-price lunch) will have higher arrest rates for both White and Black students and that Black students will have higher arrest rates compared to White students.*

Research Question 3: *Do Black student enrollment percentages predict differences in Black-White student arrest rate gaps?*

Hypothesis 3: *I hypothesize that larger Black student enrollment percentages will predict smaller Black-White student arrest rate gaps.*

DATA AND ANALYTIC SAMPLE

The present study recreates and reanalyzes the dataset examined by H&F, which uses data from the 2013-14 CRDC and Common Core of Data (CCD). Applying the same exclusion of schools that serve only preschoolers, this study investigates schools that have a total enrollment of at least 100 students and at least 25 Black and 25 White students and schools that have information on school levels from the CCD. H&F use entire student body, White, Black, and Latinx student arrest rates as outcome variables and police presence in schools as the main predictor variable and the following as control variables: Black student enrollment proportions, Latinx student enrollment proportions, total student enrollment, school type (special education, magnet, charter, or alternative schools), chronic absenteeism, number student bullying incidents based on sex, race/ethnicity, or disability, number of students who received one or more in-school suspensions, one out-of-school suspension, more than one out-of-school suspension, an expulsion with continued educational services, an expulsion without educational services, and an expulsion as a result of zero-tolerance policies, urban-centric locale (city, suburb, rural, and town), and Title I eligibility. Student arrest rates are calculated as the arrest rate per 1000 students.

The current study does not utilize certain variables used by H&F such as the variables of number of student bullying incidents based on sex, race/ethnicity, or disability, number of students who received one or more in-school suspensions, one out-of-school suspension, more than one out-of-school suspension, an expulsion with continued educational services, an expulsion without educational services, and an expulsion as a result of zero-tolerance policies to avoid the issue of endogeneity. Since arrests, suspensions, and expulsions all constitute forms of student punishment and bullying incidents would generally lead to some form of punishment, these variables are endogenous to school arrests compared to other school

characteristic measures. The analyses in this study restrict attention to non-discipline measures of school context.

One key addition in this study is the usage of school level information. As primary (elementary) schools are far more numerous than middle and high schools and disciplinary actions are comparatively infrequent, investigating student arrest rates without considering school levels would yield overall results dominated by outcomes occurring in elementary schools. In addition, schools serving special school populations, such as students with a history of behavior problems, may have broad grade spans placing them outside the usual elementary, middle, and high school categories. Therefore, this study sought to take a more detailed look at whether school levels play a role in explaining disproportionate student arrest rates. In addition, while H&F use Title I eligibility as an indicator of school-level poverty, this study uses the percentage of students qualifying for free or reduced priced lunch (FRL) as a more detailed measure of school level poverty.

Similar to H&F's study, this study utilizes Black and White student arrest rates as outcome variables, police presence in schools as the main predictor variable and the following as control variables: percentage of students qualifying for FRL, Black student enrollment proportions, Latinx student enrollment proportions, total student enrollment divided by 1000, school level (primary, middle, high, and other, with middle schools as the reference group), school urban-centric locale (city, suburb, town, or rural with rural as the reference group), and school types which include special education schools, magnet schools, charter schools, and alternative schools. Like H&F's study, Black and White student arrest rates are calculated as the arrest rate per 1000 students. The percentage of students qualifying for FRL and Black student enrollment percentage are calculated as the rate per 100 students.

Appendix 1 shows the descriptive statistics of the variables used in our analyses, which can be compared to Table 1 of H&F. The enrollment restrictions implemented in this study reduced the analysis samples to about 1/3 of approximately 30,000 schools. Of these, close to 60% were primary (elementary) schools where police are rarely placed, and arrests rarely occur. Thus, instead of the unitary dataset of 92,620 schools analyzed by H&F, this study analyzes a dataset of approximately 6,000 middle and high schools, with an additional 15,000 or so primary schools and about 800 schools with an "Other" span of grade levels, each with more than 100 total students and at least 25 Black and 25 White students enrolled.

With this analytic sample and other analysis modifications described below, the study extends H&F's estimation of the relationship between police presence and White and Black student arrest rates, allowing for these estimates to differ according to the grade span and racial composition of the school. These data and results will help pinpoint the locations where police presence is particularly important in creating racial disproportionality in student arrests.

METHODS

We estimate our analyses on H&F's full analytic sample and this study's analytic sample to compare results. For this study's analytic sample, we first estimate bivariate regression models with school police presence as the predictor variable and White and Black student arrest rates as the primary outcome variables to assess if there is a relationship between police presence in schools and White and Black student arrest rates. Next, we estimate multivariate linear regression models with additional predictor variables, including percentage of students qualifying for FRL, Black student enrollment percentage, total student enrollment divided by 1000, school level (primary, middle, high, and other with middle schools as the reference group), school urban-centric locale (city, suburb, town, or rural with rural as the reference group), and school types which include special education schools, magnet schools, charter schools, and alternative schools. We also include interaction variables between school police presence and Black student enrollment percentage and school level. This is to know whether other variables would help to explain the relationship between police presence in schools and Black and White student arrests.

As police presence in schools is not randomly assigned, there might be systematic differences between schools with and without police that could also be influencing student arrest rates in schools. In order to make these schools more comparable with each other and reduce the impact of selection bias, propensity scores are included as Homer and Fisher did in their analyses. The propensity scores indicate the likelihood

of a school to have an officer present and are calculated by estimating logistic regression models that predict police presence using the respective control variables. We generate propensity scores by including all control variables as Cuong (2013) explains that as data often contains non-sampling errors in the outcome and control variables, the mean-squared error is "still lower if all the variables in the outcome equation including those not affecting the program participation are controlled in the propensity score matching" (p.178). Cuong (2013) uses Monte Carlo simulation to demonstrate that "efficiency in estimation of the Average Treatment Effect on the Treated can be gained if all the available observed variables in the outcome equation are included in the estimation of propensity scores" (p.169).

We estimate linear regressions for all models and include the squared value of the propensity score as was done by H&F to account for potential nonlinearity. Although we use arrest rates that can range from zero to one in the regression models, we use linear probability models as the probabilities that we are modeling are not extreme, close to zero or one, but more moderate and as such, both linear and logistic models fit approximately equally well and linear models have more ease in interpretation (Von Hippel, 2015).

Lastly, we also estimate models with Black and White arrest rate differences as the outcome variable (Black student arrest rates subtracted by White student arrest rates) to assess the extent of Black-White arrest rate differences within schools and their relationships with officer presence. We use similar regression analysis methods as well as spline regression analysis centered around the median of Black student enrollment percent (0.16) to see whether Black-White arrest rate differences vary by Black student enrollment proportions.

RESULTS

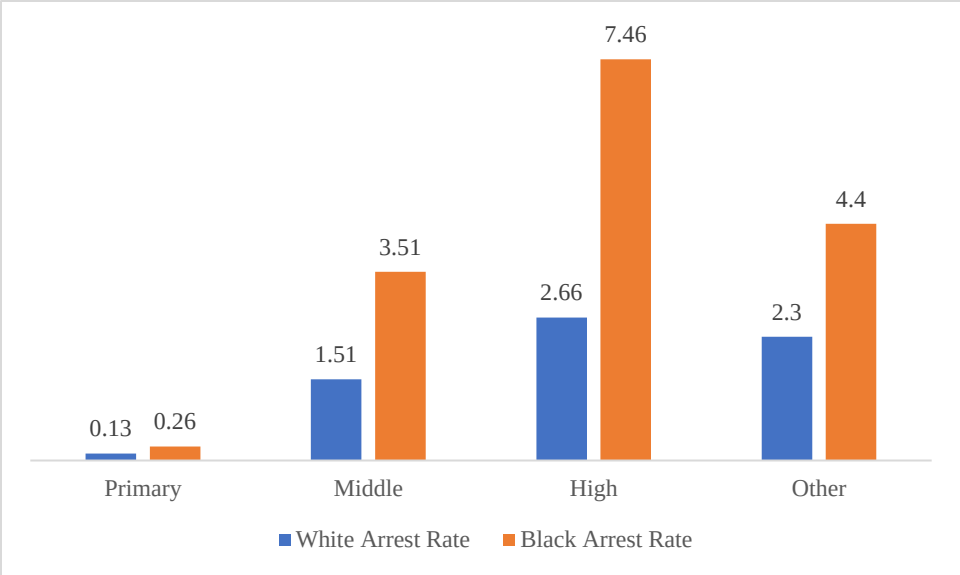
Research Question 1: *Do Homer and Fisher's results of higher arrest rates for Black students continue to be found when differentiated by school grade levels?*

Table 1 shows White and Black student arrest rates (per 1,000 students) according to the grade span of the school. Figure 1 graphs the mean arrest rates for White and Black students by primary, middle, high, and other schools. Black students are arrested at higher rates than White students at every school level. In elementary schools, the mean arrest rate for Black students, 0.26, is twice that of White students, 0.13. There is a similar pattern for middle school students with 1.51 for White students and 3.51 for Black students. These rates increase further for high school students, to 2.66 for Whites and 7.46 for Blacks. Thus, the largest racial arrest disparity occurs in high schools. Arrest rate disparities follow a similar pattern among the "Other" school category, at 2.87 for Whites and 4.48 for Blacks. The particularly high arrest rate for Black students in high school is worth further investigation. In summary, results with this analysis sample support H&F's finding of higher arrest rates for Black than White students.

TABLE 1
WHITE AND BLACK ARREST RATE PER 1,000 STUDENTS DESCRIPTIVE STATISTICS FOR SAMPLE RESTRICTED TO SCHOOLS WITH TOTAL ENROLLMENT GREATER THAN 100 STUDENTS, AT LEAST 25 BLACK STUDENTS AND 25 WHITE STUDENTS, AND INFORMATION ON SCHOOL GRADE LEVEL

		White Arrest Rate				Black Arrest Rate			
Level	Count	Mean	SD	Min	Max	Mean	SD	Min	Max
Primary	15,073	0.13	2.02	0	108.11	0.26	3.56	0	207.32
Middle	5,754	1.51	11.14	0	563.77	3.51	18.85	0	810.34
High	5,499	2.66	11.34	0	450.77	7.46	24.78	0	825.53
Other	930	2.3	13.07	0	204.08	4.4	23.7	0	375
Total	27,256	1	7.83	0	563.77	2.54	15.27	0	825.53

FIGURE 1
MEANS OF STUDENT ARREST RATES



Note. This study's analytic sample is restricted to schools with a total enrollment of at least 100 students and at least 25 White and 25 Black students.

Research Question 2: *Which school characteristics significantly predict higher student arrest rates? In particular, how does the relationship between police presence in schools and student arrest rates change when considering school characteristic variables?*

Table 2 shows the regression results of Black and White student arrest rates regressed against the presence of a school officer using this study's set of controls on Homer and Fisher's sample and this study's analytic sample**.** White and Black arrest rates are predicted separately against the presence of a police officer, the interaction of this variable with the school's educational level, and a group of control variables. Many but not all of the control variables employed by H&F are included. In the prediction equation, control variables such as general school demographics and administrative characteristics are included while variables including suspension, expulsion, and bullying rates that might themselves be outcomes of arrest rates are excluded. The study also follows H&F's practice of adjusting for selection bias by including a propensity score, and its value squared, computed from a logistic regression in which the predictor variables in the regression were used to predict the probability that each school had a police officer, as an additional control. Regression results on H&F's sample are included as well for reference.

Models 1 and 3 estimated using this study's sample in Table 2 show the relationship between a school police officer and (separately) White and Black arrest rates, using only the propensity score and its square as controls. Both police effects are positive and significant with a coefficient of 0.74 for the White and 1.55 for the Black arrest rate, indicating 0.74 additional White student arrests and 1.55 additional Black student arrests per 1,000 students when an officer is present in schools. The 2nd and 4th models added interactions between the school officer and each of the percent Black and school level (grade span) variables, as well as control variables to the equation. The interactions with percent Black were significant for Black arrest rates but not White arrest rates. The interactions with primary and other school level were significant. Since middle school was the base category for school level and the interaction between officer presence and Black enrollment percentage was 0.43 for White arrest rates and -2.26 for Black arrest rates, the police effect for this level was 1.55 (= 1.12 + 0. 43) for the White and 0.22 (= 2.48 – 2.26) for the Black arrest rate. The interaction coefficients for primary school reduced this coefficient to -0.04 (= 1.55 – 0.4 – 1.19) for Whites

and -0.37 (= 0.22 +1.31 – 1.9) for Blacks. Thus, while police *are* sometimes placed in primary schools, this effect is small in size.

TABLE 2
REGRESSION RESULTS OF BLACK AND WHITE STUDENT ARREST RATES ON THE PRESENCE OF A SCHOOL OFFICER USING THIS STUDY'S SET OF CONTROLS ON HOMER AND FISHER'S SAMPLE AND THIS STUDY'S ANALYTIC SAMPLE

	H&F's sample		This Study's Sample			
	White Rate	Black Rate	White Rate	White Rate	Black Rate	Black Rate
Officer	0.60***	1.65***	0.74***	1.12***	1.55***	2.48***
	(0.13)	(0.29)	(0.11)	(0.23)	(0.21)	(0.45)
Total Enrollment/1000	0.00***	0.00***		-0.06*		-0.22***
	(0.00)	(0.00)		(0.03)		(0.06)
Proportion Black	-0.08	-0.11		-0.43		-2.86***
	(0.16)	(0.32)		(0.37)		(0.72)
Proportion Latinx	0.84***	0.36		0.68		0.12
	(0.14)	(0.29)		(0.38)		(0.74)
Officer X Proportion Black	0.95***	-0.83		0.43		-2.26*
	(0.25)	(0.52)		(0.48)		(0.94)
Primary	-0.44***	-0.96***		-0.40		1.31
	(0.09)	(0.21)		(0.55)		(1.06)
High	0.26*	1.59***		0.77**		1.79***
	(0.12)	(0.27)		(0.27)		(0.52)
Other	0.02	0.35		0.24		0.91
	(0.17)	(0.39)		(0.46)		(0.89)
Officer X Primary	-0.80***	-1.56***		-1.19***		-1.90***
	(0.15)	(0.34)		(0.26)		(0.50)
Officer X High	0.75***	2.12***		0.25		1.61**
	(0.17)	(0.39)		(0.31)		(0.60)
Officer X Other	0.74*	0.28		1.64**		5.44***
	(0.30)	(0.66)		(0.58)		(1.11)
FRL Rate	0.35***	0.15*		1.14**		1.72*
	(0.08)	(0.07)		(0.40)		(0.78)
City	0.17	0.80***		0.35		1.51***
	(0.09)	(0.20)		(0.19)		(0.36)
Suburb	-0.08	0.03		0.41		1.62***
	(0.07)	(0.17)		(0.21)		(0.41)
Town	-0.07	0.61**		-0.09		0.56
	(0.09)	(0.20)		(0.20)		(0.39)
Special Ed. School	0.19	0.44		1.27*		2.15*
	(0.22)	(0.50)		(0.54)		(1.05)
Magnet School	1.10***	-0.10		0.09		-0.47
	(0.14)	(0.31)		(0.21)		(0.40)

Charter School	-0.27*	-1.03***		-0.32		1.09
	(0.13)	(0.28)		(0.45)		(0.87)
Alternative School	0.34	0.05		5.49***		6.59***
	(0.17)	(0.41)		(0.54)		(1.05)
Propensity Score	0.00	0.00	4.13***	0.21	5.92**	9.44*
	(.)	(.)	(1.00)	(2.45)	(1.94)	(4.75)
Propensity Score^2	0.00	0.00	-0.90	1.58	4.50*	2.80
	(.)	(.)	(1.06)	(1.61)	(2.05)	(3.12)
Constant	-0.46***	-1.32***	-0.72***	-0.25	-1.32***	-3.63*
	(0.10)	(0.23)	(0.19)	(0.88)	(0.36)	(1.71)
Observations	69,971	63,394	27,256	27,256	27,256	27,256
R-squared	0.027	0.042	0.016	0.029	0.033	0.046

Note. This study's analytic sample is restricted to schools with a total enrollment of at least 100 students and at least 25 White and 25 Black students.
FRL = Free and Reduced-Price Lunch.
Standard errors in parentheses.
*p<.05, **p<.01, ***p<.001.

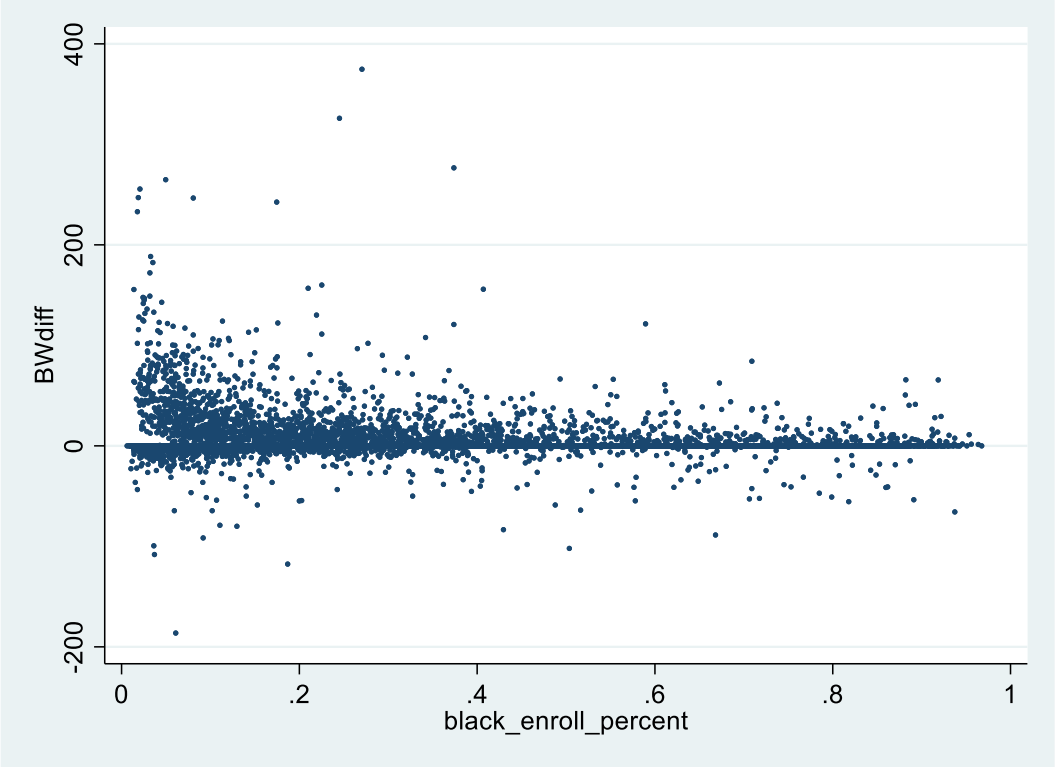
The interactions between police and high school are positive but only statistically significant for Black arrest rates. Thus, as we saw in Table 1, Black arrest rates are particularly high in high school, and this can partly be explained by a police presence effect in those schools compared to middle schools. Finally, there are large and statistically significant interactions between police and "other" schools. The coefficients are 3.56 for Whites and 2.56 for Blacks, implying a police effect of 2.76 (= 1.12 + 1.64) for White arrest rates and of 7.92 (= 2.48 + 5.44) for Black arrest rates in this school type. Police effects are strongest by far in these schools.

Most of the control variables in the 2nd and 4th models were statistically significant. Total school enrollment was negatively related to arrest rates, more strongly for Black than White students; the percentage of Black students was negatively related to arrest rates for Black students; high school arrest rates were higher than those for middle school, with effects that were much stronger for Black than White students; the percent of students on free/reduced price lunch was positively associated with arrest rates, more strongly for Black than White students; arrest rates were higher in urban and suburban than rural schools for Black students; special education had higher arrest rates with stronger effects for Black students compared to White students, and alternative schools had the strongest positive relationship with arrest rates of all the predictors in the table, and this was equally the case for White and Black arrest rates.

Research Question 3: *Do Black student enrollment percentages predict differences in Black-White student arrest rate gaps?*

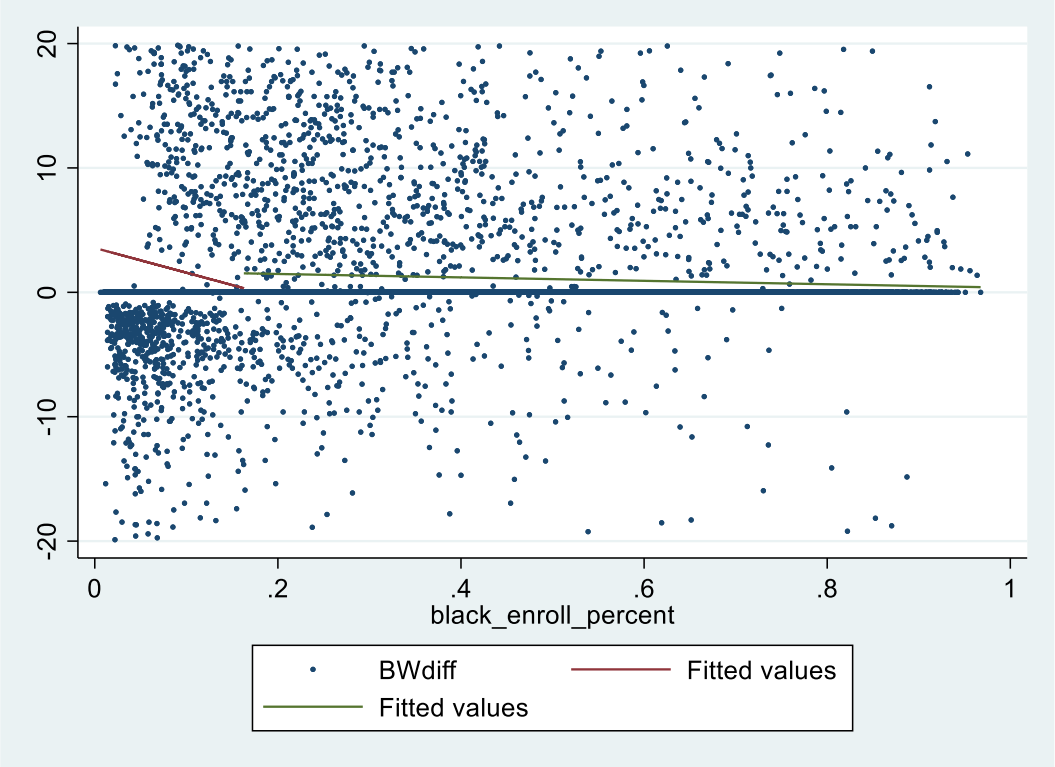
Figure 2 shows the overall scatterplot between Black student enrollment percentages and Black and White Student arrest rate differences, and Figure 3 shows the spline graph on the relationship between Black student enrollment percentages and Black and White Student arrest rate differences centered on the Black student enrollment percent median, which is 0.16.

FIGURE 2
SCATTERPLOT ON RELATIONSHIP BETWEEN BLACK STUDENT ENROLLMENT PERCENT AND BLACK AND WHITE STUDENT ARREST RATE DIFFERENCE



The scatterplot shows that as Black enrollment percentage increases, the number of schools that demonstrate extreme differences of Black and White arrest rates decrease. Based on the spline graph, there are two separate slopes and intercepts centered around the Black student enrollment percent median of 0.16. We allowed the effect of Black-White arrest differences to vary with the level of Black student enrollment percentages by fitting a two-segment spline function, with separate slopes for schools with a proportion of Black students enrolled below and above the median of 0.16. The difference between the two slopes is 18.49 (standard error of 2.59) and significant at the $p<.001$ level, indicating that schools that are below and above the median of Black student enrollment percentages demonstrate noteworthy differences in their Black-White student arrest rate gaps, with schools below median Black student enrollment proportions exhibiting larger Black-White gaps.

FIGURE 3
SPLINE GRAPH ON RELATIONSHIP BETWEEN BLACK STUDENT ENROLLMENT PERCENT AND BLACK AND WHITE STUDENT ARREST RATE DIFFERENCE CENTERED ON BLACK STUDENT ENROLLMENT PERCENT MEDIAN (=0.16)



Note. Black-White arrest rate differences were cut off from -20 to 20 for better visibility of the lines.

TABLE 3
REGRESSION RESULTS OF BLACK AND WHITE STUDENT ARREST RATE DIFFERENCES ON THE PRESENCE OF A SCHOOL OFFICER WITH AND WITHOUT CONTROLS (n=27,256)

	(1)	(2)	(3)	(4)
Officer	2.32***	0.91**	3.08***	1.50***
	(0.14)	(0.30)	(0.21)	(0.33)
Proportion Black		-3.72***	-0.83	-2.61***
		(0.44)	(0.45)	(0.53)
Officer X Proportion Black			-3.23***	-2.62***
			(0.70)	(0.69)
Total Enrollment/1000		0.02		0.02
		(0.02)		(0.02)
Proportion Latinx		-2.05***		-2.00***
		(0.43)		(0.43)
Primary		-1.34***		-1.37***
		(0.25)		(0.25)

High		1.66***		1.64***
		(0.36)		(0.36)
Other		-0.92		-0.96
		(0.54)		(0.54)
Officer X Primary		-0.95**		-0.90*
		(0.37)		(0.37)
Officer X High		1.46***		1.47***
		(0.44)		(0.44)
Officer X Other		3.79***		3.91***
		(0.83)		(0.83)
FRL Rate		2.46***		2.40***
		(0.38)		(0.38)
City		0.47*		0.47*
		(0.22)		(0.22)
Suburb		0.24		0.24
		(0.21)		(0.21)
Town		0.21		0.23
		(0.27)		(0.27)
Special Ed. School		0.54		0.47
		(0.76)		(0.76)
Magnet School		-0.11		-0.08
		(0.28)		(0.28)
Charter School		-0.57		-0.60
		(0.36)		(0.36)
Alternative School		0.94		0.93
		(0.78)		(0.78)
Constant	0.63***	0.96**	0.82***	0.77*
	(0.09)	(0.33)	(0.13)	(0.34)
R-squared	0.010	0.033	0.012	0.033

Note. This study's analytic sample is restricted to schools with a total enrollment of at least 100 students and at least 25 White and 25 Black students.
FRL = Free and Reduced-Price Lunch.
Standard errors in parentheses.
*p<.05, **p<.01, ***p<.001.

Table 3 shows the results of the difference between Black and White student arrest rates (White student arrest rates subtracted from Black student arrest rates) regressed on the presence of a school officer on this study's analytic sample both with and without this study's set of controls**.** The first model in Table 3 shows the relationship between officer presence and Black and White student arrest rate differences. The coefficient is 2.32 and statistically significant, suggesting that schools with officers have larger Black-White student arrest gaps compared to schools that do not have officers. Model 2 includes interactions between the percent Black and each of the school level (grade span) variables along with control variables to the equation. In Model 2, as middle schools are the omitted category, the Black-White arrest rate difference for middle schools is .91 arrests per 1,000 students. The difference is essentially zero (.91-.95=-.04) in primary schools and 2.37 in high schools (.91+1.46=2.37), showing a much higher gap in high schools.

Model 3 includes the proportion Black variable and the interaction between officer presence and proportion Black. The interaction between officer presence and Black enrollment percentage was -3.23 and

the main effect for police presence was 3.08, indicating that schools with very low proportions of Black students enrolled have a very large arrest rate gap—3.08 per 1,000—while the gap essentially disappears in schools with very high proportions of Black students enrolled.

Model 4 includes all variables in the equation: the proportion Black variable, the interaction between officer presence and proportion Black, and interactions between the percent Black and each of the school level (grade span) variables along with control variables to the equation In Model 4, since middle school was the base category for school level and the interaction between officer presence and Black enrollment percentage was -2.62, the police effect for this level was -1.12 (= 1.5 – 2.62) for Black-White arrest rate differences, indicating a smaller gap in schools with a larger proportion of Black students. The interaction coefficients for primary school reduced this coefficient to -3.39 (= -1.12 – 1.37 – 0.9). The police effect for high schools was 1.99 (= -1.12 + 1.64 + 1.47), demonstrating a much higher police effect compared to middle and primary schools in terms of Black and White student arrest rate differences within schools.

Among control variables in the Models 2 and 4, Latinx student proportion and FRL rate were statistically significant: Latinx student enrollment percentages were negatively related to Black and White student arrest rate differences, meaning that more schools with larger Latinx student enrollment rates saw smaller Black and White student arrest rate differences, and FRL rate was positively related, indicating that schools with higher FRL rates saw larger Black and White student arrest rate differences.

DISCUSSION

This study extends the research of H&F, who analyzed the 2013-14 CRDC data and found that police presence in schools is associated with increased student arrest rates and that this effect was stronger for Black than for White students. Testing for interactions between school police presence and both the percent Black students in school and the level (grade span) of the school, the study finds that police/arrest relationship was weakest in primary schools and strongest in high and other schools, particularly for Black student arrest rates, consistent with past studies that find that primary (elementary) schools have significantly lower rates of school discipline (and police placement) than middle or high schools (Kupchik & Ward, 2014).

Schools with lower Black student enrollment percentages were associated with higher Black student arrest rates. Along similar lines of disadvantaged student outcomes for Black students, past research has demonstrated the disproportional placement of non-White students into special education (Hibel et al., 2010). Hibel and authors (2010) find that schools with high minority student enrollments were less likely to place students into special education in general: controlling for student average performance, conduct, and socioeconomic status, otherwise identical students in high-minority schools had a lower rate of placement into special education than students in schools with lower minority enrollments. It is possible that similar mechanisms are occurring with racial disproportionalities in student arrests, and future studies would help in examining these and other potential explanations.

Looking at Black and White student arrest rate differences within schools, as the Black enrollment percentage decreases, schools that demonstrate extreme differences of Black and White arrest rates increase. In conjunction with more extreme cases of Black-White student arrest rate differences in schools with smaller proportions of Black students enrolled, spline analysis results demonstrate that schools with below median Black student enrollment proportions demonstrate larger Black-White gaps. Such findings seem to tell a different story compared to past studies that have found that schools with higher proportions of minorities are more punitive and minorities tend to be arrested more (Payne & Welch, 2010, 2015; Welch & Payne, 2010, 2012, 2018) and resonate more with studies that found teachers working in counties with higher percentages of Black students show lower levels of implicit bias (Chin et al., 2020).

Regarding Black and White student arrest rate differences within schools, primary schools with officers had a negative coefficient, indicating a reverse relationship of higher White student arrest rates compared to Black student arrest rates. The result of higher White student arrest rates compared to Black student arrest rates in elementary schools contrasts with past research findings regarding racial disparities of student discipline in elementary school. For example, a recent study found that after accounting for differences in

income, education, caregiver support, special education services and parental reports of misbehavior and family conflict, elementary school-age Black children are 3.5 times more likely to be suspended or placed in detention than their White peers (Fadus et al., 2021). Similarly, research using child and parent reports from the Fragile Families Study found that about 40 percent of non-Hispanic Black boys were suspended or expelled, compared to eight percent of non-Hispanic White or other-race boys (Jacobsen, 2019). Further research is warranted regarding how police presence could potentially change the dynamics of racial disparities of school discipline in elementary school.

There are several limitations to this study. The study is a cross-sectional analysis as only the 2013-14 school year CRDC data have the required information on officer presence: with data on additional school years that include information on the presence of sworn law officers in schools, it would be possible to test whether the introduction of a sworn law officer into schools predicts changes in arrests. The regression R-squared values in the models ranged from 0.029 to 0.046 for models including the full set of control variables, indicating that much variance regarding student arrest rates remain unexplained and require more in-depth investigation. Also, as the study is based on school-level rather than individual-level data, there is no information on out-of-school arrests for school-aged youth. Student arrests calculated in the CRDC data used in this study are defined as "an arrest of a student for any activity conducted on school grounds, during off-campus school activities (including while taking school transportation), or due to a referral by any school official" (U.S. Department of Education, 2018). As there is only data on the total number of student arrests within schools, it is difficult to parse out whether the presence of police in schools would increase the number of arrests in schools but reduce the rate of arrests of students outside of schools. Alternatively, police presence in schools could increase school-age youth not being in school at all and if so, it is possible that an even larger police effect occurs in this case. While the scope of this paper focuses on the relationship between police presence in schools and school Black-White student arrest rate gaps, future research that includes individual-level data would offer a more comprehensive picture on the police effect school-aged youth.

It would also be interesting to obtain federal grant information as past literature has demonstrated the relationship between federal grants for hiring law enforcement officers in schools and negative outcomes for students. Using Department of Justice hiring grant information, Owens (2017) finds that there is an increase in arrests when school resource officers come into schools—each officer hired per 10,000 residents corresponds with approximately 0.213 additional charges filed for in-school crimes per 10,000 minors each school year. By obtaining grant data, it would be possible to compare schools with similar demographic characteristics and arrest rates and see if there are changes in these rates after grants are obtained to hire school resource officers. It would also be informative to examine whether receiving a school police grant is related to disproportionate changes in arrest rates for students of different racial groups.

Along similar lines, information of student offenses that led to arrests would be useful as well. Theriot (2009) assessed the effect of police in schools on student arrest rates by comparing arrests at thirteen schools with an officer to fifteen schools without an officer in the same district. His analyses showed that police presence did not predict more total arrests, decreased the arrest rate for assault and weapons charges, and predicted more arrests for disorderly conduct. Such information on student offenses would enable analysis on the relationship between student race, offense type, and potential racial disproportionality on student arrests based on offense type.

The SPP warrants alarm from the educational community especially for older students and students of color. As this study demonstrates that both student arrest rates and gaps are exacerbated for students in high schools with officers present, particularly in schools with lower enrollment rates of Black students, it is difficult to dismiss such police presence as unrelated to the disproportionate funneling of Black students into the SPP. Considering the original intentions of placing police in schools—for the sake of student safety—further policy improvements are deemed needed to restore the true purposes of school officers and withdraw from negatively impacting students that should be protected by schools as opposed to channeled into the criminal justice systems.

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APPENDIX

APPENDIX 1
DESCRIPTIVE TABLE OF SCHOOLS WITH TOTAL ENROLLMENT GREATER THAN 100 STUDENTS, AT LEAST 25 BLACK STUDENTS AND 25 WHITE STUDENTS, AND INFORMATION ON SCHOOL GRADE LEVEL, BY OVERALL SAMPLE AND SCHOOLS WITH AND WITHOUT POLICE

	Overall Sample (*N*=27,256)				With Police (*n*=10,691)				Without Police (*n*=16,565)				Differences by Police Presence?
Variable	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max	
White Arrest Rate	1	7.83	0	563.77	1.9	11.12	0	563.77	0.42	4.49	0	247.79	***
Black Arrest Rate	2.54	15.27	0	825.53	4.85	22.07	0	825.53	1.05	7.97	0	321.43	***
Total School Enrollment	756.79	521.42	100	13906	956.2	612.87	100	13906	628.1	403.38	100	13306	***
Proportion Black	0.23	0.2	0.01	0.97	0.24	0.2	0.01	0.97	0.23	0.19	0.01	0.96	*
Proportion Latinx	0.19	0.2	0	0.97	0.18	0.19	0	0.97	0.2	0.2	0	0.97	***
Primary	0.55	0.5	0	1	0.3	0.46	0	1	0.71	0.45	0	1	***
Middle	0.21	0.41	0	1	0.3	0.46	0	1	0.15	0.36	0	1	***
High	0.2	0.4	0	1	0.36	0.48	0	1	0.1	0.3	0	1	***
Other	0.03	0.18	0	1	0.03	0.17	0	1	0.04	0.19	0	1	
FRL Rate	0.54	0.25	0	1	0.54	0.24	0	1	0.55	0.26	0	1	***
City	0.31	0.46	0	1	0.29	0.46	0	1	0.32	0.47	0	1	***
Suburb	0.43	0.5	0	1	0.4	0.49	0	1	0.45	0.5	0	1	***
Town	0.1	0.3	0	1	0.11	0.32	0	1	0.09	0.29	0	1	***
Rural	0.16	0.36	0	1	0.19	0.39	0	1	0.13	0.34	0	1	***
Special Ed school	0.01	0.09	0	1	0.01	0.08	0	1	0.01	0.1	0	1	***
Magnet school	0.07	0.25	0	1	0.08	0.28	0	1	0.05	0.23	0	1	***
Charter school	0.04	0.2	0	1	0.01	0.12	0	1	0.06	0.23	0	1	***
Alt school	0.01	0.09	0	1	0.01	0.09	0	1	0.01	0.09	0	1	

APPENDIX 2
DESCRIPTIVE TABLE OF SCHOOLS INCLUDED/NOT INCLUDED IN ANALYTIC SAMPLE

	Analytic Sample					Not Included in Analytic Sample					Significantly Different?
Variable	Count	Mean	Std. Dev.	Min	Max	Count	Mean	Std. Dev.	Min	Max	***
White Arrest Rate	33,234	1.00	6.82	0.00	405.35	55,295	0.45	7.87	0.00	601.50	***
Black Arrest Rate	33,234	2.69	15.97	0.00	717.39	46,901	1.06	14.30	0.00	731.00	***
Total School Enrollment	34,127	771.65	526.97	100.00	9493.00	58,487	393.11	292.51	2.00	5352.00	***
Proportion Black	34,131	0.22	0.20	0.01	0.97	58,487	0.11	0.25	0.00	1.00	***
Proportion Latinx	34,131	0.22	0.22	0.00	0.97	58,487	0.21	0.29	0.00	1.00	***
Primary	34,134	0.45	0.50	0.00	1.00	58,487	0.42	0.49	0.00	1.00	***
Middle	34,134	0.17	0.38	0.00	1.00	58,487	0.13	0.33	0.00	1.00	***
High	34,134	0.16	0.37	0.00	1.00	58,487	0.15	0.36	0.00	1.00	***
Other	34,134	0.03	0.17	0.00	1.00	58,487	0.05	0.22	0.00	1.00	***
FRL Rate	27,815	0.55	0.25	0.00	2.02	43,863	0.51	1.04	0.00	195.50	***
City	34,134	0.26	0.44	0.00	1.00	58,487	0.13	0.34	0.00	1.00	***
Suburb	34,134	0.35	0.48	0.00	1.00	58,487	0.19	0.39	0.00	1.00	***
Town	34,134	0.08	0.27	0.00	1.00	58,487	0.13	0.34	0.00	1.00	***
Rural	34,134	0.13	0.33	0.00	1.00	58,487	0.31	0.46	0.00	1.00	***
Special Ed school	34,133	0.01	0.11	0.00	1.00	58,487	0.03	0.16	0.00	1.00	***
Magnet school	34,133	0.07	0.25	0.00	1.00	58,487	0.02	0.15	0.00	1.00	***
Charter school	34,133	0.05	0.22	0.00	1.00	58,487	0.08	0.26	0.00	1.00	***
Alt school	34,133	0.01	0.11	0.00	1.00	58,487	0.06	0.24	0.00	1.00	***

Note. This study's analytic sample is restricted to schools with a total enrollment of at least 100 students and at least 25 White and 25 Black students.
FRL = Free and Reduced-Price Lunch.
Standard errors in parentheses.
*p<.05, **p<.01, ***p<.00