



Beyond School Police Officers: Racial/Ethnic Disparities in Exposure to a Fuller Range of School Disciplinary Personnel

Ismael G. Munoz

Consejo Superior de Investigaciones Científicas (CSIC)

Kenneth A. Shores

University of Delaware

Ericka S. Weathers

University of Pennsylvania

S. Colby Woods

University of Pennsylvania

Using data from the 2017–18 and 2020–21 Civil Rights Data Collection, we document disparities in exposure to disciplinary staff across US high schools and geographic levels. Black and Hispanic students are exposed to 1.1 and 0.8 more disciplinary personnel than White students, respectively, which is equivalent to roughly twice the total average exposure to disciplinary personnel in high schools. This disparity is primarily due to differences in exposure to SSOs and to between district/within metropolitan—as opposed to between school/within district or between state—variation, though disparities exist at nearly all geo-graphic scales and for LEOs. These findings highlight the need to examine all disciplinary personnel roles to inform policies aimed at reducing inequities in school discipline practices.

VERSION: January 2025

Suggested citation: Munoz, Ismael G., Kenneth A. Shores, Ericka Sherrell Weathers, and S. Colby Woods. (2025). Beyond School Police Officers: Racial/Ethnic Disparities in Exposure to a Fuller Range of School Disciplinary Personnel. (EdWorkingPaper: 25-1125). Retrieved from Annenberg Institute at Brown University: <https://doi.org/10.26300/zs00-vv71>

**Beyond School Police Officers: Racial/Ethnic Disparities in Exposure to a Fuller Range
of School Disciplinary Personnel¹**

Ismael G. Munoz, PhD
Postdoctoral Researcher
Institute of Economy, Geography and Demography – CSIC

Kenneth Shores, PhD
Associate Professor
University of Delaware

Ericka Sherrell Weathers, PhD
Assistant Professor
University of Pennsylvania

S. Colby Woods, MPP
PhD Student
University of Pennsylvania

¹ Note: The authors are listed alphabetically to reflect equal contributions to this work.

Abstract

Using data from the 2017–18 and 2020–21 Civil Rights Data Collection, we document disparities in exposure to disciplinary staff across US high schools and geographic levels. Black and Hispanic students are exposed to 1.1 and 0.8 more disciplinary personnel than White students, respectively, which is equivalent to roughly twice the total average exposure to disciplinary personnel in high schools. This disparity is primarily due to differences in exposure to SSOs and to between district/within metropolitan—as opposed to between school/within district or between state—variation, though disparities exist at nearly all geographic scales and for LEOs. These findings highlight the need to examine all disciplinary personnel roles to inform policies aimed at reducing inequities in school discipline practices.

Keywords:

Ethnic and racial disparities, school policing, school security officers, Civil Rights Data Collection, education policy

Beyond School Police Officers: Racial/Ethnic Disparities in Exposure to a Fuller Range of School Disciplinary Personnel

Federal funding to promote school safety dates back to the 1960s with an amendment to the Omnibus Crime Control and Safe Streets Act, which encouraged partnerships between schools and local law enforcement agencies ([Hinton, 2015](#)). This federal legislation and accompanying funding appear to have increased state and district interest in the use of school officers to promote school safety. However, given the complex history between law enforcement agencies and communities of color, and racial disproportionality in the legal system, conceptualizations of school safety that involve the use of law enforcement have raised concerns about racial inequity in exposure to school officers. One such concern arose from the police-free schools movement, gaining momentum in the wake of the 2020 police killing of George Floyd ([Richards, 2020](#)). As of June 2022, at least 50 school districts serving nearly two million students defunded or reduced funding for their school policing programs ([Pendharkar, 2023](#)). Notably, the Chicago Board of Education recently voted to remove police officers from schools, though the schools will still utilize roughly 1,400 school security officers ([Franza & Perlman, 2024](#)). Such a decision highlights the need for a broader discussion about the full range of school disciplinary personnel, including their distribution and effects.

School disciplinary personnel include school resource officers (who are employed by municipalities; SROs), school police officers (who are employees of schools/districts; SPOs), and school security officers (who are also employees of schools/districts; SSOs). The Civil Rights Data Collection (CRDC) refers to SROs and SPOs as law enforcement officers (LEOs), and from here on out we will refer to both types of officers under this umbrella term. LEOs provide a well-documented and understood penultimate mediating step in the school-to-prison nexus (STPN) for students of color, as they have arresting authority over students,

and it has been shown that exogenous exposure to LEOs disproportionately affects the likelihood of arrests for Black students ([Pigott et al., 2017](#); [Sorenson et al., 2023](#)).

However, the role of SSOs is less clear. We theorize that SSOs have an important mediating role in the STPN but can have contradictory influences. In one way, SSOs may contribute to the STPN by the enforcement of dress codes, behavior, and regulation of incoming contraband. Conversely, SSOs may attenuate the STPN by regulating traditionally externally policed activities that enter schools (e.g., when students bring narcotics to school) ([Vernon & Curran, 2024](#)). To date, no rigorous causal evidence speaks to these two competing roles. Qualitative evidence supports the first case (e.g., [Mallett, 2015](#)) and correlational evidence supports the latter (e.g., [Owens, 2017](#)).

Given the different potential effects of school disciplinary personnel towards racial inequality in the STPN as well as potential heterogeneity in how school disciplinary personnel interact with different racial/ethnic student populations, it is useful to know just how unequally these two types of personnel—LEOs and SSOs—are distributed across schools. For example, if future analysis indicated a causal relationship between Black student's exposure to SSOs and the STPN, this could warrant different policy and practice decisions about the use and placement of SSOs in schools. However, a systematic understanding of where SSOs are located and who is exposed to them is needed first. The availability of descriptive and causal evidence collectively would allow the field to assess whether removing LEOs from schools, while keeping SSOs intact (as in Chicago Public Schools) addresses the larger concern. As such, we seek to answer the descriptive component of the school disciplinary personnel story by exploring:

1. What is the magnitude of racial/ethnic disparities in exposure to school-level policing both overall (combining LEOs and SSOs) and disaggregated by officer type?

2. How much of the nationwide racial/ethnic disparities in exposure to policing is attributable to disparities across subnational units (i.e., region, state, metropolitan area, and district)?

Prior studies addressing racial/ethnic inequality in prevalence and exposure to school policing have focused exclusively on LEOs. These studies showed that both prevalence (i.e., where officers are employed) and exposure (i.e., likely frequency of encounters) to officers in schools is patterned by the racial/ethnic composition of the student body. For example, using data from the 2013-2014 CRDC, officer prevalence was found to be greatest in schools with the largest shares of Black and Hispanic students (e.g., [Lindsay, Lee, & Lloyd, 2018](#)). Yet, between 2013-2014 and 2017-2018, the prevalence of officers in schools with the most students of color declined, whereas the prevalence of officers in schools with the fewest students of color held steady for secondary schools and increased for elementary schools ([Gleit, 2022](#)). As it relates to exposure, students in schools with more Black, Latinx, and Native American students tend to have the greatest number of encounters with LEOs. Students in schools with more white students were also frequently exposed to officers. However, officers in the former were more frequently used to carry out punitive tasks and officers in the latter were more often directed to perform nonpunitive tasks ([Gleit, 2022](#)). These findings highlight how prevalence, exposure, and use of LEOs in schools are racially patterned.

Our research addresses some notable gaps in the literature. First, according to CRDC data, there are more full-time employed (FTE) SSOs than LEOs (30,000 FTE SSOs compared to 22,000 FTE SROs). Thus, whether SSOs are unequally distributed by race/ethnicity will help inform the field's understanding of their potential for remediating or exacerbating racial differences in the STPN. In addition, prior literature has focused on the racial/ethnic composition of schools as the primary predictor of prevalence and exposure, whereas we anticipate geographic variation in segregation to mediate exposure to school disciplinary personnel. We

expect this mediating influence, first, because racial/ethnic segregation is multilayered and varies in severity at different geographical aggregations ([Fischer et al., 2004](#); [Jang, 2024](#); [Owens & Reardon, 2016](#); [Reardon et al., 2008](#)). Second, geographical factors influence the distribution of school resources (e.g., school funding is more unequally distributed across states than within ([Lee et al., 2022](#)), and access to school resources is mediated by racial/ethnic segregation ([Sosina & Weathers, 2019](#); [Weathers & Sosina, 2022](#)). Taken together, our more comprehensive analysis of differential exposure to school disciplinary personnel will include SSOs and focus on geographic variation.

Data and Methods

We use data from the 2017-18 and 2020-21 CRDC from the U.S. Department of Education's Office for Civil Rights (OCR), covering all K-12 public schools nationwide. These cycles were selected due to reporting issues in 2015-16 that affected over 69,000 schools, ensuring data reliability. We combined CRDC data with data from the Common Core of Data (CCD), provided by NCES, specifically school enrollment by racial/ethnic group and free lunch program eligibility. Additionally, these data include the region, state, and district where the school is located, which allows us to estimate racial/ethnic differences in exposure to policing at the national and subnational levels. To obtain identifier information on metropolitan statistical areas (MSA), we used the Stanford Education Data Archive (SEDA) for the academic years 2017-18 and 2020-21. We exclude juvenile justice centers (less than 1% of schools), due to high missing data (over 50%) on relevant questions. The final dataset includes about 85,000 schools from nearly 13,000 school districts (depending on the survey cycle).

The key variables for our analyses are the number of FTE school disciplinary personnel (LEOs and SSOs combined, as well as separately) per 1,000 students within a school. We observed about 250 observations per survey year in the CRDC with extreme FTE values.

Therefore, we conservatively winsorized any observations in counts of school disciplinary personnel per 1,000 students that exceed three times the 99th percentile.

In our study, we operationalize exposure as the average level of disciplinary staffing that students from different racial/ethnic backgrounds encounter, rather than focusing solely on prevalence or encounter frequency. To estimate racial/ethnic differences in exposure to school disciplinary personnel, we employ a variance decomposition estimator that compares staffing levels between paired groups (Black-White and Hispanic-White) across multiple geographic levels. Our estimand represents the average difference in disciplinary staffing that students from different racial/ethnic backgrounds experience. We decompose these nationwide disparities into components attributable to variation between schools within the same district, between districts within the same core based statistical area (CBSA), between CBSAs within the same US Census region, and between regions. This decomposition, weighted by student enrollment at each level, helps determine whether disparities stem primarily from differences in staffing between schools or from broader geographic patterns. Technical details of our estimation strategy are provided in the Supplemental Appendix online.

We focus on the distribution of LEOs and SSOs across high schools because disciplinary personnel are more likely to be in high schools, and including elementary schools may attenuate differential exposure; however, our supplemental results also include combined elementary and high schools. For geographic decomposition, we emphasize the CBSA over the state, as the CBSA can encompass multiple state boundaries and can act as a centralized funding agency for SRO staffing. We use the CBSA as opposed to the MSA alone, as the CBSA include other more rural geographies and provides more comprehensive coverage of the US. Each MSA is its own CBSA, and there are additional CBSAs when new true MSA exists. We provide supplemental results that decompose variation into the within state (as

opposed to within CBSA) component, which can be found in Supplemental Appendix Table A1, A2, and A3.

Results

Analysis of metropolitan high schools reveals substantial racial disparities in exposure to school disciplinary personnel between Black and White students in both 2018 and 2021. The LEO and SSO combined Black-White exposure gap stood at 1.163 in 2018, moderating slightly to 1.021 by 2021. Notably, this disparity is almost entirely driven by differences in exposure to SSOs rather than LEOs, with SSO gaps of 0.974 and 0.822 in 2018 and 2021 respectively, compared to much smaller LEO gaps of 0.172 and 0.179. To help with interpretation, the average number of school disciplinary staff (SSOs and LEOs combined), SSOs, and LEOs per 1,000 students is 1.11, 0.62, and 0.48 respectively, with standard deviations of 2.32, 1.70, and 1.22. Thus, these gap magnitudes represent approximately 157% and 133% of the mean for SSOs in 2018 and 2021 respectively, equivalent to 0.573 and 0.484 SD units. For LEOs, the gaps represent roughly 36% and 37% of the mean in 2018 and 2021 respectively, equivalent to 0.141 and 0.147 SD units.

<Table 1 Here>

The geographic decomposition of the Black-White exposure gap reveals inequality at nearly all spatial scales, from regional to school-level differences. The most pronounced component emerges at the between-district within CBSA level, accounting for gaps of 0.944 (2018) and 0.832 (2021) in total personnel exposure, or roughly 80% of the total gap. Between-CBSA variation within regions contributes more modestly (0.312 in 2018), while between-school differences within districts show the smallest yet still significant contribution (0.258 in 2018).

Hispanic-White disparities in disciplinary personnel exposure, while substantial, present a different pattern and smaller magnitude compared to Black-White gaps. The overall Hispanic-White exposure differential was 0.792 in 2018, declining to 0.655 by 2021. As with

Black-White disparities, these gaps are driven by SSO exposure (0.749 in 2018, 0.711 in 2021) rather than LEO exposure, which showed minimal differences (0.026 in 2018, -0.055 in 2021).

The geographic decomposition of Hispanic-White disparities reveals a more balanced distribution across spatial scales compared to Black-White gaps. Between-CBSA and between-district components contribute similarly to the total gap (0.482 and 0.491 respectively in 2018), both substantially larger than the between-school component (0.105 in 2018). This more uniform distribution across geographic scales suggests different underlying mechanisms may drive Hispanic-White versus Black-White exposure disparities. Supplemental Appendix Tables A1 - A3 report the decomposition for all schools (A1), high schools using the state as the geographic unit instead of the CBSA (A2), and all schools using states instead of the CBSA (A3). The overall patterns are quite consistent: differential exposure to SSOs drives inequality, within state variation is the largest source of inequality (similar to within CBSA exposure), and Hispanic-White gaps in exposure are smaller and more evenly spatially distributed. The key distinction is that all school level of exposure is about 60% of the magnitude of the high school level exposure, an anticipated result due to many elementary schools having zero disciplinary personnel.

Notably, the between-region component is negative for both Black and Hispanic student exposure, meaning that regional differences partially offset more localized disparities. In Figure 1, we explain this result as attributable to *levels* differences in disciplinary personnel in US Census Regions with the largest concentrations of Black and Hispanic students. These regional patterns reflect overall school resource disparities, which researchers have shown have striking regional patterns causing school spending inequality to be regressive across regions but progressive within them ([Lee et al., 2022](#)). Our results show that this regional effect drives down overall exposure to LEOs and SSOs, but inequality in exposure persists at every other spatial level.

<Figure 1 Here>

Finally, given the result that within-CBSA inequality is by far the largest source of differential exposure, we wish to emphasize that CBSAs – and metropolitan areas specifically – vary in their level of inequality within this unit. Thus, we estimate CBSA-specific gaps using the same framework as above and plot those below, illustrating the important role of racial segregation as a predictor of exposure.

<Figure 2 Here>

Figure 2 displays scatter plots that capture bivariate associations between CBSA-specific Black-White and Hispanic-White gaps in the prevalence of SSOs and three potential predictors of exposure: racial segregation, racial composition, and racial difference in exposure to school poverty. Although both racial segregation and differences in exposure to school poverty are positively associated with racial differences in exposure to SSOs, results from multivariate regressions indicate that racial segregation is the strongest and only significant predictor of between-CBSA variation in exposure to SSOs (3.21 for the Black-White difference and 2.16 for the Hispanic-White difference). Additionally, Appendix Figure A1 shows that racial disparities in exposure to LEOs are not significantly explained by any of these three predictors.

Discussion

Our findings reveal that Black-White and Hispanic-White disparities in exposure to high school disciplinary personnel are large and geographically patterned. Black-White disparities in exposure to school disciplinary personnel are larger in magnitude compared to Hispanic-White disparities and primarily driven by disparities in exposure to SSOs. This pattern exists at nearly all spatial scales. Hispanic-White disparities in exposure to school disciplinary personnel are smaller in magnitude but also driven by disparities in exposure to SSOs. A key contrast is the more uniform distribution of Hispanic-White inequality across geographic scales.

These findings suggest that districts removing LEOs in response to the police-free schools movement (e.g., Chicago Public Schools) may still leave Black (primarily) and Hispanic students disproportionately more exposed to school disciplinary personnel (specifically, SSOs) than their white peers. Furthermore, given the substantial inequality in exposure to SSOs for Black and Hispanic students, our results support the need for empirical evidence on the causal effect of SSOs (not just LEOs) on student outcomes to better understand their role in remediating or exacerbating exposure to the STPN.

References

- Fischer, C.S., Stockmeyer, G., Stiles, J., & Hout, M. (2004). Distinguishing the geographic levels and social dimensions of US metropolitan segregation, 1960–2000. *Demography*, 41(1), 37-59.
- Franza, S. & Perlman, M. (2024, February 22). Chicago Board of Education votes to remove Chicago police officers from schools. *CBS News*. <https://www.cbsnews.com/chicago/news/chicago-board-of-education-to-vote-remove-police-officers/>
- Gleit, R.D. (2022). Cops on campus: The racial patterning of police in schools. *Socius*, 8, 1-18.
- Hinton, E. (2015). A war within our own boundaries: Lyndon Johnson's great society and the rise of the carceral state. *The Journal of American History*, 102(1), 100-112.
- Jang, H. (2024). Racial economic segregation across US Public Schools, 1991–2022. *AERA Open*, <https://doi.org/10.1177/23328584241282274>
- Lee, H., Shores, K., & Williams, E. (2022). The distribution of school resources in the United States: A comparative analysis across levels of governance, student subgroups, and educational resources. *Peabody Journal of Education*, 97(4), 395-411.
- Lindsay, C., Lee, V., and Lloyd, V. (2018) The prevalence of police officers in US schools. *Urban Wire: Crime and Justice*. <https://www.urban.org/urban-wire/prevalence-police-officers-us-schools>
- Mallett, C.A. (2016). The school-to-prison pipeline: A critical review of the punitive paradigm shift. *Child and Adolescent Social Work Journal*, 33, 15-24.
- Owens, A., Reardon, S.F., & Jencks, C. (2016). Income segregation between schools and school districts. *American Educational Research Journal*, 53(4), 1159-1197.
- Owens, E.G. (2017). Testing the school-to-prison pipeline. *Journal of Policy Analysis*

and Management, 36(1), 11-37.

- Pendharkar, E. (2023, June 29). Advocates agree: Police shouldn't handle routine discipline in schools. *Education Week*. <https://www.edweek.org/leadership/advocates-agree-police-shouldnt-handle-routine-discipline-in-schools/2023/06#:~:text=From%20May%202020%20through%20June,data%20compiled%20by%20Education%20Week%20>.
- Pigott, C., Stearns, A.E., & Khey, D.N. (2018). School resource officers and the school to prison pipeline: Discovering trends of expulsions in public schools. *American Journal of Criminal Justice*, 43, 120-138.
- Reardon, S.F., Matthews, S.A., O'Sullivan, D., Lee, B.A., Firebaugh, G., Farrell, C.R., & Bischoff, K. (2008). The geographic scale of metropolitan racial segregation. *Demography*, 45(3), 489-514.
- Richards, E. (2020, June 11). Defund police in schools? How the movement got momentum after George Floyd's death. *USA Today*. <https://www.usatoday.com/story/news/education/2020/06/11/defund-police-school-george-floyd-death-protests/5338940002/>
- Sorensen, L.C., Avila-Acosta, M., Engberg, J.B., & Bushway, S.D. (2023). The thin blue line in schools: New evidence on school-based policing across the US. *Journal of Policy Analysis and Management*, 42(4), 941-970.
- Sosina, V.E. & Weathers, E.S. (2019). Pathways to inequality: Between-district segregation and racial disparities in school district expenditures. *AERA Open*, 5(3), 1-15.
- Vernon, K. & Curran, C.F. (2023). On guard but not sworn: The relationship between school security guards, school resource officers, and student behavior, discipline, and arrests. *Criminology & Public Policy*, 23(2), 327-360.

Sosina, V. E., & Weathers, E. S. (2019). Pathways to inequality: Between-district segregation and racial disparities in school district expenditures. *AERA open*, 5(3), 2332858419872445.

Weathers, E.S. & Sosina, V.E. (2022). Separate remains unequal: Contemporary segregation and racial disparities in school district revenue. *American Educational Research Journal*, 59(5), 905-938.

Tables

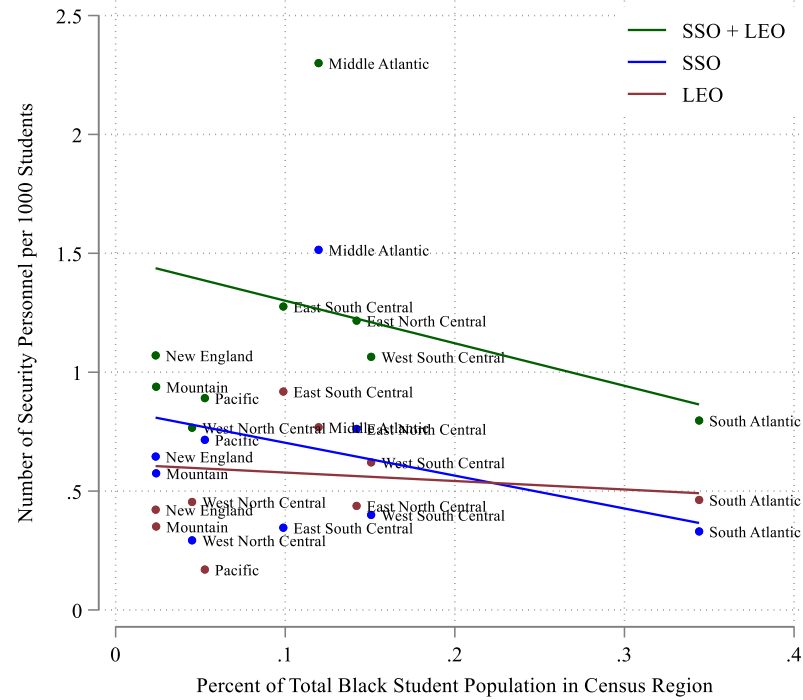
Table 1. Geographic Decomposition of Exposure to School Disciplinary Personnel: High School and CBSA

Black vs White Exposure					
2018 Gap Decomposition			2021 Gap Decomposition		
SSO + LEO	SSO	LEO	SSO + LEO	SSO	LEO
<i>Overall Gap (USA)</i>					
1.163	0.974	0.172	1.021	0.822	0.179
0.000	0.000	0.000	0.110	0.035	0.863
<i>Within Region Between CBSA</i>					
0.312	0.322	-0.007	0.289	0.291	-0.002
0.037	0.028	0.870	0.919	0.883	0.955
<i>Within CBSA Between District</i>					
0.944	0.826	0.103	0.832	0.738	0.076
0.000	0.000	0.002	0.389	0.458	0.657
<i>Within District Between Schools</i>					
0.258	0.183	0.069	0.243	0.146	0.09
0.000	0.000	0.000	0.674	0.197	0.200
<i>Between Region</i>					
-0.351	-0.357	0.007	-0.343	-0.353	0.015
Hispanic vs White Exposure					
<i>Overall Gap (USA)</i>					
0.792	0.749	0.026	0.655	0.711	-0.055
0.000	0.000	0.158	0.040	0.511	0.001
<i>Within Region Between CBSA</i>					
0.482	0.494	-0.018	0.457	0.462	-0.006
0.003	0.002	0.714	0.918	0.893	0.897
<i>Within CBS Between District</i>					
0.491	0.412	0.063	0.371	0.355	0.015
0.000	0.000	0.052	0.247	0.555	0.261
<i>Within District Between Schools</i>					
0.105	0.073	0.030	0.084	0.057	0.026
0.000	0.000	0.000	0.326	0.339	0.675
<i>Between Region</i>					
-0.286	-0.23	-0.049	-0.257	-0.163	-0.09

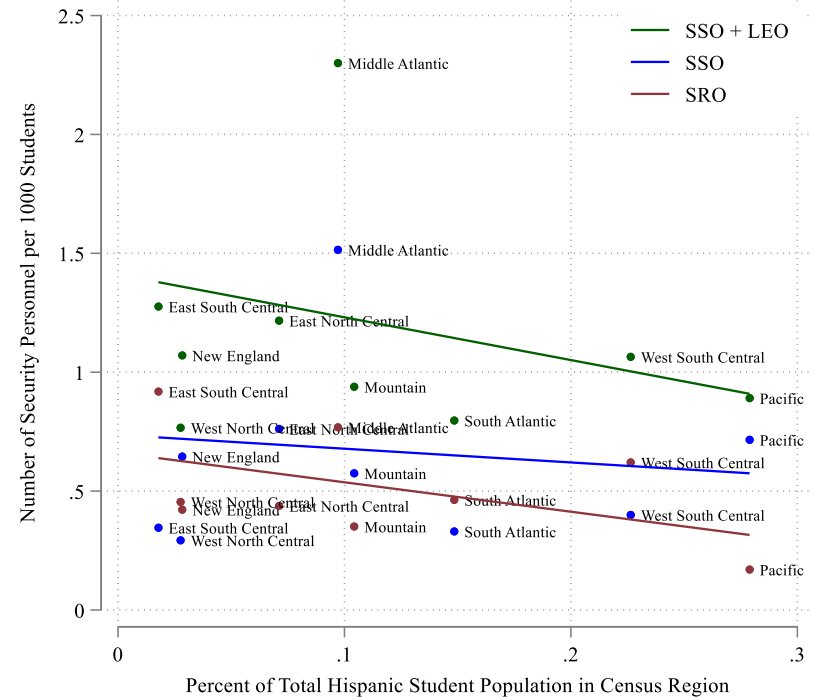
Notes: Gap estimates are based on regression estimates from Equation (1). Coefficients represent the average difference in exposure between the focal group (e.g., Black students) and the reference group (e.g., White students). However, p-values for the 2018 gap composition are based on the test of whether the gap is different from zero, whereas p-values for the 2021 gap composition are based on the test of whether the 2021 gap is different from the 2018 gap. The between region gap is not estimated and is the residual component of the total gap minus the within region, within CBSA, and within district gaps. These estimates and, specifically, tests for differences in exposure gaps between 2018 and 2021 survey years are from regression equations from Equation (1).

Figures

Figure 1. US Census Region Black and Hispanic Student Population Share and Disciplinary Personnel

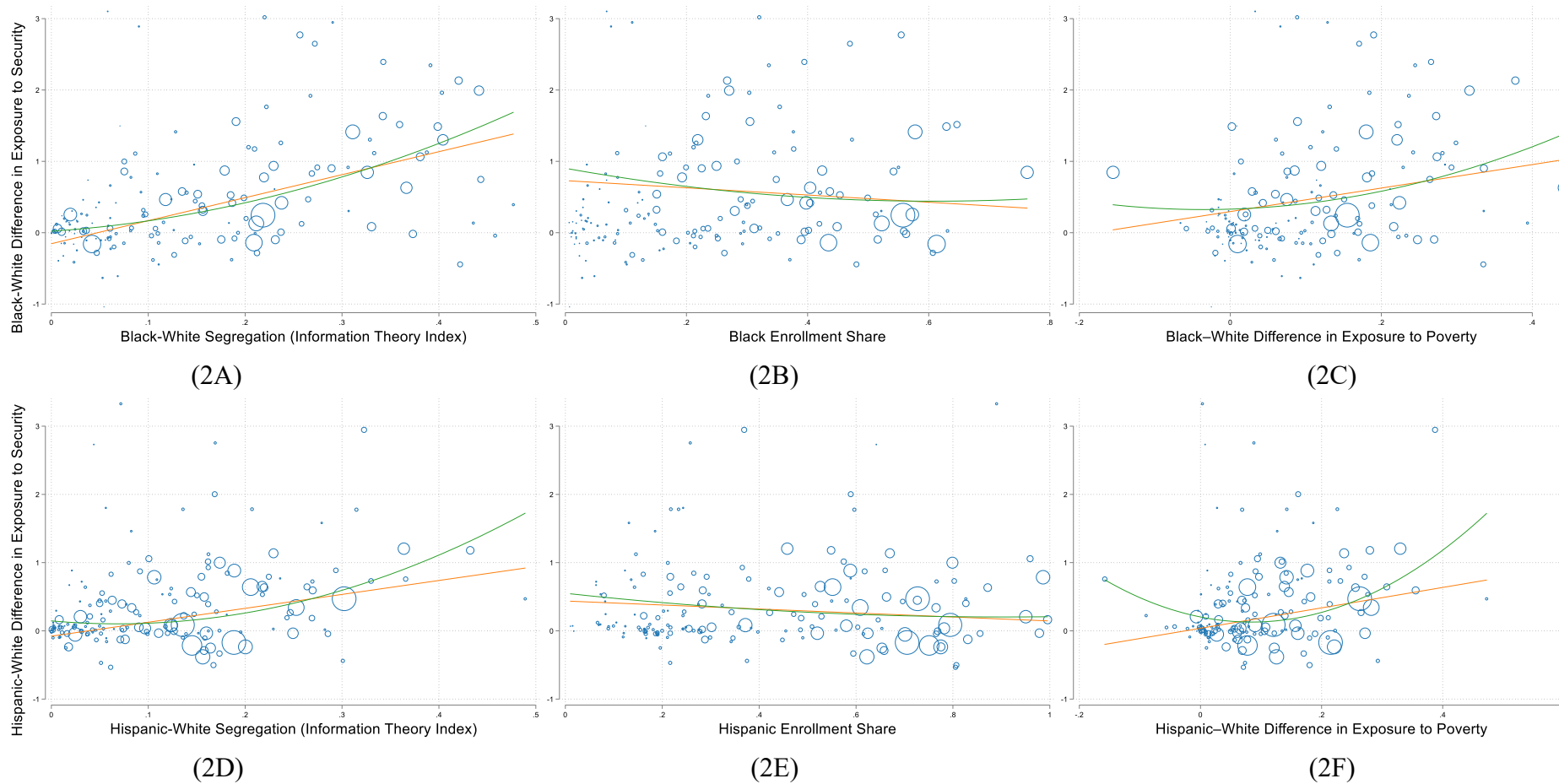


(1A)



(1B)

Note: Figure plots the US Census Region average number of discipline personnel, SSOs, and LEOs per 1000 students as a function of the Black and Hispanic student share (Panels 1A and 1B, respectively). Linear line of best fit is weighted by the Black or Hispanic student share.

Figure 2. CBSA-Specific Gaps in Exposure to SSOs and Racial Segregation

Note: Figure plots the bivariate associations between Black-White and Hispanic-White differences in exposure to SSOs (Panels 2A-2C and 2D-2F, respectively) and three predictors of exposure (racial segregation, racial proportion, and racial difference in exposure to school poverty). Linear line of best fit is weighted by the Black or Hispanic student share.

Online Appendix

Analytical Strategies

Estimating Differences in Exposure to School Disciplinary Personnel

Our primary aim is to decompose differences in racial/ethnic exposure to school disciplinary personnel at different levels of aggregation. We estimate racial/ethnic differences in exposure to school disciplinary personnel using the following equation:

$$Personnel_{lgu} = \beta \times group_{lgu} + \delta_u + \varepsilon_{lgu} \quad (1)$$

Where $Personnel_{lgu}$ indicates the number of FTE school disciplinary personnel per 1,000 students in the lower level of aggregation l (e.g., schools) for paired group g (Black-White and Hispanic-White). Because we have counts of data at the l level, in practice to estimate this equation, we stack the data so that each unit l is repeated twice, with the variable enrollment for the group g differentiating each unit l . Then, an indicator variable representing the group is created, and the regression is estimated with analytic weights using the enrollment. In practice, the estimand from this equation is the average group difference in exposure to $Staff_{lgu}$. For the total gap across the U.S., we omit any fixed effect δ_u ; for any other subnational level we include the fixed effect δ_u at the upper level of aggregation u (e.g., to calculate the within MSA average exposure gap, we include an MSA fixed effect). ε_{lgu} is the error term adjusted for heteroskedasticity. We estimate $Staff_{lgu}$ for total disciplinary staff, as well as school security officers and school law enforcement officers for both 2017-18 and 2020-21 academic years.

Decomposing Differences in Exposure to School Disciplinary Personnel

The decomposition of nationwide differences in exposure to school disciplinary staff is due to a disproportionate concentration of each racial/ethnic subgroup in particular subnational levels that assign differential numbers of school disciplinary personnel. To conduct this

decomposition, we take the total gap, designated $\text{Dif}_{(US|SC)}$, and parse it into four components: (1) between school, within district, (2) between district, within MSA (or state), (3) between MSA, within U.S. Census region, and (4) between region, within nation. Algebraically, this decomposition takes the form:

$$\begin{aligned} \text{Dif}_{US|SC} = & \text{Dif}_{(4)US|re} \\ & + \sum_{re} \frac{I_{re}n_{re}}{I_{US}n_{US}} \text{Dif}_{(3)re|msa} + \sum_{st} \frac{I_{st}n_{st}}{I_{US}n_{US}} \text{Dif}_{(2)msa|di} + \sum_{di} \frac{I_{di}n_{di}}{I_{US}n_{US}} \text{Dif}_{(1)di|sc} \end{aligned} \quad (2)$$

Where $\text{Dif}_{(US|SC)}$ is the average nationwide difference in exposure to school disciplinary personnel based on school level data. $\text{Dif}_{(US|re)}$ is the between region within nation difference in exposure. Then, if students from the target subgroup (e.g., Black) are disproportionately concentrated in regions with more school security personnel (and the opposite for the reference group, e.g., White), this component will be large. The second right-side term is a weighted sum of within region differences in exposure to school disciplinary staff based on MSA-level data ($\text{Dif}_{(re|msa)}$). n_{re} and n_{US} indicate enrollment counts at the region and nation levels, respectively; and I_{re} and I_{US} indicate the share of students in the target subgroup at the region and nation levels, respectively, where $I = 2\pi(1 - \pi)$ and π is the proportion of students in the region that belong to the target subgroup. Thus, weights are proportional to the size of the region $\frac{n_{re}}{n_{US}}$ and to the share of the target subgroup in the region $\frac{I_{re}}{I_{US}}$. Then, larger and more diverse regions, as well as those with larger within-region differences contribute more to the nationwide difference in exposure to school disciplinary personnel.

We follow a similar approach for decomposing within region differences into between MSA components², within MSA differences into between district components, and within district differences into between school components. In practice, we estimate components (2) through (4) using a series of fixed effects regressions as described in Equation (1) where the fixed effect is specified for the “within” component of interest and the “between” component are data aggregated to that level – e.g., for the within MSA component we include an MSA fixed effect and use district level data. The remaining between region component is the residual from this decomposition; that is, it is the remaining piece of the total gap $\text{Dif}_{(US|SC)}$ after subtracting out the components (2) through (4).

² Separately, we replace MSAs with states and replicate the decomposition. Because MSAs cross state lines and can define their own municipal boundaries for funding resource officers, we choose to focus on MSAs as the focal geography and report state-level decompositions in the appendix.

Appendix Tables

Table A1. Geographic Decomposition of Exposure to School Disciplinary Personnel: All Schools and CBSA

Metropolitan Sample with All Schools					
Black vs White Exposure					
2018 Gap Decomposition			2021 Gap Decomposition		
SSO + LEO	SSO	LEO	SSO + LEO	SSO	LEO
<u>Overall Gap (USA)</u>					
0.679	0.611	0.060	0.643	0.581	0.054
0.000	0.000	0.000	0.286	0.279	0.695
<u>Within Region Between CBSA</u>					
0.182	0.202	-0.022	0.159	0.205	-0.046
0.049	0.016	0.525	0.870	0.983	0.725
<u>Within CBSA Between District</u>					
0.490	0.485	0.004	0.446	0.466	-0.028
0.000	0.000	0.878	0.598	0.803	0.521
<u>Within District Between Schools</u>					
0.171	0.125	0.043	0.189	0.107	0.079
0.000	0.000	0.000	0.331	0.213	0.000
<u>Between Region</u>					
-0.164	-0.201	0.035	-0.151	-0.197	0.049
Hispanic vs White Exposure					
<u>Overall Gap (USA)</u>					
0.422	0.427	-0.028	0.351	0.448	-0.095
0.000	0.000	0.003	0.011	0.328	0.000
<u>Within Region Between CBSA</u>					
0.268	0.283	-0.028	0.25	0.289	-0.038
0.008	0.002	0.467	0.903	0.964	0.901
<u>Within CBSA Between District</u>					
0.298	0.273	0.016	0.226	0.242	-0.016
0.000	0.000	0.671	0.388	0.627	0.545
<u>Within District Between Schools</u>					
0.034	0.021	0.010	0.045	0.025	0.021
0.009	0.007	0.127	0.509	0.731	0.174
<u>Between Region</u>					
-0.178	-0.15	-0.026	-0.17	-0.108	-0.062

Notes: Gap estimates are based on regression estimates from Equation (1). Coefficients represent the average difference in exposure between the focal group (e.g., Black students) and the reference group (e.g., White students). However, p-values for the 2018 gap composition are based on the test of whether the gap is different from zero, whereas p-values for the 2021 gap composition are based on the test of whether the 2021 gap is different from the 2018 gap. The between region gap is not estimated and is the residual component of the total gap minus the within region, within CBSA, and within district gaps. These estimates and, specifically, tests for differences in exposure gaps between 2018 and 2021 survey years are from regression equations from Equation (1).

Table A2. Geographic Decomposition of Exposure to School Disciplinary Personnel: High Schools and State

State Sample for High Schools					
Black vs White Exposure					
2018 Gap Decomposition			2021 Gap Decomposition		
SSO + LEO	SSO	LEO	SSO + LEO	SSO	LEO
<i><u>Overall Gap (USA)</u></i>					
1.175	0.983	0.177	1.165	0.809	0.33
0.000	0.000	0.000	0.908	0.011	0.000
<i><u>Within Region Between State</u></i>					
0.121	0.131	-0.009	0.199	0.161	0.035
0.518	0.450	0.919	0.800	0.905	0.802
<i><u>Within State Between District</u></i>					
1.097	0.986	0.098	0.946	0.776	0.151
0.000	0.000	0.006	0.282	0.156	0.638
<i><u>Within District Between Schools</u></i>					
0.248	0.176	0.067	0.304	0.139	0.155
0.000	0.000	0.000	0.129	0.175	0.000
<i><u>Between Region</u></i>					
-0.291	-0.31	0.021	-0.284	-0.267	-0.011
Hispanic vs White Exposure					
<i><u>Overall Gap (USA)</u></i>					
0.811	0.777	0.018	0.746	0.082	0.692
0.000	0.000	0.314	0.314	0.271	0.673
<i><u>Within Region Between State</u></i>					
0.266	0.294	-0.034	0.281	0.295	-0.016
0.144	0.082	0.692	0.959	0.998	0.912
<i><u>Within State Between District</u></i>					
0.686	0.611	0.061	0.593	0.464	0.127
0.000	0.000	0.056	0.429	0.242	0.537
<i><u>Within District Between Schools</u></i>					
0.101	0.070	0.029	0.111	0.054	0.055
0.000	0.000	0.000	0.667	0.316	0.054
<i><u>Between Region</u></i>					
-0.242	-0.198	-0.038	-0.239	-0.731	0.526

Notes: Gap estimates are based on regression estimates from Equation (1). Coefficients represent the average difference in exposure between the focal group (e.g., Black students) and the reference group (e.g., White students). However, p-values for the 2018 gap composition are based on the test of whether the gap is different from zero, whereas p-values for the 2021 gap composition are based on the test of whether the 2021 gap is different from the 2018 gap. The between region gap is not estimated and is the residual component of the total gap minus the within region, within state, and within district gaps. These estimates and, specifically, tests for differences in exposure gaps between 2018 and 2021 survey years are from regression equations from Equation (1).

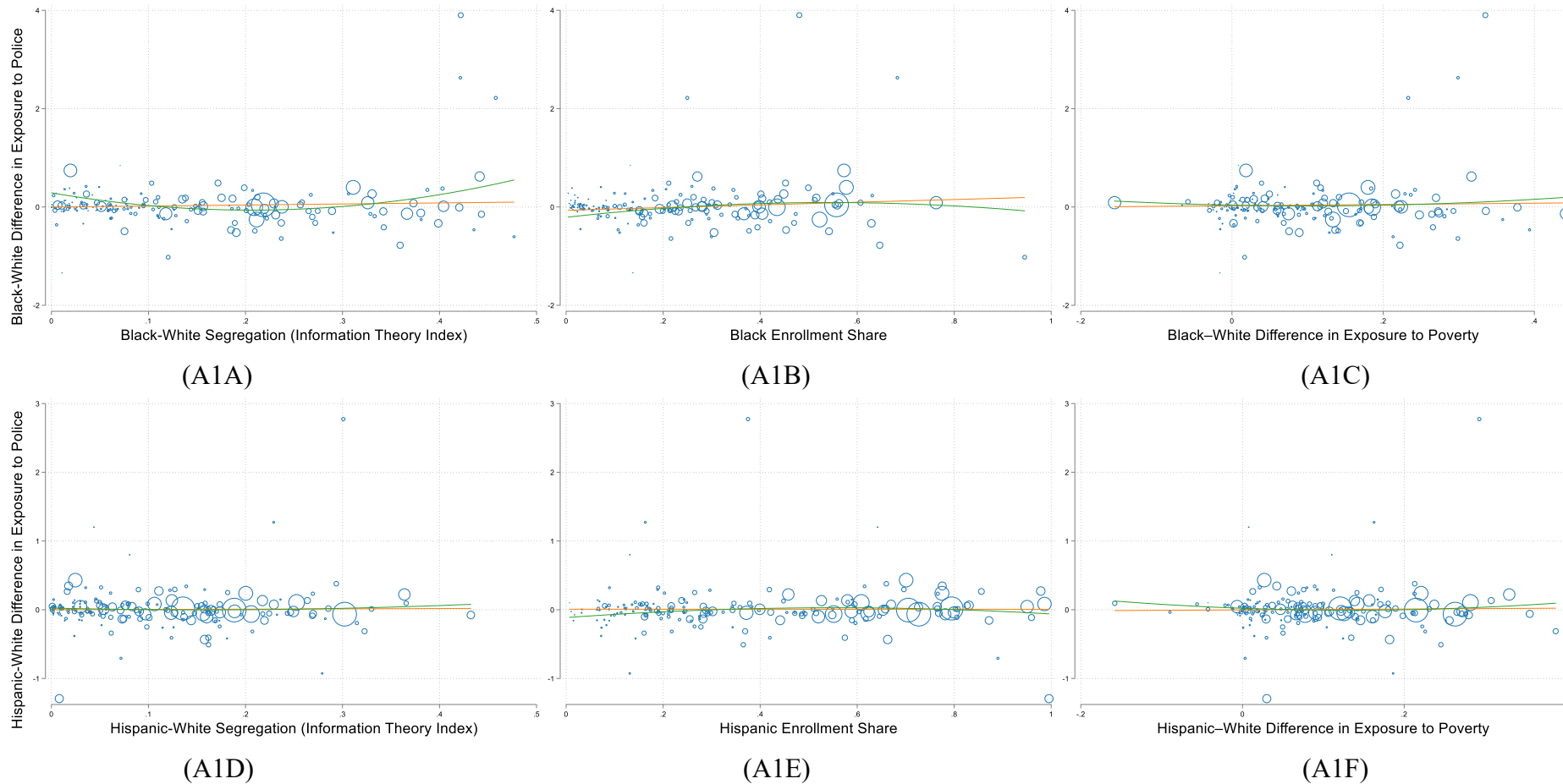
Table A3. Geographic Decomposition of Exposure to School Disciplinary Personnel: All Schools and State

State Sample for All Schools					
Black vs White Exposure					
2018 Gap Decomposition			2021 Gap Decomposition		
SSO + LEO	SSO	LEO	SSO + LEO	SSO	LEO
<i><u>Overall Gap (USA)</u></i>					
0.680	0.611	0.063	0.686	0.579	0.097
0.000	0.000	0.000	0.866	0.234	0.031
<i><u>Within Region Between State</u></i>					
0.077	0.079	-0.001	0.114	0.096	0.017
0.516	0.404	0.991	0.851	0.904	0.889
<i><u>Within State Between District</u></i>					
0.564	0.578	-0.017	0.476	0.529	-0.06
0.000	0.000	0.500	0.328	0.591	0.512
<i><u>Within District Between Schools</u></i>					
0.165	0.120	0.042	0.211	0.102	0.105
0.000	0.000	0.000	0.011	0.195	0.000
<i><u>Between Region</u></i>					
-0.126	-0.166	0.039	-0.115	-0.148	0.035
Hispanic vs White Exposure					
<i><u>Overall Gap (USA)</u></i>					
0.426	0.437	-0.033	0.376	0.081	0.663
0.000	0.000	0.000	0.066	0.378	0.000
<i><u>Within Region Between State</u></i>					
0.144	0.160	-0.028	0.132	0.177	-0.046
0.207	0.081	0.663	0.950	0.896	0.880
<i><u>Within State Between District</u></i>					
0.404	0.385	0.011	0.35	0.335	0.017
0.000	0.000	0.750	0.543	0.540	0.938
<i><u>Within District Between Schools</u></i>					
0.032	0.020	0.009	0.055	0.023	0.031
0.011	0.008	0.154	0.163	0.743	0.006
<i><u>Between Region</u></i>					
-0.154	-0.128	-0.025	-0.161	-0.454	0.661

Notes: Gap estimates are based on regression estimates from Equation (1). Coefficients represent the average difference in exposure between the focal group (e.g., Black students) and the reference group (e.g., White students). However, p-values for the 2018 gap composition are based on the test of whether the gap is different from zero, whereas p-values for the 2021 gap composition are based on the test of whether the 2021 gap is different from the 2018 gap. The between region gap is not estimated and is the residual component of the total gap minus the within region, within state, and within district gaps. These estimates and, specifically, tests for differences in exposure gaps between 2018 and 2021 survey years are from regression equations from Equation (1).

Appendix Figures

Figure A1. CBSA-Specific Gaps in Exposure to LEOs and Racial Segregation



Note: Figure plots the bivariate associations between Black-White and Hispanic-White differences in exposure to LEOs (Panels 2A-2C and 2D-2F, respectively) and three predictors of exposure (racial segregation, racial proportion, and racial difference in exposure to school poverty). Linear line of best fit is weighted by the Black or Hispanic student share.