Racial Economic Segregation among U.S. Public Schools, 1991-2020

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Despite its substantive importance as the strongest predictor of racial achievement gaps, racial economic segregation has been understudied in the previous literature on segregation. This paper describes trends in racial economic segregation over the last three decades and decomposes these trends into different geographic scales (e.g., between-state, between-district, and within-district segregation). Racial economic segregation has decreased since the late 1990s, yet Black students are still considerably isolated in schools with higher poverty rates. Between-district segregation has been the largest component of racial economic segregation, whereas within-district segregation has steadily grown during the last three decades. Findings from the present study suggest the imperativeness of inter-district policy remedies while also highlighting intra-district policy needs for promoting student diversity across schools in the district.

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Despite its substantive importance as the strongest predictor of racial achievement gaps, racial economic segregation has been understudied in the previous literature on segregation. This paper describes trends in racial economic segregation over the last three decades and decomposes these trends into different geographic scales (e.g., between-state, between-district, and within-district segregation). Racial economic segregation has decreased since the late 1990s, yet Black students are still considerably isolated in schools with higher poverty rates. Between-district segregation has been the largest component of racial economic segregation, whereas within-district segregation has steadily grown during the last three decades. Findings from the present study suggest the imperativeness of inter-district policy remedies while also highlighting intra-district policy needs for promoting student diversity across schools in the district.

Keywords: school segregation, racial segregation, economic segregation, school poverty, segregation decomposition

Introduction

Segregation is deep-rooted in U.S. society, hindering educational opportunity and social mobility for students of color. It concentrates Black and Hispanic children into higher-poverty neighborhoods (Firebaugh & Acciai, 2016) and under-resourced K-12 schools (Jackson, 2009). Schools serving racially minoritized and low-income students often have less qualified teachers with fewer years of experience (Clotfelter et al., 2005; Peske & Haycock, 2006), fewer advanced courses, and fewer college preparation resources (Kuscera et al., 2015; Rumberger & Palardy, 2005) relative to schools serving White and more affluent peers. Consequently, racial achievement gaps are wider in more segregated areas (Condron et al., 2013).

Among the many dimensions and measures of segregation, the strongest predictor of racial achievement gaps is the concentration of racially minoritized students in schools with high poverty rates (Reardon, 2016), which I refer to as "racial economic segregation." Furthermore, recent evidence (Reardon et al., 2021) shows that racial economic segregation is the primary mechanism of racial segregation leading to racial achievement gaps. Their findings suggest that Black/Hispanic students have test scores lower than their White peers, not because their schools are populated with students of color, but because they go to schools with higher poverty rates. Consequently, monitoring racial economic segregation may provide a better understanding of racial inequality in public education and lead to more effective policies that increase educational opportunities for the underserved.

This critical aspect of segregation has been surprisingly understudied, as previous research focuses primarily on *either* racial *or* economic segregation independently. Only a handful of prior studies document trends in racial economic segregation during the last few decades, but their results are inconsistent: Fahle et al. (2020) find that racial economic

segregation declined modestly from 1999 to 2016 for both Black-White and Hispanic-White comparisons, whereas the Civil Rights Project reports (Orfield et al., 2016; Orfield & Jarvie, 2020) document an increase in Black-White racial economic segregation during the 2000s. Consequently, we lack a basic understanding of how racial economic segregation among schools has changed over time.

Moreover, these prior studies do not provide evidence on how changes in racial economic segregation vary across districts, metropolitan areas, or states. Describing how racial economic segregation is attributable to segregation between and within school districts may be useful for assessing how much of the current segregation can be addressed via inter- and intra-district educational policies. In addition, identifying how between-district segregation consists of between- and within-state or between- and within-metropolitan area components may be helpful for understanding to what extent current segregation is related to macro-level demographic patterns, which may not be directly addressed via policy. Therefore, the geographic decomposition of racial economic segregation may inform the potential of policies at different organizational levels to reduce school segregation.

In this paper, I describe the national trends in racial economic segregation from 1991 to 2020 using the Longitudinal School Demographic Dataset (LSDD; Reardon et al., 2022a), a cleaned and imputed version of the Common Core of Data (CCD). I then decompose the nation's racial economic segregation into between- and within-district components to assess how much of the total racial economic segregation in the nation is attributable to intra- and inter-district variation. I also decompose between-district segregation into between- and within-state (or metropolitan area) components to identify how much segregation between school districts occurs between districts in the same states (or metropolitan areas) or between districts across states (or

metropolitan areas). To implement these analyses, I use a cleaned and imputed version of the CCD to improve on and potentially reconcile the two aforementioned prior studies that deal with racial economic segregation. I conduct a set of analyses that investigates whether and how racial economic segregation trends diverge when using different versions of the CCD or different measures of student poverty, with the purpose of better understanding discrepancies in the prior studies (Fahle et al., 2020; Orfield et al., 2016; Orfield & Jarvie, 2020).

The present study finds that racial economic segregation among U.S. public schools increased during the early- and mid-1990s and has decreased since the late 1990s. The geographic decomposition of these trends reveals that between-district segregation accounted for the largest component of racial economic segregation in the nation during the 1991-2020 period, implying that between-district processes, rather than within-district ones, have primarily shaped racial economic segregation among schools. However, the within-district component of racial economic segregation gradually increased until the mid-2010s, and the growth of within-district segregation is more salient among larger districts with more racially diverse student bodies. Taken as a whole, the decomposition analysis of between- and within-district segregation suggests that desegregation strategies across district lines, such as housing policy and inter-district collaborations, may be the most helpful pathway to improving school integration. Yet that is not to say that intra-district policies do not have their role; used in tandem with inter-district strategies, intra-district policies might reduce a non-negligible and growing part of the racial economic segregation among schools.

Literature Review

Trends in Racial and Economic Segregation among Schools

Previous studies on racial school segregation generally document sharp decreases in Black/White segregation during the court-mandated desegregation era, beginning in the late 1960s and extending through the 1970s, and stalled progress or slight increase in Black/White and Hispanic/White segregation since the 1980s. However, findings from the post-desegregation era are inconsistent due to variation in the choice of segregation measure (Reardon & Owens, 2014). Black and Hispanic students' exposure to White students gradually decreased during the 1990s and 2000s (Fiel, 2013; Orfield & Lee, 2007; Logan et al., 2017), whereas Black/White and Hispanic/White differences in exposure to White students remained stable over time (Stroub & Richards, 2013). Reardon & Owens (2014) explains that this is partly due to the decrease in the share of White students among school-age children over time, which inherently yields lower exposure to White students for students of all races (including Whites).

On the other hand, the previous literature on economic segregation reports a modest increase in income-based segregation among schools during the last few decades. Owens et al. (2016) find that income segregation increased from 1990 to 2010 between schools in the same district (i.e., within-district segregation) and between districts in the same metropolitan area (i.e., between-district segregation). The growth of between-district segregation is driven by upper-middle-class families segregating from lower-class families rather than by low-income families segregating from the rest of the population. Moreover, the rise in between-school income segregation is particularly pronounced among large school districts. While their findings focus on the 100 largest school districts and metropolitan areas, other researchers document similar results using all U.S. elementary schools (Marcotte & Dalene, 2019).

Only a few recent papers focus on racial economic segregation among schools. Findings from these studies are contradictory, even though they both use the CCD. Fahle et al. (2020) find

that racial economic segregation declined from the late 1990s until 2016 for both Black/White and Hispanic/White segregation. In contrast, the Civil Rights Project (Orfield et al., 2016; Jarvie & Orfield, 2020) documents rising Black/White racial economic segregation from the 1990s until 2010 and decreasing Hispanic/White racial economic segregation from 1993 to 2018. The disagreement across these studies may result from the fact that each paper uses different measures of student poverty. The former relies on counts of free and reduced-price lunch (FRPL) eligible students, while the latter uses counts of free lunch eligible (FLE) students. FRPL eligibility includes students whose household income is at or below 185% of the federal poverty line, while the threshold for FLE is 130% percent of the federal poverty line. In addition, the two studies take different approaches to data quality issues in the CCD. The former uses multiple imputation methods to address missing values, whereas the latter does not discuss this issue. Also, neither study investigates implausible values or data anomalies in the CCD.

Geographic Decomposition of Segregation

A geographic decomposition of segregation describes how much of total segregation in the nation is attributable to between- and within-unit components at a particular scale of geography (e.g., district, metropolitan area, or state). This approach can be useful since different mechanisms may shape segregation occurring at different geographic levels. Segregation at higher scales of geography (e.g., between-state or between-metropolitan area) may be influenced by demographic changes such as state-to-state migration, which may not be malleable to policy interventions (Lee et al., 2014). On the other hand, at lower scales of geography (e.g., between- and within-district), segregation is more susceptible to housing and educational policy such as zoning regulation, district fragmentation, and school choice (Orfield, 2013; Ritter et al., 2016;

Saporito & van Riper, 2016; Taylor et al., 2019). Students sort into districts and then into schools, depending on their family's residential choice, school district boundaries, and school choice within the district boundaries. Policies involved in each of these sorting processes may shape school segregation between and within districts.

Moreover, geographic decomposition may reveal trends in segregation varying by geographic level. The overall segregation could increase (or decrease) even though segregation between or within places may not follow the same pattern. For instance, Logan et al. (2008) document a decline in school segregation within metropolitan areas since the mandated desegregation in the 1970s. However, their decomposition analysis shows contrasting trends in school segregation by geographic component: school segregation decreased within districts, whereas between-district segregation increased during the same period. This study implies that describing segregation aggregated at a higher organizational level (e.g., the entire nation) could be incomplete due to a lack of geographic detail.

Due to these benefits, geographic decomposition has been widely used in the segregation literature. Residential segregation studies use decomposition analysis to describe changes in segregation at different geographic levels. Focusing on Black-White or multigroup racial segregation during the last several decades, they report rising between-place segregation and declining within-place segregation (Fischer et al., 2004; Fowler et al., 2016), which potentially offset each other when aggregated up to the national level (Lichter et al., 2015). On the other hand, Logan & Stults (2011) find that the overall Hispanic-White segregation decreased from 1980 to 2010, although within-metropolitan area segregation increased among metropolitan areas gaining a larger share of the Hispanic population. These findings suggest the need to consider

both *micro* (within-place) and *macro* (between-place) components in segregation research to understand the comprehensive patterns of segregation.

School segregation studies use geographic decomposition to assess how much of the total segregation is attributable to between- and within-district components and find differing results depending on the time frame and unit of analysis. Between-district segregation is shaped by district structure and residential patterns, whereas within-district segregation is also affected by within-district student sorting opportunities (Fiel, 2015; Reardon, Yun, & Eitle, 2000). Studies focusing on the 1980s and 1990s report increasing between-district and decreasing within-district racial segregation due to the desegregation of public schools since the 1954 case *Brown v. Board of Education* (Logan et al., 2008). For instance, Reardon et al. (2000) focus on racial segregation in metropolitan areas from 1989 to 1995 and document a 4% increase in between-district segregation and a 5% decrease in within-district segregation. Recent studies, however, highlight higher growth in within-district segregation. Ayscue et al. (2018) investigate racial segregation trends from 1989 to 2010 in the Charlotte and Raleigh metropolitan areas and present a pattern of stalled between-district and growing within-district segregation. In addition, regarding economic school segregation, Owens et al. (2016) show rising within-district (over 40%) and between-district segregation by income (over 15%) among the 95 largest metropolitan areas in the U.S. from the 1990s through the 2010s.

Some studies examine between- and within-*school* segregation to understand whether racially minoritized students experience disadvantages from within-school student sorting practices such as academic tracking or ability grouping (Conger, 2005). Recent evidence (Clotfelter et al., 2020) shows a sizeable amount of within-school racial segregation in middle and high schools. It also finds that within-school segregation is more severe between Hispanic

and White students than between Black and White students. On the whole, decomposing segregation into different organizational units allows us to arrive at distinct implications for educational policy, including district fragmentation, student assignment, private/charter school expansion, attendance zoning, and academic tracking.

Data

I use the Longitudinal School Demographic Dataset (LSDD), which imputes missing and implausible data in the Common Core of Data (CCD) from the school years of 1991-92 through 2020-21 (see Reardon et al., 2022b for more information on the imputation and data cleaning process). The CCD is a national database provided by the National Center for Educational Statistics (NCES), which collects administrative data from state education agencies. It contains counts of students in each U.S. public school disaggregated by race/ethnicity (e.g., Black, Hispanic, White, Asian, and Native American) and poverty status.

I use the percentage of underrepresented and racially minoritized (URM) as well as poor students in a school to construct segregation measures in the study.[1] I define URM students as Black, Hispanic, and Native American students and non-URM students as the remaining, mainly White and Asian students. I define the poor[2] as students with free lunch eligibility (FLE), whose household income is at or below 130% of the federal poverty line. I use multiple imputation (Eddings & Marchenko, 2012) to address missing values in the raw CCD. In the 1991-2020 CCD, race counts are missing from 0 to 9 percent, and free lunch eligibility counts are missing from 1 to 35 percent (see Table A1).

Charter schools and magnet schools sometimes establish their own local educational agency (LEA) and thus have unique administrative school district identifiers in the CCD. For

these schools, I use geographic school district ID based on their physical location instead of their administrative school district ID to describe the geographic patterns of school segregation.

The other database I use is the Integrated Public Use Microdata Series from the Current Population Survey (IPUMS-CPS; Flood et al., 2021). IPMUS-CPS contains individual- and household-level data on various areas, including demographics and education. The present paper uses household-level information on the number of school-aged children (5-18-year-olds), the number of URM children, and the number of children who "usually" received free and/or reduced-price lunch (FRPL) in school.

Methods

Constructing Measures of Segregation

Segregation can be conceptualized in two ways: exposure and unevenness (Massey & Denton, 1988). Exposure describes the average experience of individuals of a specific group in terms of potential contact with another group. For example, if Black students' exposure to White students is 0.2, this can be understood as White students making up one-fifth (20%) of the enrollment in the typical Black student's school. The measure of exposure is also used to compute the isolation index, which measures students' exposure to their own group.

For instance, exposure of a racial/ethnic group to school poverty indicates the proportion of poor students enrolled in the school of the typical student of a given racial/ethnic group. The formula below shows racial group A's exposure to school poverty, where N_A is the total number of students in group A in the entire geographic unit (e.g., district, metropolitan area, or state), N_{As} is the number of students in group A in school s, and p_s is the proportion of students in school s

who are poor. For instance, if Black students' exposure to school poverty is 0.62, this indicates that 62% of students in the average Black student's school qualify as poor.

$$P_{Ap} = \sum_s \frac{N_{As}}{N_A} p_s$$

(1)

The second conceptualization of segregation is unevenness, which refers to the extent to which a population of interest (e.g., Black, Hispanic, or White) is unevenly distributed across places (e.g., school, neighborhood, or district), thereby describing the difference in average contexts between different groups (Reardon, 2016). Unevenness in school segregation becomes zero when every school has the same racial or socioeconomic composition as the total student population. It reaches its maximum or minimum when each school only enrolls students of a single racial or socioeconomic group.

The present study uses a measure of unevenness to compute racial economic segregation. Specifically, it uses the URM/non-URM difference in exposure to school poverty, which is equivalent to the variance ratio index (James & Taeuber, 1985) and the relative diversity index (Reardon & Firebaugh, 2002) among the conventional measures of segregation. This measure illustrates how many more poor students are enrolled in schools for the average URM student than in schools for the average non-URM student. Below is the formula for the URM/non-URM racial difference in exposure to school poverty, denoted as Δ. For students who fall into the URM category (x) or the non-URM category (y), P_{gp} is exposure to school poverty of racial group g, N_g is the total number of students in racial group g, n_{gs} is the number of students in racial group g in school s, and p_s is the proportion of poor students in school s.

$$\Delta = P_{xp} - P_{yp} = \sum_s \frac{n_{xs}}{N_x} p_s - \sum_s \frac{n_{ys}}{N_y} p_s = \sum_s \left(\frac{n_{xs}}{N_x} - \frac{n_{ys}}{N_y} \right) p_s$$

(2)

Racial difference in exposure to school poverty becomes zero when all students experience the same school poverty rates regardless of their race. It reaches its extremes (i.e., maximum or minimum) when school poverty is concentrated in schools attended disproportionately by students of a specific race: for instance, the URM/non-URM difference in exposure to school poverty would be zero if URM and non-URM students had the same poverty rates in their schools; however, it would be maximized (i.e., have a value of 1) if all poor students are enrolled in URM students' schools and non-URM students have no poor students in their schools; it would be minimized (i.e., have a value of -1) if the reverse were true.

In addition to racial economic segregation, I construct the measures of racial and economic segregation trends separately. For racial segregation, I use the URM/non-URM difference in students' exposure to URM students (Δ_r). For students who fall into the URM category (x) or the non-URM category (y), P_{gx} is exposure to URM schoolmates of racial group g, N_g is the total number of students in racial group g, n_{gs} is the number of students in racial group g in school s, and x_s is the proportion of poor students in school s.

$$\Delta_r = P_{xx} - P_{yx} = \sum_s \frac{n_{xs}}{N_x} x_s - \sum_s \frac{n_{ys}}{N_y} x_s = \sum_s \left(\frac{n_{xs}}{N_x} - \frac{n_{ys}}{N_y} \right) x_s$$

(3)

Similarly, for economic segregation, I use the poor/nonpoor difference in students' exposure to poor students (Δ_e). When P_{pp} (P_{np}) is exposure to school poverty of FLE- (non-FLE) students, N_p (N_n) is the total number of students in FLE (non-FLE) status, n_{ps} (n_{ns}) is the number of FLE (non-FLE) students in school s, and p_s is the proportion of poor students in school s.

$$\Delta_{\mathrm{e}} = P_{pp} - P_{np} = \sum_{s} \frac{n_{xs}}{N_x} p_s - \sum_{s} \frac{n_{ys}}{N_y} p_s = \sum_{s} \left(\frac{n_{xs}}{N_x} - \frac{n_{ys}}{N_y} \right) p_s$$

(4)

These measures can be interpreted in the same way as racial economic segregation, although they indicate different dimensions of segregation. For instance, if the URM/non-URM difference in exposure to URM students is 0.4, this means that URM students, on average, go to schools with 40% more URM students than do their non-URM peers. If the poor/nonpoor difference in exposure to poor students is 0.3, poor students are generally enrolled in schools with 30% more poor students than their nonpoor peers.

Demographic Difference in Poverty Rates

I compute trends in racial differences in child poverty rates among school-aged children (5-18-year-olds) using the IPUMS-CPS to understand how much of the observed trends in racial economic segregation is driven by demographic changes in poverty rates. Please note that this is not a measure of segregation as it does not consider students' membership in schools. Rather, it illustrates how child poverty rates have changed differentially by race aside from the patterns of student sorting into schools. Comparing racial economic segregation to racial differences in child poverty rates may inform whether racial economic school segregation has trends uniquely attributable to student sorting aside from the baseline child poverty rates by race.

However, the values of racial differences in child poverty rates may not be directly comparable to levels of racial economic segregation computed from the CCD for a few reasons. First, the IPUMS-CPS is a harmonized microdata from the monthly U.S. household survey administered by the U.S. Census Bureau and the Bureau of Labor Statistics, whereas the CCD is population data obtained from all public schools in the country. Second, the IPUMS-CPS only

reports data on children's *receipt* of free or reduced-price lunch, although I use counts of students who are *eligible* for free lunch in the CCD (note that the results are consistent when using *eligibility* for free lunch and free or reduced-price lunch).

I compute racial differences in child poverty rates (Δ_{pov}) as in Eq. (5) below. For students who fall into the URM category (x) or the non-URM category (y), P_{gz} is child poverty rates for a racial group g, N_g is the total number of school-aged children in racial group g, n_{gs} is the number of school-aged children in racial group g in household h, and z_h is an indicator of whether the children in household h received FRPL. In presenting my results, I include a lowess line in presenting the trends in racial differences in poverty rates, given the noisiness of sampled data.

$$\Delta_{\text{pov}} = P_{xz} - P_{yz} = \sum_h \frac{n_{xh}}{N_x} z_h - \sum_h \frac{n_{yh}}{N_y} z_h = \sum_s \left(\frac{n_{xh}}{N_x} - \frac{n_{yh}}{N_y} \right) z_h$$

$$(5)$$

Decomposition of Racial Economic Segregation

I decompose racial economic segregation into several geographic scales, using three different geographic decompositions: Decompositions (A), (B), and (C). These decompositions express the total segregation in the nation as a sum of different geographic components.

$(A)\ (nation)\ =\ (between\ districts)\ +\ (within\ district)$

$(B)\ (nation) =\ (between\ states) +\ (between\ districts\ within\ states)$

$\qquad +\ (within\ district)$

$(C)\ (nation) =\ (between\ districts\ in\ metropolitan\ areas)$

$\qquad +(within\ district\ in\ metropolitan\ areas)$

$$+ (between\ districts\ in\ rural\ areas)$$

$$+ (within\ district\ in\ rural\ areas)$$

$$+ (the\ rest\ of\ the\ regional\ layers)$$

(6)

The choice of geographic units included in each decomposition depends on potential mechanisms of interest. For example, Decomposition (B) above includes states to explore how state educational policies and macro-level demographic patterns affect the national trends in racial economic segregation. In contrast, Decomposition (C) includes between- and within-district segregation separately for rural and metropolitan areas to identify differential patterns in the composition of between- and within-district segregation by urbanicity.

Decomposition (A) expresses the total segregation as a sum of between- and within-district components. In a nation with two exclusive racial groups (e.g., URM and non-URM) consisting of π and $(1 - \pi)$ percent, racial difference in exposure to school poverty (Δ) can be decomposed into the sum of between-district (Δ_D) and within-district components ($\sum_d \frac{I_d N_d}{IN} \Delta_d$). Note that the within-district component is not equal to the average level of within-district segregation across districts. Instead, it is a weighted sum of within-district segregation (Δ_d) weighted by a product of relative racial diversity (I_d/I)[1] and relative district size (N_d/N). Where district d has N_d students in total, $\pi_d\%$ students in the URM category and $p_d\%$ students are poor, n_{xd} (or n_{yd}) URM (or non-URM) students, and where school s has n_{xs} (or n_{ys}) URM (or non-URM) students and $p_s\%$ of poor students:

$$\Delta = \Delta_D + \sum_d \frac{I_d N_d}{IN} \Delta_d ; \quad I = \pi(1 - \pi); \quad I_d = \pi_d(1 - \pi_d)$$

$$\Delta_{\mathrm{D}} = \sum_d \left(\frac{n_{xd}}{n_x} - \frac{n_{yd}}{n_y} \right) p_d \; ; \quad \Delta_d = \sum_{s \in d} \left(\frac{n_{xs}}{n_{xd}} - \frac{n_{ys}}{n_{yd}} \right) p_s$$

(7)

Decomposition (B) decomposes between-district segregation into between-state and between-district within-state components. Where Δ_{T}, Δ_{D_t}, I_t, N_t are between-state segregation, between-district within-state segregation, racial diversity, and total enrollment in a state t, and n_{xt} (or n_{yt}), n_x (or n_y) are the number of URM (or non-URM) students in state t and in the entire nation, respectively:

$$\Delta = \Delta_{\mathrm{T}} + \sum_t \frac{I_t N_t}{IN} \Delta_{\mathrm{D}_t} + \sum_d \frac{I_d N_d}{IN} \Delta_d$$

$$\Delta_{\mathrm{T}} = \sum_t \left(\frac{n_{xt}}{n_x} - \frac{n_{yt}}{n_y} \right) p_t \; ; \quad \Delta_{\mathrm{D}_t} = \sum_{d \in t} \left(\frac{n_{xd}}{n_{xt}} - \frac{n_{yd}}{n_{yt}} \right) p_d$$

(8)

Decomposition (C) expresses the total segregation as a sum of segregation between and within districts in metropolitan areas, between and within districts in rural areas, between metropolitan areas, and between metropolitan and rural areas. I define metropolitan areas following the Core-Based Statistical Areas (CBSA) definition by the Census and consider all areas excluding metropolitan areas as rural areas. I combine the last two components and refer to them as "regional segregation," which indicates the share of segregation that is not malleable to policy remedies. Where M and R represent all metropolitan and rural areas, Δ_{Dm} is between-district segregation in metropolitan area m, Δ_{D_R} between-district segregation in rural areas, Δ_d is within-district segregation which is summed up separately for metropolitan areas and rural areas, and Δ_G is the regional component of racial economic school segregation, respectively:

$$\Delta = \sum_m \frac{I_m N_m}{IN} \Delta_{D_m} + \sum_{d \in M} \frac{I_d N_d}{IN} \Delta_d + \frac{I_R N_R}{IN} \Delta_{D_R} + \sum_{d \in R} \frac{I_d N_d}{IN} \Delta_d + \Delta_G$$

$$\Delta_G = \left(\frac{n_{xM}}{n_x} - \frac{n_{yM}}{n_y} \right) p_M + \left(\frac{n_{xR}}{n_x} - \frac{n_{yR}}{n_y} \right) p_R + \frac{I_M N_M}{IN} \sum_m \left(\frac{n_{xm}}{n_{xM}} - \frac{n_{ym}}{n_{yM}} \right) p_m$$

(9)

Results

Distribution of Race and Poverty Composition among U.S. Public Schools

Table 1 describes a joint distribution of race and poverty composition among U.S. public schools. Using the 2020-21 CCD, I present the percentages of public schools that enroll the corresponding proportions of poor and URM students, ranging from 0 to 100, broken into 10% intervals. Diagonal cells have higher frequencies than off-diagonal ones, suggesting a positive relationship between the enrollment of poor students and URM students in schools. Specifically, 21% of the public schools have less than 20% URM or poor students, while 7% identify more than 80% of their students as URM or poor. This joint distribution reveals that URM students are isolated in schools with higher poverty rates.

[Table 1 here]

Trends in Racial Economic Segregation

Racial economic segregation measures the concentration of school poverty in URM students' schools by taking differences in the average school poverty rates between URM and non-URM students. The black line in Figure 1 describes trends in racial economic segregation between schools in the entire nation from 1991 to 2020. Racial economic segregation ranges from 0.229 to 0.298, suggesting that the proportion of poor students has been roughly 20-30%

higher in URM students' schools than in their non-URM peers' schools. The trend line shows that racial economic segregation increased to 0.298 in 1997, when URM students were, on average, in schools with 29.8% higher poverty rates than non-URM students. Since 1998, racial economic segregation decreased to 0.229 in 2020.

[Figure 1 here]

The red and blue lines in Figure 1 present trends in Hispanic/White and Black/White differences in exposure to school poverty rates, illustrating how Black and Hispanic students were enrolled in higher-poverty schools than White students over the 1991-2020 period. The red line shows that the gap between Hispanic and White students' exposure to school poverty has decreased since the late 1990s. However, the difference between Black and White students' exposure to school poverty (the blue line) did not change much. The Black/White difference in exposure to school poverty was higher than the Hispanic/White difference during the 2000s and 2010s, and the gap between these two differences became wider over time.

I then compare these trends to the Civil Rights Project reports (Orfield et al., 2016; Orfield & Jarvie, 2020) and Fahle et al. (2020) to understand discrepancies in the results from the present study and the two prior studies. I investigate how differences in data cleaning and imputation could lead to discrepant findings since the raw CCD has data anomalies and missing values (e.g., 38% of FLE counts were missing in 1992 and 1996). To this end, I replicate the results using different versions of the CCD—raw and cleaned—and various measures of school poverty—FRPL and FLE counts. The Civil Rights Project reports use data most comparable to the raw CCD's FLE, although they use discrete years (1993, 1996, 2000, 2003, 2005, 2010, 2013, and 2018) and do not provide detailed information on how they select their analytic sample. Fahle et al. (2020) use the CCD's FRPL counts with missing values imputed yet do not

consider implausible, low-quality data in the CCD in the data cleaning process, which can be considered as the imputed version of CCD FRPL counts.

Figure 2 shows notable and implausible fluctuations in racial economic segregation trends based on the raw CCD for both FLE and FRPL counts. These erratic patterns imply that data anomalies and missing values in the raw data may affect substantive conclusions. The data used by the Civil Rights Project is closest to the raw CCD's FLE counts, and both show different patterns from the blue (mine) and black (Fahle et al., 2020) lines, especially during the 1990s and early 2000s. This gap is likely due to higher missing rates in the CCD in the early years (e.g., on average, 26% of FLE counts were missing from 1991 to 2004). Consequently, the results from the raw CCD point to the importance of inspecting unreasonable values and addressing missingness when using the CCD.

[Figure 2 here]

Fahle et al. (2020) use imputation for missing values but do not discuss cleaning data anomalies in the CCD. Their results (i.e., the imputed CCD's FRPL counts) are much smoother than the Civil Right Project's. Moreover, they are mostly comparable to the trend line from the cleaned CCD's FRPL counts, suggesting that data cleaning may not substantially affect substantive conclusions. However, compared to the cleaned CCD's FRPL counts, Fahle et al. (2020) present slightly higher racial economic segregation levels in the 2010s, which may be explained by the nationwide overreporting of poor students since the enactment of the Community Eligibility Provision (CEP). Overall, imputation plays a more important role than data cleaning in producing a more plausible description of racial economic segregation trends using the CCD unless a systematic reason could affect poor student counts across the nation.

Drivers of Trends in Racial Economic Segregation

Findings from Figure 1 raise questions about how different factors have shaped the trends in racial economic segregation. How are the trends described in Figure 1 related to changes in other dimensions of school segregation over time? Has the decline in racial economic segregation been driven by the relative increase in white children's poverty rates (compared to URM children) instead of the school sorting process that may isolate URM students into schools with less concentrated poverty?

To answer these questions, I compute trends in three relevant phenomena to find possible explanations behind the trends in racial economic segregation: racial segregation, economic segregation, and racial differences in child poverty rates.

[Figure 3]

Figure 3 presents trends in racial economic segregation with racial and economic segregation. Racial segregation has been the highest among the three dimensions of segregation throughout the last three decades, although it has declined since 2000. Racial segregation in the nation has maintained above 0.4, while economic segregation and racial economic segregation have fluctuated around 0.3. Economic segregation is more similar to racial economic segregation in terms of both levels and trends, increasing during the 1990s and decreasing since the late 1990s. However, economic segregation has a lower rate of decline (13% decrease from 1999 to 2018, from the maximum to the minimum over the 1991-2020 period) than racial economic segregation (18% decrease during the same period). Recently, economic segregation increased from 0.259 in 2018 to 0.272 in 2020, although the change in these two years is not enough to conclude it as an increasing trend.

Figure 3 also reveals a few patterns when comparing trends in racial economic segregation among schools with trends in the racial differences in child poverty rates (measured by FRPL receipt). First, the URM/non-URM difference in child poverty decreased during the 1990s when racial economic segregation mostly increased. This discrepancy in trends implies that the increase in racial economic segregation until the late 1990s may be driven by student sorting patterns, rather than trends in child poverty. Second, the trends in racial differences in child poverty rates and racial economic segregation go hand-in-hand from the late 1990s until the mid-2000s, suggesting that the trends in racial economic segregation during this period may be primarily driven by sociodemographic patterns (e.g., converging trends in the FRPL receipt rates across race groups). Lastly, racial economic segregation continued to decrease during the 2010s, while the decline in differential child poverty by race has stalled. The decline in racial economic segregation from the late 2000s through the 2010s may be primarily driven by the diffusion of URM students into lower-poverty schools rather than changes in child poverty by race.

Geographic Decomposition of Trends in Racial Economic Segregation

Trends in racial economic segregation in the entire country do not imply the same trends at every scale of geography. For instance, the overall decrease in total racial economic segregation since the late 1990s may be driven by a dramatic decline in between-district segregation that potentially masks a simultaneous but smaller increase in the within-district component of segregation. Therefore, investigating trends in racial economic segregation across different geographic scales may help gain more detailed insights into the overall phenomenon of racial economic segregation,

Table 2 and Figure 4 present trends in racial economic segregation decomposed into the three decompositions explained in Equation (3). Decomposition (A) divides the national segregation into between- and within-district components. The top panel in Figure 4 shows that between-district segregation has been the largest component of racial economic segregation during the last three decades, accounting for 70-80% of total segregation in the nation over the study period. However, between-district segregation has steadily decreased over time, from 0.223 (82% of total segregation) in 1991 to 0.170 (74% of total segregation) in 2020. Therefore, between-district segregation has been and continues to be the most significant driver of trends in total segregation in the nation.

The within-district component of racial economic segregation, on the other hand, has constituted a relatively minor share of total segregation, about one-fifth to a quarter of total segregation. However, this component has steadily grown during the last three decades. The within-district component of racial economic segregation increased from 0.050 (18% of total segregation) in 1991 to 0.065 (27% of total segregation) in 2015, then slightly decreased to 0.060 (26% of total segregation) in 2020, corresponding to a 20% growth over three decades. These results imply that the relative importance of the within-district component has marginally but continuously risen over time.

However, this finding does not imply that within-district segregation in *every* district has grown at the same rate. As noted earlier, the within-district component is a sum of within-district segregation weighted by district size and relative diversity ($\sum_d \frac{I_d N_d}{IN} \Delta_d$). Districts are more heavily weighted in the computation of the within-district component if they have a more racially diverse ($I_d = (1 - \pi_d)\pi_d$, where π_d is the proportion of URM in the district d) and larger total

enrollment (N_d). I thus look into trends in within-district segregation among districts with higher and lower weights separately to identify the locus of the growth in the within-district component.

Among the most diverse and largest districts (the top ten percent of weight), average within-district segregation increased from 0.046 in 1991 to 0.053 in 2020 (15% growth). On the contrary, the least diverse and smallest districts (the bottom ten percent of weight) have maintained very low within-district segregation (less than 0.003 throughout the 1991-2020 period). Therefore, trends in within-district racial economic segregation are shaped by the increase in the average within-district segregation in districts with a larger and more racially diverse student population.

[Figure 4 here]

[Table 2 here]

Decomposition (B) decomposes between-district segregation into between-state and between-district within-state components of segregation, expressing total segregation as a sum of between-state, between-district (within-state), and within-district components. Between-state racial economic segregation has declined since the mid-1990s, from 0.053 in 1995 to 0.045 in 2000 and to 0.035 in 2020 (18%, 16%, and 15% of total segregation, respectively). The decline in between-state segregation (34% decrease from 1995 to 2020) is even steeper than in between-district within-state segregation (29% decrease during the same period), suggesting that racial economic school segregation in the nation is mostly driven by within-state processes instead of between-state ones.

Decomposition (C) applies the decomposition of between- and within-district segregation separately for metropolitan and rural areas, yielding four geographic components. I then refer to the remaining components as regional segregation (i.e., segregation between metropolitan and

rural areas and between metropolitan areas). Regional segregation has decreased since the mid-1990s (from 0.084 in 1995 to 0.048 in 2020; 43% decrease).

Racial economic segregation within metropolitan areas (i.e., between- and within-district segregation in metropolitan areas) accounts for 60-75% of segregation in the nation during this period, as opposed to segregation within rural areas, which takes less than 10% of total segregation. The large share of racial economic segregation in metropolitan areas may result from the fact that the majority of the U.S. population—particularly racially minoritized groups—lives in metropolitan areas. Specifically, 89% of Black people, 93% of Hispanic people, and 64% of Native Americans reside in metropolitan areas. Overall, the metropolitan areas cover 84% of the entire population (U.S. Census Bureau, 2012).

Within metropolitan areas, patterns in between- and within-district components of racial economic segregation are similar to Decomposition (A). Between-district segregation has been the largest component in segregation in metropolitan areas and slightly decreased over time, taking up about 60-70% of the total segregation among metropolitan area schools. On the contrary, within-district segregation in metropolitan areas has slightly but steadily increased from 0.047 in 1991 to 0.063 in 2015 and then decreased to 0.058 in 2020 (more than 30% of the total segregation among metropolitan area schools over the 1991-2020 period; 23% growth).

Supplementary Analysis

I ran two supplementary analyses to better understand the substantive conclusions from the present study. I specifically focused on (a) whether the trends in racial economic segregation are consistent when using different measures of student poverty and (b) how the geographic

decomposition of racial and economic segregation—in addition to racial economic segregation—has changed over the study period.

For the first supplementary analysis, I replicate the present study's analysis using different data sources on student poverty. FLE is not the most widely used or the only measure for student poverty, although it is the most available measure spanning the last three decades. Consequently, the main results of this study may be valid only for one specific measure of student poverty. To address this concern, I replicate the same analyses using two other data containing the number of poor students. I first use the number of students eligible for free and reduced-price lunch (FRPL) in the CCD whose household income is at or below 185% of the federal poverty. FRPL is a more popular measure of student poverty, and Domina et al. (2018) mentioned that it effectively captures the variation in educational disadvantages. However, the FRPL counts are not available in the CCD before 1997. I thus use FLE counts for the present study to obtain trends in racial economic segregation during the 1990s.

The second measure of school poverty I use is the percentage of economically disadvantaged (ECD) students in each school provided by EDFacts data from 2013 to 2018. EDFacts contains the school-level number of students in grades 3 to 8 disaggregated by race/ethnicity and ECD status along with other subgroup categories. Each state has its own definition of ECD to track student performance on state assessments since the No Child Left Behind Act of 2002. While states have the authority to define ECD status, it is largely equivalent to FRPL in most states.

Figure B1 compares trends in racial economic based on FLE, FRPL, and ECD counts. All three trend lines show the decrease in racial economic segregation since the late 1990s. However, a few patterns may imply an inconsistency between the FLE- and FRPL-based trends in racial

economic segregation: the FLE-based racial economic segregation noticeably dropped in 1998, and the pre-1998 FLE-based trend looks more comparable to the post-1998 FRPL-based trend than the post-1998 FLE-based trend. These patterns may be due to the reporting change in the CCD in 1998. The CCD had schools report only the number of FLE students until 1997 and then started collecting the number of FRPL eligible students in 1998. I identified eight states (Alaska, Arizona, California, Georgia, Kansas, Nevada, South Carolina, and South Dakota) that seemed to have the 1997 FLE counts more similar to the 1998 FRPL counts than the 1998 FLE counts and thus may have driven the 1998 drop in the FLE-based racial economic segregation. Figure B2 shows that all states other than those eight states had a smaller decrease in racial economic segregation in 1998 and racial economic segregation has had downward trends since the late 1990s. It thus confirms that racial economic segregation decreased during the 2000s and 2010s, even for states whose racial economic segregation may have been more impacted by the CCD reporting change. Additionally, Figure B3 shows that the results from different measures of student poverty converge at every scale of geography, suggesting that findings from the present paper would be robust for the choice of student poverty data.

The second supplementary analysis describes the geographic decomposition analyses for other dimensions of school segregation—racial and economic segregation, respectively. Figures C1 through C3 present the geographic decomposition of racial and economic segregation trends. Both racial and economic segregation show similar geographic compositions to racial economic segregation. Between-district segregation accounts for the largest share of segregation in all three dimensions of segregation compared to the other components. One exception is that economic segregation exhibits much higher within-district segregation, which seems worth further investigation, although it is out of the scope of this study.

Discussion

The present study innovates on past research mainly in two aspects. First, it uses a more thoroughly cleaned dataset spanning the longest period than prior studies describing trends in racial economic segregation. I rigorously review data quality issues in the CCD and implement multiple imputation methods to obtain higher-quality data on counts of racially minoritized and poor students. I then reconcile discrepancies in the previous studies on how racial economic segregation has changed over the last few decades, based on supplementary analyses using different measures of student poverty and different versions of the CCD. Second, the present study decomposes the overall trends in racial economic segregation into several geographic scales. The geographic decomposition analysis informs how much of the current racial economic segregation can be addressed via policy remedies at different organizational levels.

Findings from the present study bring significant implications for both scholarship and policymaking on school segregation. For scholars, the findings offer clearer evidence on trends in an important but understudied dimension of school segregation. The present study shows that racial economic segregation increased during the 1990s and has steadily declined since the late 1990s. At a closer look, the gap between Hispanic and White students' exposure to school poverty has decreased, whereas the same gap between Black and White has been maintained over time. This pattern is consistent with the fact that the proportion of poor students in the average Black student's school has become the highest among students of other races since the 2000s (Fahle et al., 2020). I thus suggest that Black students' concentration in high-poverty schools should be prioritized in discussing racial economic segregation.

Moreover, this study delves into data quality issues in free lunch student counts in the CCD and reconciles existing discrepancies in prior studies. I replicate the trends in racial economic segregation using different versions of the CCD—raw, imputed, and cleaned—to compare with Fahle et al. (2020), Orfield & Jarvie (2020), and Orfield et al. (2016). Comparing my results with those of the two prior studies reveals that using the raw CCD may yield implausible values in the computation of segregation trends, especially during the 1990s, due to its higher missing rates in the early years of the CCD collection. In contrast, the results from the imputed CCD used by Fahle et al. (202) show minor differences from those based on the cleaned CCD. Consequently, I suggest that addressing missing values in the CCD is critical to making plausible inferences about historical trends.

For policymakers, the geographic decomposition analysis provides insights into which organizational scale policies should be targeted to design strategies that can address the current racial economic segregation most effectively. First, between-district segregation has accounted for the largest part of the total racial economic segregation, suggesting the pressing need for inter-district collaborations beyond district boundaries and efforts to promote wider access to housing for racially underrepresented groups. However, the impact of these strategies may be limited since the *Milliken v. Bradley* decision in 1974, when the U.S. Supreme Court ruled that federal courts could not implement multi-district remedies without clear evidence of school districts' committed acts causing racial discrimination. Moreover, the present study reveals that the within-district component of racial economic segregation has steadily grown over the last three decades. This growth is mainly driven by increased within-district segregation among districts with larger and more racially diverse student enrollment. This finding necessitates

public attention to intra-district strategies such as prioritizing racially minoritized students' access to schools with less concentrated poverty within the district.

Second, segregation among schools in metropolitan areas is exceedingly higher than segregation in the rest of the nation, suggesting that it is imperative to focus on the concentration of racially minoritized students into highly disadvantaged schools in metropolitan areas. This is particularly crucial for two reasons: the metropolitan areas include the vast majority of the nation's URM population, and the concentration of poverty in minoritized students' schools has been reported as the strongest predictor of racial achievement gaps by an array of past studies (e.g., Reardon, 2016; Reardon et al., 2021). Consequently, addressing racial economic segregation in metropolitan areas should be the priority in policy consideration due to those areas' higher levels of segregation and over-representation of the URM student population.

Lastly, segregation at higher scales of geography (i.e., between-state and regional segregation) indicates how much of the current segregation consists of components that may not be directly addressed via state and district policy efforts. The present study finds that between-state and regional racial economic segregation have accounted for moderate shares of the total segregation (from 17% and 28% in 1991 to 15% and 21% in 2020, respectively). They also decreased over the 1991-2020 period: a 22% drop in between-state segregation and a 38% drop in regional segregation. These declines may be attributable to residential pattern changes among Hispanics during the 1990s and 2000s (Card & Lewis, 2007; Johnson & Lichter, 2016). Since the 1990s, the Hispanic population started moving out of its traditionally urban residence and grew in rural areas due to job growth in agriculture, meat packing, and food processing. This influx of the Hispanic population into rural areas continued through 2010 (Lee et al., 2014), having Hispanics more exposed to lower-poverty places. Therefore, states and districts have sufficient

leeway to prevent racially minoritized students from being concentrated in high-poverty schools via inter- and intra-district policy efforts mentioned above.

Despite its significant implications for scholars and policymakers, this study has a few limitations. One is that FLE student enrollment in schools is not available by grades in the CCD, which hinders detailed analyses on whether trends in racial economic segregation diverge across grades. Geographic decomposition of racial economic segregation by grade may be of interest since different school options are available depending on grades and possibly affect residential preference among parents for younger versus older children (Goyette et al., 2014). This analysis would be feasible with students' race and poverty status counts disaggregated by grade.

In sum, this study provides a thorough description of trends in racial economic segregation during the last three decades using rigorously cleaned data of student enrollment by race and poverty status. The results from the geographic decomposition analysis underscore the magnitude of between-district racial economic segregation and the role of inter-district educational and housing policy efforts to promote student diversity across schools, particularly among districts in metropolitan areas. These measures are imperative but may not be readily feasible since district leaders do not have enough discretion to collaborate on cross-district integration policies in the current U.S. context (Holme & Finnigan, 2013). Lastly, this study highlights the growing importance of intra-district strategy to address school segregation, based on the constant rise in within-district racial economic segregation among larger, more racially diverse districts.

NOTES

1. $\pi(1-\pi)$ is the key component of Simpson's Interaction Index (Reardon & Firebaugh, 2002), often denoted as I. It has a minimum of 0 for no racial diversity (i.e., only one racial group exists) and a maximum of 0.25 for maximal racial diversity (i.e., two racial groups are evenly distributed, each occupying 50% of the total population).

2. I use the term "poor" to describe their economic status defined relative to the federal poverty line and to avoid any confusion with other data sources (e.g., "economically disadvantaged (ECD)" in EDFacts data). However, from the standpoint of equity-mindedness, I acknowledge that this may not be the best expression to describe students who lack economic sources.

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Tables and Figures

Table 1. Joint Distribution of Racial and Economic Composition among Schools

Percentage of Poor Students	Percentage of URM Students										Total
	0-10%	10-20%	20-30%	30-40%	40-50%	50-60%	60-70%	70-80%	80-90%	90-100%	
0-10%	6.97	3.13	0.71	0.14	0.06	0.05	0.01	0.01	0.02	0.06	11.16
10-20%	6.66	4.05	2.82	1.26	0.49	0.2	0.1	0.03	0.03	0.05	15.69
20-30%	5.03	3.02	2.41	2.23	1.49	0.7	0.33	0.16	0.07	0.11	15.55
30-40%	3.15	2.04	1.92	1.92	1.64	1.31	0.79	0.41	0.2	0.27	13.65
40-50%	1.78	1.07	1.28	1.44	1.45	1.46	1.2	0.77	0.6	0.59	11.64
50-60%	0.82	0.51	0.67	0.86	1.06	1.12	1.36	1.08	0.84	1.03	9.35
60-70%	0.33	0.2	0.31	0.45	0.59	0.78	0.96	1.2	1.35	1.82	7.99
70-80%	0.11	0.06	0.09	0.16	0.24	0.38	0.55	0.88	1.39	3.1	6.96
80-90%	0.04	0.02	0.03	0.05	0.09	0.14	0.26	0.43	0.95	4.01	6.02
90-100%	0.01	0.01	0.01	0.01	0.02	0.02	0.04	0.09	0.18	1.57	1.96
Total	24.9	14.11	10.25	8.52	7.13	6.16	5.6	5.06	5.63	12.61	100.00

Table 2. Trends in Racial Economic Segregation with Geographic Decompositions, 1991-2020

	1991	1995	2000	2005	2010	2015	2020
Total Segregation	0.273	0.296	0.282	0.263	0.249	0.240	0.230
Decomposition (A)							
Between-District	0.223	0.242	0.223	0.201	0.185	0.175	0.170
	(0.818)	(0.818)	(0.791)	(0.767)	(0.741)	(0.728)	(0.739)
Within-District	0.050	0.054	0.059	0.061	0.065	0.065	0.060
	(0.182)	(0.182)	(0.209)	(0.233)	(0.259)	(0.272)	(0.261)
Decomposition (B)							
Between-State	0.045	0.053	0.045	0.038	0.034	0.032	0.035
	(0.165)	(0.180)	(0.159)	(0.144)	(0.136)	(0.135)	(0.153)
Between-District, Within-State	0.178	0.189	0.178	0.164	0.151	0.142	0.135
	(0.653)	(0.638)	(0.632)	(0.623)	(0.605)	(0.593)	(0.585)
Within-District	0.050	0.054	0.059	0.061	0.065	0.065	0.060
	(0.182)	(0.182)	(0.209)	(0.233)	(0.259)	(0.272)	(0.261)
Decomposition (C)							
Between-District in Metropolitan Areas	0.120	0.131	0.126	0.123	0.118	0.113	0.106
	(0.438)	(0.442)	(0.447)	(0.470)	(0.473)	(0.469)	(0.460)
Within-District in Metropolitan Areas	0.047	0.051	0.056	0.059	0.062	0.063	0.058
	(0.173)	(0.173)	(0.200)	(0.223)	(0.249)	(0.263)	(0.254)
Between-District in Rural Areas	0.027	0.027	0.024	0.021	0.017	0.016	0.016
	(0.097)	(0.091)	(0.086)	(0.079)	(0.068)	(0.067)	(0.070)
Within-District in Rural Areas	0.002	0.002	0.003	0.003	0.002	0.002	0.002
	(0.008)	(0.008)	(0.010)	(0.010)	(0.010)	(0.009)	(0.007)
Regional	0.077	0.084	0.073	0.057	0.050	0.046	0.048
	(0.283)	(0.285)	(0.258)	(0.218)	(0.200)	(0.193)	(0.209)

Note: The percentage share of each geographic component is in parentheses.
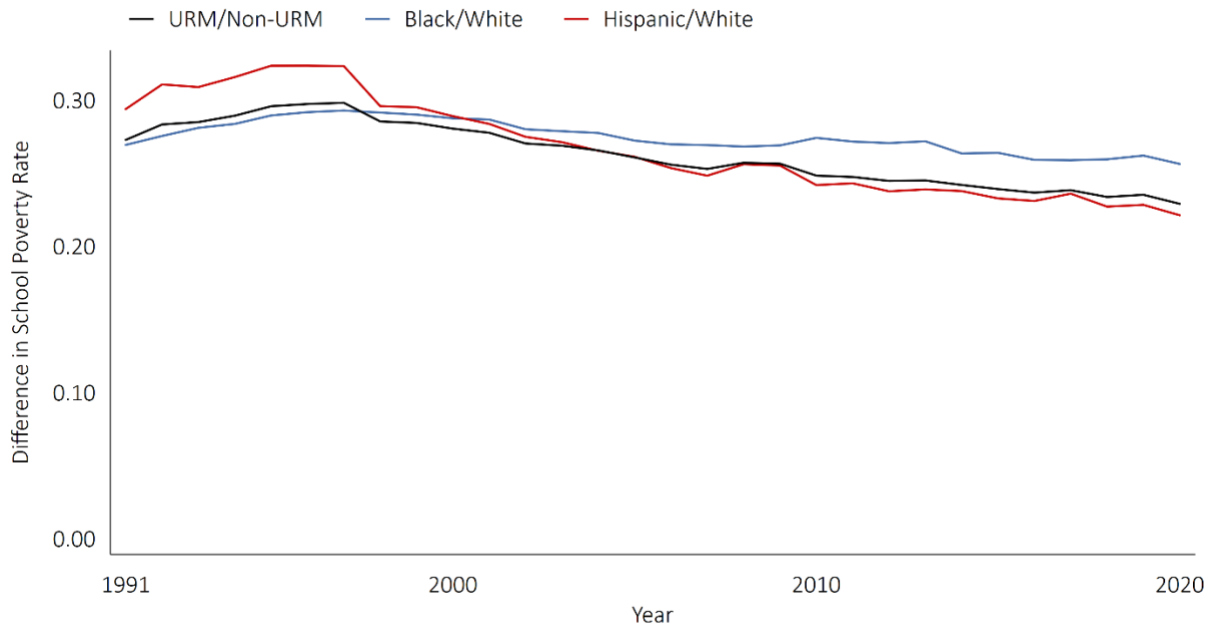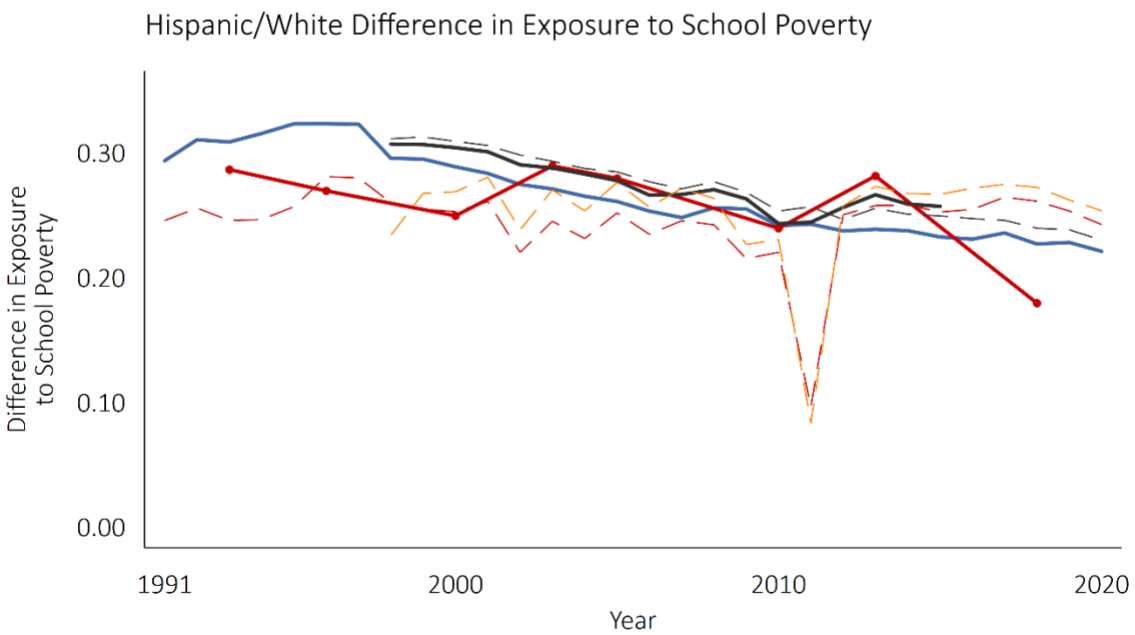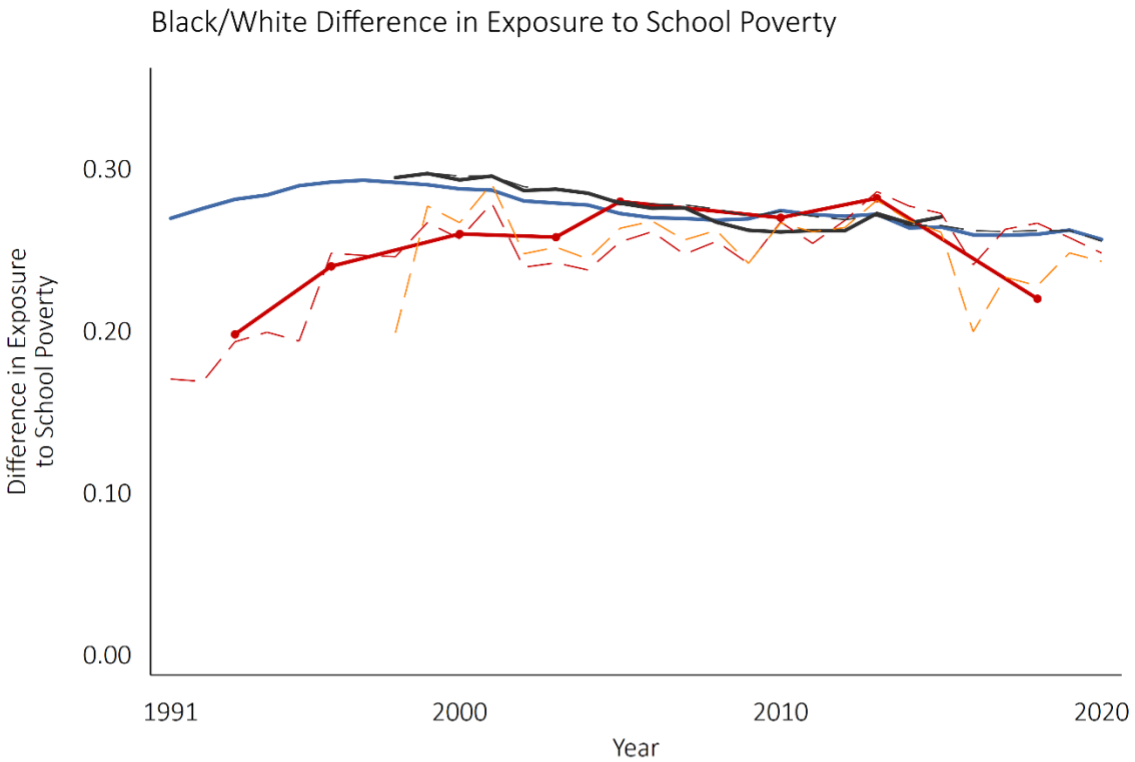
Figure 1. Trends in Racial Economic Segregation, 1991-2020

Figure 2. Comparison of Trends in Black/White and Hispanic/White Differences in Exposure to School Poverty with Previous Studies

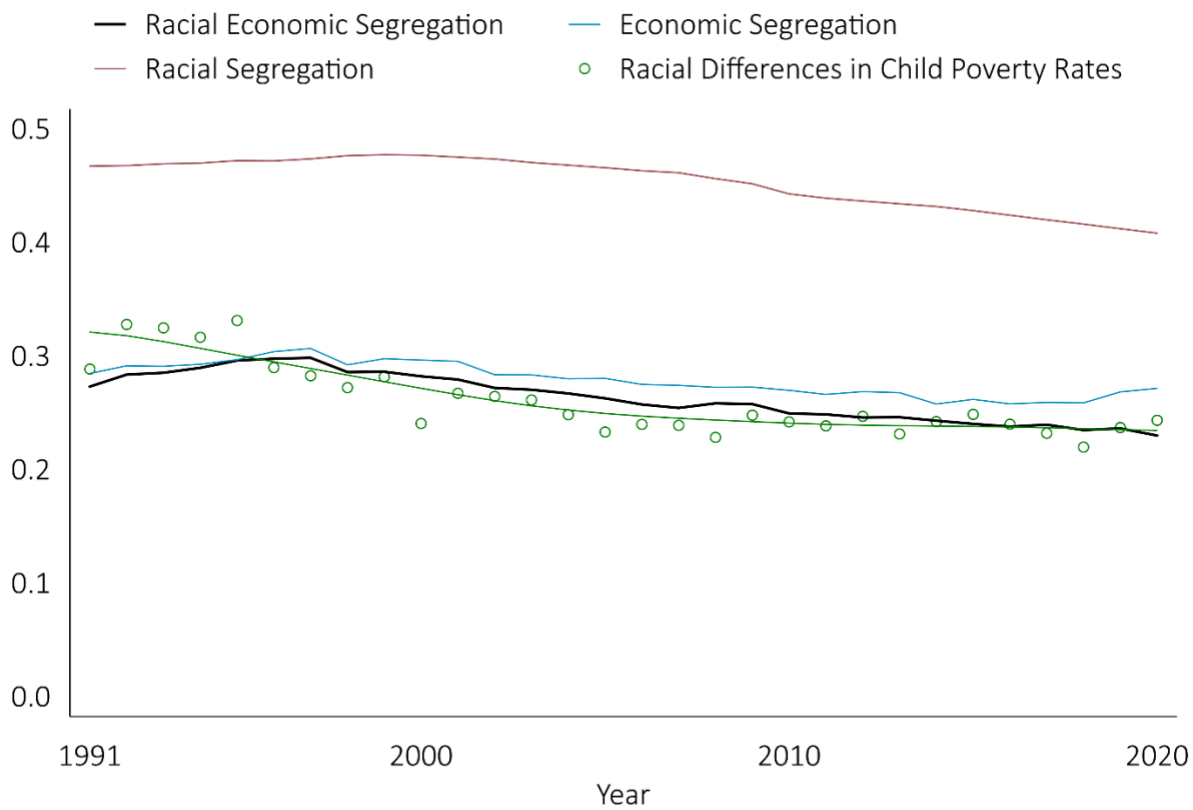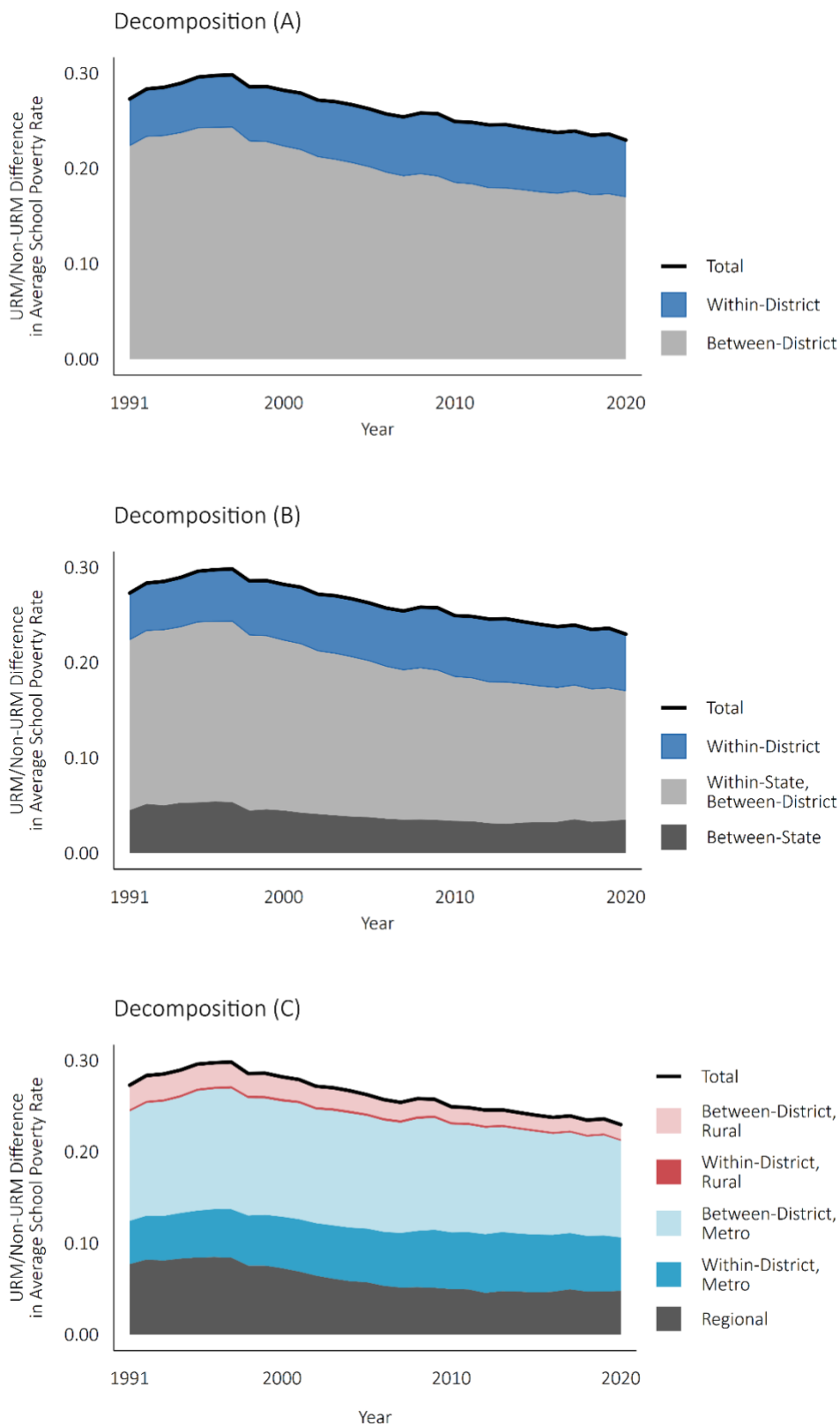Figure 3. Trends in Racial Economic, Racial, and Economic Segregation, 1991-2020

Figure 4. Geographic Decompositions of Trends in Racial Economic Segregation

Appendix

Table A1. Missing Rates in Race and Free Lunch Eligibility Counts in the CCD by Year

Year	Race	FLE
1991	0.085	0.352
1992	0.038	0.298
1993	0.012	0.238
1994	0.009	0.222
1995	0.011	0.238
1996	0.038	0.208
1997	0.011	0.185
1998	0.010	0.191
1999	0.029	0.166
2000	0.020	0.146
2001	0.021	0.133
2002	0.022	0.136
2003	0.021	0.155
2004	0.030	0.131
2005	0.005	0.090
2006	0.007	0.041
2007	0.007	0.080
2008	0.011	0.038
2009	0.008	0.046
2010	0.008	0.015
2011	0.011	0.100
2012	0.010	0.020
2013	0.010	0.023
2014	0.006	0.046
2015	0.006	0.072
2016	0.005	0.102
2017	0.005	0.090
2018	0.004	0.110
2019	0.004	0.109
2020	0.000	0.232

Figure B1. Trends in Racial Economic Segregation from Different Measures of Student Poverty
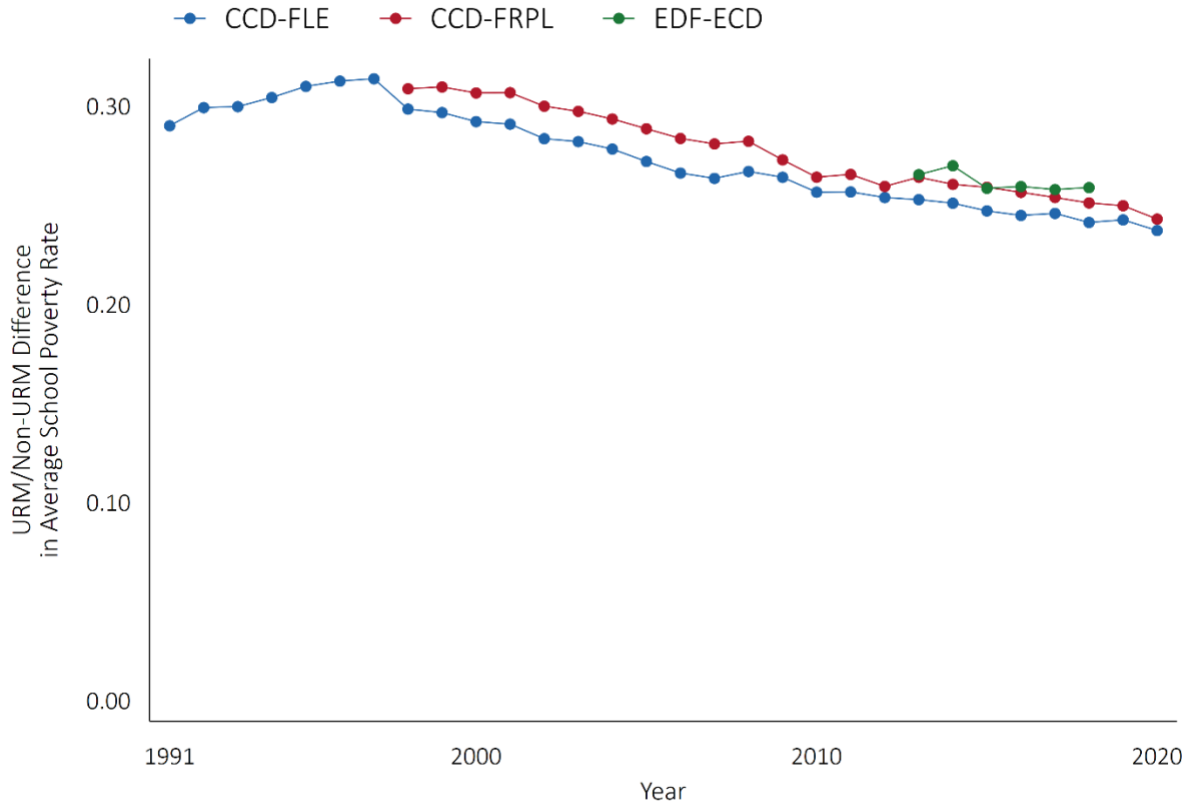
Figure B2. Trends in Racial Economic Segregation Using Different Sets of States
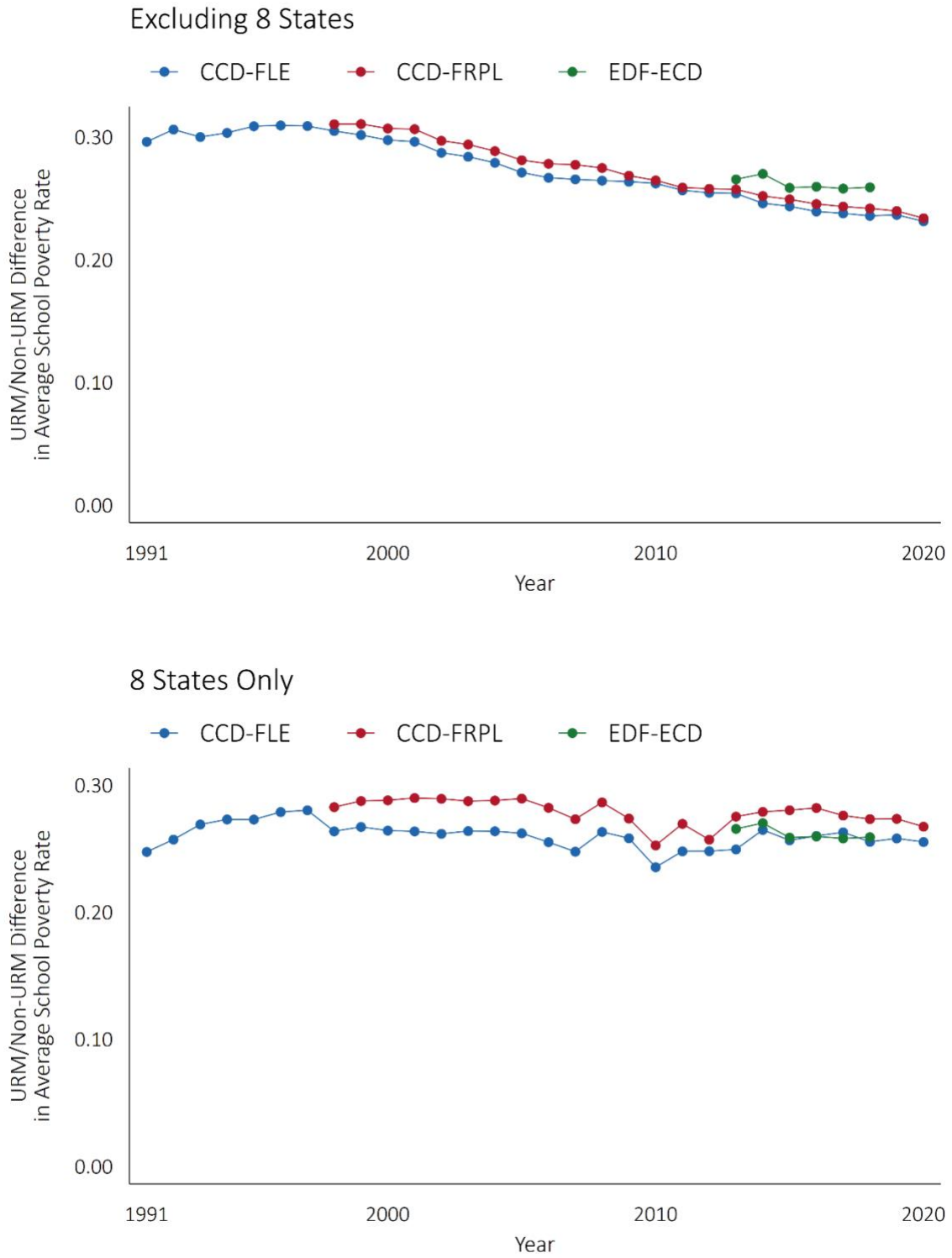
Figure B3. Geographic Components of Racial Economic Segregation Trends Using Different Measures of Student Poverty
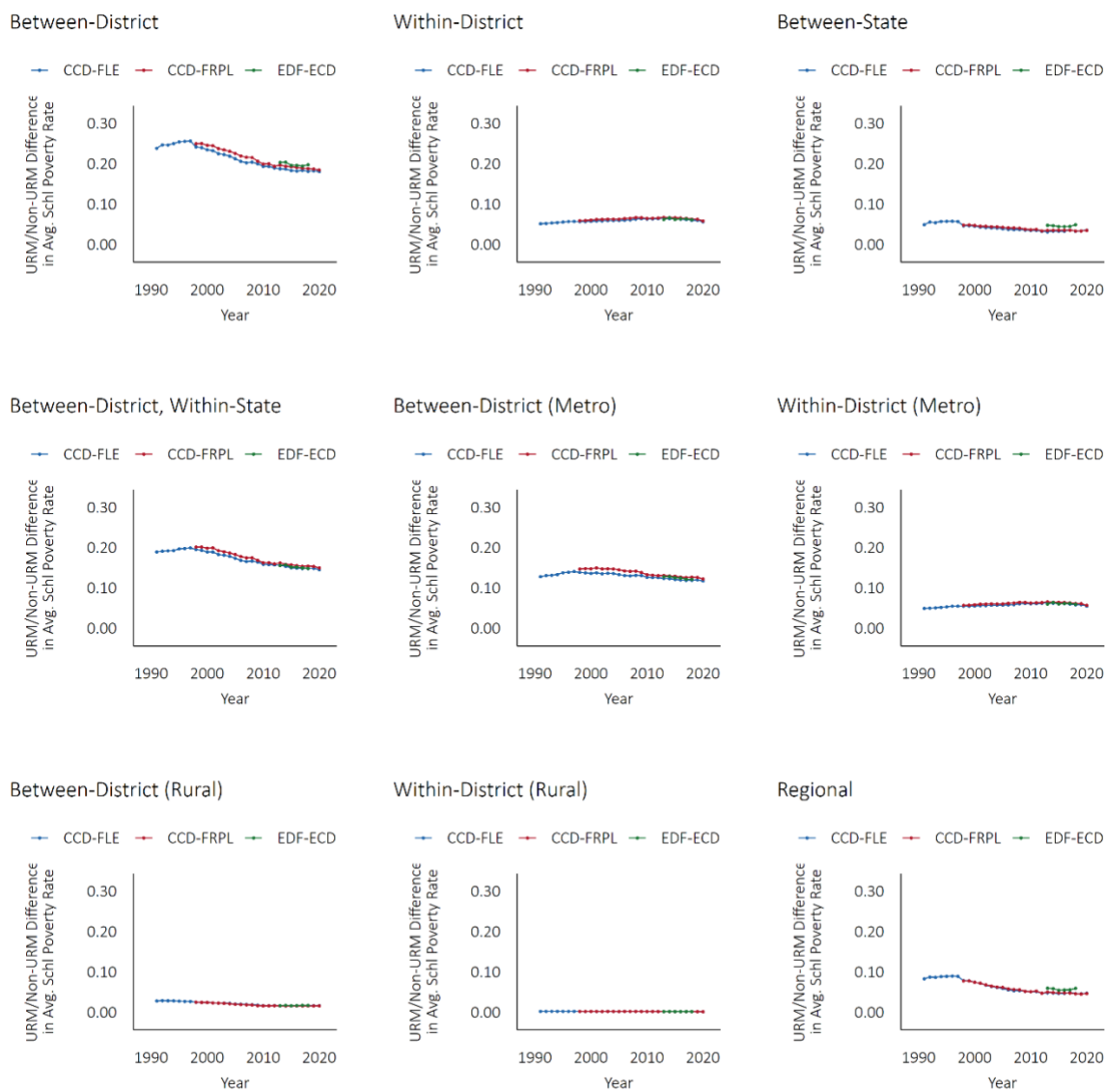
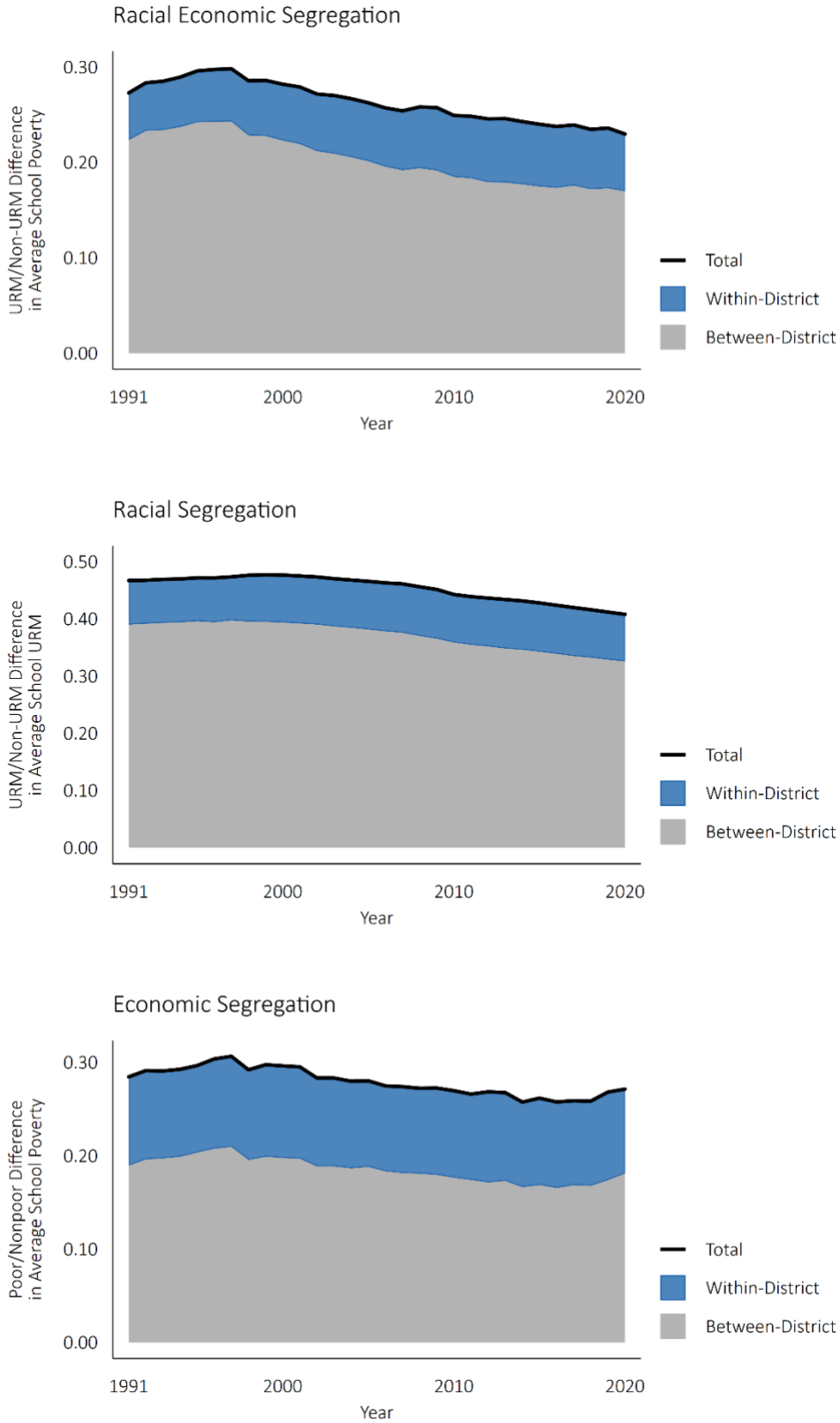Figure C1. Decomposition (A) for Racial and Economic Segregation

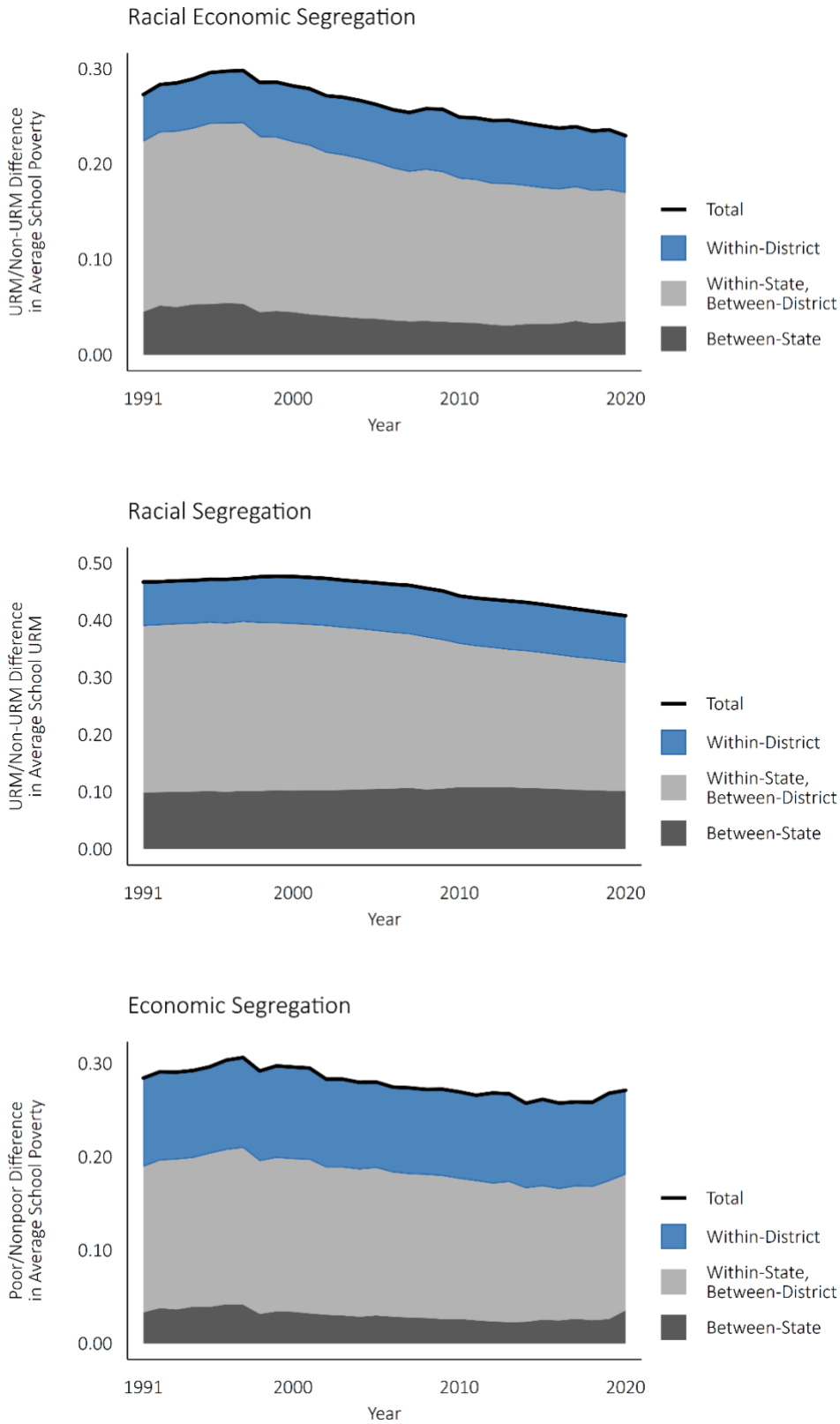Figure C2. Decomposition (B) for Racial and Economic Segregation

Racial Economic Segregation

Racial Segregation

Economic Segregation

Figure C3. Decomposition (C) for Racial and Economic Segregation