

Socioeconomic-Based School Assignment Policy and Racial Segregation Levels: Evidence From the Wake County Public School System

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In the wake of political and legal challenges facing race-based integration, districts have turned to socioeconomic integration initiatives in an attempt to achieve greater racial balance across schools. Empirically, the extent to which these initiatives generate such balance is an open question. In this article, we leverage the school assignment system that the Wake County Public School System employed throughout the 2000s to provide evidence on this issue. Although our results show that Wake County Public School System's socioeconomic-based assignment policy had negligible effects on average levels of segregation across the district, it substantially reduced racial segregation for students who would have attended majority-minority schools under a residence-based assignment policy. The policy also exposed these students to peers with different racial/ethnic backgrounds, higher mean achievement levels, and more advantaged neighborhood contexts. We explore how residential context and details of the policy interacted to produce this pattern of effects and close the article by discussing the implications of our results for research and policy.

KEYWORDS: education policy, race/ethnicity, socioeconomic status, school segregation

Introduction

The Supreme Court's landmark 1954 ruling in *Brown vs. Board of Education* set the stage for a long line of formal policy actions designed to integrate schools in the United States. In the decades following the *Brown* ruling, these efforts focused almost exclusively on achieving integration on the basis of race. More recently, and at least partially, in response to political and legal challenges facing race-based integration efforts, the policy focus has shifted to initiatives designed to achieve integration on the basis of socio-economic status (SES).¹ For example, under the Obama administration, the U.S. Department of Education (USED) explored the prospect of adding socio-economic integration to the list of approved school turnaround strategies under the federal School Improvement Grant program. Similarly, USED identified programs promoting socioeconomic integration as one of five major funding priorities in the Investing in Innovation (I3) grant program. Many of these efforts to promote socioeconomic integration implicitly assume that they will produce greater levels of racial and ethnic integration and, more generally, will significantly change students' schooling contexts—these assumptions, however, have been subject to little empirical assessment.²

In this article, we take advantage of the unique socioeconomic-based school assignment system that the Wake County Public School System (WCPSS) employed throughout the 2000s to provide evidence on the

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relationship between socioeconomic integration efforts and racial and ethnic segregation levels. In particular, we draw on annual student-level data indicating the school that each student in WCPSS would attend under both the socioeconomic integration policy and a pure residence-based assignment system to calculate racial and ethnic segregation levels under each scenario. We assess segregation levels using standard measures such as the information theory index, the exposure index, and the isolation index. We perform this analysis for all students in WCPSS, as well as for the subgroup of students who would have attended majority-minority schools under a residence-based school assignment policy. For this subgroup, we not only examine the extent to which the integration policy altered the racial and ethnic segregation levels they face, but also how it shaped their broader schooling context.

Our results show that, relative to a pure residence-based school assignment system, there were no meaningful differences in overall racial/ethnic segregation levels in WCPSS under the socioeconomic integration policy. However, the policy substantially reduced the segregation levels faced by students who would have attended majority-minority schools under a residence-based assignment policy—we refer to the school a student would have attended under residence-based assignment as their neighborhood school. For this group of students, the average Black student would have attended a neighborhood school that was 14% White under a pure residence-based assignment system. However, the socioeconomic-based assignment policy resulted in the average Black student attending a school that was 38% White—an increase of more than 20 percentage points. We further show that, for students who would have attended majority-minority schools under residence-based assignment, the socioeconomic-based assignment policy significantly changed other aspects of these students' schooling context, including the achievement levels and neighborhood backgrounds of their peers. Considered together, our analyses provide valuable empirical evidence on the operations and effects of socioeconomic integration policies.

We proceed by briefly describing major racial integration efforts that transpired in the decades following the Supreme Court decision in *Brown vs. Board of Education* and summarizing the relevant scholarly work analyzing these efforts. We then detail the challenges that race-based integration policies have faced in recent years, which have contributed to the shift in policy emphasis to socioeconomic-based integration strategies—here we detail WCPSS's specific school assignment policy. We also summarize prior work on socioeconomic integration in this section. After providing this contextual information, we move on to describing the data that underlie our analyses, as well as our approach to comparing racial/ethnic segregation under the socioeconomic school assignment policy with the same outcomes under a residential-based assignment system. Finally, we present the results

of our analyses and close the article by discussing the implications of the findings for research and both current and future integration efforts.

Race, Socioeconomic Status, and School Integration

The U.S. Supreme Court's 1954 decision in *Brown vs. Board of Education* was intended to eliminate *de jure* racial segregation in the nation's schools. Although meaningful change was slow to come to many states and districts, the eventual enforcement of the court order ultimately produced substantial declines in racial segregation—particularly in the South—throughout the late-1960s, 1970s, and into the 1980s (Coleman, Kelly, & Moore, 1975; Johnson, 2011; Welch & Light, 1987; see Reardon & Owens, 2014 for a review). Segregation trends since that time are more nuanced—measures of exposure often show increasing levels of segregation across the United States (Frankenberg & Lee, 2002; Orfield & Lee, 2007), while measures of unevenness have typically found segregation levels to be stable, or even declining (Fiel, 2013; Stroub & Richards, 2013). Both measures, however, provide evidence that segregation increased among Southern schools throughout the 1990s (Reardon & Yun, 2002), although there is evidence that those increases were reversed in the most recent decade (Stroub & Richards, 2013).

A number of studies have estimated the effect of racial desegregation on a wide array of different outcomes. The most convincing of these studies exploit plausibly exogenous variation—often generated by differences in the timing of the imposition or expiration of desegregation orders—to estimate these effects. This line of work has found desegregation to increase Black educational achievement (Billings, Deming, & Rockoff, 2014; Card & Rothstein, 2007; Mickelson, Bottia, & Lambert, 2013) and attainment (Guryan, 2004; Johnson, 2011; Lutz, 2011; Reber, 2010).³ These studies also find desegregation to increase the later-life earnings of Black males (Ashenfelter, Collins, & Yoon, 2006; Johnson, 2011), improve Blacks' later-life health status (Johnson, 2011), reduce the probability of criminal behavior and victimization (Lafree & Arum, 2006; Weiner, Lutz, & Ludwig, 2009; see Bergman, 2016), and limit the likelihood of living in poverty as an adult (Johnson, 2011). Most of this work finds desegregation to have either no effects (Johnson, 2011) or small positive effects (Weiner et al., 2009) on White students' outcomes.

Despite the evidence indicating desegregation to have substantial benefits across a large range of dimensions, the means by which integration has been achieved have not always proven popular. Reardon and Owens (2014) note that court desegregation orders were the single largest driver of the segregation declines that occurred in the 1960s, 1970s, and 1980s—these orders may have also contributed to the relative stability of segregation levels in recent years. However, over half of districts ever subject to court-ordered

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desegregation have been released from these orders, with most of these releases occurring in the past 20 years (Reardon, Grewal, Kalogrides, & Greenberg, 2012). Perhaps unsurprisingly, the vast majority of districts released from court-ordered desegregation have elected not to implement voluntary desegregation policies. However, a relatively small number of districts, such as Seattle and Louisville, did decide to initiate voluntary desegregation efforts. These voluntary efforts were complicated by the U.S. Supreme Court's 2007 decision in *Parents Involved in Community Schools v. Seattle School District No. 1*, which held school assignment systems considering the race of individual students to be unconstitutional. Together, these political and legal factors have imposed hurdles for racial integration efforts, putting supporters of these policies in a tough spot.

Rather than abandon integration efforts completely, however, supporters have redirected the focus toward policies that promote socioeconomic integration (e.g., Kahlenberg, 2012; Potter, Quick, & Davies, 2016). For example, under the Obama administration, USED explored the prospect of adding socioeconomic integration to the list of approved school turnaround strategies under the federal School Improvement Grant program. Similarly, USED identified programs promoting socioeconomic integration as one of five major funding priorities in the Investing in Innovation grant program. A major appeal of socioeconomic integration policies stems from the fact that they offer a race-neutral approach to school assignment while potentially achieving some degree of racial integration. Further support for pursuing such policies comes from Reardon's (2016) work showing that—out of 16 separate segregation measures—differences in mean poverty rates between the schools of Black and White students is the single strongest predictor of racial achievement gaps. Although the analytic approach does not support a causal interpretation, the results suggest that reducing race-based disparities in exposure to poor classmates could help close achievement gaps.

Relative to the literature on racial desegregation, the set of studies analyzing socioeconomic integration policies is much smaller. Beyond Reardon's (2016) aforementioned work, a few studies have examined trends in economic segregation of schools and districts, typically finding meaningful increases in between-district income segregation in recent decades (Corcoran & Evans, 2010; Owens, Reardon, & Jencks, 2016). Interestingly, these studies show little evidence of increased between-school income segregation overall but demonstrate meaningful increases in the 100 largest school districts in the United States (Owens et al., 2016).

Only a handful of studies explicitly analyze the link between socioeconomic-based school assignment policies and racial integration levels. In general, this work demonstrates that these policies can generate increased racial integration but are not guaranteed to do so. For instance, in the context of Chicago's exam schools, Ellison and Pathak (2016) show that a race-neutral

admissions policy can be designed to achieve varying degrees of racial diversity but that achieving higher levels of minority representation comes at a cost of lower average composite admissions scores for admitted students, relative to a purely race-based admissions policy. Similarly, Reardon, Yun, and Kurlaender (2006) compute the upper and lower bounds on racial segregation levels resulting from a socioeconomic-based school assignment policy, finding that such an approach to school assignment will not necessarily lead to greater levels of racial integration. The authors show that the ultimate level of racial desegregation resulting from an income-based assignment policy is contingent on the details of the school assignment policy, the magnitude of within-district racial income disparities, and existing patterns of racial and socioeconomic segregation.

Expanding on this work, and perhaps most directly relevant to our analysis, is Reardon and Rhodes' (2011) study examining how the introduction of socioeconomic-based school assignment policies affected a district's racial/ethnic segregation levels. Analyzing data from 40 districts that introduced such plans between 1992 and 2006—including WCPSS—the authors provide evidence that these policies vary in their impacts and that the variation is a function of two factors: (1) the strength of the socioeconomic-based assignment policy—the authors define weak policies as those that solely provide transfer priority to socioeconomically disadvantaged students and strong policies as those that use socioeconomic balancing—and (2) whether the socioeconomic-based assignment policy supplanted an existing race-based policy. The authors find that districts supplanting a race-based assignment policy with a weak socioeconomic-based one exhibited moderate increases in segregation. However, weak socioeconomic-based policies had no effects on segregation if there was no existing race-based assignment policy in the district. Strong socioeconomic-based assignment policies, in contrast, decreased segregation if no prior race-based policy existed in the district. These strong policies had no effect, though, if they replaced a race-based plan.

In addition to the multidistrict analysis described above, Reardon and Rhodes (2011) focus in greater detail on nine districts—including WCPSS—that implemented strong socioeconomic-based assignment policies in the years of their analysis. For WCPSS, the authors depict segregation trends from 1990 to 2005, a time period that spans the district's transition from a race-based school assignment policy to one based on SES. The analysis shows a clear decline in socioeconomic segregation in the years after implementation of the assignment policy. However, the analysis also shows no significant changes in racial/ethnic segregation levels in WCPSS as the district transitioned from a race-based to a socio-economic based assignment policy—segregation levels continued on their previous trajectory.

Our work builds on the analyses of Reardon and Rhodes (2011) in three main ways. First, we compare segregation levels under WCPSS' socioeconomic-based assignment policy with a counterfactual of residence-based

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school assignment—as noted above, Reardon and Rhodes (2011) employ a counterfactual of race-based assignment policy. Given the legal and political challenges facing race-based assignment policies, we believe that a counterfactual of residence-based school assignment is most policy relevant in this day and age. Second, our work is unique in its exploration of the effects of the socioeconomic-based assignment policy on segregation for the subset of students who would have attended schools with high concentrations of minority students under a residence-based assignment regime. Most existing work examines how assignment policies affect segregation levels faced by the average student—and such analysis is undoubtedly important—but the average student is arguably not the primary target of integration-oriented assignment policies. Rather, the primary target of these policies is typically students who would have attended schools with large concentrations of minority students. Our analysis will provide among the first evidence on how socioeconomic integration efforts shape the racial segregation levels faced by such students. Finally, our work extends prior scholarship by analyzing how socioeconomic-based integration efforts shape aspects of students’ schooling context beyond the racial segregation levels they face, with a particular focus on peer achievement levels. Together, our access to student-level data containing a record of each student’s neighborhood and attended school allows us to conduct a series of analyses that paint a more detailed picture of the effects of socioeconomic integration efforts than previous work provides.

Evolution of School Assignment Policy in the Wake County Public School System

As in many cities, desegregation was a slow process for schools in the Raleigh metropolitan area in the years immediately following the Supreme Court’s *Brown* ruling—by the mid-1960s, only a handful of Black students attended schools that were predominantly White (Ayscue, Siegel-Hawley, Kucsera, & Woodward, 2018; Parcel, Hendrix, & Taylor, 2015). However, a series of court rulings and threats of withheld federal funding in the late-1960s and early-1970s ratcheted up the pressure for Raleigh-area schools to meaningfully desegregate (Mickelson, Smith, & Nelson, 2015)—at the time, the educational landscape in Raleigh consisted of a mostly White county school district and a majority Black city school district. This federal pressure, coupled with local concerns that the growing racial and socioeconomic stratification would threaten Raleigh’s economic prospects, led officials to pursue a politically controversial merger of the city and county school districts (Benjamin, 2012). Because of citizen resistance to the plan, officials pursued the merger through an appeal to the state legislature, which approved the proposal in 1974—the merger officially went into effect 2 years later, and in 1976, WCPSS was born.

Among WCPSS' first major actions after the merger was implementation of a magnet school program. In particular, the district opened a number of magnet schools in majority Black neighborhoods in an effort to draw White students and achieve voluntary integration, at least in these schools. Along with this voluntary desegregation effort, WCPSS also implemented a more formal desegregation program in 1982. This policy, which came to be known as the 15-45 policy, held that the student body at each school in the district was to be no less than 15% Black and no more than 45% Black. The 15-45 policy was in place for nearly 20 years, but in the late 1990s, the district began to fear that its race-based assignment policy would be ruled unconstitutional—these fears ultimately proved well-founded—and redesigned the policy to achieve balance on SES and achievement levels, rather than race.

The socioeconomic-based assignment policy, which went into effect in the 2000–2001 school year and extended through the 2009–2010 school year, set a maximum target of 40% of enrolled students eligible for free or reduced-price lunch (FRL) in a given school. In addition, the assignment policy set a target of no school serving a student body in which more than 25% of students were performing below grade level, as measured by district standardized tests.⁴ WCPSS used a multifaceted student assignment policy to achieve these targets. WCPSS first divided the county into roughly 1,500 geographic nodes, each of which contained approximately 125 students. Each of these nodes was then assigned to what WCPSS refers to as a “base” school—we refer to these as neighborhood schools—which served as the default school for a student to attend. However, pure residence-based school assignments—where each student attended his or her neighborhood school—would fail to meet WCPSS’ targets regarding socioeconomic balance and student achievement. Consequently, the district employed several additional components in its school assignment policy. First, the district continued to operate a set of magnet schools that attracted relatively affluent students to schools predominantly located in socioeconomically disadvantaged neighborhoods. Second, WCPSS operated a number of year-round schools that families had to apply in order to attend. Although WCPSS’ initiation of year-round schooling was primarily a strategy to address rapid student enrollment growth, these schools also provided the district a lever for managing the socioeconomic composition of these schools.

Finally, to fully meet the districts’ targets concerning SES and student achievement, WCPSS annually reassigned a small number of the aforementioned nodes—and the students within those nodes—to a school other than their neighborhood school. The district considered two main factors—SES and school capacity constraints—when identifying the specific nodes that would be reassigned away from their neighborhood school. Thus, neighborhood schools with large proportions of socioeconomically disadvantaged students may have some of their nodes reassigned to other, more affluent

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schools. The reverse could occur as well, with schools serving relatively affluent students having some of their nodes reassigned to schools serving a less advantaged student population. These reassignment decisions, however, were made in the context of explosive student enrollment growth, which resulted in many WCPSS schools bumping up against capacity constraints. So in addition to considering socioeconomic balance, district officials also used reassessments to keep school sizes in check by reassigning nodes away from oversubscribed schools. Although reassignment affected only a small proportion of students in any given year—typically no more than 5%—this component of the school assignment policy generated significant controversy as parents disliked the uncertainty it generated (Parcel & Taylor, 2015).

Ultimately, this uncertainty—coupled with rapid population growth, demographic change, and shifting political winds in both Wake County and North Carolina more broadly—resulted in the WCPSS school board significant scaling back SES-based school assignment beginning in 2010. That is when Wake County voters handed control of the school board to a conservative majority who quickly moved to implement an assignment policy with neighborhood schools at the forefront. These changes illustrate the difficulty of maintaining commitment to SES-based integration over time. Even in a district like WCPSS, which has a longer history of integration efforts than nearly any other in the country, any number of factors can quickly derail SES-based integration efforts.

In sum, throughout the 2000s, WCPSS employed a multipronged school assignment system to achieve its desired level of socioeconomic and achievement balance across schools. The multifaceted nature of WCPSS' assignment system raises the question of how the voluntary aspects of the system, namely, magnet schools and year-round schools, relate to involuntary reassignment, as well as to the broader SES-based integration policy. In addressing this question, we believe that it is important to distinguish between district policy—that no school will have more than 40% of its students eligible for FRL or more than 25% of students performing below grade level—and assignment-based strategies for implementing that policy, such as magnet schools, year-round schools, and involuntary reassignment. We believe that this distinction clarifies our view of the voluntary and involuntary aspects of WCPSS' school assignment system as complementary strategies for achieving the district's SES-based integration policy. Indeed, in the concluding section of this article, we discuss the imperative for districts to employ a large and diverse set of school assignment strategies—like WCPSS did—if they hope to achieve meaningful school-level integration. Viewing the voluntary and involuntary aspects of WCPSS' school assignment system as complementary integration strategies illuminates a number of issues relevant to both research and policy. For example, it raises the question of the relative contributions of the voluntary and involuntary assignment

strategies in achieving integration goals. It also highlights the potential for voluntary strategies to generate school-level integration, but simply push segregation down to the classroom level. Such questions are undeniably policy-relevant and should serve as the basis of future inquiry, but they are beyond the scope of our analysis.

At the end of the day, most WCPSS students attended their neighborhood school under the district's SES-based integration policy, but a nontrivial number did not. Below we describe how we take advantage of the fact that our data identify each student's neighborhood school as well as the school they actually attended under the assignment policy. We also detail how we use this information to calculate the difference between racial/ethnic segregation levels under the socioeconomic-based policy and those levels under a counterfactual of pure residential assignment.⁵

Data and Sample

We conduct our analyses using a dataset constructed from administrative records maintained by WCPSS, coupled with information from the U.S. Census Bureau. Our dataset contains annual, individual-level observations with a wide range of information for every student enrolled in WCPSS between the 2002–2003 and 2009–2010 school years. In particular, our dataset contains information on student demographic characteristics, academic achievement, attendance, disciplinary actions, WCPSS node, neighborhood of residence, neighborhood school assignment, school of attendance, and school characteristics.

Demographically, our dataset contains common measures such as age, grade, gender, race/ethnicity, special education status, and English language learner (ELL) status. Our data do not contain an indicator of FRL eligibility. With respect to achievement, our data contain students' scale scores on the reading and math assessments North Carolina uses for federal accountability purposes. We standardize these scores by grade, subject, and year.

Most important for the purposes of this article, however, is the information in our data on WCPSS node, neighborhood school assignment, and school of attendance. As described above, throughout much of the 2000s, WCPSS operated under a school assignment policy that used geographic nodes to achieve a degree of balance in student achievement and SES across schools. Our data contain an annual identifier of the node in which each student resides as well as the neighborhood school connected to that node—we have a measure of the school that each student would have attended in the absence of the assignment policy designed to achieve socio-economic balance. Our data also include an identifier of the school that students actually attend each year, as well as an indication of the reason why students were not attending their neighborhood school. There are several reasons other than forced reassignment why students may not have attended

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their neighborhood school, including magnet school attendance, enrollment in a year-round school, and receipt of ELL or special education services, among other reasons. Our data indicate that about 60% of students not attending their base school do so to attend magnets (34%) or year-round (27%) options, with only a minority of students not attending their neighborhood school due to reassignment.

In addition to the identifier for the WCPSS-assigned node for each student, our data also contain an annual identifier of the census tract in which each student resides. We used this identifier as the basis for merging in observable neighborhood characteristics from the American Community Survey. Our data contain a wide variety of such characteristics, including information on levels of educational attainment, employment rates, household structure, racial/ethnic composition, income, residential vacancies, owner occupancy, home values, and receipt of public assistance. Together, the breadth of information contained in our dataset facilitate analyses that provide insight into the relationship between school assignment policies designed to achieve socioeconomic integration and racial/ethnic segregation levels.

Table 1 summarizes the characteristics of our analytic sample. The table illustrates that approximately one-quarter of WCPSS students were Black, about 10% were Hispanic, and just over 50% were White. The average WCPSS student attended a school that was broadly representative—with regard to race and ethnicity—of the district, and about 62% of WCPSS students attended their neighborhood school during the time period our data span. Interestingly, the typical WCPSS student resided in a neighborhood that was about 65% White and 25% Black. Approximately 45% of adults in the average student's neighborhood had a bachelor's degree, about 7% were unemployed, and average median neighborhood income was about \$80,000. Supplemental Table A1 (available online) in the appendix presents these statistics separately for Black, White, and Hispanic students. The table reveals that—compared with the average Black or Hispanic student—the average White student had higher achievement levels, attended more advantaged schools, and lived in a neighborhood with a higher median income and a larger proportion of adults with a college degree.

Comparing WCPSS with the state as a whole reveals that the district was almost perfectly representative with respect to race and ethnicity. Across the full time period we study, the enrollments of both WCPSS and North Carolina more broadly were about 50% White, one-third Black, and just over 10% Hispanic. However, the district underwent a notable demographic shift in the years our data span, with the proportion of Hispanic students doubling from 6.5% in 2003 to 13% in 2010 and the proportion of White students declining from 60% to 51% during this time. With respect to SES, WCPSS was significantly more affluent than the state as a whole, with about 35% of students in WCPSS qualifying for FRL, compared with more than half

Table 1
Sample Descriptive Statistics

Characteristics	All Years		2003		2010	
	M	SD	M	SD	M	SD
Student characteristics						
Math achievement	0.000	1.000	0.001	1.000	0.001	1.000
Reading achievement	0.000	1.000	0.000	1.000	0.000	1.000
Black	0.263	0.440	0.265	0.442	0.256	0.436
Hispanic	0.102	0.303	0.067	0.250	0.130	0.337
White	0.544	0.498	0.597	0.491	0.507	0.500
Other race	0.090	0.287	0.071	0.258	0.107	0.309
ELL	0.048	0.213	0.045	0.207	0.051	0.221
Special education	0.137	0.344	0.144	0.350	0.128	0.333
Male	0.508	0.499	0.509	0.499	0.509	0.500
Attends neighborhood school	0.622	0.485	0.721	0.448	0.522	0.500
N- Student-year observations	981,824	981,824	104,811	104,811	136,196	136,196
N- Unique students	243,555	243,555	104,811	104,811	136,196	136,196
School characteristics						
Average math achievement	-0.004	0.359	-0.005	0.311	-0.001	0.341
Average reading achievement	-0.010	0.331	-0.006	0.283	-0.001	0.310
Proportion Black	0.263	0.145	0.265	0.137	0.256	0.142
Proportion Hispanic	0.102	0.066	0.067	0.046	0.130	0.068
Proportion White	0.544	0.164	0.596	0.147	0.507	0.163
Proportion other race	0.090	0.056	0.071	0.039	0.107	0.068
Proportion ELL	0.048	0.046	0.045	0.051	0.052	0.039
Proportion special education	0.137	0.044	0.143	0.045	0.127	0.042
Proportion male	0.508	0.028	0.509	0.027	0.509	0.029

(continued)

Table 1 (continued)

Characteristics	All Years		2003		2010	
	M	SD	M	SD	M	SD
Proportion attending neighborhood school	0.739	0.281	0.721	0.318	0.749	0.234
N- School-year observations	1,166	1,166	128	128	163	163
N- Unique schools	165	165	128	128	163	163
Neighborhood characteristics						
Proportion White	0.646	0.228	0.598	0.269	0.677	0.198
Proportion Black	0.245	0.223	0.309	0.260	0.212	0.199
Proportion Asian	0.047	0.062	0.029	0.030	0.057	0.076
Proportion other race	0.059	0.046	0.062	0.039	0.051	0.042
Proportion unemployed	0.067	0.041	0.054	0.045	0.077	0.042
Proportion adults with bachelor's degree	0.455	0.192	0.343	0.152	0.493	0.189
Proportion households twice the poverty line	0.744	0.164	0.730	0.163	0.752	0.162
Median family income (\$)	80,610	33,093	66,732	27,689	86,652	33,287
Proportion high school dropout	0.084	0.084	0.116	0.087	0.073	0.077
Proportion some college	0.272	0.068	0.251	0.048	0.276	0.076
Proportion public assistance income	0.011	0.013	0.017	0.017	0.010	0.012
Proportion labor market participation	0.725	0.069	0.720	0.074	0.727	0.067
Proportion married households	0.526	0.174	0.463	0.155	0.558	0.172
N- Neighborhood-year observations	1,481	1,481	186	186	186	186
N- Unique neighborhoods	186	186	186	186	186	186

Note. ELL = English language learner. The N sizes are based on the modal number of observations across the set of variables.

of students across the state more broadly. WCPSS also outperformed the state as a whole on standardized tests. According to data from the Stanford Education Data Archive, WCPSS performed about 0.3 standard deviations higher than the state average. WCPSS' outperformance of the state as a whole is driven almost entirely by White students, who scored about one-half of a standard deviation higher than the average White student in the state—Black and Hispanic students in WCPSS scored at about the state average, a pattern that led to large race-based achievement gaps in the district (Reardon et al., 2017).

Socioeconomic Status, School Assignment Policy, and Segregation Levels

We leverage the fact that our data contain annual information on both students' neighborhood school and the school they actually attended under WCPSS' school assignment policy to calculate racial/ethnic segregation levels under each scenario. As we describe in greater detail below, we first aggregate the student-level records to the school level on the basis of students' observed school of attendance—we perform this aggregation annually for each year from 2002–2003 to 2009–2010. We then aggregate the student-level records to the school level a second time, but this aggregation is done annually on the basis of students' neighborhood school. In effect, we create two school-by-year level datasets. The first depicts the racial/ethnic composition of WCPSS schools under the socioeconomic-based assignment policy—the observed state of the world. The second dataset contains information on the composition of schools in a counterfactual world where all students attend their neighborhood school. Using these two datasets, we calculate annual levels of racial/ethnic segregation under both the observed and counterfactual states of the world. The difference between the two sets of calculations represents the effect of the socioeconomic-based assignment policy on racial/ethnic segregation levels.

The major threat to the validity of our empirical approach is the possibility of endogenous residential location decisions. That is, it is possible that families make residential location decisions under the socioeconomic-based assignment policy that differ from the locational decisions they would have made in the absence of the policy. Work leveraging a court decision releasing the Charlotte-Mecklenburg school district from their desegregation order provides some evidence of such behavior (Liebowitz & Page, 2014). The study indicates that, after the district was released from the court-ordered desegregation plan, White families who moved were substantially more likely to relocate to a neighborhood with a greater proportion of White residence than their prior neighborhood, compared with White families' relocation patterns under the desegregation order. However, the relatively low number of White families relocating after the unitary

declaration, coupled with the increased propensity of non-White movers to also move to Whiter neighborhoods, resulted in no meaningful change in overall residential segregation patterns in the district. Although such findings raise some concerns about the potential for endogenous residential location decisions, features of the Charlotte context potentially limit the relevance to our analysis, and to WCPSS more generally. In Charlotte, the transition from the desegregation-oriented school assignment policy to the post-desegregation assignment policy generated a clear change for some families in the school their child would attend based on the location of their residence. Importantly, though, the school connected to each residence was known to families under each assignment policy, thus allowing families to make informed—and potentially different—residential location decisions under each policy. As we describe below, considerable uncertainty in the connection between residential location and assigned neighborhood school under WCPSS's socioeconomic-based school assignment policy resulted in Wake County families facing a similar incentive structure regarding residential location as they would have under a pure residence-based school assignment policy—this serves to mitigate the validity threat posed by endogenous residential location decisions.

More generally, we argue that the validity threat posed by endogenous residential location is likely to be minimal in the WCPSS context for two main reasons. First, during the years the socioeconomic-based assignment policy was in effect, a solid majority of students—over 60%—attended their neighborhood school. This implies that the families locating in a given neighborhood in order for their children to attend a particular school are, in fact, highly likely to attend that school. As such, the incentive structure for residential location decisions under the socioeconomic-based assignment policy is comparable to that under a pure residence-based assignment policy. A related phenomenon could involve exiting the district in response to the socioeconomic-based assignment policy, particularly among White families. However, our data show that less than 10% of students exit the district in any given year, which is a very low interdistrict mobility rate for a large district like WCPSS. Moreover, this exit rate does not meaningfully vary across the time period we study, and our data show that White students are least likely to exit the district. Second, and more important, families had little *a priori* information as to whether a particular node would be reassigned away from its neighborhood school in a given school year. Parcel and Taylor (2015) make clear that reassignments occurred annually and, although the district communicated these decisions many months in advance, families that did not monitor the process sometimes felt blindsided by reassignment decisions. Moreover, our data show that some nodes were reassigned multiple times over the years we study, while others maintained the same neighborhood school throughout the full time period. This unpredictability of the assignment process mitigates families' ability to select

a residential location on the basis of whether the node is likely to be reassigned away from its neighborhood school.

Because we cannot eliminate the possibility of validity threats posed by endogenous residential location decisions, we briefly discuss two possible scenarios for how these validity threats could manifest. First, it is possible that, relative to a pure residence-based assignment system, the socioeconomic-based assignment system affected residential location decisions in a manner that led to greater levels of residential segregation. Under this scenario, our analysis would overestimate the difference in racial/ethnic segregation between the counterfactual neighborhood schools and the observed schools of attendance. On the other hand, and perhaps more likely given the findings of Liebowitz and Page (2014), is the possibility that the socioeconomic-based school assignment policy affected locational decisions in a manner that led to lower levels of residential segregation, compared with a residence-based assignment policy. The lack of certainty regarding the connection between families' residential location and their assigned school may have resulted in them making decisions on the basis of other factors, such as employment location, that serve to decrease residential segregation. Alternatively, families may learn that residing in a relatively integrated neighborhood minimizes their chance of reassignment and ultimately make such a housing decision. Under these scenarios, our analysis would underestimate the difference in racial/ethnic segregation levels between counterfactual neighborhood schools and observed schools of attendance. Although either scenario is plausible, we believe that neither is likely for the reasons outlined above.

Earlier, we described that the first step in our analysis involved aggregating the individual records to the school level on two bases: (1) students' school of attendance and (2) students' neighborhood school. The result of this aggregation is two datasets that provide respective annual information on the actual composition of schools (i.e., with the socioeconomic-based assignment policy in effect) and the composition of schools in a counterfactual world where all students attend their neighborhood school. Figure 1 presents information on the distribution of school racial/ethnic composition under each of these two scenarios. Specifically, aggregating across years, the three panels of the figure present the respective percentages of Black, White, and Hispanic students at five points of the distribution of schools—the 5th, 25th, 50th, 75th, and 95th percentiles. Figure 2 presents average school reading and math achievement, respectively, at the same five points of the distribution, again aggregated across years. Although achievement segregation is not the focus of the article, a major pillar of WCPSS' school assignment policy involved ensuring that no school had more than a quarter of its students performing below grade level. Figure 2 provides a cursory look at this issue. Supplemental Tables A2 and A3 in the appendix (available in the online

School Assignment Policy and Racial Segregation Levels

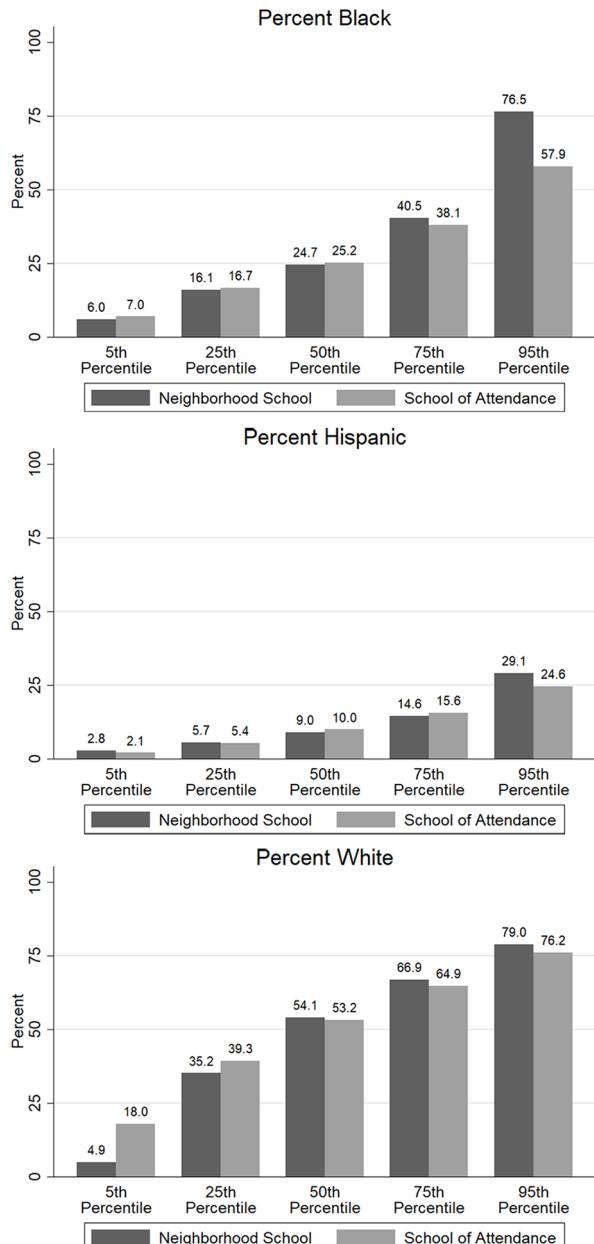


Figure 1. Racial/ethnic composition of neighborhood schools and schools of attendance, by percentile of the distribution of each set of schools.

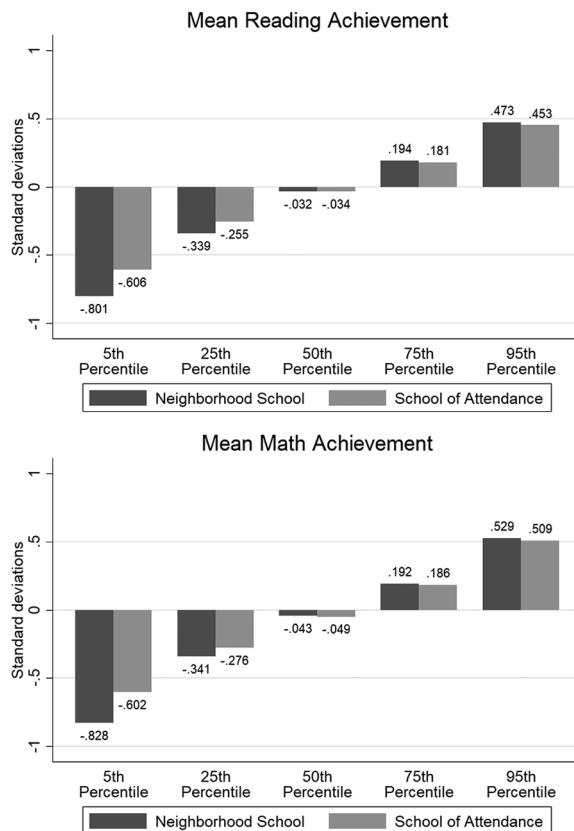


Figure 2. Average achievement of neighborhood schools and schools of attendance, by percentile of the distribution of schools.

version of the journal) provide this information separately for each year from 2002–2003 through 2009–2010.

We highlight four takeaways from Figures 1 and 2. First, throughout the bottom half of the distribution of schools, Figure 1 shows little difference between neighborhood schools and attended schools in the percentage of students who are Black. For example, the median neighborhood and attended school each have student bodies that are approximately 25% Black. However, noticeable differences in the percentage of Black students in neighborhood and attended schools begin to emerge in the upper half of the distribution, and particularly at the 95th percentile. Figure 1 shows that schools at this point in the distribution would have been about 77% Black if all students attended their neighborhood school. Under the

socioeconomic-based assignment policies, though, schools were only about 58% Black.

Second, for Hispanic students, the composition of neighborhood and attended schools is relatively similar at each point of the distribution of schools. Even at the 95th percentile, schools would have been about 29% Hispanic if all students attended their neighborhood school but were actually 25% Hispanic under WCPSS' assignment policy. We do note, though, that there was significant growth in WCPSS' Hispanic population over the period we studied. Supplemental Table A2 in the appendix (available in the online version of the journal) illustrates that the median school grew from approximately 5% Hispanic in the 2002–2003 school year to about 13% Hispanic in the 2009–2010 school year.

Third, with regard to the percentage of White students in the student body, Figure 1 reveals noticeable differences in the bottom half of the distribution between neighborhood and attended schools. For example, neighborhood and attended schools were 5% and 18% White, respectively, at the 5th percentile of the distribution. Similar differences are present at the 25th percentile, albeit smaller in magnitude. Interestingly, there is very little difference between neighborhood and attended schools in the percentage of White students in the upper half of the distribution. Majority White schools remained so and exhibited little difference on this score with and without the presence of the socioeconomic-based assignment policy.

Finally, Figure 2 illustrates a substantial difference in average school achievement between neighborhood and attended schools in the bottom half of the distribution. A school at the 5th percentile of the neighborhood school distribution had an average reading achievement level 0.80 standard deviations below the district mean. A school at that point of the attended school distribution, in contrast, had an average achievement level only 0.61 standard deviations below the district-wide average. Though the differences are smaller in magnitude, Figure 2 illustrates a similar pattern at the 25th percentile of the distribution. Math results are substantively similar to those for reading. Considered together, the results in Figures 1 and 2 suggest that the socioeconomic assignment policy resulted in substantively different levels of racial/ethnic segregation and average student achievement, relative to a counterfactual world where all students attended their neighborhood school. The differences in segregation levels are particularly evident for students whose neighborhood school had large proportions of Black students.

We investigate the differences between neighborhood and attended schools in their racial/ethnic composition more formally using three common measures of segregation—the information theory index (also referred to as Theil's H), the exposure index, and the isolation index—each of which conveys different, and complementary, information about segregation levels. In particular, these measures reflect the two major conceptualizations of segregation in the literature. The information theory index provides

evidence on the degree to which different groups of students are evenly distributed across schools in the district—it speaks to the conceptualization of segregation as disproportionality in group proportions (Reardon & Firebaugh, 2002). The isolation and exposure indices, on the other hand, measure the degree of contact that students of one group are likely to have with students of another group within schools in the district—these measures reflect a conceptualization of segregation as potential intergroup interaction.

The information theory index is based on the concept of entropy—represented by E in Equation (1) below—which is a multigroup diversity measure that can be written as

$$E = \sum_{x=1}^n R_x \ln\left(\frac{1}{R_x}\right) \quad (1)$$

where R_x represents the proportion of total district enrollment made up of group x . This measure serves as the basis of the information theory index, which is represented by H in Equation (2) below and can be written as

$$H = \frac{\sum_{s=1}^n \frac{t_s}{T} (E - E_s)}{E} \quad (2)$$

where the level of racial/ethnic imbalance across schools, s , in WCPSS is calculated using measures of school enrollment (t) and total district enrollment (T), as well as the aforementioned measure of entropy, calculated both for each school (E_s) and the district as a whole (E). Conceptually, the information theory index conveys the average deviation in schools' racial/ethnic composition from the racial/ethnic composition of the district as a whole—it is a measure of the degree to which students of different racial/ethnic groups in WCPSS are evenly distributed across schools in the district. The measure ranges from 0 to 1, with a value of 0 indicating no segregation and a value 1 of indicating total segregation.⁶

Whereas the information theory index measures the extent to which group members are evenly distributed across units, the exposure and isolation indexes measure the level of potential contact between members of different groups. The exposure index can be written as

$$P_{xy} = \sum_{s=1}^n \frac{t_{xs}}{X} * \frac{t_{ys}}{t_s} \quad (3)$$

where the exposure of group x to group y (P_{xy}) is again calculated across n WCPSS schools s in a given school year. In the calculation, t_{xs} and t_{ys} represent, respectively, the number of students in groups x and y in each school, t_s represents total school enrollment, and X is the districtwide population of group x . The exposure of group x to itself is considered its isolation and is calculated by replacing the t_{ys} term in Equation (3) with t_{xs} . Both the

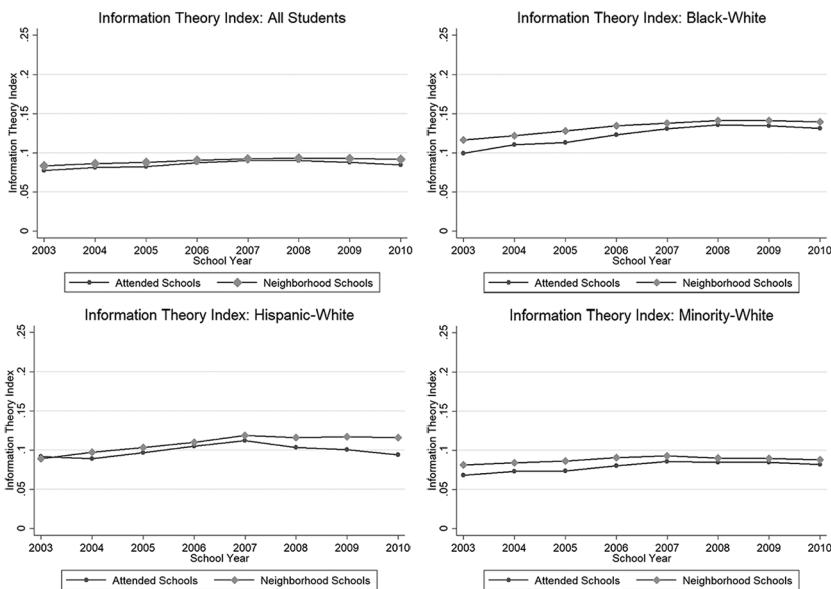


Figure 3. Information theory index (Theil's H) for neighborhood schools and schools of attendance, by year and racial/ethnic comparison.

exposure and isolation indexes range from 0 to 1. Large values on the exposure index correspond to low levels of segregation, but the reverse is true for the isolation index—large values indicate high segregation levels.

Using each of these three indexes, we first calculate the level of segregation across schools that students actually attended. We then calculate the level of segregation that would have been observed in a counterfactual world where all students attended their neighborhood school—that is, if school assignments were made on the basis of residential location.⁷ The results of these calculations are presented in Figures 3 to 5 for each year from 2002–2003 to 2009–2010. Figure 3 presents the information theory index results for four separate comparisons—all student groups, Black-White, Hispanic-White, and minority-White—while Figure 4 presents the Black-White and Hispanic-White exposure indices. Figure 5 presents the isolation index calculations for Black, White, and Hispanic students. Supplemental Table A4 in the appendix (available in the online version of the journal) presents the calculations underlying Figures 3 to 5.

Taken together, Figures 3 to 5 indicate that district-wide segregation levels under the socioeconomic-based school assignment policy were not meaningfully different than they would have been under pure residential

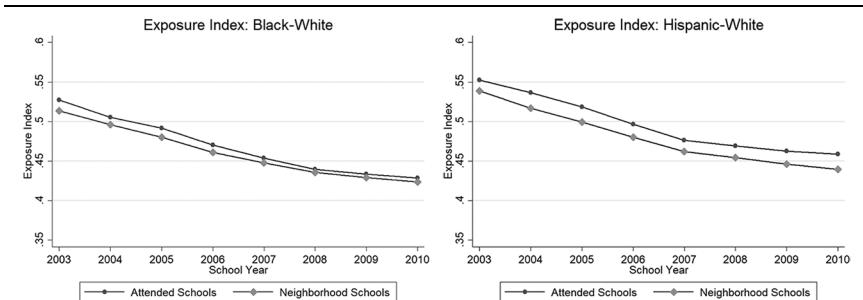


Figure 4. Exposure index for neighborhood schools and schools of attendance, by year and racial/ethnic comparison.

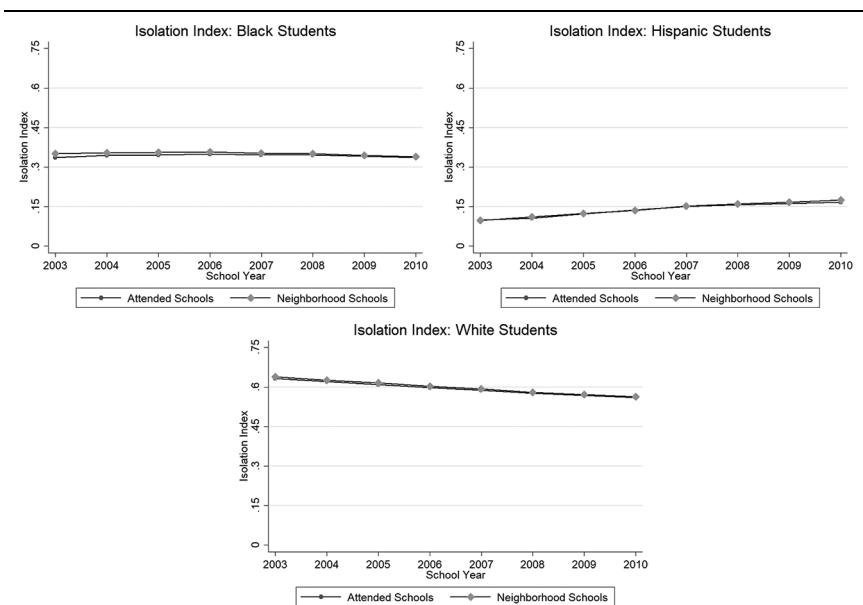


Figure 5. Isolation index for neighborhood schools and schools of attendance, by year and racial/ethnic comparison.

school assignment. For example, the “All Students” panel of Figure 3 shows near-identical information theory calculations for students’ neighborhood and attended schools across each year we analyze. Figure 3 provides evidence that WCPSS’ socioeconomic school assignment policy resulted in

a slightly more even distribution of Black and White students in the early years of the policy and of Hispanic and White students in later years—these groups were more evenly distributed across their attended schools than they would have been under their counterfactual neighborhood school assignments. However, the magnitudes of these differences are only in the range of 0.02 and thus quite small from a substantive standpoint. Unsurprisingly, results for the minority-White comparison generally reflect the results from the Black-White and Hispanic-White comparisons. Taken as a whole, the information theory index calculations indicate that, compared with a residence-based assignment system, WCPSS' socioeconomic-based assignment policy slightly increased the degree to which Black, Hispanic, and White students were evenly distributed across schools in the district. However, the magnitudes of these increases are quite small.

Turning to the exposure index, the results in Figure 4 illustrate that the socioeconomic-based assignment policy slightly increased the exposure of Blacks and Hispanics to Whites. As with the information theory index, though, the substantive magnitudes of the differences are small. For example, when averaged across all the years we analyze, the calculations indicate that the average Black student's neighborhood school was 45.8% White and the average Black student's attended school was 46.5% White—a difference of less than one percentage point. The differences between neighborhood and attended schools for the Hispanic-White comparison are somewhat larger but still only in the range of two percentage points (see Supplemental Table A4 in the appendix [available in the online version of the journal] for the specific calculations). The observed decline in Black-White and Hispanic-White exposure over the time period is attributable to the fact that the percentage of White students in WCPSS declined from 59.7% in 2003 to 50.7% in 2010.

The substantive takeaway from the isolation index is similar to the prior two indexes—Figure 5 shows that the socioeconomic-based assignment policy produced small declines in isolation for Black students, particularly in the early years of the policy. Averaging the calculations across all years, our data span reveals that the average Black student's neighborhood school was 35.0% Black while their school of attendance was 34.3% Black, a difference of less than one percentage point. Figure 5 shows similar—or even smaller—reductions in isolation for the other racial/ethnic groups.

Students With Majority-Minority Neighborhood Schools

The results in Figures 3 to 5 are consistent with the findings in Figure 1 showing relatively little difference in the composition of the median neighborhood and attended school. However, Figure 1 also showed noticeable differences between neighborhood and attended schools in the tails of the distribution. For example, schools at the 95th percentile of the “percent

Black” distribution would have been about 77% Black if all students attended their neighborhood school. Under the socioeconomic-based assignment policies, though, schools at this point in the distribution were only about 58% Black. Similar differences are seen in the lower tail of the “percent White” distribution. This pattern suggests that segregation levels under the socioeconomic-based assignment policy may not be much different from those under a residence-based assignment system for the average WCPSS student, but they may be markedly different for students who would have attended majority-minority schools under a residence-based school assignment policy.

To more formally examine this possibility, we perform an analysis where we limit our sample to students whose neighborhood schools have a large proportion of minority students, which we define in two ways: (1) Schools over 50% non-White and (2) Schools over 75% non-White. To situate these two sets of schools within the broader WCPSS context, we note that a school with just more than 50% non-White students falls at approximately the 60th percentile of the distribution of schools when that distribution is ordered by the proportion of non-White students—a school with just over 75% non-White students falls at about the 85th percentile of that same distribution. Table 2 presents descriptive statistics for these two groups of students—it also includes full-sample descriptive statistics as a point of comparison. In particular, Table 2 presents average achievement levels, demographic characteristics, and schooling classifications (e.g., special education and ELL), as well as mean school and neighborhood characteristics. The table illustrates that students are, on average, quite low-achieving, with mean reading and math scores for students with majority-minority neighborhood schools scoring about one third of a standard deviation below the districtwide average. Scores for students with 75% minority neighborhood schools are even lower, more than one half of a standard deviation below average. Students in these schools are also more likely to be classified as ELL and receive special education services. Finally, Table 2 illustrates that the average student with a majority-minority (or 75% minority) neighborhood school resides in noticeably less advantaged neighborhoods than the typical WCPSS student.

We recognize that students attending these schools represent a relatively small proportion of WCPSS’ total student enrollment, but we believe that this student population is worthy of in-depth analysis for at least two reasons. First, although WCPSS’ socioeconomic-based assignment policy applied to the whole district, it is clear that this policy—and the race-based assignment policy preceding it—was primarily rooted in a desire to avoid concentrating racial or ethnic minorities in a small number of schools (see Parcel & Taylor, 2015, p. 19). We believe that our analysis will provide unique insight into how WCPSS’ school assignment policy performed on this score. Second, as reviewed in Section II, the academic literature provides evidence that the benefits of racial integration disproportionately accrue to minority

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Table 2
Characteristics of Full Sample, Students With Majority-Minority Neighborhood Schools, and Students With 75% Minority Neighborhood Schools: 2003–2010

Characteristics	Full Sample	Majority-Minority Neighborhood School	75% Minority Neighborhood School
Student characteristics			
Mean math achievement	0.000	-0.309	-0.546
Mean reading achievement	0.000	-0.288	-0.523
Black	0.263	0.416	0.580
Hispanic	0.102	0.159	0.192
White	0.544	0.344	0.161
Other race	0.090	0.082	0.068
ELL status	0.048	0.079	0.105
Special ed status	0.137	0.154	0.166
Male	0.508	0.509	0.502
Attends neighborhood school	0.622	0.559	0.557
School characteristics			
Mean math achievement	-0.004	-0.172	-0.209
Mean reading achievement	-0.010	-0.162	-0.198
Proportion Black	0.263	0.372	0.418
Proportion Hispanic	0.102	0.139	0.143
Proportion White	0.544	0.402	0.349
Proportion other race	0.090	0.087	0.090
Proportion ELL	0.048	0.065	0.071
Proportion special education	0.137	0.147	0.137
Proportion male	0.508	0.509	0.507
Proportion attending neighborhood school	0.739	0.671	0.558
Neighborhood characteristics			
Proportion White	0.646	0.539	0.370
Proportion Black	0.245	0.353	0.522
Proportion unemployed	0.067	0.078	0.098
Proportion adults with BA degree	0.455	0.357	0.284
Median family income (\$)	80,610	64,197	51,708
Proportion high school dropout	0.084	0.117	0.146
Proportion single-parent households	0.158	0.198	0.250
N- Student-year observations	981,824	340,513	66,722
N- Unique students	243,555	107,767	29,576

Note. ELL = English language learner.

students who would have otherwise attended highly segregated schools. By assessing whether WCPSS' socioeconomic-based assignment policy exposes these students to a more racially diverse schooling context, our analysis sets

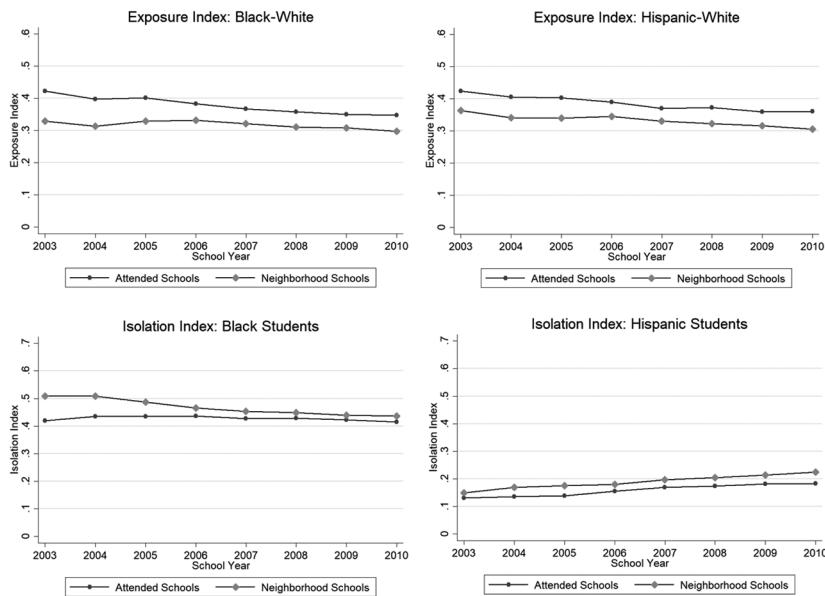


Figure 6. Isolation and exposure for majority minority neighborhood schools and schools of attendance, by racial/ethnic comparison.

the stage for potential future work examining whether WCPSS' policy affected student outcomes.

Our first step in this analysis involves calculating the exposure and isolation indexes for two sets of students: (1) those whose neighborhood schools were majority-minority and (2) those whose neighborhood schools would have consisted of at least 75% non-White students. We perform this calculation under the assumption that students would have attended these neighborhood schools under a residence-based school assignment policy. Next, we use our student-level data to identify every school attended by a student whose neighborhood school would have enrolled at least 50% (or 75%) non-White students. We then calculate the isolation and exposure indexes across the schools attended by students whose neighborhood schools would have enrolled more than 50% (or 75%) non-White students. In this calculation, we weight each school by the number of students attending that school whose neighborhood school was at least 50% (or 75%) non-White.⁸ The results of these two sets of calculations are presented in Figures 6 and 7. Figure 6 presents the results for the set of students with majority-minority neighborhood schools, while Figure 7 presents results for the set of students whose neighborhood school would have been more than 75%

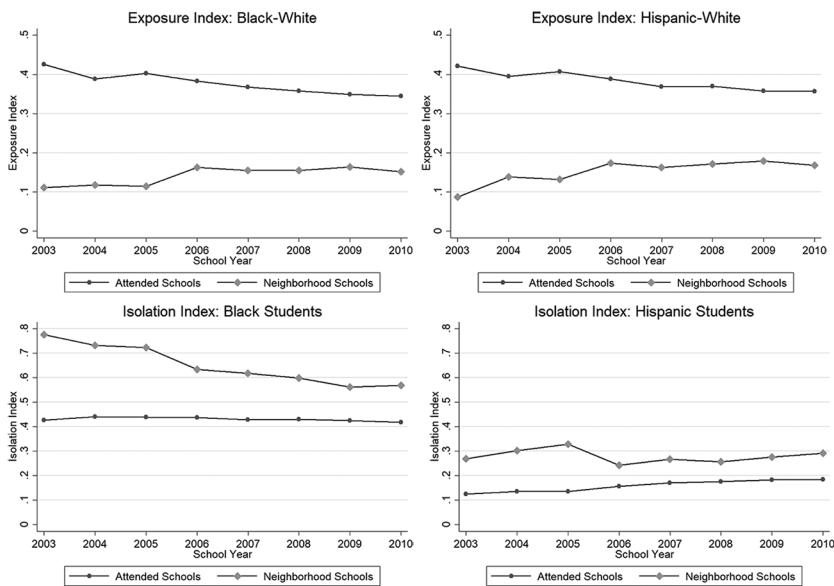


Figure 7. Isolation and exposure for neighborhood schools with 75% minority students and schools of attendance, by racial/ethnic comparison.

minority. The number of majority-minority neighborhood schools in WCPSS ranges from 42 in 2002–2003 to 65 in 2009–2010. The number of neighborhood schools that would have been more than 75% minority is smaller, ranging from 13 in 2002–2003 to 24 in 2009–2010. Supplemental Table A5 in the appendix (available in the online version of the journal) presents the calculations underlying Figures 6 and 7.

We highlight three takeaways from the exposure index results in Figure 6. First, for both the Black-White and Hispanic-White comparisons, WCPSS' socioeconomic-based assignment policy increased minority students' exposure to White students. Averaging the calculations across all years reveals that the policy increased Black-White exposure for students with majority-minority neighborhood schools by about six percentage points—Black students' neighborhood schools were, on average, 32% White, but their attended schools were 38% White. Figure 6 makes clear that these effects were somewhat larger in the early years of the policy and somewhat smaller in the later years. Second, the effects of the assignment policy on Hispanic-White exposure for students with majority-minority neighborhood schools are broadly similar to the effects on Black-White exposure, increasing Hispanic students' exposure to White students by an average of five

percentage points across the years we analyze. Third, both Black-White and Hispanic-White exposure exhibited continual decline across the years we analyze. Although these declines are likely attributable to multiple factors, evidence indicates that the significant growth of WCPSS' Hispanic population is a major contributor.

The isolation index results in Figure 6 paint a similar substantive picture. In particular, the figure demonstrates that WCPSS' socioeconomic-based assignment policy reduced the isolation of both Black and Hispanic students with majority-minority neighborhood schools, relative to a residence-based assignment policy. When combined across all years we analyze, the data for this subsample show that the average Black students' neighborhood school was about 47% Black, whereas their attended school was about 43% Black, a reduction of about four percentage points. We note that the policy induced larger reductions in isolation in its early years than in its later years. WCPSS' socioeconomic-based assignment policy generated a similar reduction in the isolation of Hispanic students with majority-minority neighborhood schools. Figure 6 also makes clear that, whether we consider neighborhood schools or those that students actually attend, the isolation of Hispanic students increased over time. Again, evidence indicates that this trend is also influenced by the sizable growth in the Hispanic population that WCPSS experienced over this time period.

The integrating effects of WCPSS' socioeconomic-based assignment policy are even more pronounced in Figure 7, where we examine the set of students with neighborhood schools that would have enrolled at least 75% minority students. Results from the exposure index reveal that WCPSS' socioeconomic-based assignment policy substantially increased Black-White and Hispanic-White exposure for this subsample of students. Under a pure residence-based assignment policy, the average Black student in this subsample would have attended a school that was only 14% White across the years we analyze. This student, however, actually attended a school that was about 38% White, a difference of 24 percentage points. WCPSS' assignment policy had a similarly sized effect on Hispanic-White exposure for this subset of students. Figure 7 again makes clear that the integrating effects of WCPSS' school assignment policy were larger in its early years than in its later years.

Further results in Figure 7 provide evidence that WCPSS' socioeconomic-based assignment policy reduced the racial/ethnic isolation of students with neighborhood schools that would have been more than 75% non-White. The analysis indicates that the average Black student in this subsample attended a school that was less than 45% Black but had a neighborhood school with a significantly larger percentage of Black students—the specific percentage ranges from 55% to 75%, depending on the year.⁹ Effects on Hispanic isolation are substantively similar but smaller in magnitude. When averaged across years, the average Hispanic student in this

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subsample attended a school that was about 16% Hispanic but had a neighborhood school that was 28% Hispanic.

Together, Figures 6 and 7 make clear that WCPSS' socioeconomic-based school assignment policy meaningfully reduced the racial/ethnic isolation levels faced by students with majority-minority neighborhood schools. These results contrast with the full-sample results in Figures 3 to 5, which showed no meaningful difference in exposure or isolation levels between neighborhood and attended schools for the average WCPSS student. As such, the implications of the socioeconomic-based assignment policy for racial integration were largest for those who would have otherwise been most isolated. This is consistent with policymakers' desire to design a school assignment policy that would minimize the concentration of racial or ethnic minority students in a small number of schools. We further explore the contexts to which this student subgroup was exposed—and how the socioeconomic-based assignment policy affected this exposure—in the following section.

Contextual Changes for Students With Majority-Minority Neighborhood Schools

It is clear that for students who would have attended a majority-minority neighborhood school under a pure residence-based school assignment policy, WCPSS' socioeconomic-based assignment policy resulted in exposure to a much more racially and ethnically diverse group of peers. In this section, we identify and explore the processes that produced these changes. We also assess whether the socioeconomic assignment policy changed other aspects of these students' schooling context as well.

There are two primary ways in which WCPSS' socioeconomic-based school assignment policy could result in students with majority-minority (or 75% minority) neighborhood schools being exposed to a more racially and ethnically diverse group of peers. First, the policy could result in students with majority-minority (or 75% minority) neighborhood schools attending other schools in the district, which have a different peer composition. Second, the policy could result in students with majority White neighborhood schools attending majority-minority (or 75% minority) neighborhood schools. In practice, both of these processes contributed to the differential peer composition between students' majority-minority (or 75% minority) neighborhood school and their school of attendance, and we explore each of them in greater detail.

Table 3 provides insight into the latter process, where relatively affluent students are either reassigned or transferred into schools that would have enrolled at least 75% minority students under a residence-based school assignment policy. The first column of the table presents the characteristics of students who attend these schools as their neighborhood schools. These students are quite disadvantaged, scoring more than 0.6 standard deviations

Table 3
Characteristics of Students Attending Their 75% Minority Neighborhood Schools and Characteristics of Peers Reassigned or Transferred Into Those Schools: 2003–2010

Characteristics	Attending 75% Minority Neighborhood School	Peers (Students Reassigned or Transferred in)
Student characteristics		
Mean math achievement	-0.636	0.288
Mean reading achievement	-0.618	0.291
Black	0.629	0.286
Hispanic	0.197	0.035
White	0.113	0.546
Other race	0.061	0.133
ELL status	0.105	0.009
Special Ed status	0.156	0.108
Male	0.493	0.500
Neighborhood characteristics		
Proportion White	0.319	0.634
Proportion Black	0.574	0.263
Proportion unemployed	0.102	0.071
Proportion adults with BA degree	0.261	0.452
Median family income (\$)	48,757	80,476
Proportion high school dropout	0.157	0.081
Proportion single-parent households	0.262	0.160
N- Student-year observations	37,184	81,192
N- Unique students	18,243	32,864

Note. ELL = English language learner.

below the districtwide average, being disproportionately likely to carry ELL and special education designations, and residing in disadvantaged neighborhoods as measured by median income, educational attainment, and unemployment rates. The second column of Table 3 presents the characteristics of students who are either reassigned or transferred into schools that would have enrolled at least 75% minority students under a residence-based school assignment policy. These peers are relatively advantaged, with the average student scoring more than one-quarter of a standard deviation above the districtwide average and residing in a neighborhood with a median income of more than \$80,000. In addition, students reassigned or transferred into schools that would have enrolled at least 75% minority students under a residence-based school assignment policy exhibit a very different racial/ethnic profile than the students who attend these schools as their neighborhood school. More than half of the students who transfer in are White—compared

with only 11% of students attending the school as their neighborhood school. Furthermore, 63% of students who attend these schools as their neighborhood school are Black and 20% are Hispanic, while only 29% of transfer students identify as Black and just 4% as Hispanic. Together, Table 3 makes clear that the WCPSS school assignment policy exposes students who attended a school that would have enrolled at least 75% minority students to a very different—and more advantaged—set of peers.

Figure 8 brings this into further relief, presenting the distribution of student achievement for the two sets of students depicted in Table 3. Specifically, it presents the achievement distributions for (1) students who attended schools that would have enrolled at least 75% minority students under a residence-based assignment policy as their neighborhood school and (2) students who are reassigned or transferred into those schools. The figure makes clear that the achievement profiles of these two groups of students differ dramatically. Among students who attend these schools as their neighborhood school, only about a quarter score above the district mean, and the average student scores more than 0.6 standard deviations below the districtwide mean. This contrasts starkly with students who are either reassigned or transferred into these schools. Among this student group, more than two thirds score above the district mean, and the average student is nearly one third of a standard deviation above the district mean. Table 3 and Figure 8 make clear that this process produces schools with two very different groups of students and a bimodal distribution of student achievement.

Table 4 provides insight into the process by which the WCPSS school assignment policy results in students with 75% minority neighborhood schools attending other schools in the district. The first column of Table 4 presents the characteristics of students who were reassigned or transferred out of neighborhood schools that would have enrolled at least 75% minority students under a residence-based assignment policy. The table makes clear that these students scored, on average, about 0.4 standard deviations below the districtwide mean. It further demonstrates that about half of these students are Black, 20% White, and 20% Hispanic. Finally, these students are more likely than the average WCPSS student to be designated as ELL and special education, and they reside in relatively disadvantaged neighborhoods as measured by multiple economic and educational indicators. Interestingly, a comparison of the first column of Table 4 with the first column of Table 3 reveals that students who are either reassigned or transferred out of 75% minority neighborhood schools are somewhat more advantaged than students who remain enrolled in these neighborhood schools.

The second column of Table 4 presents characteristics of the peers that students in the first column of Table 4 are exposed to at their school of attendance. Because students who are either reassigned or transferred out of

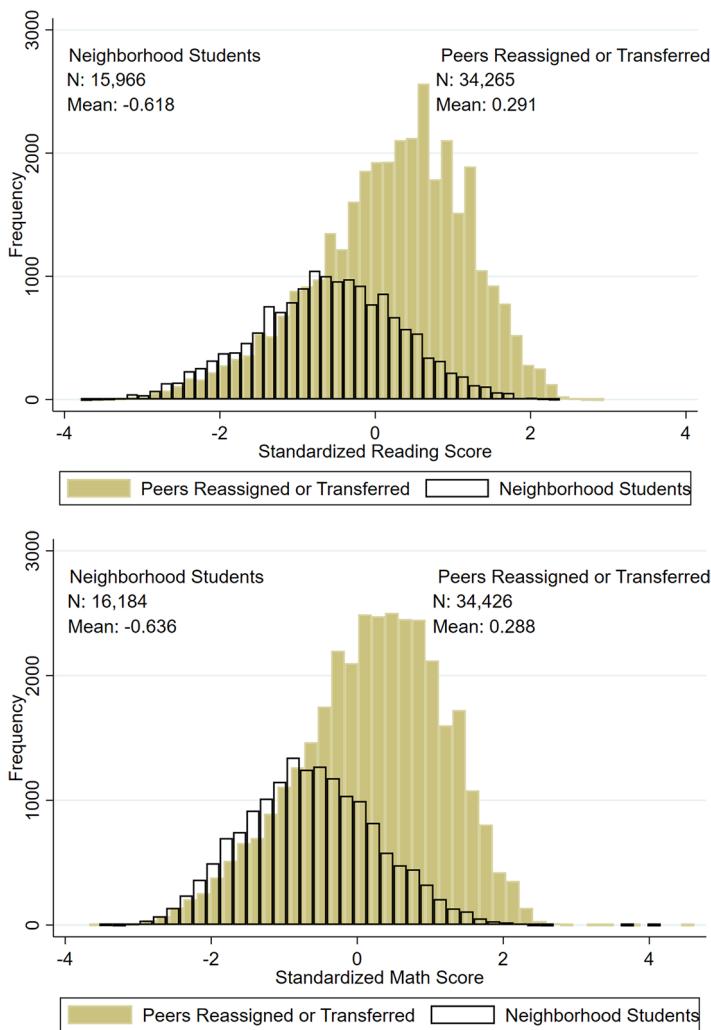


Figure 8. Distribution of reading and math achievement for students attending their 75% minority neighborhood schools and for peers reassigned or transferred into those schools.

minority-concentrated neighborhood schools are dispersed to nearly every school in WCPSS, the statistics in this column are similar to overall district averages.¹⁰ In particular, these peers have an average achievement score just below the district-wide mean and largely mirror the racial and ethnic

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Table 4
**Characteristics of Students Reassigned or Transferred
 out of 75% Minority Neighborhood School and Characteristics
 of Peers at the Schools They Attend: 2003–2010**

Characteristics	Students Reassigned or Transferred Out of 75% Minority Neighborhood School	Peers
Student characteristics		
Mean math achievement	-0.442	-0.027
Mean reading achievement	-0.412	-0.005
Black	0.518	0.300
Hispanic	0.186	0.110
White	0.220	0.506
Other race	0.076	0.084
ELL status	0.105	0.049
Special education status	0.178	0.133
Male	0.513	0.507
Neighborhood characteristics		
Proportion White	0.433	0.647
Proportion Black	0.456	0.256
Proportion unemployed	0.094	0.072
Proportion adults with BA degree	0.313	0.451
Median family income (\$)	55,428	79,243
Proportion high school dropout	0.133	0.083
Proportion single-parent households	0.236	0.165
N- Student-year observations	29,538	747,245
N- Unique Students	16,017	221,374

Note. ELL = English language learner. The mean characteristics for the second column of peers are weighted by number of students attending their school whose neighborhood school was over 75% minority.

composition of the district, although the results indicate a slightly larger proportion of Black peers and a correspondingly lower proportion of White ones. Similarly, the typical neighborhood contexts in which these peers lived resembled that of the district more broadly.

Figure 9 further contextualizes the results in Table 4. In particular, the figure presents the distribution of student achievement for the two sets of students depicted in Table 4: (1) students who were reassigned or transferred out of neighborhood schools that would have enrolled at least 75% minority students under a residence-based assignment policy and (2) the peers with whom the first group of students attend school. We highlight two substantive takeaways from Figure 9. First, students who transfer out of a 75% minority neighborhood school represent a very small proportion of students across the schools they subsequently attend. Second, the

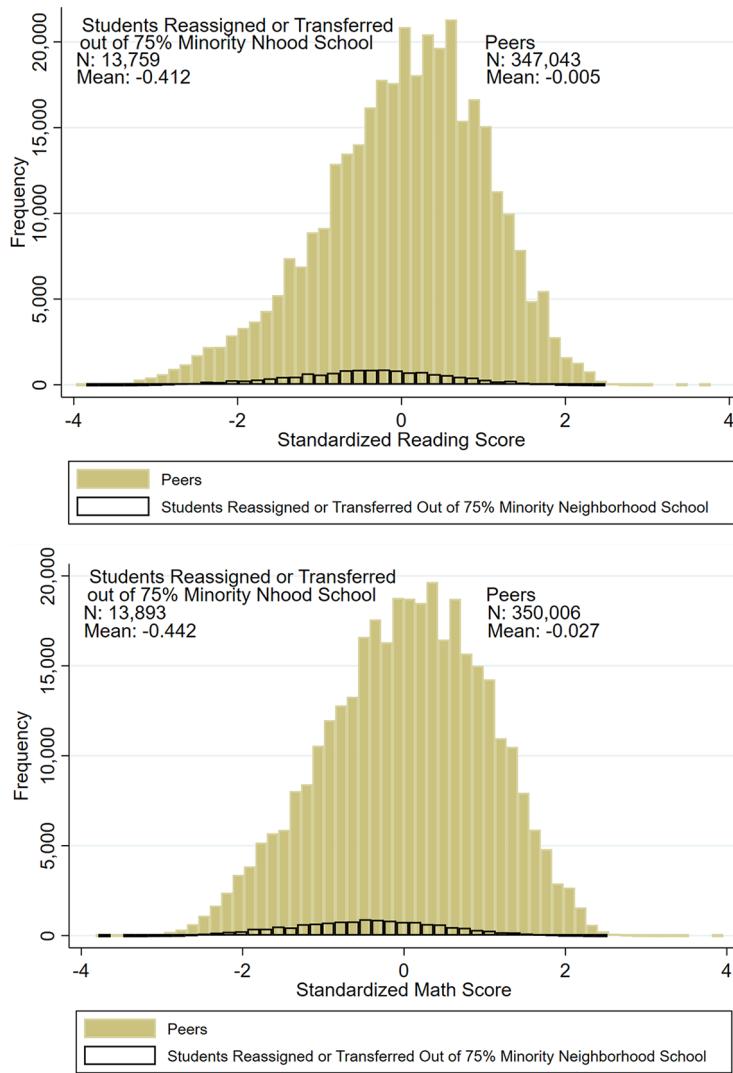


Figure 9. Distribution of reading and math achievement for students reassigned or transferred out of 75% neighborhood school and characteristics of peers at the schools they attend.

achievement differences between the two groups of students in Figure 9 are not as dramatic as the differences in Figure 8—students who transfer out of a 75% minority neighborhood school score, on average, about 0.4 standard

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deviations below the districtwide mean, while their peers have an average score at about the districtwide mean.

Taken together, the results in Tables 3 and 4 and Figures 8 and 9 illustrate that WCPSS' socioeconomic-based assignment policy dramatically changed the schooling contexts of students with 75% minority neighborhood schools. Interestingly, though, the specific nature of the change depends on whether students attend their neighborhood school or not. For those who attend their neighborhood school—about 56% of these students do—they are exposed to peers who have significantly above-average achievement, yet are broadly representative of the district in terms of both racial and ethnic composition, as well as in terms of the neighborhoods in which they reside. The quarter of students who do not attend their majority-minority neighborhood school, in contrast, are exposed to peers with near-average achievement levels. And compared with the peers of students who attend their 75% minority neighborhood school, these peers are somewhat more likely to be Black, Hispanic, and have special education or ELL designations.

Socioeconomic-Based School Assignment, Residential Context, and School Segregation

Considered together, our analyses show that WCPSS' socioeconomic-based school assignment policy shapes racial/ethnic segregation levels very differently depending on the set of students serving as the focus of the analysis. When focusing on the district as a whole, it is clear that the policy had relatively little effect on districtwide segregation levels. However, an analytical focus on the subset of students with majority-minority neighborhood schools makes clear that the policy substantially changed the segregation level these students faced—they experienced greater exposure to other racial groups and exhibited lower levels of isolation than they would have under a pure residence-based assignment policy. In this section, we explore how the details of WCPSS' socioeconomic-based school assignment policy interacted with the residential context of Wake County to produce the observed pattern of effects.

Wake County has long been residentially segregated by race. To gain a sense of the degree of this segregation, we used our data from 2003 to 2010 to calculate the normalized two-group exposure index for Black and White students across residential nodes. This calculation returns a value of nearly 0.5, implying that, on average, Black students live in nodes with only half the proportion of White students than would be the case if White students were evenly distributed across nodes. The literature characterizes the degree of segregation we observe across nodes in Wake County to be quite high (Reardon et al., 2006), with Massey and Denton (1989) even deeming it “extreme.” Figure 10 provides a visual depiction of this

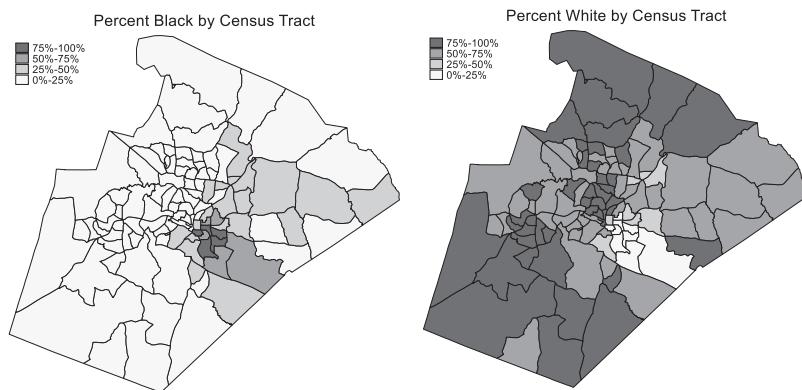


Figure 10. Racial composition of Wake County: 2007.

segregation, mapping the racial composition of Wake County, specifically the percent of Black residents (left panel) and the percent of White residents (right panel) in each census tract. The map makes clear that there are several majority-Black tracts on the east side of Raleigh and a handful of integrated tracts in the northeast side of the county. It is also clear, however, that large swaths of the county contain no significant population of Black residents, a fact that contributes to the high degree of Black-White residential segregation described above.

In addition to being racially segregated, Wake County was also quite segregated along socioeconomic lines during the time period we study. Brown University's American Communities project provides insight into the degree of socioeconomic segregation in Wake County. This work used the rank-ordered information theory index to calculate socioeconomic segregation levels of the 117 largest U.S. metropolitan areas during the 2000s. Results showed the degree of socioeconomic segregation in Wake County to be about one standard deviation above the mean of these metro areas, indicating a significant degree of socioeconomic segregation (American Communities Project, 2018). Figure 11 illustrates this socioeconomic segregation, mapping the median family income in each Wake County Census tract. The map reveals a swath of low-income tracts in the middle of the county. A juxtaposition with Figure 10 illustrates considerable overlap between these low-income tracts and the majority-Black tracts. Indeed, data indicate that, in 2007, the median income for White families in Wake County was about \$90,000 but only \$44,000 for Black families in the county. Together, these data paint a picture of a county with high levels of Black-White segregation, which generates socioeconomic segregation due to the significant income disparities between these two groups. This residential

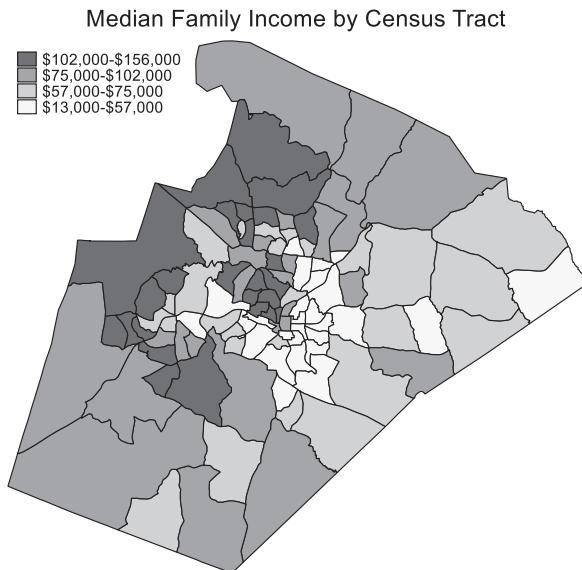


Figure 11. Median family income in Wake County census tracts: 2007.

context has significant implications for the pattern of results we observe with respect to the effects of WCPSS' socioeconomic-based assignment policy on school segregation levels.

Our districtwide analysis showed WCPSS' assignment policy to have no meaningful effect on racial segregation levels, relative to a pure residence-based assignment policy. Reardon et al. (2006) explain that such a finding is unsurprising in a context with high levels of racial segregation, as is the case in Wake County. When racial groups are residentially separated from one another—and minimizing transportation time and costs is at least a consideration—a district can most efficiently achieve a degree of socioeconomic balance by integrating low- and high-income students from the same racial or ethnic group. In our analysis of WCPSS as a whole, it is likely that such a process accounts for our findings, particularly the integration of low- and high-income White students, given the fact that WCPSS was majority White during the time period we study.

WCPSS' options for meeting its socioeconomic balance targets in majority-minority neighborhood schools were somewhat less straightforward, however. The tight relationship between race and income in Wake County effectively necessitated some degree of racial integration to achieve the district's socioeconomic targets, particularly in neighborhood schools where minority students would have comprised more than 75% of the enrollment. This reality

is illustrated by the fact that more than 50% of students who transferred into these schools (i.e., attending these schools, but for whom the school is not their neighborhood school) were White.

Moreover, instead of relying solely on forced node reassignment to achieve socioeconomic, and thus racial, diversity in these schools, WCPSS employed additional strategies to attract relatively affluent students to these schools. Most notably, WCPSS located a disproportionate number of their magnet programs in majority-minority schools, and particularly in neighborhood schools where minority students would comprise more than 75% of the enrollment. Indeed, our data indicate that a full 60% of students transferring into those schools—many of whom were White—did so in order to attend a magnet program. As a point of comparison, only 33% of transfers into schools with minority populations below the 75% threshold did so in order to attend a magnet program.

Unfortunately, our data do not shed light on the extent to which the magnet programs were a full-school curricula or a set of courses and resources available to only a subset of students at the school. They do show, however, that WCPSS successfully used this strategy to bring together students from very diverse backgrounds and circumstances in order to educate them in a single schooling context. As advantaged students enter what would otherwise be relatively disadvantaged schooling contexts, they may bring with them additional resources—educational, social, and financial—that could improve the educational experiences for all students at the school. Indeed, Reardon (2016) finds that the negative effects of racial segregation occur largely through the accompanying socioeconomic segregation—schools with large proportions of low-income minority students often lack the resources of schools serving relatively affluent White populations. Our findings suggest that WCPSS developed a school assignment policy that reduced the racial isolation of students who would have been most segregated under pure residence-based school assignment.

Discussion and Conclusion

The political and legal challenges facing race-based integration efforts have contributed to a shift in policy focus toward socioeconomic integration initiatives, which supporters believe offer a feasible approach to achieving similar outcomes—particularly racial diversity—as race-based integration policies. However, there is limited empirical evidence on the operations and effects of socioeconomic-based assignment policies, and the evidence that does exist suggests that economic integration policies are not guaranteed to result in increased racial diversity (Reardon et al. 2006). In this article, we leveraged the socioeconomic-based school assignment system that the WCPSS employed throughout the 2000s to provide evidence on the effects of socioeconomic integration efforts with respect to racial and ethnic

segregation levels—we conceptualize segregation as both evenness and exposure, employing measures that align with each of these conceptualizations. Our analyses were facilitated by our unique data indicating the school that each student would attend in both the presence and the absence of the socioeconomic-based assignment policy. We focused on the effects of the policy for the full WCPSS student population, as well as the subgroup of students who would have attended majority-minority schools under a pure residence-based school assignment policy.

Our analyses demonstrate that, overall, WCPSS' socioeconomic-based school assignment policy produced similar levels of racial/ethnic segregation in the district—both in terms of unevenness and exposure—as a residence-based school assignment system. However, the results of the full-sample analysis mask the fact that the socioeconomic-based assignment policy substantially reduced the segregation levels faced by students who would have attended majority-minority (or 75% minority) neighborhood schools in the absence of the policy. Within the group of students whose counterfactual neighborhood school would have enrolled more than 75% minority students, the average Black student would have attended a school that would have been 14% White. However, the socioeconomic-based assignment policy resulted in the average Black student in this subgroup actually attending a school that was 38% White—an increase of 24 percentage points. Our analysis further demonstrates that, for students with majority-minority neighborhood schools, the socioeconomic-based assignment policy significantly changed other aspects of these students' schooling context, particularly the achievement levels and neighborhood backgrounds of their peers.

Our analyses are made possible by our unique data, which contain records of both the school that a student attended under the socioeconomic-based school assignment policy and the school the student would have attended under a pure residence-based assignment policy. Such information is not typically recorded in administrative datasets, but its presence in our data allowed us to design our analysis in ways that make several important contributions to the school integration literature. First, our data allow us to conduct our analysis under the counterfactual of residence-based school assignment, which is the dominant approach that districts across the country use to assign students to schools. Prior work examining how WCPSS' socioeconomic-based school assignment policy affected racial segregation levels in the district (e.g., Reardon & Rhodes, 2011) operates under a counterfactual of race-based school assignment. That is, it compares racial segregation levels across WCPSS schools when the district's race-based school assignment policy was in place to the cross-school segregation levels observed under the socioeconomic-based school assignment policy. Although such comparisons undoubtedly provide important information, our approach generates results with arguably broader relevance to policymakers and practitioners. The vast majority of school districts across the country assign students to

schools on the basis of residential location. By employing a counterfactual of residence-based school assignment, our analysis is directly relevant to this large set of districts, providing insight into how moving to a socioeconomic-based assignment policy may shape racial and ethnic segregation levels across their schools.

Second, the nature of our data allows us to base our comparisons on a different source of variation than that underlying prior work. In particular, existing work relies primarily on temporal variation—the shift from one school assignment policy to another—as the basis for assessing how socioeconomic-based assignment policies shape racial and ethnic segregation levels. Our work, in contrast, exploits within-student variation in the school each student would attend at a given point in time under different assignment policies. Such an approach arguably provides districts with evidence more directly relevant to a potential decision to change school assignment policy. It provides evidence as to how an immediate change from a residence-based assignment policy to a socioeconomic-based school assignment system might shape racial and ethnic segregation levels.

Third, the fact that our data contain information on the school that each student would have attended under two school assignment policies—the socioeconomic-based assignment policy that WCPSS employed and a pure residence-based assignment policy—facilitates our focus on students who would have attended schools with disproportionately large concentrations of minority students under a residence-based assignment policy. Prior work has been unable to separately analyze student subgroups due to the absence of data on any sort of student-specific counterfactual school assignment. Our focus on this subgroup of students generates what is arguably the most important contribution of our article, demonstrating negligible differences in overall racial/ethnic segregation levels under the two school assignment policies, but dramatic reductions in racial segregation levels under the socioeconomic-based assignment policy for students who would have attended majority-minority schools. More generally, our analysis makes clear that focusing on the effect of a policy change on overall segregation levels may mask important heterogeneity across policy-relevant student subgroups.

Along with making these contributions to the scholarly literature, our work significantly advances our understanding of the operations of socioeconomic-based assignment policies and provides a number of important lessons to districts across the country. At a basic level, our analysis demonstrates that it is possible to implement a broad-based (i.e., districtwide) policy that has large integrating effects for students assigned to a majority-minority neighborhood school, but only trivially changes the schooling context of the average student in the district. Such a demonstration is notable for at least two reasons. First, it is quite uncommon for broad-based education policies to disproportionately change the schooling contexts of disadvantaged student populations in the ways in which we demonstrate

above—exposure to a more diverse set of relatively high-achieving peers. Political realities often result in broad-based policies bestowing educational benefits on advantaged student populations while doing little to change the schooling contexts of their less advantaged peers. WCPSS' school assignment policy arguably does just the opposite, and below we examine how the design of the policy facilitates this uncommon pattern of effects. Second, by doing little to involuntarily change the schooling context of the average WCPSS student, the district's school assignment policy earned a degree of political palatability. Advantaged families wield disproportionate power in school district politics, and an assignment policy that resulted in the typical student's schooling context involuntarily diverging from their residential context would likely be unsustainable from a political standpoint.

The demographic composition and residential sorting patterns in WCPSS resemble those of many other districts across the country, particularly urban districts in the South and Midwest with some degree of racial/ethnic diversity and a significant degree of residential segregation among these groups. These districts—and perhaps others—can learn several important lessons from WCPSS regarding the design of a school assignment policy that achieves a degree of both socioeconomic and racial/ethnic integration. To start, districts must be willing to use multiple policy levers in order to achieve their integration goals. In WCPSS' case, the district coupled voluntary choice into different schooling options, notably magnet schools and year-round schooling, with involuntary reassignment of a relatively small number of students to achieve its desired degree of socioeconomic balance across schools. In theory, districts could also construct school attendance zones in a manner that promotes integration—WCPSS was effectively constrained from employing this tool due to the small size of nodes (about 125 students on average) and efforts to ensure geographic contiguity. More generally, WCPSS' experience suggests that districts would do well to identify all policy levers at their disposal and consider the role that each may play in achieving the desired goals.

However, WCPSS' experience also demonstrates the importance of deploying these policy levers in a politically sustainable fashion, and we highlight two decisions of WCPSS leadership that served to maximize the likelihood of political sustainability. First, by electing to disproportionately locate educational options with appeal to affluent families—magnet programs and year-round schooling—in neighborhood schools with high concentrations of socioeconomically disadvantaged children, WCPSS leadership effectively ensured that advantaged families would not only enroll their children in these schools, but compete to do so. This tactic was instrumental in generating the substantial reductions in racial segregation levels for students who would have attended majority-minority schools. Second, to the extent possible, the district worked to minimize involuntary reassessments, with a particular focus on doing so for relatively advantaged families. Indeed, our data show that students in neighborhood schools with large concentrations of disadvantaged students were

more likely to be reassigned than students assigned to neighborhood schools with more advantaged student populations. The effort to minimize reassessments among advantaged families was likely motivated by a desire to head off potential political opposition and, as noted above, such opposition is most likely to foment among advantaged families. Of course, these actions further perpetuate the historical pattern of disadvantaged households disproportionately bearing the costs of integration.

District leadership was afforded these decisions by the design of WCPSS' policy, which set a maximum target of 40% of enrolled students eligible for FRL in a given school, but specified no floor for school-level FRL percentage. This design undoubtedly contributed to the pattern of results observed above. Indeed, the fact that the policy mandated no changes in schools with high concentrations of socioeconomically advantaged students contributed to the fact that the socioeconomic-based assignment policy had no average effect on racial/ethnic segregation levels faced by the average WCPSS student, relative to a pure residence-based assignment policy. If, in contrast, WCPSS' policy had specified a relatively high floor in the percentage of FRL students at each school, then the socioeconomic-based assignment policy would have been more likely to affect overall racial/ethnic segregation levels in the district. It would not have been guaranteed to do so, however, given the residential sorting patterns in the district. The disproportionate residential proximity of low- and high-income White students—compared with Black students—could have resulted in WCPSS achieving the FRL floor by integrating low- and high-income White students, and thus having little effect on overall racial/ethnic segregation levels in the district. In general, though, this scenario illustrates how different results can emerge from integration-oriented school assignment policies with different design details.

The preceding discussion highlights a number of tradeoffs and constraints that districts will likely encounter when considering implementation of a socioeconomic-based school assignment policy. First, political realities will often constrain districts' options regarding both the degree of integration that can reasonably be pursued via school assignment policy and the policy tools used to pursue that diversity. For example, political considerations may lead districts to design a policy that places a cap on the percentage of students eligible for FRL at a given school, as opposed to a policy that works to achieve an equal share of FRL-eligible students at each school across the district. And perhaps districts will feel forced to pursue that scaled-back diversity goal via voluntary choice rather than the potentially more efficient approach of redrawn attendance boundaries. With political realities often constraining the set of feasible policy options, district leadership will need to evaluate whether available options will ultimately achieve district goals surrounding integration. As one example, voluntary selection into magnet programs or year-round schooling can facilitate school-level diversity, but it may just push segregation down to the classroom level.

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Different districts will likely reach different conclusions as to whether such a scenario is worth pursuing.

In closing, our analyses demonstrate that a socioeconomic-based assignment policy implemented at scale may meaningfully decrease racial segregation levels faced by a subset of students. This finding, coupled with the body of work demonstrating positive effects of racial desegregation across several outcomes, supports an expectation that WCPSS' socioeconomic-based assignment policy will positively influence outcomes such as student achievement and attainment, at least for those students for whom the socioeconomic integration policy decreased racial segregation. Future work would do well to assess this hypothesis empirically. More generally, there is little existing evidence as to whether socioeconomic integration policies have any effect on student outcomes. As socioeconomic integration policies become more common, future work should focus on estimating their effects on a broad range of outcomes, potentially using the racial desegregation literature as a roadmap. Indeed, the prospect of socioeconomic-based school assignment policies becoming more widespread puts a premium on gaining a better understanding of their operations and effects.

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Notes

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¹Race-based integration efforts have faced challenges on several fronts in recent years. For example, court-ordered desegregation plans have expired in hundreds of medium-sized and large cities in the past two decades (Reardon et al., 2012), and, although there are notable exceptions, many of these communities have declined to voluntarily continue integration efforts. Additionally, a series of court cases culminating in the Supreme Court case *Parents Involved in Community Schools v. Seattle School District No. 1 (Parents)* have challenged the constitutionality of race-based assignment systems. The majority opinion in *Parents* held school assignment systems that considered the race of individual students to be unconstitutional, which halted the voluntary desegregation efforts occurring in several cities, such as Seattle and Louisville.

²There are some instances in which the assumed connections between socioeconomic and racial/ethnic integration are made explicit. For example, the guidance provided by the U.S. Department of Justice and the U.S. Department of Education to states and districts in the wake of the Supreme Court decision in *Parents Involved in Community Schools v. Seattle School District No. 1* suggested that districts consider race-neutral factors such as SES or parental educational attainment as a method for pursuing racial/ethnic diversity.

³Work by Bergman (2016) provides evidence that school desegregation increases educational attainment for Hispanics.

⁴In addition to balance on SES and achievement, WCPSS' assignment policy listed five additional factors that would be considered in the school assignment process (Wake

Education Partnership, 2003): (1) instructional program; (2) consistency with elementary, middle, and high school grade ranges; (3) facility capacity; (4) stability for families; and (5) proximity.

⁵The assignment policy designed to achieve socioeconomic diversity remained in place through the 2009–2010 school year. However, school assignment policy was a major issue in the 2009 school board races, and the election results produced a board in which a majority of members favored changing the school assignment policy. In the spring of 2010, the board voted to replace the assignment policy that prioritized socioeconomic diversity with a “controlled choice” policy that allowed families to rank their top choices from a list of schools generated on the basis of proximity to their residence and school capacity. This assignment policy was in effect for 1 year before another board elections produced a new majority that revised the policy once again. The most recent policy still considers proximity and capacity as major factors determining school assignment, but it reintroduces socioeconomic and achievement diversity by stating that assignments should maximize academic success for all students and school assignments should attempt to minimize concentrations of low-achieving and low-income students at each school—the policy does not set specific targets for socioeconomic or achievement diversity, however.

⁶The information theory index is conceptually similar to the dissimilarity index, which also measures how evenly different groups are spread across units of analysis—in our case, schools. More specifically, the dissimilarity index represents the proportion of a group that must be moved from schools where the group is overrepresented—relative to the total population—to units where the group is underrepresented in order to achieve equal distribution across the schools. The index ranges from 0 (no relocation necessary to achieve even spread) to 1 (all members must be relocated to achieve even spread). Although the dissimilarity index arguably has a more intuitive interpretation, the information theory index has more appealing properties—it obeys the principle of transfers (Reardon & Firebaugh, 2002)—which drives our decision to feature this measure in our analysis. However, the dissimilarity index returns substantively similar results, which are presented in Supplemental Table A4 in the appendix (available in the online version of the journal).

⁷Specifically, we calculate the index in a counterfactual world where each student attended the original neighborhood school assigned to the node in which they reside. Over time, a number of nodes exhibited changes in their neighborhood school assignments. Because these changes may have been endogenous—they may have been used to help achieve the socioeconomic diversity and achievement targets—we elect to use the initial neighborhood school assigned to a node as the counterfactual in our analysis. Results are substantively similar, however, if we use contemporarily assigned neighborhood schools as the counterfactual.

⁸Specifically, the weight factor we employ in our analysis can be written as $n_s/(N/S)$ where n_s represents the number of students assigned to a highly segregated neighborhood school attending school s , N represents the total number of students assigned to highly segregated neighborhood schools, and S represents the total number of schools attended by students assigned to a highly segregated neighborhood school.

⁹The noticeable drop in isolation for Black and Hispanic students between the 2004–2005 and 2005–2006 school years in Figure 7 is attributable to three large schools first exceeding the 75% minority threshold in 2005–2006—they were just below this threshold in 2004–2005.

¹⁰We weight the characteristics in the second column of Table 4 by the number of students who transfer out of a 75% minority neighborhood school and attend school with these peers.

References

- American Communities Project. (2018). Raleigh-Cary, NC: Data for the Metropolitan Statistical Area. Diversity and disparities, American Communities Project. Retrieved from <https://s4.ad.brown.edu/projects/diversity/IncSeg1/IncSeg.aspx?metroid=39580&indicator=1>

School Assignment Policy and Racial Segregation Levels

- Ashenfelter, O., Collins, W. J., & Yoon, A. (2006). Evaluating the role of *Brown v. Board of Education* in school equalization, desegregation, and the income of African Americans. *American Law and Economics Review*, 8, 213–248.
- Ayscue, J. B., Siegel-Hawley, G., Kucsera, J., & Woodward, B. (2018). School segregation and resegregation in Charlotte and Raleigh, 1989-2010. *Educational Policy*, 32, 3–54.
- Benjamin, K. (2012). Suburbanizing Jim Crow: The impact of school policy on residential segregation in Raleigh. *Journal of Urban History*, 38, 225–246.
- Bergman, P. (2016). *The risks and benefits of school integration for participating students: Evidence from a randomized desegregation program*. (Working Paper). Retrieved from <http://www.columbia.edu/~psb2101/BergmanSchoolIntegration.pdf>
- Billings, S. B., Deming, D. J., & Rockoff, J. (2014). School segregation, educational attainment, and crime: Evidence from the end of busing in Charlotte-Mecklenburg. *Quarterly Journal of Economics*, 129, 435–476.
- Card, D., & Rothstein, J. (2007). Racial segregation and the black-white test score gap. *Journal of Public Economics*, 91, 2158–2184.
- Coleman, J. S., Kelly, S. D., & Moore, J. A. (1975). *Trends in school segregation, 1968–73*. Washington, DC: Urban Institute.
- Corcoran, S., & Evans, W. N. (2010). *Income inequality, the median voter, and the support for public education* (NBER Working Paper No. 16097). Cambridge, MA: National Bureau of Economic Research.
- Ellison, G., & Pathak, P. A. (2016). *The efficiency of race-neutral alternatives to race-based affirmative action: Evidence from Chicago's exam schools* (NBER Working Paper No. 22589). Cambridge, MA: National Bureau of Economic Research.
- Fiel, J. E. (2013). Decomposing school resegregation social closure, racial imbalance, and racial isolation. *American Sociological Review*, 78, 828–848.
- Frankenberg, E., & Lee, C. (2002). *Race in American public schools: Rapidly resegregating school districts*. Cambridge, MA: Harvard Civil Rights Project.
- Guryan, J. (2004). Desegregation and black dropout rates. *American Economic Review*, 94, 919–943.
- Johnson, R. C. (2011). *Long-run impacts of school desegregation and school quality on adult attainments* (NBER Working Paper No. 16664). Cambridge, MA: National Bureau of Economic Research.
- Kahlenberg, R. D. (Ed.). (2012). *The future of school integration: Socioeconomic diversity as an education reform strategy*. New York, NY: Century Foundation.
- LaFree, G., & Arum, R. (2006). The impact of racially inclusive schooling on adult incarceration rates among U.S. cohorts of African Americans and Whites since 1930. *Criminology*, 44, 73–103.
- Liebowitz, D. D., & Page, L. C. (2014). Does school policy affect housing choices? Evidence from the end of desegregation in Charlotte-Mecklenburg. *American Educational Research Journal*, 51, 671–703.
- Lutz, B. (2011). The end of court-ordered desegregation. *American Economic Journal: Economic Policy*, 3(2), 130–168.
- Massey, D. S., & Denton, N. A. (1989). Hypersegregation in U.S. metropolitan areas: Black and Hispanic segregation along five dimensions. *Demography*, 26, 373–391.
- Mickelson, R. A., Bottia, M. C., & Lambert, R. (2013). Effects of school racial composition on K-12 mathematics outcomes: A metaregression analysis. *Review of Educational Research*, 83, 121–158.

- Mickelson, R. A., Smith, S. S., & Nelson, A. H. (Eds.). (2015). *Yesterday, today, and tomorrow: School desegregation and resegregation in Charlotte*. Cambridge, MA: Harvard Education Press.
- Orfield, G., & Lee, C. (2007). *Historic reversals, accelerating resegregation, and the need for new integration strategies*. Los Angeles: Civil Rights Project/Proyecto Derechos Civiles, University of California–Los Angeles.
- Owens, A., Reardon, S. F., & Jencks, C. (2016). Income segregation between schools and school districts. *American Educational Research Journal*, 53(4), 1159–1197.
- Parcel, T. L., Hendrix, J. A., & Taylor, A. J. (2015). Race, politics, and school assignment policies in Charlotte-Mecklenburg and Wake County, North Carolina. In R. A. Mickelson, S. S. Smith, & A. Hawn Nelson (Eds.), *Yesterday, today, and tomorrow: School desegregation and resegregation in Charlotte* (pp. 85–100). Cambridge, MA: Harvard Education Press.
- Parcel, T. L., & Taylor, A. J. (2015). *The end of consensus: Diversity, neighborhoods, and the politics of public school assignments*. Chapel Hill: University of North Carolina Press.
- Potter, H., Quick, K., & Davies, E. (2016). *A new wave of school integration: Districts and charters pursuing socioeconomic diversity*. New York, NY: Century Foundation.
- Reardon, S. F. (2016). School segregation and racial academic achievement gaps. *RSF: The Russell Sage Foundation Journal of the Social Sciences*, 2(5), 34–57.
- Reardon, S. F., & Firebaugh, G. (2002). Measures of multigroup segregation. *Sociological Methodology*, 32(1), 33–67.
- Reardon, S. F., Grewal, E. T., Kalogrides, D., & Greenberg, E. (2012). Brown fades: The end of court-ordered school desegregation and the resegregation of American public schools. *Journal of Policy Analysis and Management*, 31, 876–904.
- Reardon, S. F., Ho, A. D., Shear, B. R., Fahle, E. M., Kalogrides, D., & DiSalvo, R. (2017). *Stanford Education Data Archive* (Version 2.0). Retrieved from <http://purl.stanford.edu/db586ns4974>
- Reardon, S. F., & Owens, A. (2014). 60 years after *Brown*: Trends and consequences of school segregation. *Annual Review of Sociology*, 40, 199–218.
- Reardon, S. F., & Rhodes, L. (2011). The effects of socioeconomic school integration plans on racial school desegregation. In E. Frankenberg & E. DeBray (Eds.), *Integrating schools in a changing society: New policies and legal options for a multiracial generation* (pp. 187–208). Chapel Hill, NC: University of North Carolina Press.
- Reardon, S. F., & Yun, J. T. (2002). Segregation in church and state? Vouchers and racial enrollment patterns among public and private schools. *Teachers College Record*, 2002, 10968.
- Reardon, S. F., Yun, J. T., & Kurlaender, M. (2006). Implications of income-based school assignment policies for racial school segregation. *Educational Evaluation and Policy Analysis*, 28, 49–75.
- Reber, S. J. (2010). School desegregation and educational attainment for blacks. *Journal of Human Resources*, 45, 893–914.
- Stroub, K. J., & Richards, M. P. (2013). From resegregation to reintegration: Trends in the racial/ethnic segregation of metropolitan public schools, 1993–2009. *American Educational Research Journal*, 50, 497–531.
- Wake Education Partnership. (2003). *Making choices: Diversity, student assignment and quality in Wake's public schools*. Retrieved from http://www.wakeed.org/wp-content/uploads/2015/02/Making_Choices_report.pdf

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- Weiner, D. A., Lutz, B. F., & Ludwig, J. (2009). *The effects of school desegregation on crime* (NBER Working Paper No. 15380). Cambridge, MA: National Bureau of Economic Research.
- Welch, F., & Light, A. (1987). *New evidence on school desegregation*. Washington, DC: U.S. Commission on Civil Rights.

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