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Still Separate, Still Unequal: The Relation of Segregation in Neighborhoods and Schools to Education Inequality

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Ambiguity remains as to whether contemporary levels of racial segregation in and outside of the U.S. South are a serious problem. This article subsequently examines the math and science test-scores of 3rd-graders that participated in the Early Childhood Longitudinal Study. Test-score performances are estimated using multilevel statistical methods for the national sample, and for children in low and high minority schools within and outside of the South. The analysis reveals lower test-scores for students in high minority schools, especially for African Americans and southern children in high minority private schools. In addition, a neighborhood's economic segregation appears to have a stronger association with test-scores than its racial segregation. The article concludes with a discussion of how school and neighborhood segregation reproduces racial stratification.

Keywords: Brown v. Board of Education, *segregation, neighborhoods, test-scores, inequality*

Sixty years after *Brown v. Board of Education of Topeka Kansas* (1954), the nation has secured racially separate schools once again. School desegregation reached the height of its success during the Nixon-Ford administrations (1969-1977). For example, the percentage of African Americans in southern schools that were at least 99 percent Black declined from 99.5 percent in 1962 to 17.9 percent by 1975 (The South includes the states of DE, DC, FL, GA, MD, NC, SC, VA, WV, AL, KY, MS, TN, AR, LA, OK, and TX). A similar trend occurred in the North, where the proportion of African Americans in schools that were at least 99 percent Black declined to 14.4 percent (Mazmanian & Sabatier, 1989). In the South, school desegregation was assisted by racial segregation's decline within specific geographic units. For example, the Black–White segregation index (i.e., the proportion of African Americans needing to change geographic units for each unit's Black population to equal its percentage of the overall population) in major southern cities was relatively high and ranged from .62 to .86 in 1950 (Taeuber & Taeuber, 2009), in contrast to segregation at the county level which declined from a high of .70 in 1910 to a low of .49 in 1960 (Massey, 2001). Since southern school systems were organized by counties rather than by cities, this lower level of county segregation provided the racial diversity necessary for the desegregation of southern schools once the *Civil Rights Act of 1964* enabled enforcement of the *Brown* rulings of 1954 and 1955.

As the migration of southern African Americans to the cities of the North reduced racial segregation in southern counties, it gave northern cities motive to confine Black settlers to ghettos and exacerbate residential levels of racial segregation and isolation (i.e., measure of interracial exposure expected among races that share residential areas). The influx also encouraged "White-flight", that is, a corresponding increase in White residents' departure from central cities or metropolitan areas. On this point, Boustan (2010) estimated every Black arrival to Northern cities between 1940 and 1970 resulted in 2.7 White departures, while Reber (2005) showed an exodus of White students followed the implementation of desegregation plans large enough to offset approximately one-third of a district's reduction in segregation. Segregation indices among northern large cities consequently increased from an average of .56 in 1910 to .81 in 1960 and exceeded average southern segregation levels by 10 percent (Massey, 2001). Subsequently, the school systems of cities such as St. Louis, Missouri (Wells & Crain, 1997), Yonkers, New York (Briggs, Darden, & Aidala, 1999), and Columbus, Ohio (Jacobs, 1998) became more racially homogeneous, and required urban-suburban busing and mobility plans to achieve the region's eventual decline in school segregation. Nonetheless, even the desegregation plans of large counties such as Prince George's, Maryland (Orfield & Eaton, 1996) could not survive persistent White-flight, and the Supreme Court eventually restricted the use of urban-suburban desegregation plans to combat the growing *de facto* segregation (i.e., by fact, not law) White-flight had left behind (*Milliken v. Bradley*, 1974).

While the *Milliken* decision blunted *Brown's* ability to address *de facto* segregation, other court rulings granted southern school systems unitary status (i.e., release from judicial oversight) after systems attempted to desegregate, regardless of how unsuccessful or limited the remedy appeared (Orfield & Eaton, 1996). Furthermore, the Supreme Court in 2007 limited the use of race by northern and southern districts to achieve school racial balances (*Meredith v. Jefferson County Board of Education,* 2007; *Parents Involved in Community Schools v. Seattle School District No. 1,* 2007). Research has shown that once released from desegregation plans and judicial oversight, school systems tended to re-segregate (Reardon et al., 2012).

School re-segregation has also been assisted by the selective migration patterns of immigrants, slower population growth for Whites, and the "return migration" of African Americans to the South. Nowhere has re-segregation been more rapid than in the southern states, with Georgia and Texas leading the way. In those two states, Frankenberg and Lee (2002) found 8 of the 10 most rapidly re-segregating school systems, and that their decline in African American exposure to Whites ranged from 32 percent to 45 percent in a four-year period. These legal and population developments have left approximately 74 percent of all African American students attending majority non-White schools (U.S. Department of Education, 2011). More than a recounting of the nation's effort at implementing the *Brown* decisions, this history demonstrates that the success and failure of school desegregation has always been linked to the distribution of racial groups across geographic areas.

The important question that we confront 60 years after *Brown* is how consequential is the current racial make-up of neighborhoods and schools to the distribution of achievement among African Americans and their racial/ethnic counterparts in and outside of the U.S. South? In answering this question, the analysis considers the extent to which social background characteristics and neighborhood segregation account for regional differences in 3rd graders' test-scores, among what neighborhood dimensions might test-scores vary, and whether the school's racial composition moderates how social background characteristics and neighborhood segregation relate to children's test-score performances. The analysis reveals a lower math and science performance for all students within high minority schools, especially for African Americans and southern children in high minority private schools. In addition, residential segregation appears unassociated with learning in low and high minority schools, but neighborhood income does. The article concludes by observing how school racial segregation leaves the achievement of children vulnerable to neighborhood economic conditions, which in turn facilitates the reproduction of racial status hierarchies.

Desegregation, Segregation, and Education Outcomes

There are many reasons to be concerned about racial segregation in schooling. The *Brown* ruling found that *de jure* segregation (i.e., by law) was inherently unequal, could inflict psychological harm on children and incite feelings of relative deprivation and racial resentment (Bell, 2005). Another claimed that racial segregation prevents social learning, the exposure of children to cultural practices other than their own, and ultimately greater racial interaction (Wells, 1995). Segregation is also important because, by grouping people of a similar background, it ensures a greater number of them experience the same systemic inequalities. Research linking these contentions to learning has been irregular; however, finding both positive and null effects associated with desegregation, and negative educational outcomes related to school segregation.

Those studies reporting positive desegregation results examined the educational persistence and test-scores of African American adults, who reported attending integrated schools, were shown in the census to have enrolled in districts that implemented desegregation plans, or participated in a court-ordered mobility program. For instance, African American adults who reported attending integrated schools had higher verbal test-scores and educational attainment than those who did not attend integrated schools (Crain, 1971; Crain & Mahard, 1978). Others found desegregation is positively related to educational persistence. Guryan (2004) for instance, estimated change between 1970 and 1980 in the dropout rates of 125 school districts that implemented desegregation plans and discovers a 2 to 3 percentage point reduction in the African American dropout rate. Similarly, Ashenfelter, Collins, and Yoon (2006) estimated changes in the 1990 graduation rate of four cohorts of southern African American men as they experienced declining levels of school segregation. High school graduation increased most, about 3 to 5 points, for men who were educated when school segregation was at its lowest level. Finally, participation in court-ordered public housing tenant relocation programs in Chicago gave researchers the rare opportunity to assess how African American children fared once they moved to mostly White suburbs (Johnson, 2012a). Studies revealed that children who enrolled in suburban schools after relocation were more likely than city movers to stay in school, take college-track courses, and attend four-year colleges (Rosenbaum, Kulieke, & Rubinowitz, 1988).

The second group of studies suggests that school desegregation or integration provide few benefits, or worse, may be related to declines in African American outcomes. In this body of research is an influential review of 19 studies that presented a skeptical assessment of desegregation effects related to reading and concluded that there were no benefits of desegregation for children's math scores (Cook, 1984). While the relevance of the review may be limited to the period in which its primary studies were conducted, Rivkin's (2000) more recent work found that a higher proportion of White classmates, or attending a school district with an involuntary desegregation plan, lowers the test-scores of African American high school students.

While some social activists argued that there are no benefits to desegregation (Armor, Thernstrom & Thernstrom, 2006), social scientists have convincingly shown that underrepresented children, and those that typically test well, have lowered performances in segregated schools. Brown-Jeffy (2009) for example found more "egalitarian achievement" in high minority schools which alludes to an often drawn conclusion in research that stratification according to race and achievement is less evident in those schools (Sorensen & Hallinan, 1984) and more pronounced in heterogeneous schools (Jencks & Mayer, 1990). Unfortunately, Brown-Jeffy also reported that when at least one half of the students in a high school are African American or Hispanic, math achievement is diminished for students of all racial backgrounds. Additionally, Caldas and Bankston (1998) showed that when the percentage of African American students reaches high levels, a negative association with all 10th graders' Louisiana Graduation Exit Examination score emerges.

Schofield and Hausmann (2011) suggested that desegregation programs may have had their greatest impact on the academic outcomes of elementary students; however, very few of the studies contained in their review (or available for review in this article) address the academic outcomes of children in elementary school. The dearth of studies that examine desegregation and segregation within the elementary school context leaves unexplored many other school features that set the stage for children's subsequent learning. Therefore, little is known about the role pre-school experiences, full-day kindergarten programs, or other indicators of school exposure may or may not play in muting the effects of its racial composition. There is, consequently, a missed opportunity to understand how school composition affects academic differentiation according to race, social class, gender, and residency, which we know begins to form early in children's educational careers.

Residential Effects

In addition to the role that residential patterns play in determining the segregation of schools, many argue that the demographic make-up of neighborhoods inspire social processes that directly impact school functioning and child development (Clark, 1965; Massey & Denton, 1993). As

Johnson (2010) pointed out, neighborhood effects research has pursued this thesis in a variety of ways with mixed results. First, research has examined the impact of residential concentrations of African Americans, finding that higher rates of African American residency are negatively related to the likelihood of attending college for African American males (Duncan, 1994), attending a private or selective public high school (Lauen, 2007), and positively related to greater disparities in learning outcomes for youth with emotional and behavioral disorders (Madyun & Lee, 2008. Second, other studies have assessed the importance of neighborhood composition by considering its ethnic diversity, which appears positively related to the attainment of adolescents (Duncan, Connell, & Klebanov, 1997; Halpern-Felsher et al., 1997) but negatively related to the IQ of 5 and 6-year olds (Klebanov et al., 1997). A third approach, which explores the impact of White neighbors on the learning of African Americans, has consistently found that the proportion of White neighbors in the area is unrelated to the achievement of African Americans (Datcher, 1982; Ginther, Haveman, & Wolfe, 2000; Madyun & Lee, 2008 Vartanian & Gleason, 1999). As is evident from the summary of these studies, most of them focus on the education experiences of adolescents, educational attainment, and children that have not yet started compulsory education, which implies that the present study is sorely needed.

Another limitation of research in this area extends from the difficulty of simultaneously estimating neighborhood and school effects when the two are so highly correlated. This has led neighborhood effects research to rarely contain school composition variables, and for school effects research to treat the neighborhood or urban context as an unspecified or individual level characteristic rather than as a unit of analysis for the estimation of variance parameters (Johnson, 2012b). To get around this difficulty, studies might estimate achievement inequality between and within schools, and then do the same for neighborhoods. For example, using a sub-sample of the ECLS-K data, Benson and Borman (2009) showed that being in a school with a minority composition one standard deviation above the mean was related to lower first grade reading growth rates and explained away at least one half of the Black–White differential in reading. These authors argued that "this finding reinforces previous research (see Coleman et al., 1966) that has concluded that the segregation of African American students into high-minority schools hinders their achievement" (Benson & Bowman, 2009, p. 30). However, a nearly identical negative effect emerges once they repeated the analysis using neighborhood racial composition rather than the schools' composition. Although the analysis confirms that racial composition is important in both contexts when considered apart, it does not give us a clear understanding of neighborhoods' and schools' relative importance.

One study that does, completed by Card and Rothstein (2005), found that residential segregation has a stronger impact on the SAT scores of African American students than school segregation. Nevertheless, when they consider other neighborhood characteristics to which African Americans are exposed, namely its economic composition, these authors found that racial segregation loses its influence. Their observations about the importance of neighborhood socioeconomic status (SES) are notable for several reasons. First, while the census has shown a decline in levels of neighborhood racial segregation over the last four decades (Gleaser & Vigdor, 2001), economic segregation has increased most prominently in the metropolitan areas of the northern Rust Belt. Second, among no other demographic group was the rate of increasing economic segregation greater than it was among African Americans (Jargowsky, 1996; Yang & Jargowsky, 2006). Between 1970 and 1990 the neighborhood sorting index of SES increased from 0.34 to 0.48 for African Americans—approximately 41 percent—while it increased only by 21 percent for Whites and 27 percent for Hispanics (Jargowsky, 1996). Since that time, the decline in metropolitan level economic segregation has been lowest among African Americans and remains well above its 1970 and 1980 levels (Yang & Jargowsky, 2006). How these economic changes influence schools that vary in their racial composition in the South and non-South is generally unknown. Consequently, this study will consider the effects of neighborhood economic composition as well as its racial composition.

The review of literature leads one to the following questions:

- Do the test-scores of children in the South differ from those of children outside of the South, and do social background characteristics and residential segregation account for those differences?
- Do test-score performances vary according to a neighborhoods' racial and economic composition?
- Does a school's racial composition moderate how social background characteristics and residential segregation relate to children's test-score performances in and outside of the South?

METHODS

Data Source

The Early Childhood Longitudinal Study, Kindergarten Cohort 1998 -1999 (ECLS-K; see Beveridge et al., 2004; Rock & Pollack, 2002) is used to examine these questions because it remains the nation's most recent survey of early childhood educational experiences. The National Center for Education Statistics (NCES) collected data about families, schools, neighborhoods and activities of 22,782 children, who were chosen at random from 1277 randomly selected public and private kindergarten programs (The analysis used a panel weight to compensate for the unequal probabilities of selection inherent in the ECLS-K's stratified sampling design). Data used were collected in 2002 while children were in 3rd grade because it is the earliest wave that assessed test-scores in science, and also to avoid the increase in attrition that occurred in later waves. Not all third-graders however were used in this analysis. For instance, Native Americans were too few in number within the South (n = 29) to retain in this analysis. Once children who were Native American and of an uncategorized race were removed, the sample reduced to 20,028. While values that were missing in 3rd grade (wave 5) for characteristics such as gender, age, race, and parents' immigrant status were filled in from other waves, children who did not have any wave 5 cognitive data had to be eliminated. After this elimination the final analytical sample was 13,787. This number reflects a sample attrition of 31.16 percent, so the findings of this analysis are not generalizable to the children who entered kindergarten in the base year of this survey and moved onto 3rd grade. To understand the impact of attrition, the grade 1 test-score means of the samples were compared with children present and absent in grade 3. These comparisons reveal insignificant increases in grade 1 math (M = 61.26 to 61.74) and general knowledge (M = 34.35 to 34.55) once the children who were missing in third grade were omitted from the grade 1 sample, suggesting that the results of this analysis will closely resemble the complete national sample.

The residential measures included in this analysis come from an NCES companion data file that linked ECLS-K children to the tract and zip code in which they resided. The geo-coding process of the ECLS-K resulted in a less than 1 percent difference in the identification of children's tracts (Beveridge et al., 2004). Rather than deleting children from the sample, those who had no tract identified were linked to their zip code characteristics. The merging resulted in the inclusion of 4102 geographic units.

Finally, understanding regional differences in school and neighborhood racial composition and academic performance required to disaggregate the full analytical sample according to southern region and school racial composition. The southern sample includes 4608 children from the NCES-designated states discussed earlier. The sample of non-southern states has 9179 children.

Study Constructs

The science and math test-scores released in 2009 were used as the survey's final recalibrated scale-scores. This author compared test-scores in these subjects for southern residents, according to child-level developmental and social background characteristics, while controlling for relevant school-related factors. Among the developmental measures was a measure of children's Age in Grade 3 and Prior Test Performance to help screen out the influence of unobserved characteristics. In the ECLS-K, the prior test performance measure for science is called general knowledge and assesses children's conceptual understanding of scientific facts, and skills and abilities to form questions about the natural world, to try to answer them on the basis of the tools and the evidence collected, and to communicate answers and how the answers were obtained. (Rock & Pollack, 2002, pp. 2-7)

Among the social background characteristics, the author explored children's race/ethnic membership (i.e., Hispanic, White, Asian, and African American), and consider whether they have a Single Parent and an Immigrant Parent because the Northeast and West regions have higher percentages of immigrants, and because immigrant parents may instill in their children a different disposition toward education (Ogbu, 1987). Since racial groups typically differ in their SES, measures of social class must be included to account for its influence on test performances. A composite measure of family SES was used that reflects the occupational status, educational level, and total household income of parents and segment it into equal-sized quintiles (Low SES, Middle Low SES, etc.). Being Male is also included because gender differences are thought to be most pronounced within math and science subjects. Next, this author account for the amount of children's exposure to schooling by considering their Pre-kindergarten experiences in Head Start, center care or day care; whether they Repeated a Grade; and attended a Full-day Kindergarten program. Private School is also considered because Reardon and Yun (2002) showed that the average African American private school student attends a private school that is approximately 53 percent African American. Finally, residency in the South and City location are considered since the largest cities are located outside of the traditional South and generally have lower test-scores for underrepresented children. All of these social background variables are coded as 1 = yes, 0 = no.

In addition to the investigation of test-score inequality along dimensions of children's social background, the interest in racial segregation required that this author create measures of schools' racial composition and census tract racial and economic make-up. Addressing school composition first, the percentage school minority variable is divided into equal thirds and the lower and upper third is used to create samples of children within Low and High percent Minority Schools within the South and non-South. These samples, consisting of 47.04 (n = 2168) and 55.42 (n = 5087) percent of all southern and non-southern children, respectively, contrast the analysis of the national sample. The neighborhood variables included two census measures of the tract's Median Family Income and Percent Minority Composition, with minority being defined as Hispanic, Black, Asian/Pacific Islander, American Indian, and other. The author segmented both of these variables into equal size quintiles and omitted the middle category from the analysis (e.g., Family Income Quintile 1, Family Income Quintile 2, etc.; 1 = yes, 0 = no). Segmenting the SES variable in this way allows for the detection of its possible non-linear association with test-scores. The constructs and their means and standard deviations are presented in Table 1.

Estimation

Using hierarchical linear models (Raudenbush & Bryk, 2002), child-measures of math and science are modeled according to their developmental, social background, and school characteristics at level 1, and residential measures at level 2. In the first unconditional model specification below, children's achievement Y_{cn} is viewed as a function of an intercept for child c in neighborhood n yielding the Level 1 equation:

$$Y_{cn} = \beta_{0n} + e_{cn} \quad (1)$$

Where:

Y_{cn} is the outcome of child c within neighborhood n

β_{0n} is the mean outcome level in neighborhood n

e_{cn} is an error term assumed normally distributed

Table 1

Descriptive Statistics for Nation (N = 13787), South (N = 4608), and Non-South (N = 9179)

	Nation		South		Non-South	
	M	*SD*	*M*	*SD*	*M*	*SD*
Math score, grade 3	98.992	24.657	97.730	24.937	99.625	24.492
Math score, grade 1	61.438	18.114	61.151	18.124	61.588	18.108
Science score, grade 3	50.270	15.147	49.065	14.951	50.874	15.209
General knowledge score, grade 1	34.395	7.703	33.907	7.620	34.649	7.734
Age in grade 3 (categorical, 1-6)	3.470	1.417	3.580	1.372	3.40	1.435
Male (1 = male, 0 = female)	.510	.500	.520	.500	.510	.500
Low SES (1 = yes, 0 = no)	.195	.396	.233	.423	.175	.380
Middle low SES (1 = yes, 0 = no)	.197	.398	.209	.406	.192	.393
Middle SES (1 = yes, 0 = no)	.197	.398	.184	.387	.204	.403
Middle high SES (1 = yes, 0 = no)	.204	.403	.194	.395	.210	.407
High SES (1 = yes, 0 = no)	.204	.403	.177	.382	.218	.413
Asian/Pacific Islander (1 = yes, 0 = no)	.077	.266	.034	.183	.099	.298
Black (1 = yes, 0 = no)	.156	.362	.265	.441	.099	.298
Hispanic (1 = yes, 0 = no)	.187	.390	.152	.359	.205	.404
White (1 = yes, 0 = no)	.579	.493	.547	.497	.596	.490
Immigrant parent (1 = yes, 0 = no)	.199	.399	.145	.352	.227	.419
Single parent (1 = yes, 0 = no)	.261	.439	.312	.463	.235	.424
Repeated grade ever (1 = yes, 0 = no)	.035	.183	.036	.187	.034	.181
Pre-kindergarten (1 = yes, 0 = no)	.097	.296	.113	.316	.089	.284
All day kindergarten (1 = yes, 0 = no)	.560	.496	.819	.384	.425	.494
Private school (1 = yes, 0 = no)	.194	.395	.154	.361	.214	.410
School % minority	33.462	35.070	36.643	34.352	31.825	35.324
South	.341	.474				
Non-South	.658	.474				
City	.406	.491	.404	.490	.408	.491
Area % minority	33.725	32.008	37.020	30.965	32.020	32.405
Area % minority quintile 1	.206	.404	.113	.316	.254	.435
Area % minority quintile 2	.202	.401	.204	.403	.201	.400
Area % minority quintile 4	.196	.397	.223	.416	.182	.386
Area % minority quintile 5	.194	.395	.204	.403	.189	.392
Area median family income	51441.81	23415.64	47188.90	22026.02	53642.668	23807.66
Area median family income quintile 1	.192	.394	.245	.430	.165	.371
Area median family income quintile 2	.201	.400	.251	.433	.175	.380
Area median family income quintile 4	.203	.402	.155	.362	.227	.419
Area median family income quintile 5	.201	.401	.153	.359	.226	.418

Note. M = Mean; *SD* = Standard Deviation.

The second unconditional model includes the variable South, which estimates the mean deviation of the southern region from the math or science intercept, β_{0n}.

$$Y_{cn} = \beta_{0n} + \beta_{1n}(\text{South})_{cn} + e_{cn} \qquad (2)$$

Level 1 of the conditional model includes the social background variables. In the specification of level 1, test-scores, Y_{cn} is a function of students' age, race, gender, family SES quintile (with the middle quintile excluded), parents' immigrant status, and single parent status. The author also considered children's educational experiences, including their first grade test-score, whether they had pre-kindergarten education, attended a full-day kindergarten program, repeated kindergarten, or attended private school. Finally, city and southern residency was considered. The full level 1 equation is as follows:

$$Y_{cn} = \beta_{0n} + \beta_{1n}(\textit{Age})_{cn} + \beta_{2\text{-}5n}(\textit{Race})_{cn} + \beta_{6n}(\textit{Male})_{cn} + \beta_{7\text{-}10n}(\textit{SES Quintiles})_{cn} + \beta_{11n}(\textit{Immigrant Parent})_{cn} + \beta_{12n}(\textit{Single Parent})_{cn}\ \beta_{13n}(\textit{Test-Score})_{cn} + \beta_{14n}(\textit{Pre-Kindergarten})_{cn} + \beta_{15n}(\textit{Full Day K})_{cn} + \beta_{16n}(\textit{Repeat Grade})_{cn} + \beta_{17n}(\textit{Private School})_{cn} + \beta_{18n}(\textit{City})_{cn} + \beta_{19n}(\textit{South})_{cn} + e_{cn} \qquad (3)$$

Level 2 of the conditional model estimates neighborhood-to-neighborhood variation in mean test-scores for all of the neighborhood variables. Hence, test-scores, β_{0n} is a function of quintiles of neighborhood percentage minority (middle quintile excluded), and quintiles of median family incomes (middle quintile excluded). The level 2 equation is expressed as:

$$\beta_{0n} = \gamma_{00} + \gamma_{0,1\text{-}4}(\%\ \text{Minority})_n + \gamma_{0,5\text{-}8}(\text{Median Family Income})_n + r_{0n} \quad (4)$$

In this equation, the intercept γ_{00n}, represents the test-score for all neighborhoods in the sample. The neighborhood variables indicate the estimated deviation from the mean test-score associated with a unit increase among those factors.

The equations 1 thru 4 are specified for the full sample. In order to ascertain whether a school's racial composition moderates how social background characteristics and residential segregation relate to children's test-score performances in and outside of the South, the southern and non-southern samples are taken and segmented into thirds according to children's school minority composition. Once the samples are disaggregated according to the schools' minority composition, the author estimates the conditional model again.

ANALYSIS

Descriptive Statistics

Tables 1 and 2 provide descriptive information for the full and regional samples. Looking at math and science outcomes first, Table 1 shows that test-scores are slightly lower among children in the South, this difference being a little over 1.8 points in both subjects. Considering the social background measures, southern children are more likely than those outside of the South to be African American, attend schools with a higher minority composition, and be in the lowest SES quintile. In fact, 50 percent of Southerners are in the two lowest SES quintiles compared to 35 percent of children in non-southern regions. In terms of school differences, the most notable one shows nearly 82 percent of southern children attend full-day kindergarten programs, a rate that is nearly double that of children outside of the South.

Table 2 displays how southern and non-southern children are distributed according to SES among three school minority composition categories. The lower third of school minority composition spans 0 to 11 percent, the middle third 11.01 to 53.87 percent, with the upper third being in excess of 53.9 percent minority. Most striking in this table is that children with the greatest economic disadvantage are concentrated in high minority schools within the South (53.5 percent) and non-South (57.8 percent). Viewing every third line of column 1 shows that children in low minority schools in the South are somewhat evenly distributed across all SES quintiles while the proportion of non-southern children in low minority schools increases with SES. This implies that being in the top SES quintiles does not increase the likelihood that southern children will attend low minority schools to the extent it does for non-southern children. On this point, 47.1 percent of children that attend low minority schools in non-southern regions are also in the highest two SES quintiles while 38.3 percent are in the South. In sum, individual SES and school minority composition co-vary more dramatically in non-southern than southern schools because higher proportions of affluent children are in low minority schools and poor children are overrepresented in high minority schools. This reality is even more noteworthy given the majority of non-southern children 55.42 percent (n = 5087) are in low or high minority schools, whereas the majority of children in the South (52.96 percent) attend schools with moderate levels of racial segregation.

Table 2

Cross-tabulations of School Minority Composition and Student Socioeconomic Status (SES)

Region	**Southern**			**Non-southern**		
Distribution Category	Low % Minority School	Middle % Minority School	High % Minority School	Low % Minority School	Middle % Minority School	High % Minority School
First SES Quintile						
Number	401	292	796	609	321	1275
% Within Quintile	26.9	19.6	53.5	27.6	14.6	57.8
% Within School Minority	22.4	12.0	33.7	12.4	7.8	31.3
Second SES Quintile						
Number	392	445	524	932	627	901
% Within Quintile	28.8	32.7	38.5	37.9	25.5	36.6
% Within School Minority	21.9	18.2	22.2	19.0	15.3	22.1
Third SES Quintile						
Number	313	466	449	1047	803	802
% Within Quintile	25.5	37.9	36.6	39.5	30.3	30.2
% Within School Minority	17.5	19.1	19.0	21.4	19.6	19.7
Fourth SES Quintile						
Number	327	587	351	1088	1034	641
% Within Quintile	25.8	46.4	27.7	39.4	37.4	23.2
% Within School Minority	18.3	24.1	14.8	22.2	25.3	15.7
Fifth SES Quintile						
Number	358	650	245	1221	1307	455
% Within Quintile	28.6	51.9	19.6	40.9	43.8	15.3
% Within School Minority	20.0	26.6	10.4	24.9	31.9	11.2

Full Analysis

In order to understand whether there are regional, social background, and residential differences in test-score inequality, Table 3 reports mean test-scores in math and science, as well as models that consider regional differences, the impact of children's social background, and the racial and economic composition of neighborhoods. Considering math first, model 2 shows no significant difference in the test performance of children in the South ($\widehat{\beta}_1$ = -.66 points). Model 3 adds the social background variables and reveals sizable differences according to gender, social class and race. With regard to gender, the estimate for males ($\widehat{\beta}_6$ = 2.90 points) is significantly higher than it is for girls. Next, all four SES categories are significantly different than the mean test-score with the total test-score difference between children in the low and high SES quintiles equaling 8.86 points, over a third of a standard deviation unit (.36) difference. Finally, the test-scores of African Americans ($\widehat{\beta}_4$ = -4.81 points) show the most significant shortfall among all racial groups and all other dimensions of children's social background. Among the school experience measures, attending a pre-kindergarten program ($\widehat{\beta}_{14}$ = -1.77 points) and having repeated a grade ($\widehat{\beta}_{16}$ = -1.92 points) are related to lowered math scores. Most surprising however is the large and negative estimate for private school attendance ($\widehat{\beta}_{17}$ = -3.76 points), which is nearly twice as large as the one for having repeated a grade.

When children's neighborhood features are added in model 4, the private school math estimate ($\widehat{\beta}_{17}$ = -4.11 points) becomes the largest in the model, representing approximately a sixth of a standard deviation unit loss in math. Residential characteristics apparently account for some of the racial inequality since the African American estimate reduces to $\widehat{\beta}_{4}$ = -3.88 points and the Hispanic shortfall in math disappears once they are included. Finally, model 4 also shows that the neighborhood's level of racial segregation seems unrelated to math scores, while its median family income has varied significant impacts across quintiles—evidence that its relationship to math is non-linear.

The science analysis results mirror those of math, but with a few noteworthy exceptions. First, the estimate for southern region is significant and negative ($\widehat{\beta}_{1}$ = -1.01 points); however, this estimate becomes insignificantly different than the average once children's social background characteristics are considered in model 3. Among these background characteristics, having an immigrant parent ($\widehat{\beta}_{11}$ = 1.91 points) is related to higher science scores while being within a single parent home ($\widehat{\beta}_{12}$ = -.99 points) is related to lower scores. Second, model 4 reveals higher science test-scores for children within low minority neighborhoods ($\hat{\gamma}_{01}$= .99 points).

Disaggregated Analysis

The third research question is considered next of whether a school's racial composition moderates how social background characteristics and residential segregation relate to children's test-score performances in and outside of the South. Pursuant to this question, Table 4 displays the full model for children in low and high minority schools in the South and non-South. While the full models in the national analysis show no significant difference in math test-scores according to southern residency, considering schools' racial composition reveals much larger school differences across regions. For example, the math gap in the non-South equals a total of 13.15 points, favoring kids in low minority schools ($\widehat{\beta}_{0}$ = 103.58 points) over kids in high minority schools ($\widehat{\beta}_{0}$ = 90.43 points), while that gap is only 6.86 points in the South.

Viewing the social background characteristics reveals that African Americans do less well in high minority schools in both regions, and are the only racial group to trail the performance of White children, which are the referent group. The boost that being male and high income provides to children's math performance appears consistent across school minority types in the non-South, but does not materialize in southern high minority schools. This analysis also qualifies the surprisingly negative association between private school attendance and achievement found in the full sample analysis (see Table 3). This shortfall is due to the performances of children in high minority schools in both the South ($\widehat{\beta}_{17}$ = -10.88 points) and other regions ($\widehat{\beta}_{17}$ = -4.09 points). The larger of these two negative estimates amounts to a .436 standard deviation unit reduction in math. As with the full analysis results, neighborhood racial composition remains unrelated to math scores, while neighborhood economic disadvantage appears significantly associated with lowered math scores in non-South high minority schools.

Table 3

Math and Science, National Sample (N = 13,787)

	Math				Science			
Fixed Effects	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	98.232***	98.241***	98.636***	98.736***	49.897***	49.909***	50.451***	50.465***
Prior test score			0.999***	0.993***			1.387***	1.381***
Age in grade 3			-0.259	-0.228			0.082	0.084
Male			2.904***	2.864***			2.376***	2.379***
Low SES			-4.141***	-3.622***			-1.553***	-1.493***
Middle low SES			-2.037***	-1.787***			-0.693*	-0.652
Middle high SES			1.408**	1.082*			0.708*	0.630
High SES			4.716***	3.821***			2.811***	2.585***
Asian/Pacific Islander			1.045	0.968			0.011	0.215
Black			-4.809***	-3.881***			-4.269***	-3.978***
Hispanic			-1.382*	-0.754			-1.505***	-1.255***
Immigrant parent			0.758	0.851			1.908***	1.950***
Single parent			-0.912	-0.816			-0.993***	-0.949***
Repeated grade ever			-1.920*	-2.122*			-1.828**	-1.833**
Pre-kindergarten			-1.770**	-1.611**			-0.692*	-0.642
Full-day kindergarten			0.022	0.437			0.674*	0.700**
Private school			-3.756***	-4.112***			-1.539***	-1.588***
City			1.053*	1.580***			0.085	0.269
South		-0.664	0.194	0.280		-1.005*	-0.023	0.190
Area % minority quintile 1				-0.374				0.992*
Area % minority quintile 2				-0.443				0.346
Area % minority quintile 4				0.319				-0.196
Area % minority quintile 5				-1.515				0.238
Area income quintile 1				-2.415***				-0.234
Area income quintile 2				-1.292*				-0.471
Area income quintile 4				0.503				0.163
Area income quintile 5				2.664***				0.802*
Variance, τ	176.752***	176.309***	30.102***	28.574***	81.192***	80.812***	10.143***	9.798***
Standard Deviation	13.294	13.278	5.487	5.345	9.011	8.989	3.185	3.130

Note. *p < .05; **p < .01; ***p < .001

Mirroring the results for math, the science analysis confirms that the largest test-score gap is between high and low minority schools outside the South at 11.69 points compared to 8.18 in the South. Also similar to the math analysis is the reported science shortfall for children in high minority private schools in both regions. Subsequently, the science results differ from the math analysis in many ways. First, racial stratification in science performance is more apparent than social class. Hispanics for example do less well in high minority schools in both regions, African Americans do less well in both school types and regions, and Asian Americans do much better than White children in non-southern low minority schools ($\widehat{\beta}_3$ = 4.80 points). Second, the benefit of having immigrant parents that emerged in the full analysis appears to be in part due to the stronger performance of children in high minority schools in both the South ($\widehat{\beta}_{11}$ = 2.39 points) and non-South ($\widehat{\beta}_{11}$ = 2.23 points). Apparently, the positive impact of having immigrant parents on test-scores does not distinguish this group among populations that have generally higher scores, as is the case in low minority schools. Third, science shortfalls for children who have a single parent also seem isolated to high minority schools irrespective of regional residency. The fourth difference appears among the neighborhood dimensions, where being in a southern low minority school is related to much higher science test-scores ($\hat{\gamma}_{04}$ = 11.15 points) for children in high minority neighborhoods.

Discussion

Following the unprecedented declines in the number of African American children attending predominantly minority schools during the Nixon–Ford administrations, the nation has witnessed a dramatic resurgence in rates of racial separation in schools, especially in the South. Segregation is thought to hamper the achievement of historically underrepresented children by instilling in them feelings of inferiority and relative deprivation, limiting their social learning and exposure to other cultural practices, and by making them easy targets for differential treatment within systems that seek the reproduction of racial stratification. Research; however, has revealed only tenuous and inconsistent evidence about the relationship of racial segregation to academic performances. Ambiguity about the effects of racial segregation on African American achievement, at both the neighborhood and school level, keeps out of reach a consensus on whether contemporary levels of racial segregation in and outside of the South are a serious problem.

To assess the educational importance of segregation, this study uses the Early Childhood Longitudinal Study and multilevel statistical methodologies to examine the 3rd grade math and science scores of racial groups within southern and non-southern regions that vary in their degree of school and neighborhood racial segregation. More specifically, this author investigates whether the test-scores of children in the historical U.S. South differ from those of children outside of the South, and the extent to which social background characteristics and neighborhood segregation might account for those differences; if test-score performances vary according to a neighborhoods' racial and economic composition; and, whether a school's racial composition moderates how social background characteristics and neighborhood segregation relate to children's test-score performances in and outside of the South.

While this analysis reveals that there are few differences between the South and non-South in children's average math and science performances after accounting for their social characteristics it provided both clarification and knowledge about compositional influences on children's educational experiences. First, the analysis models confirmed what was implied in Table 2; that there existed more educational inequality in non-southern than southern schools, where much larger gaps in math and science performances were found between children in low and high minority schools. Non-southern children can expect to do better than southern children if they are in low minority schools and worse than southern children if they are in high minority schools. It

Table 4

Math and Science in South (N = 2168) and Non-South (N = 5087)

	Math				Science			
	South		*Non-South*		*South*		*Non-South*	
Fixed Effects	**Low % Minority School**	**High % Minority School**	**Low % Minority School**	**High % Minority School**	**Low % Minority School**	**High % Minority School**	**Low % Minority School**	**High % Minority School**
Intercept	98.760***	91.901***	103.584***	90.430***	52.280***	44.098***	55.485***	43.789***
Prior test score	0.929***	1.073***	0.894***	1.079***	1.363***	1.200***	1.549***	1.216***
Age in grade 3	-0.387	0.004	0.039	-0.060	0.152	0.189	0.137	-0.179
Male	2.876*	1.530	3.726***	2.776***	3.092***	0.883	2.331***	1.974***
Low SES	-2.638	-4.003**	-4.864*	-0.535	-2.730	-2.266**	-1.952	0.070
Middle low SES	-0.838	-1.038	-1.180	-1.609	-2.086	-1.499*	0.001	0.349
Middle high SES	0.666	-0.049	2.047	2.147	2.265	-0.052	-0.002	1.815*
High SES	5.998**	3.296	5.897***	4.591**	4.128***	0.826	-0.019	5.676***
Asian/Pacific Islander	-6.138	0.581	2.232	0.588	-5.106*	-0.439	4.802*	-1.466
Black	-7.768	-3.672**	-2.755	-4.199**	-5.130**	-4.400***	1.430	-4.463***
Hispanic	0.668	0.594	0.432	-2.181	-3.646	-2.682**	-1.330	-2.122**
Immigrant parent	4.252	1.571	1.749	1.093	1.461	2.385*	0.358	2.229***
Single parent	-3.365	-0.664	-1.334	-0.890	-1.161	-1.202*	0.564	-1.142*
Repeated grade	-11.447**	-0.391	-1.082	-0.910	-4.514	-3.122*	-1.696	-1.580
Pre-kindergarten	-1.410	-0.936	-3.577*	-0.904	-1.935	-0.718	-2.051*	-0.280
Full-day kindergarten	-3.346	1.783	-1.705	1.025	-0.363	1.267	0.756	0.743
Private school	-2.979	-10.884***	-1.714	-4.089**	-1.515	-3.670*	-0.903	-2.601***
City	0.294	3.127**	-1.273	1.222	1.143	0.132	-0.847	-0.466
Area % minority quintile 1	-0.073	5.089	-0.375	1.806	0.569	1.195	2.004	-0.862
Area % minority quintile 2	-2.045	1.369	-0.347	0.540	-0.253	-0.936	0.954	1.119
Area % minority quintile 4	3.812	0.765	2.813	1.981	-0.316	-1.162	-1.227	0.595
Area % minority quintile 5	13.060	-0.459	19.494	-0.090	11.148***	0.322	-12.194	-0.056
Area income quintile 1	-3.677	-2.742	-2.976	-3.601**	-0.569	-1.902*	3.431*	0.001
Area income quintile 2	-0.239	0.630	-2.303	2.906*	-0.829	-0.826	-0.537	-0.138
Area income quintile 4	1.358	0.577	-1.230	-2.135	-1.781	0.797	-0.459	0.321
Area income quintile 5	3.580	-0.267	-1.130	-0.484	-1.187	2.063	0.237	1.563
Variance, τ	32.435***	36.167***	15.444***	34.238***	1.161	7.635***	7.365***	8.318***
Standard Deviation	5.695	6.014	3.929	5.851	1.0775	2.763	2.714	2.884

Note. $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$

was also expected that the educational costs of being in a high minority school would be particularly high for African Americans, and greatest outside the South given their greater relative disadvantage in those regions. This finding nonetheless qualifies accepted notions about high minority schools having less stratification in them. While that may be true, racial stratification was always evident among high minority schools in this analysis while the same cannot be said for low minority schools. While the re-segregation of southern schools is an ominous trend, worthy of more national concern, the educational consequences of segregation within neighborhoods and schools remain higher in non-southern regions.

Second, this analysis found that the school's racial composition may determine the association of its educational programs to learning. For example, while children's pre-kindergarten experiences helped them to equal the test performance of their peers in southern schools and high minority schools, these experiences became associated with significantly lower scores within low minority schools outside the South. This is also the case with private school attendance. The consistent and relatively large negative effect associated with children's private school attendance was isolated, in the disaggregated analysis, to children that attend high minority schools. In fact, among all the demographic dimensions considered in this analysis, the lowest average math test-score was recorded for southern children attending high minority private schools. This is most concerning because racial segregation in private schools receives little attention because they operate beyond the reach of public policy and the enrollment in private schools is erroneously considered a "choice." Private school selection is most often constrained by family finances, making private school enrollment, in reality, a choice among limited options. Nonetheless, this analysis implies that southern families concerned with test-performances should carefully consider whether segregated private schools are better options than segregated or integrated public schools.

Third, this analysis did not rule out the importance of the neighborhood's racial composition, which was found associated with higher science scores for children in low minority areas. This implies that residential segregation secures educational advantages for White children, who continue to be the most racially isolated group. However, the analysis did not confirm the notion that increased levels of minority residency in neighborhoods led to lowered achievement within either of the school composition types and regions. The neighborhood economic estimates allude to another way of understanding the problem of school segregation, since low neighborhood SES was found negatively associated with test-scores in science and math in both regions, but more so in the non-South. Wilson (1987) noted long ago that racial segregation organized Black communities and then macroeconomic change within northern metropolitan areas destroyed those communities. The same explanation can be applied to schools: Social sorting has grouped African American children into schools so that neighborhood economic conditions can limit their educational capacity, and aid the reproduction of racial stratification. Put differently, racial ghettos are no longer needed to reproduce status hierarchies according race as long as racially segregated schools exist.

CONCLUSION

While the findings of this study add to our knowledge, they should be interpreted within the traditional limits of observational research. More research is needed that considers residential and school contributions to children's achievement. The present study has sought to understand regional, neighborhood, and school differences but other geographies of opportunity await exploration (e.g., metropolitan areas, suburbs, etc.). Moving beyond the limits of this current study, future research should also acknowledge that segregation may have very different effects when estimated among different age groups and when other outcomes are considered. Ultimately, this line of research should consider what kinds of educational arrangements work to disrupt residential systems of racial stratification and reproduction through schools. Until these remedies are identified and the public fully commits to their implementation, our schools will continue to represent the unfulfilled promise of *Brown.*

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