

School Racial Segregation and the Health of Black Children

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abstract

OBJECTIVES: Few researchers have evaluated whether school racial segregation, a key manifestation of structural racism, affects child health, despite its potential impacts on school quality, social networks, and stress from discrimination. We investigated whether school racial segregation affects Black children's health and health behaviors.

METHODS: We estimated the association of school segregation with child health, leveraging a natural experiment in which school districts in recent years experienced increased school segregation. School segregation was operationalized as the Black-White dissimilarity index. We used ordinary least squares models as well as quasi-experimental instrumental variables analysis, which can reduce bias from unobserved confounders. Data from the Child Development Supplement of the Panel Study of Income Dynamics (1997–2014, $n = 1248$ Black children) were linked with district-level school segregation measures. Multivariable regressions were adjusted for individual-, neighborhood-, and district-level covariates. We also performed subgroup analyses by child sex and age.

RESULTS: In instrumental variables models, a one standard deviation increase in school segregation was associated with increased behavioral problems (2.53 points on a 27-point scale; 95% CI, 0.26 to 4.80), probability of having ever drunk alcohol (0.23; 95% CI, 0.049 to 0.42), and drinking at least monthly (0.20; 95% CI, 0.053 to 0.35). School segregation was more strongly associated with drinking behaviors among girls.

CONCLUSIONS: School segregation was associated with worse outcomes on several measures of well-being among Black children, which may contribute to health inequities across the life span. These results highlight the need to promote school racial integration and support Black youth attending segregated schools.



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WHAT'S KNOWN ON THIS SUBJECT: School racial segregation may affect child health through its impact on school quality, social networks, and stress from discrimination, yet few studies have investigated the association of school segregation with child health, despite increasing US school segregation.

WHAT THIS STUDY ADDS: School segregation was associated with worse outcomes on several measures of well-being among Black children, including behavioral problems and drinking activities. These outcomes may contribute to health inequities across the life span.

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Racial and ethnic inequities in child health and health behaviors in the United States persist, with worse health among Black children.^{1,2} Inequities in schooling environments may be a driver of child health disparities, given the centrality of schools in children's lives.³ Indeed, school-aged children spend ~20% of their time (1200 hours per year) in school.⁴ Attending highly segregated schools, a common experience for Black children, may be a particularly salient determinant of health inequities.⁵ School segregation may adversely affect Black children's health and behaviors through reduced school quality and increased exposure to racial discrimination.⁶⁻¹⁰ Conversely, school segregation could plausibly improve health outcomes by reducing exposure to interpersonal racism from White peers or teachers.^{11,12} Evidence on the health impacts of school segregation, however, is sparse.

Legal decisions that have reshaped the landscape of US school segregation in the past 3 decades are troubling.¹³⁻¹⁶ In 1954, the Supreme Court's landmark decision in *Brown v Board of Education* ruled that school racial segregation was unconstitutional, resulting in substantial increases in racial integration across schools in the 1960s-1970s. This desegregation led to improvements in Black people's well-being, including an increase in educational and occupational attainment and self-rated health^{17,18} and possibly reduced teen fertility rates.^{19,20} In 1991, however, the Supreme Court began issuing rulings that made it easier for districts to be released from court-ordered desegregation.²¹ Since then, ~600 of 1000 school districts previously under court-ordered desegregation have been released from oversight, reverting to

neighborhood-based school assignment (Supplemental Fig 1 A and B).¹³⁻¹⁵ Highly segregated schools with ≤10% White students have more than tripled from 5.7% to 18.6%.¹⁶ To our knowledge, there are no studies of the effects of this recent increase in school segregation on child health, other than a single study revealing an increased risk of preterm birth.²²

In the current study, we evaluated how recent school resegregation trends are associated with health among Black children, providing evidence on an understudied risk factor of child health disparities as well as on a specific modifiable policy. We used national survey data and a quasi-experimental design that leveraged the quasi-random (ie, arbitrary) timing of school districts' releases from court desegregation orders to estimate the association of school segregation with health. We examined a broad range of outcomes, providing some of the first evidence on the impacts of school racial segregation on child health.

METHODS

Data Sources

Data on child health and behaviors were drawn from the Panel Study of Income Dynamics (PSID), which recruited a nationally representative sample of families in 1968 and interviewed them annually through 1997 and biennially thereafter. In 1997, PSID also began the Child Development Supplement (CDS), which collected additional data on children aged 0 to 12 years. Two follow-up surveys of children who were still <18 years of age were conducted in 2002 and 2007. In 2014, a new CDS cohort was launched for children aged 0 to 17 years. We linked health data from these 4 CDS waves with data from the main PSID survey on children's

individual and family demographic characteristics (including residential census blocks), focusing on children's observed schooling years.

Data on school district court orders were compiled by Reardon²³ and ProPublica.²⁴ School district demographic characteristics and segregation measures (from 1991 on) were derived from the Common Core of Data compiled by the National Center for Education Statistics.²⁵ We linked school district data with PSID residential data using a crosswalk that mapped school districts onto census blocks.

Study Sample

We restricted our analysis to Black children in PSID. Among the 3263 Black children who participated in at least 1 CDS wave, we included 2750 who were school-aged (5-17 years) between 1991 and 2014. After applying relevant inclusion and exclusion criteria (Supplemental Methods), the final analytic sample included 1248 Black children who ever lived in districts under desegregation orders in 1991. Each child potentially participated in multiple survey waves, and we used all available person-year observations. The sample size for each outcome varied because some data were collected in limited years or for limited age ranges (Supplemental Table 4).

Exposure

We operationalized school segregation as the average level of school segregation in the school districts children attended between their first observed schooling year (baseline) and the year in which a given health outcome was measured. School district-level racial segregation was measured using the Black-White dissimilarity index (range, 0-1), a standard measure of segregation that represents the proportion of Black or White students who would have to move

to a different school to achieve a uniform Black-White distribution across schools within a district.^{13,26} Higher values represent higher segregation (Supplemental Methods).

One challenge in identifying the health effects of school segregation is confounding: School segregation is often correlated with individual and family characteristics (eg, socioeconomic status) and neighborhood characteristics (eg, poverty, residential segregation) that could affect both school segregation and health (Supplemental Fig 2). To circumvent this problem, we leveraged changes in school segregation created by local court decisions that released school districts from court-ordered desegregation since 1991 (when the relevant Supreme Court decision occurred). Discontinuous increases in school segregation have been noted in released districts after these court decisions relative to districts that remained under court order (Supplemental Table 3), which we have also observed for the sample in the current study.^{13,14} Previous work has revealed that many arbitrary factors affected the timing of release procedures, such as unequal court caseloads across districts and the varying duration of the release process,^{13,15,16,27} making the timing of these releases effectively quasi-random. Accordingly, empirical evidence has revealed that school districts that were released from court-ordered desegregation were similar to those that were not released on most observable characteristics (eg, baseline segregation levels, student racial composition), although larger districts were more likely to be released.¹³ This evidence supports the idea that releases led to exogenous variation in school segregation that is less likely to be confounded by individual and

neighborhood factors and is the basis of our quasi-experimental approach (described below). This is similar to other studies that have leveraged variation in education policies to examine the effects of school characteristics on health.^{28,29}

Outcomes

We selected child health outcomes and behaviors likely to be affected by school segregation.^{30–33} Health outcomes include self-rated health (dichotomized as poor, fair, or good vs very good or excellent); diagnoses of asthma, obesity, and mental/emotional health problems; and the Behavioral Problem Index (BPI), a validated scale (score range, 0–27) that asks about antisocial behavior, hyperactivity, and other indications of behavioral difficulties.³⁴ For health behaviors, we included 2 outcomes representing whether children participated in >30 minutes of vigorous physical activities at least 3 days a week inside school in physical education (PE) class and separately outside of school; 3 alcohol-related binary outcomes (ever drank, drank at least monthly, and binged on alcohol [≥ 5 drinks at a time] at least monthly); 2 smoking-related binary outcomes (ever smoked and ever smoked regularly); and 1 smoking-related continuous outcome (number of days smoked in past month). See the Supplemental Methods and Supplemental Table 4 for survey questions and outcome coding.

Covariates

Individual-level covariates included binary child sex (as a proxy for gender identity and exposure to gendered psychosocial experiences),³⁵ age when outcomes were measured, and family inflation-adjusted income and parental marital status at baseline. Birth year indicator variables (ie, fixed effects) were included to account for secular

trends. We also included district covariates corresponding to each child's first observed school district in 1991, including total student enrollment, student racial composition, and percentage of students eligible for free or reduced-price lunch. Furthermore, we included district-level residential racial segregation, as measured by the Black-White dissimilarity index across census tracts within each district. Finally, fixed effects for state of residence at baseline were included to adjust for any observed or unobserved time-invariant state factors that could influence district release status and health.

Statistical Analyses

To estimate the association between school segregation and each outcome, we first fit ordinary least squares (OLS) models, regressing each outcome on average exposure to school segregation and adjusting for the covariates discussed above. SEs were clustered at the district and individual levels to account for correlated observations in the same district and for the same individual. However, OLS models may suffer from confounding from unmeasured common causes of the exposure and outcome.

We therefore next performed instrumental variables (IV) analysis, an established technique that relies on a quasi-randomly determined exposure (known as the instrument) that affects the predictor (school segregation) but does not suffer from the same unobserved confounding.³⁶ The quasi-random perturbation in the predictor caused by the instrument is used to infer the effects of the predictor on the outcome. Here, we leveraged the arbitrary timing of each district's release from court-ordered desegregation. Thus, the instrument we used represents the average years elapsed since a child's school

district was released from court-ordered desegregation (see Supplemental Methods for detailed instrument construction). We performed several tests that supported the validity of the instrument to provide reassurance of the validity of IV assumptions; details, including first-stage coefficients and *F* statistics, are provided in the Supplemental Methods and shown in Supplemental Tables 5–8.

These IV models were fit as 2-stage multivariable regressions adjusted for the covariates described above. We estimated linear models for both binary and continuous outcomes because IV probit/logistic regressions failed to converge. For outcomes that are not reversible (eg, ever diagnosed with asthma), we dropped observations after the outcome was first reported (Supplemental Methods and Supplemental Table 9). SEs were again clustered at the district and individual levels. We also performed reduced-form analyses, regressing each outcome directly on the instrument, to estimate the association of desegregation order releases with health as opposed to the association of school segregation itself.

Secondary Analyses

The association of segregation with children's health may differ by key characteristics.^{37–40} We performed subgroup analyses by age at outcome ascertainment (5–10 vs 11–17 years) and sex. We also performed a sensitivity analysis using an alternative racial segregation measure (Supplemental Methods and Supplemental Table 10).

RESULTS

Sample Characteristics

At baseline, 48% of the sample children were girls, 38% had married parents, and the average inflation-adjusted family income

was \$41 936. The mean age at interview was 11 (SD, 3.5) years. Approximately 35% of children had poor, fair, or good health; 15% had asthma; 9% were obese; and 14% had a mental/emotional problem. The mean BPI score was 8.0 (SD, 6.7) out of a possible 27 points. Approximately 37% of children >11 years old had ever drunk alcohol, and 33% had ever smoked (Table 1).

The mean level of school segregation that children were exposed to was 0.47; that is, 47% of Black or White students would have needed to move to another school in the same district to reach even racial distributions across schools. The average number of years elapsed between districts' release years and when outcomes were measured was 2.9. The school districts that children attended at baseline were, on average, large (97 170 student enrollment) and 49% Black, with a majority of students eligible for free or reduced-price lunch. Average residential segregation was 0.56, indicating a medium to high level of neighborhood segregation within districts.^{41,42}

Association of School Segregation With Child Health (OLS Models)

In OLS models (Table 2), we were unable to rule out the null hypothesis that there was no association between school segregation and well-being among Black children.

Association of School District Release From Court-Ordered Desegregation With Child Health (IV Reduced Form Models)

More years elapsed since districts' release from court-ordered desegregation was associated with an increase in children's BPI ($\beta = 0.16$ points; 95% CI, 0.031 to 0.28), probability of ever drinking alcohol ($\beta = 0.031$; 95% CI, 0.0080 to

0.054), and probability of drinking alcohol at least monthly ($\beta = 0.028$; 95% CI, 0.0088 to 0.047), with no associations for other outcomes (Table 2).

Estimated Effect of School Segregation on Child Health (IV Models)

In quasi-experimental IV models (Table 2), a 1-SD increase in school segregation was associated with an increase in BPI ($\beta = 2.53$ points; 95% CI, 0.26 to 4.80), probability of ever drinking alcohol ($\beta = 0.23$; 95% CI, 0.049 to 0.42), and probability of drinking alcohol at least monthly ($\beta = 0.20$; 95% CI, 0.05 to 0.35), with no associations for other outcomes.

Subgroup Analyses

In IV models stratified by sex, school segregation was associated with an increased probability of drinking alcohol at least monthly for Black girls but not boys (girls: $\beta = 0.33$ [95% CI, 0.050 to 0.62]; boys: $\beta = 0.095$ [95% CI, –0.049 to 0.24]) (Table 3). There were no associations between school segregation and vigorous activities outside PE class and smoking regularly among each stratified group, even though the associations were statistically significantly different between the 2 groups.

IV analyses stratified by age showed that school segregation was associated with an increased probability of having asthma among younger children but not older children, but the difference between the 2 groups was not statistically significant (age 5–10 years: $\beta = 0.19$ [95% CI, 0.027 to 0.35]; age 11–17 years: $\beta = 0.02$ [95% CI, –0.11 to 0.15]).

DISCUSSION

We provide in this article some of the first evidence on the

TABLE 1 Descriptive Summary

	% or Mean (SD)	Person-Year Observations
Individual characteristics		
Age at interview, y	10.9 (3.5)	—
Birth year	1994 (6.9)	—
Girls	48.2	—
Family income at baseline, \$	41 936 (36 858)	—
Parents ever married at baseline	38.0	—
Outcome		
Poor, fair, or good health	34.8	1872
Asthma	15.0	1705
Obesity	9.0	1436
Mental/emotional problem	14.5	1806
BPI score	8.0 (6.7)	1781
Alcohol consumption		
Ever	37.0	511
Drank at least monthly	18.1	518
Had ≥ 5 drinks at a time at least monthly	4.4	518
Smoking		
Ever	32.6	516
Ever smoked regularly	5.2	520
No. of days smoked in the last month	0.8 (4.3)	520
Physical education class >3 d/wk	26.7	633
Vigorous activities outside physical education class >3 d/wk	54.3	634
Exposure to school segregation		
Average Black-White dissimilarity index	0.47 (0.21)	—
Instrument for exposure to school segregation		
Average no. of years elapsed since release from court-ordered desegregation	2.9 (4.7)	—
School district characteristics, baseline		
Total students enrolled	97 170 (154 822)	—
Black students	49.1	—
White students	30.9	—
Hispanic students	16.4	—
Receiving free or reduced-price lunch	57.8	—
Residential segregation, Black-White dissimilarity index	0.56 (0.22)	—

Sample was drawn from CDS waves 1997, 2002, 2007, and 2014 and includes 1248 Black children who ever resided in districts that had been under the desegregation order in 1991. Children may have participated in >1 wave, and we used all available person-year observations. School district characteristics represent the 1991 characteristics for the first observed district (baseline) in which each child resided. The number of baseline school districts was 439. —, not applicable.

relationship between school racial segregation and the well-being of Black children, using a robust, quasi-experimental design to evaluate a specific set of local policies. Previous researchers studying the effects of school segregation evaluated the desegregation of schools in the 1960s–1980s. We provide timely evidence on more recent trends that have resulted in resurgent segregation in districts across the country. We found that greater school segregation is associated with increased behavioral problems and alcohol consumption among Black children, especially for girls.

These findings have important implications for Black children's well-being in childhood and across the life span.

The results for behavioral problems align with prior literature linking social, racial, and economic marginalization with inequities in child behavioral problems.^{43–47} Children who are consistently exposed to stressful family and neighborhood environments may have more difficulty managing mental and emotional challenges and may experience impaired cognitive development.^{46,48,49} Here, school segregation may lead to

increased child stress. For instance, Black children may experience harsher disciplinary treatment at racially segregated schools, as part of the “school-to-prison pipeline.”^{7,8,50} More frequent police contact, which often accompanies this discipline, is associated with poorer mental health among adolescents, especially Black girls.³³ Additionally, segregated schools have fewer resources to provide adequate support for children's mental health and cognitive development. For example, relative to majority-White schools, segregated schools often have high teacher turnover, less experienced

TABLE 2 Association of School Segregation With Health Among Black Children

Outcome	Coefficient (95% CI)		
	OLS	Reduced Form	IV
Poor, fair, good health	−0.023 (−0.060 to 0.014)	0.0038 (−0.0030 to 0.011)	0.062 (−0.049 to 0.17)
Asthma	−0.0079 (−0.046 to 0.030)	0.0057 (−0.0012 to 0.013)	0.095 (−0.022 to 0.21)
Obesity	0.0068 (−0.024 to 0.038)	0.0035 (−0.0022 to 0.0092)	0.055 (−0.041 to 0.15)
Mental/emotional problem	−0.024 (−0.036 to 0.031)	0.0044 (−0.0023 to 0.011)	0.074 (−0.044 to 0.19)
BPI	−0.19 (−0.77 to 0.39)	0.16* (0.031 to 0.28)	2.53* (0.26 to 4.80)
Physical education class >3 d/wk	−0.018 (−0.070 to 0.035)	−0.0017 (−0.016 to 0.013)	−0.012 (−0.12 to 0.094)
Vigorous activities outside physical education class >3 d/wk	0.032 (−0.026 to 0.090)	0.017 (−0.0071 to 0.041)	0.12 (−0.043 to 0.28)
Alcohol consumption			
Ever	0.034 (−0.045 to 0.11)	0.031** (0.0080 to 0.054)	0.23** (0.049 to 0.42)
Drank at least monthly	0.013 (−0.054 to 0.079)	0.028** (0.0088 to 0.047)	0.20** (0.053 to 0.35)
Had ≥5 drinks at a time at least monthly	0.026 (−0.033 to 0.085)	0.010 (−0.0011 to 0.022)	0.075 (−0.0082 to 0.16)
Smoking			
Ever	0.082 (−0.058 to 0.074)	0.0049 (−0.017 to 0.027)	0.036 (−0.13 to 0.20)
Ever smoked regularly	0.022 (−0.011 to 0.055)	0.0039 (−0.0096 to 0.017)	0.028 (−0.069 to 0.13)
No. of days smoked	0.0091 (−0.59 to 0.61)	0.0081 (−0.18 to 0.20)	0.059 (−1.32 to 1.43)

Sample was drawn from the 1997, 2002, 2007, and 2014 waves of the Panel Study of Income Dynamics Child Development Supplement, and includes Black children who ever resided in school districts that had been under court-ordered desegregation in 1991. The association was estimated with regressions of health on cumulative average segregation (OLS), regressions of health on the average years elapsed since release from desegregation order (reduced form), or IV estimates of the effects of cumulative average segregation on health with the average years elapsed since the school district was released from the desegregation order as an instrument. All models were adjusted for baseline school district characteristics (total student enrollment, student racial composition, percentage of students eligible for free or reduced-price lunch, and residential segregation measured by the Black-White dissimilarity index), individual characteristics (sex, age, family inflation-adjusted income, and parental marital status), and fixed effects for birth year and state. Exposure to school segregation is measured by the Black-White dissimilarity index. SEs are clustered at the district and individual levels.

* $P < .05$; ** $P < .01$.

teachers, limited material resources, and crowded classrooms due to an inequitable distribution of school funding, all of which can lead to poorer mental health management among children.^{51,52,53} Because children with behavioral conditions are more likely to have lower educational achievement and psychosocial resources later^{54–56} and poor early academic achievement can lead to increased adolescent behavioral difficulties,^{57,58} school segregation-induced behavioral problems could exacerbate a harmful cycle of racial inequities in lifetime well-being.

Similarly, the results for alcohol consumption may be explained by unhealthy coping behaviors due to increased stress from school segregation or peer effects.^{7,8,50,59} Previous (correlational) studies revealed that higher levels of racial segregation in a school are associated with a decreased odds of drinking and smoking for students,

especially Black girls.^{60–63} However, these studies either controlled for school characteristics that likely mediate the relationship between school segregation and health or estimated the effect of within-school segregation, both downstream effects of policies at the district level that determine school segregation levels. Our results thus do not necessarily contradict those of other studies, given our differing methods.

In IV models, we did not find that school segregation was associated with other child health indicators, including general health, obesity, and a diagnosis of a mental/emotional problem, even though school segregation may lead to reduced school resources with consequences for other domains of children's health.^{6,10} For example, reduced funding for maintaining segregated schools' physical infrastructure might lead to increases in students' exposure to asthmagens.^{30,64} Of note, these IV

estimates were large and positive with wide CIs, and IV methods in general have less statistical power than conventional analyses.⁶⁵ Larger samples with better statistical power may help us to clarify whether associations are truly null or simply imprecisely estimated in the current sample.

IV estimates contrasted with those from correlational OLS models, which did not show associations between school segregation and any outcome. OLS models typically suffer from confounding by unmeasured characteristics, such that their null results may obscure the actual negative impact of school segregation on child behavioral problems. For example, students in segregated schools may live in segregated neighborhoods that protect against behavioral or emotional problems among children. Although many researchers have highlighted the numerous negative health impacts of residential

TABLE 3 Association of School Segregation With Health Among Black Children, Subgroup Analyses

Outcome	Coefficient (95% CI)			
	Sex		Age, y	
	Male ^a	Female	11–17 ^a	5–10
Poor, fair, or good health	0.082 (−0.11 to 0.27)	0.029 (−0.10 to 0.16)	0.040 (−0.093 to 0.17)	0.072 (−0.10 to 0.24)
Asthma	0.077 (−0.096 to 0.25)	0.11 (−0.022 to 0.25)	0.02 (−0.11 to 0.15)	0.19* (0.027 to 0.35)
Obesity	0.050 (−0.083 to 0.17)	0.029 (−0.092 to 0.15)	0.088 (−0.028 to 0.20)	0.0090 (−0.12 to 0.14)
Mental/emotional problem	0.13 (−0.047 to 0.30)	0.029 (−0.12 to 0.18)	0.087 (−0.046 to 0.22)	0.070 (−0.12 to 0.26)
BPI	2.64 (−0.27 to 5.55)	2.42 (−0.31 to 5.16)	2.42 (0.14 to 4.71)	3.44 (0.076 to 6.80)
Physical education class >3 d/wk	−0.10 (−0.29 to 0.086)	0.071 (−0.079 to 0.22)	—	—
Vigorous activities outside physical education class >3 d/wk	0.13 (−0.070 to 0.33)	0.035 (−0.17 to 0.24) ^b	—	—
Alcohol consumption				
Ever	0.18 (−0.0042 to 0.40)	0.34* (0.039 to 0.64)	—	—
Drank at least monthly	0.095 (−0.049 to 0.24)	0.33* (0.050 to 0.62) ^b	—	—
Had ≥5 drinks at a time at least monthly	0.054 (−0.025 to 0.13)	0.12 (−0.020 to 0.25)	—	—
Smoking				
Ever	0.026 (−0.22 to 0.27)	0.065 (−0.25 to 0.38)	—	—
Ever smoked regularly	0.083 (−0.11 to 0.27)	−0.015 (−0.071 to 0.042) ^b	—	—
No. of days smoked	0.051 (−2.23 to 2.33)	0.36 (−0.40 to 1.11)	—	—

Sample was drawn from the 1997, 2002, 2007, and 2014 waves of the Panel Study of Income Dynamics Child Development Supplement, and includes Black children who ever resided in districts that had been under the desegregation order in 1991. Coefficients represent IV estimates of the effects of cumulative average segregation on health with the average years elapsed since the school district was released from the desegregation order as instrument. All models include the baseline school district characteristics (total student enrollment, student racial composition, percentage of students eligible for free or reduced-price lunch, and residential segregation index measured by the Black-White dissimilarity index), individual characteristics (sex, age, family inflation-adjusted income, and parental marital status), and fixed effects for birth year and state. Exposure to school segregation is measured by the Black-White dissimilarity index. IV is the average years elapsed from dismissal. SEs are clustered at the district and individual levels. —, not applicable.

* $P < .05$.

^aReference group.

^bEstimate is statistically significantly different from the estimate for the reference group. The significance is derived from an interaction model of sex or age with the school segregation exposure.

segregated neighborhoods for Black adults,^{66–69} a small number have suggested that living in segregated neighborhoods may confer mental health benefits perhaps because of increased social support and lower exposure to interpersonal racism.^{70–73} Thus, results from OLS models may be confounded by the protective effect of neighborhoods. Alternately, IV results may deviate from OLS results because the 2 approaches are used to estimate different parameters. OLS models provide estimated associations between health and school segregation generally from any cause. In contrast, IV models yield estimates of the local average treatment effect⁷⁴ of school segregation driven by changes in court orders. The latter may be

particularly damaging for Black children's health.

This study has several strengths, which include addressing a policy-relevant question using a robust quasi-experimental design and rich, nationwide, longitudinal data. The study also has limitations. First, outcomes and covariates were self-reported and may be subject to reporting biases. Second, school segregation measures were captured at the district level and do not address segregation at larger (eg, between districts) or smaller (eg, within schools) levels.^{75,76} For this study, however, court decisions were targeted at school districts, and data on the specific schools that children attended are not available

in PSID, making schools a less relevant unit of analysis. Third, releases from desegregation orders may have affected child health through channels other than school segregation (eg, changing district residential characteristics), which we argue is unlikely because previous studies revealed few changes in residential segregation after districts were released from desegregation orders.²¹ Finally, we did not investigate mechanisms through which school segregation affects child health; we leave this to future work.

CONCLUSIONS

In this study, we found that recent school resegregation resulting from school districts being released from *Brown v Board of Education* desegregation

orders is associated with increased behavioral problems among Black school-aged children and alcohol drinking behaviors, especially among girls. The results highlight the need for structural interventions to improve the school environment for Black children, including reforming school funding formulas to increase government funding and education resources

in segregated districts,⁷⁷ reducing biased and disproportionately harsh treatment targeted at Black children, and promoting school racial integration (eg, busing initiatives proposed in the Strength in Diversity Act⁷⁸). Future investigators should evaluate the effects of such policies on educational and health inequities.

ABBREVIATIONS

BPI: Behavioral Problem Index
CDS: Child Development Supplement
IV: instrumental variables
OLS: ordinary least squares
PE: physical education
PSID: Panel Study on Income Dynamics

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