Appendix Materials

Appendix A. Census tract-level racial residential segregation: G* statistics

Local Getis-Ord G* statistics measuring residential racial segregation of Black Americans from other racial/ethnic groups was calculated by members of the research team (Dr. Kiarri N. Kershaw and Cyanna C. McGowan at Northwestern University). This G* statistic is widely used to quantify spatial clustering. It is effectively a Z-score: it compares the proportion of the population in a focal tract and its neighboring tracts that is Black to the proportion of a larger surrounding geographic area that is Black. Neighboring tracts to a focal tract are specified by the spatial weights matrices (SWMs). In this study, we used the queen "Conceptualization of Spatial Relationships," where any tract that touches the focal tract (either an edge or a node) is considered a neighbor. The larger area is a Core-Based Statistical Area (CBSA); counties were used for tracts that were not in CBSAs.

The G* statistic is calculated from the formula below. Technically, it equals the difference between the sum of *x* values for a focal tract and its neighboring tracts and the expected value for the larger area if there is no clustering, and then standardized:

$$G_i^* = \frac{\sum_{j=1}^n w_{i,j} x_j - \bar{X} \sum_{j=1}^n w_{i,j}}{S \sqrt{\frac{\left[n \sum_{j=1}^n w_{i,j}^2 - \left(\sum_{j=1}^n w_{i,j} \right)^2 \right]}{n-1}}} \qquad \text{Eq. (A.1)}$$

where x_j is the proportion of tract j's population who was Black, $w_{i,j}$ is the spatial weight between tracts *i* and *j*, *n* is equal to the total number of tracts, $\bar{X}$ is the mean proportion Black across all tracts, and:

$$S = \sqrt{\frac{\sum_{j=1}^n x_j^2}{n} - (\bar{X})^2} \qquad \text{Eq. (A.2)}$$

Since the G* statistic is a z-score, a G* statistic greater than 1.96 (two standard deviations above the mean) would indicate a tract and its neighboring tracts have a higher proportion of Black residents than the average within their CBSA or county.

Census tract-level data on the count of Black Americans per tract, which was used to create the tract-level G* statistics, came from the 1990, 2000, and 2010 Decennial Censuses, the 2010-2014 5-year ACS estimates, and 2014-2018 5-year ACS estimates. All data were normalized to 2010 Census tract boundaries, and 2013 CBSA designations. SAS 0.4, ArcGIS PRO 2.4, and Rstudio 1.2 were used to calculate the final G* statistics.

For more detailed documentation on calculating the G* statistics, please visit the project's website (https://www.openicpsr.org/openicpsr/project/170541/version/V2/view), or contact Cyanna C. McGowan at cyanna.mcgowan@northwestern.edu.

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Appendix B. Dichotomization of general health status

While general health is often dichotomized as "poor/fair" vs. "good/very good/excellent" in the literature about adult health, it is common to have "good" categorized together with "poor/fair" in the literature about child health. Poor or fair general health among children is rarer and less informative about how general health varies across the population. In our sample, less than 3% of children reported poor or fair health. Categorizing "good" with "very good or excellent" would lead to little variation in general health status across exposed segregation levels and would decrease our statistical power to detect any meaningful effect.

Appendix C

Table C.1. Association of residential segregation with child health outcomes, by race

	Estimated coefficient [95% CI]		
	Poor/fair/good health	Overweight/obese	Behavioral problems index
Black children	0.010* [0.001 0.019]	-0.007 [-0.019, 0.005]	0.034 [-0.107, 0.176]
White children	0.006 [-0.007, 0.020]	-0.023 [-0.048, 0.002]	0.160 [-0.142, 0.462]

* $p < 0.05$, ** $p < 0.01$

Note: Sample data were drawn from the Panel Study of Income Dynamics' Child Development Supplement (CDS) waves in 1997, 2002, 2007, and 2014. Sample includes 1251 Black children and 1427 White children who participated in CDS waves at least twice. Residential segregation was measured using local Getis-Ord G* statistics, which use census tract as a unit of neighborhood measurement. Coefficients were estimated using linear regression models with individual fixed effects, adjusting for time-varying covariates described in the Methods, but not family income and neighborhood characteristics that may serve as mediators.

Table C.2. Association of childhood residential segregation trajectories with child health, by race

	Estimated coefficient [95% CI]		
	Poor/fair/good health	Overweight/obese	Behavioral problems index
Black children			
Always in low segregation	ref.	ref.	ref.
Always in high segregation	-0.022 [-0.055, 0.010]	-0.002 [-0.045, 0.041]	-0.190 [-0.414, 0.793]
From high to low segregation	-0.049* [-0.090, -0.007]	-0.027 [-0.083, 0.030]	0.403 [-0.361, 1.167]
From low to high segregation	-0.039 [-0.084, 0.006]	-0.054 [-0.113, 0.005]	0.608 [-0.207, 1.422]
Others	-0.018 [-0.060, 0.024]	-0.010 [-0.061, 0.042]	-0.160 [-0.861, 0.541]
White children			
Always in low segregation	ref.	ref.	ref.
Always in high segregation	0.010 [-0.052, 0.072]	0.026 [-0.061, 0.113]	-0.712 [-1,896, 0.472]
From high to low segregation	-0.037* [-0.073, -0.001]	-0.014 [-0.084, 0.057]	-0.089 [-0.947, 1.125]
From low to high segregation	0.049 [-0.015, 0.113]	0.029 [-0.057, 0.116]	1.225 [-0.026, 2.475]
Others	0.038 [-0.015, 0.090]	0.039 [-0.028, 0.107]	1.759** [0.749, 2.769]

* $p < 0.05$, ** $p < 0.01$

Note: Data were drawn from the Panel Study of Income Dynamics' Child Development Supplement (CDS) waves in 1997, 2002, 2007, and 2014. Sample includes 3253 Black children and 3628 White children who participated in CDS waves at least once. Residential segregation was measured using local Getis-Ord G* statistics, which use census tract as a unit of neighborhood measurement. High segregation was defined as G* statistics greater than 1.96. Coefficients were estimated using linear regression models with individual fixed effects, adjusting for time-varying covariates described in the Methods, but not family income and neighborhood characteristics that may serve as mediators. Standard errors were clustered at the individual level to account for within-person correlation.