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The Effects of Racial Segregation on Intergenerational Mobility: Evidence from Historical Railroad Placement†

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This paper provides new evidence on the causal impacts of citywide racial segregation on intergenerational mobility. We use an instrumental variable approach that relies on plausibly exogenous variation in segregation due to the arrangement of railroad tracks in the nineteenth century. Our analysis finds that higher segregation reduces upward mobility for Black children from households across the income distribution and White children from low-income households. Moreover, segregation lowers academic achievement while increasing incarceration and teenage birth rates. An analysis of mechanisms shows that segregation reduces government spending, weakens support for antipoverty policies, and increases racially conservative attitudes among White residents. (*JEL* I38, J13, J15, J62, N32, N72, R30)

A large literature has documented the important role of place in shaping the long-run outcomes of children (Chyn and Katz 2021). Recent studies have found that upward mobility rates vary considerably across areas in the United States and are generally lower for Black children (Chetty et al. 2014; Davis and Mazumder 2018; Chetty et al. 2020). However, understanding the mechanisms underlying disparities in upward mobility remains a key challenge.

This paper provides new evidence on the causal impacts of citywide racial segregation, a long-suspected driver of disparities in intergenerational mobility. Our analysis builds on descriptive work that suggests racial sorting shapes children's opportunities by limiting their access to employment and essential public goods (Wilson 1987; Massey and Denton 1993; Durlauf 1996; Bayer, Charles, and Park 2021). While prior work such as Cutler and Glaeser (1997) and Ananat (2011)

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use design-based strategies to estimate the effects of segregation on other outcomes, these papers did not study income mobility due to a lack of appropriate data.

Our analysis makes progress on understanding the effects of segregation by combining a quasi-experimental research design with newly available intergenerational mobility measures from the Opportunity Atlas (Chetty et al. 2026). We use historical railroad configurations as an instrumental variable (IV) for contemporaneous racial segregation, an approach that follows Ananat (2011). This strategy takes advantage of the fact that cities that were subdivided to a greater extent by railroads in the nineteenth century became more segregated in the decades following the Great Migration. The main outcomes of interest are measures of upward mobility by race and parental rank in the national income distribution that are based on IRS records for children in the 1978–1983 birth cohorts.

The IV estimates reveal that racial segregation reduces the intergenerational mobility of Black children, with especially large effects for those from the poorest families. For a child whose parents are at the first percentile of the nationwide income distribution, a 1 standard deviation (SD) increase in racial segregation leads to a 4.4 percentile decline in the child's long-run income rank, which amounts to 16 percent of average mobility for this group and is equivalent to around $4,200 in lost annual income. At the twenty-fifth percentile, the analogous impact is a 3.9 percentile decline. The negative effects of segregation on mobility are also sizable and statistically significant for Black children whose parents have income at the fiftieth and seventy-fifth percentiles of the distribution.

For White children, we find evidence of heterogeneous impacts with segregation worsening outcomes for those from lower-income households and benefiting children from the top of the distribution. For a White child whose parents are at the first percentile of the nationwide income distribution, a 1 SD increase in racial segregation lowers upward mobility by 3.3 percentiles (9 percent). There are also detectable declines in mobility for White children whose parents have income at the twenty-fifth and fiftieth percentiles of the income distribution. At the one hundredth percentile, we find that segregation has a significant, small positive impact on a child's income rank.

Our analysis also shows that the effects of segregation extend beyond children's long-run income ranks. Using additional data from the Opportunity Atlas and the Stanford Education Data Archive (SEDA), we find that racial segregation leads to increases in the probability that boys are ultimately incarcerated, raises the likelihood that girls give birth while they are a teenager, and lowers average test scores. The impacts are especially large-in-magnitude for incarceration and teenage childbearing. For example, a 1 SD increase in segregation leads to a 29 percent increase in incarceration for Black boys from the poorest families and a 22 percent increase for White boys.

The effects of segregation on mobility could reflect several distinct components. First, segregation could shape exposure effects, which are the causal impact of spending one additional year of childhood living in a location on later-life income (Chetty and Hendren 2018a). Second, segregation could shape residual causal factors that do not scale with years of exposure—for example, effects that are concentrated at particular childhood ages or that exhibit threshold/nonlinear responses.

Finally, segregation could affect migration and thereby change the sorting of families across cities on unobserved dimensions. We therefore decompose the effects on upward mobility into an exposure effect component and a remaining component that combines these latter two forces. The evidence suggests segregation significantly reduces exposure effects for children from lower-income families, even though these exposure effects do not account for all of the impacts on intergenerational mobility. For children with parents at the first percentile of the income distribution, a basic extrapolation of our results implies that a 1 standard deviation increase in segregation leads to a 1.7 percentile decline in income rank due to exposure effects. An important caveat is that this decomposition exercise relies on pooled measures of exposure effects (Chetty and Hendren 2018b) that do not vary by race.

What mechanisms shape the effects of segregation on overall mobility rates? To address this question, we examine the supply and demand for government programs and policies that plausibly affect upward mobility. Our results show that racial segregation leads to widespread reductions in government expenditures per capita—a finding that echoes work by Cox et al. (2022), which documents that segregation lowers police expenditures. To understand these results on expenditures, we also study survey-based measures of political attitudes and racial attitudes. Our analysis of the latter is motivated by prior research linking support for redistributive programs to racial resentment (Gilens 1999; Fox 2004; Wetts and Willer 2018; Metzl 2019). We provide evidence that segregation weakens support for welfare and antipoverty programs while worsening White individuals' attitudes toward minorities and opposition to integration-related policies such as affirmative action and race-based school busing. The survey-based findings are consistent with evidence from Ananat and Washington (2009), which studies alternative measures of racial and political attitudes.

Overall, the main contribution of this paper is to provide new evidence on the link between racial segregation and intergenerational mobility. Most directly, our analysis complements earlier work that finds segregation worsens average schooling attainment, SAT scores, poverty rates, and homicide victimization for Black individuals (Cutler and Glaeser 1997; Card and Rothstein 2007; Ananat 2011; De La Roca, Ellen and Steil 2018; Cox et al. 2022). Prior work finds mixed evidence that segregation affects the economic outcomes of White children (Cutler and Glaeser 1997; Ananat 2011; De La Roca, Ellen, and Steil 2018) or racial attitudes expressed by White individuals (Cutler, Glaeser, and Vigdor 1999). Relative to these papers, we provide the first analysis of long-run child outcomes by both race *and* parent income level. Our analysis of more comprehensive data reveals that the effects of segregation are broader than previously recognized, with negative impacts for Black children across the income distribution. We also innovate by showing that segregation affects public good provision and attitudes in ways that could drive the widespread declines in upward mobility that we document.

This paper also relates to research on the Great Migration of Black individuals out of the South (Boustan 2010; Collins and Wanamaker 2015; Boustan 2016; Shertzer and Walsh 2019; Stuart and Taylor 2021; Derenoncourt 2022; Calderon, Fouka, and Tabellini 2023; Baran, Chyn, and Stuart 2024). Our work is closely related to important recent work by Derenoncourt (2022), which provides evidence that

Great Migration population flows reduced upward mobility. Relative to her work, we offer two contributions. First, her analysis studies the effects of greater levels of Black migration and finds small and statistically insignificant effects for White children. In contrast, we find heterogeneous impacts of racial segregation for White children with particularly detrimental impacts for those from lower-income households. Second, we perform supplementary analysis that demonstrates that racial segregation has distinct impacts on upward mobility outside of other demographic changes associated with the Great Migration. In a specification that uses instruments based on historical railroad configurations and the shift-share approach used in prior work (e.g., Boustan 2010; Derenoncourt 2022; Fouka, Mazumder, and Tabellini 2022), we find that higher levels of racial segregation and increases in the Black population share due to the Great Migration each have distinct negative impacts on the upward mobility of children.

Finally, our findings relate to work studying how historical events and institutions in the United States shape long-run and contemporaneous outcomes (Nunn 2009, 2014). We provide new evidence that the racial segregation facilitated specifically by the nineteenth-century placement of railroad lines had far-reaching impacts on the economic mobility of Black and White children and racial attitudes. These findings add to a rich existing literature on the historical determinants of economic progress and welfare for minorities in the United States (Andrews et al. 2017; Alsan and Wanamaker 2018; Albright et al. 2021; Derenoncourt 2022; Williams 2022; Feir, Gillezeau, and Jones 2024).

I. Background on Racial Segregation in the United States

Our analysis focuses on US cities outside of the South, where racial segregation has long been a prominent feature (Cutler, Glaeser, and Vigdor 1999; Logan and Parman 2017; Bayer, Charles, and Park 2021). This phenomenon can be traced to the Great Migration, as nearly 6 million African Americans moved from the South between 1915 and 1970 in search of better economic and social opportunities. After arriving in Northern cities, these migrants moved to specific neighborhoods due to their relatively disadvantaged economic position and discrimination.

Racial neighborhood sorting historically arose from both centralized and decentralized actions. Racial covenants prevented the sale of homes to non-White individuals in the early twentieth century (Rothstein 2017; Sood, Speagle, and Ehrman-Solberg 2021). Although these covenants were unenforceable after 1948, voluntary efforts to limit Black individuals' housing options remained in place. Realtors engaged in discriminatory and predatory practices, and White mobs threatened Black families with violence (Sugrue 1996; Li 2021; Hartley and Rose 2023). The arrival of Black migrants was often followed by White households leaving neighborhoods and central cities for less racially diverse areas (Boustan 2010; Shertzer and Walsh 2019).

Although racial segregation has declined in recent decades, cities that were more segregated during and after the Great Migration continue to be relatively more segregated. For example, metro areas like Cleveland, Chicago, and Detroit were among the ten most-segregated cities in both 1970 and 1990. More broadly, the correlation between racial segregation (measured by the dissimilarity index) between 1970 and 1990 across all metro areas is 0.7 (Cutler, Glaeser, and Vigdor 1999).

II. Framework for Understanding Mobility and Segregation

Before turning to our empirical analysis, we discuss how segregation could affect intergenerational mobility in principle. As in Chetty et al. (2014) and Chetty and Hendren (2018a), we assume that child i's later-life income rank in the nationwide distribution can be summarized as

$$y_i = \mu_{c(i)} + \psi_{c(i)} p_i + \epsilon_i, \tag{1}$$

where $c(i)$ is their location during childhood, and p_i is their parents' income rank in the nationwide distribution.[1] Equation (1) is a linear projection, so ϵ_i is an orthogonal residual. We allow equation (1) to differ by children's race, but suppress that notation for simplicity. Based on this linear relationship, absolute mobility of children is defined as the average nationwide income rank for those who grew up in location c with parents who have a nationwide income rank p:

$$\bar{y}_{c,p} = \mu_c + \psi_c p. \tag{2}$$

Equation (2) makes clear that absolute mobility depends on where children grow up and their parents' income rank.

Prior research suggests that racial segregation may shape a city's absolute mobility rates in several ways. For example, opportunities for minority children may be particularly low if segregation increases exposure to discrimination or reduces access to social networks that facilitate economic success (Wilson 1987; Massey and Denton 1993; Cutler and Glaeser 1997). In addition, children of all races may be negatively impacted if segregation reduces support and funding for local public goods, such as schools (Alesina, Baqir, and Easterly 1999). Finally, households may sort systematically across cities with different levels of racial segregation. For example, Vigdor (2002) shows that Black individuals with more education are less likely to migrate into segregated cities. To the extent that parental education affects long-run outcomes of children even after conditioning on income, this type of sorting could influence absolute mobility rates.

The framework above also clarifies one way in which our study of absolute mobility differs from prior analysis of the effects of segregation on average outcomes (e.g., Cutler and Glaeser 1997; Ananat 2011). Formally, the average outcome for children that grow up in location c is $\bar{y}_c = \mu_c + \psi_c \bar{p}_c$. This expression highlights that segregation could affect average child outcomes simply by shifting average parental income in a location ($\bar{p}_c$). This composition effect is not present in our analysis since we study average child outcomes conditional on parental income rank ($\bar{y}_{c,p}$). Nonetheless, absolute mobility could depend on sorting along non-income dimensions, and we study this phenomenon as part of our analysis.

[1] We assume that all children grow up in a single location to simplify the exposition here, although the measures used in our empirical analysis do not rely on this assumption.

III. Estimating the Effects of Segregation on Upward Mobility

A. *Empirical Strategy*

To understand how segregation affects income mobility, we estimate regressions of the form

$$\bar{y}_{c,p} = \alpha_p + Seg_c \beta_p + \epsilon_{c,p}, \tag{3}$$

where $\bar{y}_{c,p}$ is the absolute mobility measure considered in Section II for children that grow up in city c and have parents with income rank p; Seg_c is a measure of racial segregation in 1990; and $\epsilon_{c,p}$ is an error term. Following prior studies (e.g., Cutler and Glaeser 1997; Ananat 2011), we measure segregation using the index of dissimilarity:

$$Seg_c = \frac{1}{2} \sum_{n \in c} \left| \frac{Black_n}{Black_c} - \frac{White_n}{White_c} \right|, \tag{4}$$

where $Black_n$ is the Black population in census tract n; $Black_c$ is the Black population in the city; and $White_n$ and $White_c$ are defined analogously for the White population. This index can be interpreted as the share of the Black population that would have to change neighborhoods to achieve complete integration. The lower bound is 0, indicating complete integration, and the upper bound is 1, indicating complete segregation.

Interpreting OLS estimates of equation (3) as the causal effect of racial segregation on upward mobility is difficult. Segregation arises from many factors, such as local government policies, housing market conditions, the geographic distribution of jobs, and racial animus. These factors could have independent effects on children's long-run outcomes, leading to endogeneity in equation (3). Moreover, the effects of racial segregation could also vary based on the factors driving its formation. For example, long-standing segregation could lead to larger reductions in mobility because its effects on local institutions accumulate over decades. By comparison, segregation that emerged more recently may have had less time to operate, thereby limiting its impacts. In this way, OLS estimates may reflect a particular weighted average of heterogeneous effects.

To address the limitations associated with OLS estimates, we rely on prior work by Ananat (2011), which uses a measure of historical railroad placement to construct an IV for contemporaneous segregation in Northern cities. When Black migrants arrived in a city, previously built railroads served as visible markers that coordinated behavior among White residents (e.g., landlords might not rent to Black families on one side of the tracks). Even as racial boundaries changed during the twentieth century, the initial coordination established by railroads facilitated subsequent segregation.

The amount of subdivision generated by railroad track placement influenced the resulting amount of segregation. Intuitively, cities where railroads created a larger

number of small, physically separated areas had more potential for racial segregation. To capture this idea, Ananat (2011) uses a railroad division index (RDI),

$$RDI_c = 1 - \sum_{r \in c} \left(\frac{area_r}{area_c} \right)^2, \tag{5}$$

where r indexes "railroad neighborhoods" (polygons constructed by the intersection of historical railroad lines); $area_r$ is the land area in a railroad neighborhood; and $area_c$ is the total land area in city c. The RDI equals one minus a Herfindahl-Hirschman Index in terms of land shares. A city with a single railroad neighborhood would have an RDI of 0, while a city that is divided into a nearly infinite number of railroad neighborhoods would have an RDI of 1.

While we follow Ananat (2011) in using RDI_c as an IV for racial segregation, our main specification differs by not controlling for historical railroad track per square kilometer, a correlate of RDI that could independently affect migration flows and outcomes. We make this modeling choice for two reasons. First, recent work by Blandhol et al. (2022) shows that interpreting linear IV estimates as local average treatment effects is not necessarily warranted when covariates are included in the regression. Second, a single outlier in terms of railroad track density leads to sensitivity across models that control for this variable in different ways. The source of this sensitivity is that RDI and railroad track density are strongly correlated when excluding this outlier, which leads to weak instrument problems when attempting to control for railroad track density more flexibly.

The validity of this approach rests on the plausibility of an exclusion restriction. We assume that historical railroad placement, RDI_c, is only related to upward mobility through its effects on segregation. Our identification arises in part from geological features, like the slope of land, that affected where historical railroads were built in a city *and* the extent of historical railroad development. The Supplemental Appendix contains two results that support the assumption that RDI affects upward mobility through racial segregation. First, estimates are very similar if we include railroad track length in the specification, as in the main specification of Ananat (2011). Second, estimates are also very similar if we control for city characteristics as of 1910 and 1920, which Ananat (2011) uses for a balance test exercise.[2] Our focus on intergenerational mobility does not require that segregation has no effect on the income of parents. However, segregation will only affect mobility if it changes children's outcomes conditional on their parents' income, as explained in Section II.

In addition to the exclusion restriction, this IV approach requires a relevant first stage. Supplemental Appendix Figure 1 confirms the finding in Ananat (2011) that higher values of the RDI are associated with increased racial segregation in 1990. The RDI explains 18 percent of the variation in the 1990 dissimilarity index, and the associated first-stage F-statistic is 22.[3]

[2] Supplemental Appendix A shows that the balance test results conducted by Ananat (2011) are similar when not controlling for historical railroad track length.

[3] Robustness tests discussed in Section IVA show that our main conclusions do not change when we use approaches that are appropriate regardless of the strength of the instrument.

Our empirical strategy identifies a reduced-form effect of segregation that we interpret as a summary measure of both contemporaneous and historical channels. Specifically, consider the following two possibilities. First, the IV estimates of β_p could stem from contemporaneous changes in the characteristics of local areas that occur due to segregation. For example, segregation in 1990 could influence mobility for children by shaping their access to public goods and opportunities in the labor market.[4] Second, the IV estimates of β_p could reflect a range of effects from historical forces. Such a scenario may occur because RDI increased segregation throughout the twentieth century and thereby shaped city conditions for past generations. This could matter for the upward mobility of recent cohorts of children if segregation had effects on local institutions or government policies that shape outcomes of adults and children.

B. *Sample and Data Sources*

Our main analysis sample consists of the 121 non-Southern metropolitan areas for which Ananat (2011) located nineteenth century maps needed to construct the RDI. We link this sample to additional data sources as summarized below. These supplemental data provide information specific to US counties, which we aggregate to 1990-vintage metro area definitions used by Ananat (2011). Supplemental Appendix Table 1 provides a more detailed overview of each variable utilized in our main analysis.

For each metropolitan area, we use the Opportunity Atlas (Chetty et al. 2026) to construct contemporary measures of race-specific absolute mobility for children whose parents have average income at percentiles 1, 25, 50, 75, and 100 of the nationwide distribution.[5] Mobility is measured by calculating later-life ranks in the nationwide income distribution for children born from 1978 to 1983 using IRS administrative records on income from 2014 to 2015 (when the respective cohorts were aged 31–37). In addition to absolute mobility measures, we study incarceration and teenage pregnancy rates from the Opportunity Atlas. Incarceration is based on the 2010 census short form, while teenage fertility is measured using IRS records of whether a woman claimed a dependent when she was between the ages of 13 and 19. We also study schooling outcomes using average test scores for White and Black students from SEDA (Reardon et al. 2021). These data cover mandatory state standardized assessments in math and English language arts (ELA) for students in grades 3 through 8 during the 2008–2009 through the 2017–2018 school years.

We link the sample to additional data sources to explore the robustness of our results and study mechanisms. We use decennial census data from 1910 to 1990 to measure the Black population share and number of Black residents in a metro

[4] Our analysis of mechanisms in Section V aims to provide suggestive evidence on the relationship between segregation and contemporary government policies.

[5] Chetty et al. (2026) account for the fact that children live in different locations during their childhood by using exposure weights. They construct average income over a five-year period. The nationwide income distribution used to determine percentiles is not race-specific, which means that a Black and a White family at the same percentile have the same income level.

area. To decompose how places influence children's long-run outcomes, we use exposure effect estimates from Chetty and Hendren (2018b). As detailed in Section IVD, exposure effect estimates represent the causal effect of spending one additional year of childhood in an area. These estimates are based on the income rank at age 26 for a sample of children whose parents moved once during their childhood using the universe of federal income tax records from 1996 to 2012. The data from Chetty and Hendren (2018b) allow us to construct exposure effect estimates at income percentiles 1, 25, 50, 75, and 100 (see Supplemental Appendix B). Unlike measures of upward mobility, exposure effects are pooled across children of all races.

We also study mechanisms using several datasets that allow us to examine the supply and demand for redistributive programs and other government policies. We measure government expenditures using average spending reported in the 1987 and 1992 Census of Governments. To measure political and social attitudes, we use survey responses from various waves of the Cooperative Congressional Election Study (CCES) and the American National Election Studies (ANES). From the CCES, we use measures of support for decreasing spending on welfare programs, health care, and education; opposition to increases in the minimum wage; two questions designed to proxy for "racial resentment;" opposition to affirmative action; and support for aggressive policing policies (as a complementary measure of racial attitudes and resentment). From the ANES, we use two questions on opposition to school racial integration and busing from historical surveys (waves between 1970 and 1994).[6] We create index measures for attitudes toward redistributive policy, racial resentment, and aggressive policing using the approach in Kling, Liebman, and Katz (2007).

IV. Results

A. *Impacts of Segregation on Intergenerational Mobility*

Table 1 presents our main analysis of the effects of racial segregation on the upward mobility for Black (panel A) and White (panel B) children. Column 1 reports OLS estimates of equation (3) for comparison. Next, column 2 reports our preferred IV estimates based on historical railroad placement. Each row reports results for children whose parents have income at a given percentile.

Our first main finding is that the IV estimates indicate that segregation reduces upward mobility of Black children, especially those from poorer families.[7] For a child whose parents have pretax income at the first percentile of the nationwide distribution ($2,192), a 1 SD increase in racial segregation—similar to the difference between Minneapolis (0.61) and Philadelphia (0.75) or between Philadelphia and Detroit (0.87)—leads to a 4.4 percentile decline in the child's long-run income rank.

[6] Supplemental Appendix C provides details on these surveys and the specific questions used.

[7] Supplemental Appendix Figures 2 and 3 illustrate the bivariate relationship between absolute mobility measures for Black and White children and the RDI. The patterns in Table 1 are evident in these scatter plots. These results imply that outliers are not driving our estimates.

TABLE 1—EFFECTS OF RACIAL SEGREGATION ON UPWARD MOBILITY, BY RACE AND PARENTAL INCOME RANK IN NATIONWIDE DISTRIBUTION

	OLS	2SLS		
	1990 dissimilarity index (1)	1990 dissimilarity index (2)	Effect of 1 SD increase (3)	Mean of dep. var. (4)
Panel A. Black mobility				
1st percentile	−0.119	−0.322	−0.044	0.270
	(0.025)	(0.090)		
25th percentile	−0.111	−0.283	−0.039	0.339
	(0.019)	(0.070)		
50th percentile	−0.104	−0.250	−0.034	0.397
	(0.020)	(0.063)		
75th percentile	−0.097	−0.217	−0.030	0.455
	(0.026)	(0.066)		
100th percentile	−0.078	−0.128	−0.017	0.611
	(0.050)	(0.112)		
Panel B. White mobility				
1st percentile	−0.063	−0.243	−0.033	0.357
	(0.025)	(0.063)		
25th percentile	−0.022	−0.161	−0.022	0.450
	(0.020)	(0.048)		
50th percentile	0.010	−0.096	−0.013	0.524
	(0.017)	(0.038)		
75th percentile	0.043	−0.028	−0.004	0.601
	(0.015)	(0.033)		
100th percentile	0.099	0.084	0.011	0.728
	(0.018)	(0.039)		

Notes: This table reports point estimates and heteroskedasticity robust standard errors (in parentheses) from regressions in which the key independent variable is the racial dissimilarity index in 1990. Each combination of cells reports results from regressions where the dependent variable is upward mobility for different groups of children (e.g., the first row reports effects on upward mobility for Black children whose parents' income is in the first percentile of the nationwide income distribution). Column 1 presents ordinary least squares estimates, while column 2 presents estimates in which the dissimilarity index is instrumented by the railroad division index (RDI). Column 3 scales the coefficients reported in column 2 by 1 standard deviation of the dissimilarity index (0.136), and column 4 reports the mean of the dependent variable. Sample contains 121 non-Southern metro areas for which the RDI variable is available.

Source: Authors' calculations using data from Ananat (2011) and Chetty et al. (2026)

Since the average Black child with parental income at the first percentile has income at the twenty-seventh percentile of the nationwide distribution as an adult, the 4.4 percentile decline is equal to 16 percent of the average mobility for this group.[8] The estimates for children from percentiles 25, 50, and 75 are also significant, but smaller in magnitude. For a child with parental income at the seventy-fifth percentile, a 1 SD increase in racial segregation leads to a 3.0 percentile (7 percent) decline

[8] Black children born to parents in the first percentile reach the twenty-seventh percentile ($17,500 in annual household income) on average, and a drop to the 22.6th percentile amounts to about $4,200 in lost income.

in upward mobility. Notably, the OLS estimates understate the negative impacts of segregation.[9]

Our second main finding in Table 1 is that segregation has heterogeneous effects for White children. For White children from lower-income families, segregation reduces mobility, with the IV estimates showing that a 1 SD increase in racial segregation leads to a 3.3 percentile (9 percent) decrease in upward mobility for White children with parental income at the first percentile. The impacts are also negative and statistically significant for White children from percentiles 25 and 50. In contrast, White children from the richest families (i.e., the one hundredth percentile) appear to benefit from segregation, although these estimates are relatively small in magnitude.

Supplemental Appendix D presents several results that support the robustness of our findings. First, we include results that demonstrate our estimates are not sensitive to including a range of controls in our main specification (Supplemental Appendix Table 3). Notably, we find similar results when controlling for the historical railroad track density, as in Ananat (2011), or other city characteristics measured in 1910–1920.[10] Second, we implement the specification check from Ananat (2011), which is based on the idea that the RDI should only affect outcomes in cities that received a substantial number of Black migrants. Our results show that the relationships between upward mobility and RDI in cities that are closer to the South (which received more migrants) mirror the results in Table 1, while coefficients are generally smaller for cities further from the South (Supplemental Appendix Table 5). Third, we demonstrate the robustness of our results to using alternative measures of racial segregation. Importantly, we find that the effects of racial segregation are, if anything, somewhat larger when we use a dissimilarity index from the 1940 census (Supplemental Appendix Table 6). This result is especially important because this segregation measure predates some events and policies of interest, such as urban renewal (Collins and Shester 2013; LaVoice 2024; Shi et al. 2022) and riots (Collins and Margo 2007).

Finally, we conclude our main results by noting that our finding that racial segregation reduces the upward mobility of White children from lower-income households is unique in the literature. A natural discussion point for this result is the finding from Ananat (2011) that segregation appears to benefit White households by lowering their poverty rates when measured at the city and county levels.[11] Supplemental Appendix Table 7 revisits this question by studying poverty consistently at the metro level to align with our analysis of other outcomes. At this broader geography, we find

[9] As discussed in Section IIIA, OLS and IV estimates could differ for two reasons. First, OLS estimates could suffer from omitted variable bias. For example, the presence of more attractive suburban neighborhoods or jurisdictions within a metro area could independently increase both segregation and upward mobility. A second possibility is that segregation catalyzed by historical railroad placement had more negative impacts on poor Black children, possibly because long-standing segregation led to deeper interpersonal or institutional racism. Consistent with this interpretation, Section V shows that IV estimates on several potential mechanisms are larger in magnitude than OLS estimates.

[10] We also address concerns related to geography by demonstrating that our results are unchanged if we control for census region fixed effects or restrict our sample to exclude cities adjacent to one of the Great Lakes.

[11] Ananat (2011) measures poverty rates for about half of the observations using data at the county level or city level, with the remaining poverty rate observations being at the metro level.

that the estimated IV impact of racial segregation on metro-level White poverty rates is indistinguishable from zero. We interpret the difference between this result relative to Ananat (2011) as being due to the fact that lower-income White residents live further away from the central city in metro areas with more segregation due to the railroad division index. More generally, our metro-level results suggest that racial segregation has little effect on the share of White children living in low-income households, but nonetheless lowers the economic mobility of these White children.

B. *Effects of Segregation versus Black Population Share*

Do the estimates in the previous section reflect causal effects of segregation per se on mobility? Previous research by Derenoncourt (2022) shows that the arrival of Black migrants during the Great Migration changed cities in ways that lowered upward mobility. She highlights segregation as one mechanism for the effects of Black population flows, in addition to discussing distinct mechanisms such as decreases in public expenditures. Because racial segregation is positively correlated with the Black population share and the number of Black residents, it is possible that our results reflect the impacts of these demographic variables instead of segregation.[12]

Our findings on the impact of segregation for White children is one initial distinction that suggests that our segregation results are not driven by the response to Black migration isolated in Derenoncourt (2022). Her analysis shows that increases in the Black population had statistically insignificant and small-in-magnitude impacts on the mobility of White children from low- and high-income households. This contrasts with the large and significant impacts of segregation that we detect for White children with parents at or below the fiftieth percentile of the income distribution.

To further explore Black population changes and the interpretation of our results, we conduct a supplementary analysis that separately identifies the effects of city-wide segregation and Black population shares using two sources of plausibly exogenous variation. Specifically, we are interested in the following regression model for income mobility:

$$\bar{y}_{c,p} = \alpha_p + Seg_c \beta_p + BlackSharePctile_c \gamma_p + \epsilon_{c,p}, \tag{6}$$

where $BlackSharePctile_c$ is the percentile of the 1990 Black population share. To address the endogeneity of the Black population share, we build on the approaches from previous work (e.g., Boustan 2010; Derenoncourt 2022; Fouka, Mazumder and Tabellini 2022) and rely on a shift-share instrument that is based on preexisting settlements of African Americans who lived outside the South prior to the Great Migration. As in our main analysis, we rely on historical railroad track configuration as an instrument.

Intuitively, the shift-share instrument approach in this analysis combines two sources of variation. First, it leverages variation over time in total Black emigration from the South for each decade from 1910 to 1990—a period that precedes the beginning of

[12] For example, cities in our sample with higher segregation in 1990 also have much higher Black population shares (correlation: 0.54).

Table 2—Effects of Racial Segregation and Black Population Share on Upward Mobility, by Race and Parental Income Rank in Nationwide Distribution

	Black upward mobility (1)	Black upward mobility (2)	White upward mobility (3)	White upward mobility (4)
Panel A. 1st percentile				
1990 dissimilarity index	−0.328	−0.225	−0.248	−0.286
	(0.092)	(0.108)	(0.065)	(0.102)
1990 Black share percentile		−0.059		0.022
		(0.045)		(0.043)
Panel B. 25th percentile				
1990 dissimilarity index	−0.288	−0.196	−0.165	−0.184
	(0.073)	(0.078)	(0.049)	(0.078)
1990 Black share percentile		−0.053		0.011
		(0.033)		(0.033)
Panel C. 50th percentile				
1990 dissimilarity index	−0.255	−0.170	−0.099	−0.104
	(0.065)	(0.065)	(0.039)	(0.062)
1990 Black share percentile		−0.049		0.003
		(0.030)		(0.026)
Panel D. 75th percentile				
1990 dissimilarity index	−0.221	−0.145	−0.030	−0.019
	(0.068)	(0.071)	(0.034)	(0.050)
1990 Black share percentile		−0.044		−0.006
		(0.035)		(0.021)
Panel E. 100th percentile				
1990 dissimilarity index	−0.131	−0.077	0.085	0.120
	(0.114)	(0.143)	(0.040)	(0.053)
1990 Black share percentile		−0.032		−0.020
		(0.068)		(0.022)
Panel F. Summary statistics				
SD, dissimilarity index	0.136	0.136	0.136	0.136
SD, Black share percentile	0.290	0.290	0.290	0.290

Notes: This table reports point estimates and heteroskedasticity robust standard errors (in parentheses) from regressions in which the key independent variables are the racial dissimilarity index in 1990 and the percentile of the Black population share distribution in 1990. In columns 1 and 3, the instrumental variable is the railroad division index (RDI). In columns 2 and 4, the instrumental variables are the RDI and the percentile of the predicted change in Black population from 1910 to 1990 as a share of total population in 1910. See notes to Table 1 for additional details on specification, sample, and sources. Sample contains 119 non-Southern metro areas for which the RDI variable and predicted migration variable are available.

the Great Migration (circa 1915) and extends to the period when we measure racial segregation and the Black population share (1990). Second, it predicts inflows to each Northern metro area in our sample based on the share of Southern-born Black individuals living there in 1910. Supplemental Appendix E contains details on the construction of the instrument.

Table 2 reports results from our analysis of the distinct impacts of segregation and Black population shares on outcomes for children. For comparison, column 1 reports estimates from our main specification that only instruments for segregation

on the sample for which we can construct the shift-share instrument.[13] Based on equation (6), column 2 reports IV estimates on the impact on mobility for Black children.[14] For all Black children except those with parents at the one hundredth percentile, we find consistently negative and statistically significant impacts of segregation. Notably, column 2 also shows that we replicate the qualitative finding from Derenoncourt (2022): We find that a 1 percentile point increase in the Black population share results in a 0.053 percentile point reduction in Black mobility for children with parents at the twenty-fifth percentile of the income distribution. The estimates in column 4 for White children indicate that segregation lowers mobility, but the Black population share does not have an independent effect for this group.

Overall, the weight of this evidence suggests that our estimated impacts of segregation do not simply reflect differences in the relative size of the Black population. Comparing Tables 1 and 2, the main qualitative conclusions on the effects of segregation remain the same. The main distinction across the tables is that the point estimates are slightly attenuated relative to a model that omits the Black population share.

C. *Impacts of Segregation on Incarceration, Teenage Births, and Test Scores*

Next, we study incarceration (for men), teenage pregnancy (for women), and schooling achievement. Panels A and B of Table 3 indicate that racial segregation increases incarceration rates for Black and White children with parental income at the fiftieth percentile and below. However, the magnitudes are larger for Black individuals. A 1 SD increase in racial segregation leads to a 6.7 percentage point (29 percent) increase in the probability of incarceration for Black boys from a first percentile income family, and a 1.4 percentage point (22 percent) increase for White boys.[15] There is little effect on incarceration for children from families at the seventy-fifth percentile of the income distribution or above, where incarceration rates are much lower.

Panels C and D show that segregation also leads to higher teenage fertility for girls of both races. Similar to our findings for incarceration, the impacts tend to be larger in magnitude for Black children. As seen in column 2, a 1 SD increase in racial segregation raises the probability of a teenage birth for a Black girl from a first percentile income family by 11 percentage points (22 percent). The effect on a White girl from a first percentile income family is 6 percentage points (23 percent). Only for White girls from the richest families do we find no effect of segregation on teenage fertility.

Finally, panel E examines childhood academic achievement as measured by average scores on statewide standardized tests for primary school students. Segregation reduces test scores of both Black and White students, with a 1 SD increase in

[13] These results differ only slightly from those in Table 1 because we do not construct a predicted migration instrumental variable for two metro areas in Oklahoma, which are treated as part of the South.

[14] The Kleibergen and Paap (2006) *F*-statistic for the model with two endogenous variables and two instruments is 8.6.

[15] Supplemental Appendix Table 8 shows that these results are robust to controlling for different sets of observed variables.

Table 3—Effects of Racial Segregation on Incarceration, Teenage Births, and Grade 3–8 Test Scores

	OLS	2SLS		
	1990 dissimilarity index (1)	1990 dissimilarity index (2)	Effect of 1 SD increase (3)	Mean of dep. var. (4)
Panel A. Black male incarceration				
1st percentile	0.179	0.492	0.067	0.233
	(0.066)	(0.161)		
25th percentile	0.107	0.243	0.033	0.131
	(0.030)	(0.072)		
50th percentile	0.075	0.131	0.018	0.085
	(0.019)	(0.049)		
75th percentile	0.053	0.054	0.007	0.053
	(0.020)	(0.054)		
100th percentile	0.033	−0.014	−0.002	0.025
	(0.027)	(0.070)		
Panel B. White male incarceration				
1st percentile	0.009	0.100	0.014	0.063
	(0.013)	(0.042)		
25th percentile	0.002	0.042	0.006	0.029
	(0.006)	(0.018)		
50th percentile	−0.001	0.017	0.002	0.015
	(0.003)	(0.008)		
75th percentile	−0.003	0.004	0.001	0.007
	(0.002)	(0.004)		
100th percentile	−0.004	−0.006	−0.001	0.001
	(0.002)	(0.004)		

(*continued*)

segregation leading to a 0.13 SD decline for Black students and a 0.07 SD decline for White students. This finding suggests that the segregation-induced decline in upward mobility does not arise simply because of worse labor market discrimination or access to jobs (e.g., Bertrand and Mullainathan 2004; Charles and Guryan 2011; Kline, Rose, and Walters 2022), but also due to decreases in children's human capital.

D. *Impacts of Segregation on Childhood Exposure Effects*

So far, we have shown that racial segregation decreases upward mobility. The change in upward mobility could arise from impacts on place-specific exposure effects (Chetty and Hendren 2018a) or other factors such as household sorting to cities based on nonincome characteristics or causal effects that do not scale with exposure.[16] To make this point formally, consider the following decomposition of mobility for children who grow up in city c with parental income rank p:

$$\bar{y}_{c,p} = \lambda_{c,p} + \theta_{c,p}, \tag{7}$$

[16] Examples of effects that do not scale with years of exposure include the quality of teachers in a particular grade, peer influences in secondary school, and training and employment opportunities for 18-year-olds.

TABLE 3—EFFECTS OF RACIAL SEGREGATION ON INCARCERATION, TEENAGE BIRTHS, AND GRADE 3–8 TEST SCORES (*continued*)

	OLS	2SLS		
	1990 dissimilarity index (1)	1990 dissimilarity index (2)	Effect of 1 SD increase (3)	Mean of dep. var. (4)
Panel C. Black female teenage birth				
1st percentile	0.449	0.776	0.106	0.488
	(0.072)	(0.188)		
25th percentile	0.393	0.688	0.094	0.396
	(0.056)	(0.138)		
50th percentile	0.330	0.589	0.080	0.292
	(0.045)	(0.101)		
75th percentile	0.281	0.510	0.069	0.210
	(0.045)	(0.101)		
100th percentile	0.190	0.367	0.050	0.061
	(0.063)	(0.162)		
Panel D. White female teenage birth				
1st percentile	0.080	0.464	0.063	0.278
	(0.052)	(0.150)		
25th percentile	0.049	0.333	0.045	0.206
	(0.039)	(0.109)		
50th percentile	0.020	0.213	0.029	0.140
	(0.027)	(0.073)		
75th percentile	−0.006	0.105	0.014	0.080
	(0.017)	(0.041)		
100th percentile	−0.035	−0.017	−0.002	0.014
	(0.011)	(0.017)		
Panel E. Test scores in grades 3–8				
Black test scores	−0.529	−0.977	−0.133	−0.496
	(0.133)	(0.315)		
White test scores	−0.033	−0.502	−0.068	0.250
	(0.134)	(0.313)		

Notes: This table reports point estimates and heteroskedasticity robust standard errors (in parentheses) from regressions in which the key independent variable is the racial dissimilarity index in 1990. The outcome variables are incarceration rates for men (panels A and B), teenage birth rates for women (panels C and D), and state standardized test scores for students in grades 3 to 8 (panel E). See notes to Table 1 for additional details on specification, sample, and sources.

where $\lambda_{c,p}$ is a causal exposure effect that does not depend on family characteristics besides income, and $\theta_{c,p}$ is the city-level average of all other factors that influence mobility for children of parents with income rank p.

To study the degree to which segregation operates due to changes in exposure effects, we use estimates of $\lambda_{c,p}$ from Chetty and Hendren (2018b) of the causal impact of spending a year of childhood living in an area. These estimates are obtained using a research design that relies on variation in children's age at the time of migration. As such, the impact of racial segregation on exposure effects should not reflect sorting (i.e., changes in $\theta_{c,p}$). A key caveat is that exposure effects are only available for pooled samples of children of all races.

Table 4—Decomposing the Effects of Racial Segregation on Upward Mobility into Exposure Effects and Other Factors

	Dependent variable:				
	Black upward mobility (1)	White upward mobility (2)	Pooled upward mobility (3)	Pooled exposure effect (4)	Pooled non-exposure effect (5)
Panel A. 1st percentile					
1990 dissimilarity index	−0.322	−0.243	−0.282	−0.111	−0.171
	(0.090)	(0.063)	(0.069)	(0.034)	(0.050)
Effect of 1 SD increase	−0.044	−0.033	−0.038	−0.015	−0.023
Mean of dep. var	0.270	0.357	0.322	−0.003	0.325
Panel B. 25th percentile					
1990 dissimilarity index	−0.283	−0.161	−0.193	−0.060	−0.133
	(0.070)	(0.048)	(0.053)	(0.024)	(0.040)
Effect of 1 SD increase	−0.039	−0.022	−0.026	−0.008	−0.018
Mean of dep. var	0.339	0.450	0.416	−0.002	0.418
Panel C. 50th percentile					
1990 dissimilarity index	−0.250	−0.096	−0.110	−0.008	−0.103
	(0.063)	(0.038)	(0.042)	(0.019)	(0.034)
Effect of 1 SD increase	−0.034	−0.013	−0.015	−0.001	−0.014
Mean of dep. var	0.397	0.524	0.503	−0.002	0.505
Panel D. 75th percentile					
1990 dissimilarity index	−0.217	−0.028	−0.031	0.045	−0.076
	(0.066)	(0.033)	(0.036)	(0.024)	(0.031)
Effect of 1 SD increase	−0.030	−0.004	−0.004	0.006	−0.010
Mean of dep. var	0.455	0.601	0.586	−0.001	0.588
Panel E. 100th percentile					
1990 dissimilarity index	−0.128	0.084	0.096	0.097	−0.002
	(0.112)	(0.039)	(0.044)	(0.035)	(0.031)
Effect of 1 SD increase	−0.017	0.011	0.013	0.013	0.000
Mean of dep. var	0.611	0.728	0.720	−0.001	0.721

Notes: This table reports point estimates and heteroskedasticity robust standard errors (in parentheses) from regressions in which the key independent variable is the racial dissimilarity index in 1990. In all regressions the dissimilarity index is instrumented by the railroad division index (RDI). Columns 1 and 2 repeat the estimates from column 2 of Table 1. Column 3 reports comparable estimates for a pooled sample consisting of children of all races. In column 4, the dependent variable is the full-childhood exposure effect (i.e., an estimate of $\lambda_{c,p}$ from Chetty and Hendren (2018b) scaled by assuming 20 years of exposure). In column 5, the dependent variable is the component of upward mobility not explained by exposure effects (equal to the outcome in column 3 minus the outcome in column 4). See notes to Table 1 for additional details on specification, sample, and sources.

Table 4 reports estimates of the effects of segregation on upward mobility and exposure effects. For comparison, columns 1 and 2 reproduce the race-specific results on upward mobility from Table 1. In column 3, we report the estimated effects of segregation on pooled upward mobility, which is directly comparable to the pooled measure of exposure effects. Column 4 displays effects of segregation where the dependent variable is an estimate of each city's *full* exposure effect, i.e., we scale the one-year estimated exposure effect from Chetty and Hendren (2018b) by assuming a 20-year duration of childhood exposure.[17]

[17] See Supplemental Appendix B for full details on the measure of exposure effects used in our analysis.

The easiest-to-interpret results in Table 4 are for children with parents at lower-income percentiles. The effects of racial segregation on upward mobility of Black and White children are most similar in the bottom of the income distribution, so the pooled *mobility* estimates could be reasonably informative about both groups at lower incomes. However, if the exposure effects differ by race, then the pooled exposure effects could reflect a weighted average of the race-specific effects. For example, if exposure effects of racial segregation are negative for Black children and positive, but smaller in absolute value, for White children, then the overall exposure effect might be negative but smaller in magnitude than both race-specific effects. At higher-income percentiles, the pooled estimates largely reflect impacts on White children, who constitute a majority of the sample.

We find that racial segregation lowers a city's exposure effects for children from low-income families. Overall, our estimates suggest that 39 percent ($= 0.111/0.282$) of the effects of segregation on mobility for children at the first percentile are due to the impacts on exposure effects.[18] Similarly, changes in exposure effects account for 31 percent ($= 0.060/0.193$) of the effects of segregation on mobility for children at the twenty-fifth percentile. At higher percentiles of the parent income distribution, we find no evidence of negative impacts on exposure effects. These results suggest that factors besides exposure effects—such as sorting or place effects that do not scale with years of exposure—account for a substantial amount of the effects of segregation on pooled upward mobility.

Interestingly, the finding of a substantial role for nonexposure effects differs from Chetty and Hendren (2018b), which examines the correlation between upward mobility, exposure effects, and racial segregation across all commuting zones in the United States (including rural areas and the South).[19] These findings also differ from Derenoncourt (2022), which finds that increases in a city's Black population due to the Great Migration reduced upward mobility for children primarily by changing exposure effects. Future work with more granular data may help explain the conditions under which exposure and other effects diverge.

[18] When combined with the estimates from Table 1, this implies that a 1 SD increase in segregation would reduce the mobility of Black children born to the poorest families by 1.7 percentile points due to exposure effects ($= 0.044 \times 0.39$).

[19] Our finding of a more important role for nonexposure effects than Chetty and Hendren (2018b) could be due to either our focus on the dissimilarity index in non-southern metro areas (versus their analysis using *all* commuting zones) or the fact that we use an instrumental variable strategy. To assess the importance of the first channel, we use our sample and preferred measure of segregation to conduct an exercise used by Chetty and Hendren (2018b) to gauge the importance of exposure effects. In an OLS specification, we find that a 1 SD increase in segregation is associated with a 2.5 percent decrease in income (as measured by upward mobility) of children born to parents at the twenty-fifth percentile of the income distribution, and 51.0 percent of this association reflects exposure effects. By comparison, Chetty and Hendren (2018b) estimate that a 1 SD increase in segregation is associated with a 5.2 percent decrease in child income, and that 80.8 percent of this association reflects exposure effects (p. 1210). Both sets of numbers are based on OLS estimates, so the decrease from 80.8 percent to 51.0 percent implies that differences in the sample and measure of segregation are quantitatively important.

Table 5—Effects of Racial Segregation on Public Expenditures

	OLS	2SLS		
Dependent variable	1990 dissimilarity index (1)	1990 dissimilarity index (2)	Effect of 1 SD increase (3)	Mean of dep. var. (4)
Total expenditures per capita	−3.400 (0.832)	−4.271 (1.275)	−0.581	1.494
Education expenditures per capita	−1.384 (0.339)	−1.638 (0.596)	−0.223	0.681
Public safety expenditures per capita	−0.486 (0.127)	−0.597 (0.175)	−0.081	0.169
Welfare and health expenditures per capita	−0.678 (0.242)	−0.779 (0.324)	−0.106	0.228
Infrastructure expenditures per capita	−0.337 (0.091)	−0.482 (0.155)	−0.066	0.172
Other expenditures per capita	−0.515 (0.114)	−0.775 (0.204)	−0.105	0.244

Notes: This table reports point estimates and heteroskedasticity robust standard errors (in parentheses) from regressions in which the key independent variable is the racial dissimilarity index in 1990. Expenditures per capita are the average from 1987 and 1992, measured in thousands of 1990 dollars per person. Each cell of the table has 121 metro observations. See notes to Table 1 for additional details on specification and sample.

Source: Authors' calculations using data from Ananat (2011) and US Bureau of the Census (2015).

V. Segregation, Government Spending, and Political Economy

A. *Government Spending*

To further explore how segregation lowers upward mobility, Table 5 studies segregation and several categories of government spending. Our analysis is motivated by a large literature showing that various public programs have important impacts on long-run child outcomes (e.g., East et al. 2023; Bailey et al. 2024).

We find that a 1 SD increase in racial segregation decreases total expenditures per capita by 39 percent. The declines are broad-based, with large and significant reductions in education, public safety, welfare and health, and infrastructure. Education is the largest expenditure category in general and accounts for the largest share of the decline in expenditures at 38 percent. Decreases in public safety expenditures and welfare and health expenditures account for a further 32 percent of the reduction in total spending. The decrease in public safety expenditures is consistent with Cox et al. (2022), who find that racial segregation also reduces police expenditures per capita.

B. *Political Economy*

The results so far suggest that reduced public spending may play a role in explaining why segregation worsens mobility for both Black and lower-income White children. This section examines why racial segregation weakens government spending.

Specifically, we explore whether residential segregation affects redistribution preferences and racial attitudes. We start by examining survey responses among White residents.

Panel A of Table 6 begins by studying an index of four CCES questions measuring opposition to state legislature spending and increases in the minimum wage. The estimates in the first row reveal that a 1 SD increase in segregation increases opposition to redistributive spending by 0.45 SD (i.e., the effect of 0.376 divided by the SD of the index of 0.835). The next rows show that a 1 SD increase in segregation decreases support for specific redistributive policies by 0.20–0.74 SD.

Why might segregation reduce support for redistributive policies? Prior research has suggested racial resentment erodes support for and implementation of inequality-reducing policies (Gilens 1995, 1996; Tesler 2012; Metzl 2019; Cramer 2020; McGhee 2021).[20] To examine the link between segregation and racial attitudes, panel B of Table 6 studies an attitudes index that is based on questions from the CCES and the ANES that measure racial resentment and opposition to government policies that support minorities. While opinions on affirmative action, school integration and busing do not directly measure racial attitudes, anti-Black attitudes have been associated with opposition to these policies (Sears, Hensler, and Speer 1979; Kluegel and Smith 1982; Bobo 1983). All measures are scaled so that higher values reflect more out-group hostility.

We find that a 1 SD increase in racial segregation causes a 0.68 SD increase in the racial attitudes index. The disaggregated results show relatively similar, significant effects on each of the underlying measures of the index, ranging from 0.57 to 0.85 SDs. Notably, these results build on evidence from Ananat and Washington (2009) that reveals that segregation causes non-Black survey respondents to express more negative feelings toward Black individuals and less support for government aid to Black individuals.[21]

As a complementary measure of racial attitudes and resentment, we study support for aggressive policing. Our analysis is motivated by a long history of police forces being used to enforce and exacerbate racial disparities in the United States (e.g., Alexander 2010). We explore policing attitudes using an index of CCES questions for whether respondents oppose bans on chokeholds by police, the creation of "bad cop" registries, the use of police-worn body cameras, laws that allow individuals to sue police, and mandatory minimum sentencing laws.[22] We find that

[20] Note that the effects of racial segregation on preferences for redistribution are conceptually distinct from the effects of the Black population share (Abascal, Ganter, and Baldassarri 2023). This latter effect is more analogous to the literature on immigration and ethnic diversity (Alesina, Baqir, and Easterly 1999; Alesina, Miano, and Stantcheva 2023; Luttmer 2001; Halla, Wagner, and Zweimüller 2017; Dustmann, Vasiljeva, and Piil Damm 2019; Bazzi et al. 2019; Giuliano and Tabellini 2020; Steinmayr 2021).

[21] The main finding of Ananat and Washington (2009) is that segregation reduces the ability to elect representatives who vote in favor of legislation favored by Black citizens. While their mechanisms analysis uses the same ANES data from which we take questions, we use distinct questions regarding attitudes toward school racial integration and school busing policies. Our analysis also differs because we use CCES data. An advantage of the CCES is that it has complete coverage of the metro areas in our sample, whereas the ANES contains respondents in less than half of the areas.

[22] While there is limited work on attitudes toward specific policing policies, prior work has shown variation over time and large racial disparities in broader attitudes such as confidence in police (see Owens and Ba 2021 for discussion).

Table 6—Effects of Racial Segregation on White Residents' Attitudes

Dependent variable	OLS: 1990 dissimilarity index (1)	2SLS: 1990 dissimilarity index (2)	2SLS: Effect of 1 SD increase (3)	SD of dep. var. (4)
Panel A. Redistributive policy attitudes				
Redistributive policy attitudes index	1.263	2.762	0.376	0.835
	(0.512)	(1.446)		
Index components				
Decrease state legislature spending on welfare	1.670	2.172	0.296	1.000
	(0.593)	(1.699)		
Decrease state legislature spending on health	0.966	2.040	0.278	1.000
	(0.668)	(1.478)		
Decrease state legislature spending on education	1.174	1.436	0.195	1.000
	(0.682)	(1.527)		
Oppose minimum wage increase	1.243	5.398	0.735	1.000
	(0.614)	(2.087)		
Panel B. Racial attitudes				
Racial attitudes index	2.149	4.464	0.607	0.889
	(0.597)	(1.434)		
Index components				
Racial resentment A	2.392	4.178	0.569	1.000
	(0.666)	(1.628)		
Racial resentment B	2.396	4.938	0.672	1.000
	(0.635)	(1.713)		
Oppose affirmative action	2.039	4.791	0.652	1.000
	(0.635)	(1.592)		
Oppose school integration (ANES)	2.715	4.763	0.648	1.000
	(0.716)	(1.510)		
Oppose school busing (ANES)	0.981	6.280	0.854	1.000
	(0.979)	(2.043)		
Panel C. Aggressive policing attitudes				
Aggressive policing attitudes index	0.569	2.284	0.311	0.692
	(0.481)	(1.200)		
Index components				
Oppose ending mandatory minimum laws	1.175	1.236	0.168	1.000
	(0.719)	(1.496)		
Oppose body cams	−0.458	1.613	0.219	1.000
	(0.737)	(1.839)		
Oppose choke hold bans	−0.211	1.690	0.230	1.000
	(0.681)	(1.621)		
Oppose bad cop registry	1.120	3.299	0.449	1.000
	(0.628)	(1.587)		
Oppose allowing individuals to sue police	1.221	3.584	0.488	1.000
	(0.649)	(1.337)		

Notes: This table reports point estimates and heteroskedasticity robust standard errors (in parentheses) from regressions in which the key independent variable is the racial dissimilarity index in 1990. All measures are constructed using responses to the CCES (except opposition to school busing and integration, which are taken from the ANES), as detailed in Supplemental Appendix C. "Racial resentment A" reflects agreement with the statement: "The Irish, Italians, Jews and many other minorities overcame prejudice and worked their way up. Blacks should do the same." "Racial resentment B" reflects disagreement with the statement: "Generations of slavery and discrimination have created conditions that make it difficult for Blacks to work their way out of the lower class." Index components are *z*-scores, and the summary indices are equal to the average of their respective components.

Table 7—Effects of Racial Segregation on Attitudes, by Income for White Respondents and Black Respondents

	OLS	2SLS		
Dependent variable	1990 dissimilarity index (1)	1990 dissimilarity index (2)	Effect of 1 SD increase (3)	SD of dep. var. (4)
Panel A. All White respondents				
Redistributive policy attitudes index	1.263	2.762	0.376	0.835
	(0.512)	(1.446)		
(3-item) racial attitudes index	2.276	4.636	0.631	0.954
	(0.619)	(1.595)		
Aggressive policing attitudes index	0.569	2.284	0.311	0.692
	(0.481)	(1.200)		
Panel B. White, below median income				
Redistributive policy attitudes index	2.196	3.216	0.438	0.885
	(0.537)	(1.416)		
(3-item) Racial attitudes index	2.655	5.128	0.698	0.968
	(0.629)	(1.666)		
Aggressive policing attitudes index	1.392	2.864	0.390	0.799
	(0.560)	(1.506)		
Panel C. White, above median income				
Redistributive policy attitudes index	0.000	1.959	0.267	1.304
	(0.877)	(2.118)		
(3-item) racial attitudes index	1.639	3.105	0.423	1.140
	(0.776)	(1.698)		
Aggressive policing attitudes index	−0.321	0.970	0.132	1.320
	(0.881)	(1.576)		
Panel D. Black respondents				
Redistributive policy attitudes index	−1.232	−2.868	−0.390	1.661
	(1.264)	(2.471)		
(3-item) racial attitudes index	−2.985	−4.724	−0.643	1.549
	(1.372)	(2.330)		
Aggressive policing attitudes index	−0.185	−0.206	−0.028	1.979
	(1.042)	(1.975)		

Notes: This table reports point estimates and heteroskedasticity robust standard errors (in parentheses) from regressions in which the key independent variable is the racial dissimilarity index in 1990. The racial attitudes index here differs from Table 6 by excluding the outcomes from the ANES (attitudes toward school integration and school busing), which has a smaller sample size. The family income cutoff for panels B and C is $60,000. When constructing *z*-scores, we use the mean and standard deviation for all White respondents to facilitate comparisons of the effects of segregation across different groups.

racial segregation increases White individuals' support for aggressive policing, with a 1 SD increase in segregation leading to a 0.45 SD increase in the index.

Finally, due to the heterogeneous effects of segregation on upward mobility of White individuals, Table 7 tests whether policy attitudes are shifted differently by racial and income groups.[23] Panels B and C report effects separately for White survey respondents from the bottom and top halves of the income distribution (based

[23] Table 7 displays results for summary indices by subgroup. Supplemental Appendix Tables 9, 10, and 11 show results for the full sets of index components.

on a family income cutoff of $60,000). While lower- and higher-income White respondents move in the same direction, we see larger responses for lower-income White individuals across all three families of attitudes. In panel D, Black respondents move in the opposite direction (increased support for redistribution), suggesting that the pattern observed for low-income White individuals is not simply driven by decreases in upward mobility. This analysis reveals that segregation leads to particularly large reductions in lower-income White individuals' desire for redistributive spending, although this group is harmed more by segregation (relative to higher-income White individuals) and more likely to benefit from increased government spending and minimum wage increases.

These results are consistent with theoretical predictions based on the contact hypothesis (Allport 1954). Fewer intergroup interactions in segregated cities may incubate and foment racial resentment among White residents. Relatedly, by concentrating a racial out-group, segregation may create a salient racial threat (Key 1949; Kinder and Mendelberg 1995; Oliver and Mendelberg 2000; Rocha and Espino 2009) that may be further exploited by politicians and others as a scapegoat for worsened outcomes for lower-income White individuals (Grosjean, Masera, and Yousaf 2020; Bauer et al. 2021).[24]

VI. Conclusion

Using plausibly exogenous variation in racial segregation due to historical railroad placements, this paper shows that segregation leads to widespread reductions in economic mobility. Racial segregation constrains the upward mobility of Black children across the parental income distribution. For White children, we find that segregation worsens mobility for those from lower-income households, while there are positive impacts for those from the wealthiest families.

We conduct two exercises to explore the channels that drive our main results. First, segregation lowers mobility due to both reductions in causal exposure effects and other factors, such as sorting along nonincome dimensions. Second, segregation adversely impacts the supply and demand for social programs and the characteristics of places that plausibly shape upward mobility. Specifically, we find that segregation reduces government expenditures, increases opposition to redistributive policies, and worsens racial attitudes.

Overall, our analysis implies that the causal impacts of historical racial segregation are important for understanding disparities in economic mobility across US cities. Moreover, the evidence is consistent with the hypothesis that public good provision and political economy considerations are important channels. Although Black-White racial segregation has declined since 1970, it remains a defining feature of most cities, which suggests policy efforts to reduce its harmful impacts have potential for enhancing economic growth and equality.

[24] The results by income could be interpreted as consistent with predictions based on "last place aversion." Kuziemko et al. (2014) provides theory and empirical evidence showing that low-income individuals express less support for redistributive policies that aid others who are lower in the income distribution. While Kuziemko et al. (2014) argues that such last place aversion does not simply reflect the racialization of policies (e.g., Gilens 1996), it is possible that this aversion is heightened by these factors (Darity 2022).

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