

School Desegregation and Black Teacher Employment

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Abstract

Prior to the racial integration of schools in the southern United States, predominantly African American schools were staffed almost exclusively by African American teachers as well, and teaching constituted an extraordinarily large share of professional employment among southern blacks. The large-scale desegregation of southern schools occurring after passage of the 1964 Civil Rights Act represented a potential threat to this employment base, and this paper estimates how student integration affected black teacher employment. Using newly assembled archival data from 781 southern school districts observed between 1964 and 1972, I estimate that a school district transitioning from fully segregated to fully integrated education, which approximates the experience of the modal southern district in this period, led to a 25% reduction in black teacher employment. A series of tests indicate that these employment reductions were not due to school district self-selection into desegregation or unobserved district characteristics associated with desegregation. Additional estimates using synthetic cohorts from the Decennial Censuses indicate that displaced southern black teachers either entered lower skill occupations within the South or migrated out of the region to continue teaching, and that southern school districts compensated for reduced black teacher employment by decreasing the overall scale of their operations and by increasing their recruitment of white teachers, especially white men and whites from outside the South.

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1 Introduction

From Reconstruction through the mid-1960s, the vast majority of schools in the southern United States were segregated on the basis of race. One feature of the segregated southern school systems from this period was that schools enrolling African American students were staffed almost exclusively by African American teachers as well. This practice was largely unique to the South, and in other regions predominantly black schools were often staffed by white teachers, with these regional differences reflecting the broader set of southern segregationist institutions designed to minimize social and professional contact between African Americans and whites (Foster 1997).

In conjunction with the exclusion of African Americans from nearly all other high-skill occupations in the South, the practice of staffing black schools with black teachers led teaching to constitute an extraordinarily important component of middle-class southern black employment in this period. As of 1960, 45% of southern African Americans who had completed any post-secondary education reported “teacher” as their occupation, with no other occupation reaching a 5% employment share in this population.¹

In the years following passage of the 1964 Civil Rights Act (CRA), the southern system of de-jure school segregation was rapidly dismantled. In the fall of 1964 - notably a full decade after the landmark *Brown vs. Board of Education* ruling declared segregated schools unconstitutional - fewer than 5% of African American students in the eleven states of the former Confederacy were attending school with whites, but by the fall of 1970 this figure had grown to over 90% (Cascio et al. 2008, 2010). This fundamental reorganization of the southern public education system was a potential threat to the employment of black teachers. In principle student desegregation could have been achieved with minimal negative employment effects for black teachers by simultaneously integrating faculties, but in practice there was substantial uncertainty as to how many of the black teachers previously employed at segregated schools would be absorbed into newly integrated institutions.

The historical record contains numerous reports of black teachers being overtly fired as a result of post-CRA student desegregation. For instance a 1965 letter from a southern superintendent to the principal of a black school reads “Schools will be integrated beginning with the 1965-1966 school year in order to comply with the Civil Rights Law...and I must request you inform your teachers that [their] positions will be terminated on May 25” (US Office of Education 1965). Likewise, a trade publication from this period noted in its August 1965 issue that “The increased desegregation this fall under the new Civil Rights legislation will cause the dismissal of teachers no longer needed because of consolidated schools or classrooms. Estimates of the number of Negro teachers affected ranged from about 400 to 5,000” (Southern Education Report 1965). Reports of layoffs among black teachers were sufficiently widespread that in remarks at the National Education Association annual conference, President Lyndon Johnson promised to direct the Commissioner of Education to “pay special attention, in reviewing desegregation plans, to guard against any pattern of dismissal based on race” (National Education Association 1965).

While this anecdotal evidence makes it clear that at least some black teaching positions were eliminated following integration, it is not well understood whether the desegregation process itself systematically reduced the employment of black teachers, or how large any such negative employment effects were. Student

¹Author’s calculations using Ruggles (2015). The most common non-teaching occupations among college educated southern blacks in 1960 were private household workers (4.0%), clerical workers (3.9%), proprietors (2.6%) and nurses (2.1%). Despite the common saying that educated African Americans in the Jim Crow South could either “teach or preach” just 1.7% of college educated southern blacks reported clergy as their occupation in 1960, and virtually all were men.

desegregation occurred during a period of rapidly changing social and economic policy in a variety of areas that could have plausibly affected black teacher employment levels, and to a substantive extent individual school districts self-selected into particular integration paths by deciding how quickly and completely they complied with federal mandates. These factors make it difficult to reliably infer causal effects from simple associations between student integration and black teacher employment.

Furthermore, little is known about the broader educational and labor market impacts of integration-induced reductions in black teacher employment. The consequences of eliminating significant numbers of African American held teaching positions are potentially far-reaching, and include spillovers into other occupations and regions where displaced southern black teachers may have sought employment, as well as changes in the operations and white teacher recruitment practices of thousands of school districts.

To help address these outstanding questions, the current paper estimates the effect of student desegregation on the employment of black teachers in a manner that accounts for unobserved school district characteristics and non-random district selection into integration, and also quantifies various secondary consequences of reduced black teacher employment in the South during this period. Drawing on multiple archival data sources, I assemble information on student desegregation levels and the racial composition of teaching staffs for 781 southern school districts observed between 1964 and 1972. I then estimate difference-in-difference style specifications that model black teacher employment as a function of student desegregation, while accounting for time-invariant district characteristics, general year effects, and various district-year specific factors.

The primary finding is that the post-CRA desegregation process caused systematic and qualitatively large reductions in the employment of African American teachers in the South. My preferred estimates find that transitioning from fully segregated to fully integrated education, which approximates the experience of the modal southern school district during the study period, reduced black teacher employment by an average of 25%. A series of tests indicate that these reductions were a causal result of the student desegregation process itself: Student desegregation in future years is uncorrelated with current black teacher employment levels, the findings are robust to the inclusion of district-specific linear time trends, and the results are similar after controlling for district-year specific funding from federal, state and local sources. Observed heterogeneous treatment effects with respect to various baseline district characteristics are also consistent with a causal interpretation.

To better understand the full consequences of these employment reductions, I take advantage of the fact that student desegregation occurred primarily between the 1960 and 1970 Decennial Censuses and implement a synthetic cohort approach that allows me to observe employment outcomes within narrowly defined groups before and after desegregation. These analyses indicate that approximately one half of the southern black teachers displaced during desegregation entered lower skill professions within the South, while the other half migrated out of the region to continue teaching. There is no evidence that displaced southern black teachers were able to transition to other forms of professional employment within the region. Additional results suggest that southern school districts both increased their recruitment of white teachers after eliminating large numbers of black held teaching positions, and also reduced their overall (all race) teacher employment levels, with these overall employment reductions facilitated by white student enrollment declines and operational efficiencies from operating unified school systems. Among newly recruited white teachers, there were notable increases in the proportion who were born outside of the South, who were men, and who were relatively young, but little to no change in their educational qualifications.

Before proceeding, one aspect of interpreting the analysis presented below warrants clarification. While the

paper finds that student integration reduced the employment of African American teachers, this does not imply that such reductions were a necessary or inevitable result of integration. Indeed, evidence from the historical record discussed below strongly indicates that the displacement of black teachers was a conscious policy choice made by the relevant school administrators, boards of education, state officials, and even federal level courts and policy makers. The presented estimates therefore correspond to the employment impacts of desegregation *as implemented in practice*, and it seems likely that student integration could have been achieved without disproportionately adverse impacts on black teacher employment had this been deemed a priority.

2 Background

Historical Context

Prior to 1954 schools throughout the southern United States maintained explicit and legally required segregation of students by race. In 1954 the US Supreme Court ruled in *Brown v. Board of Education of Topeka Kansas* that racially segregated schools violated the Equal Protection clause of the Fourteenth Amendment. However, while a subsequent 1955 case (“*Brown II*”) ordered segregated districts to integrate “with all deliberate speed” the *Brown* rulings lacked strong enforcement mechanisms and meaningful compliance only occurred in “border” states such as Oklahoma, Missouri, Kentucky, West Virginia, Maryland, Delaware and Washington DC.

Available evidence indicates that the student integration occurring in border states during this period caused substantial reductions in black teacher employment, and legal protections for displaced black teachers were virtually non-existent. In a critical test case, a suit was brought by 11 black teachers dismissed after the integration-induced closure of the sole black school in Moberly, Missouri. All 125 white teachers in the district were retained, some of whom were manifestly less qualified than the dismissed black teachers. A District Court judge refused to reinstate the black teachers, with the ruling upheld by the 8th Circuit Court of Appeals and an appeal declined by the Supreme Court, and the *Moberly* precedent was subsequently used to dismiss virtually all legal cases involving black teacher employment reductions for the next decade.² Calculations by a researcher at the National Education Association estimated that at least 3,000 black teachers were dismissed in the Border Region between 1954 and 1964 (Ethridge 1979) .

Despite the clear presence of black teacher dismissals in the immediate post-*Brown* period, the aggregate employment impacts of these initial desegregation efforts were ultimately limited by the fact that southern black students and teachers were heavily concentrated in the 11 states of the former Confederacy, where only token integration occurred prior to the 1964 implementation of the CRA. In contrast to the *Brown* rulings, the CRA authorized the US attorney general to bring suits directly against districts failing to desegregate, and allowed federal agencies to withhold funds from non-compliant school districts, a threat which took on new importance after passage of the 1965 Elementary and Secondary Education Act greatly expanded federal educational funding. As noted above, these policy changes led to the virtual elimination of de-jure student segregation in the South by 1970, but in doing so raised the potential for larger scale reductions in black teacher employment than those experienced in the post-*Brown* period.

²*Brooks v. School District of Moberly, Missouri*. See accounts in Ethridge (1979) and Fultz (2004).

While the legislative language and enforcement mechanisms detailed in the CRA were very clear and effective with respect to student desegregation, they were far more ambiguous with respect to teacher employment practices or the desegregation of teaching faculties. Indeed the Act's critical Title VI, which empowered federal agencies to withhold funds to non-compliant local governments, also had language stating that "Nothing contained in this Title shall be construed to authorize action...with respect to any employment practice" and some southern school districts argued that this precluded the termination of federal funds due to district practices related to the demotions, firing or non-hiring of black teachers.

The first set of Title VI compliance guidelines issued by the Department of Health, Education and Welfare (HEW) in April 1965, which provided school districts with the conditions they needed to meet in order to receive federal education funds, were also very weak with respect to desegregating teaching faculties or protecting black teachers from unjust dismissals. A regional trade journal noted in 1965 that "faculty desegregation is...a problem on which federal officials have allowed a great deal of leeway" (Southern Education Report 1965), while Orfield (1969) describes the guidelines as "merely paying lip service to the need for equitable faculty hiring and staffing policies." In a striking statement of federal indifference towards black teachers during this initial phase of CRA enforcement, an HEW attorney told the Washington Post in 1965 that "in a war there must be some casualties, and perhaps the black teachers will be the casualties in the fight for equal education of black students (Washington Post, September 21 1965)." Court rulings in this period were also generally unsupportive of black teachers fired as part of the student desegregation process, with a federal judge commenting in a 1965 suit brought by three dismissed black teachers in Arkansas that "the Fourteenth Amendment...is not a teacher tenure law" (Detweiler 1969).

The positions of the federal government and courts on issues of faculty desegregation and employment protections for black teachers did strengthen through the late 1960s and early 1970s. The 1966 HEW compliance guidelines required districts to begin integrating their teaching staffs, on the grounds that segregated faculties restricted the rights of students to receive an education free of racial consideration (Southern Education Report 1966; Fultz 2004), although specific numerical requirements were not detailed and Cascio et al. (2010) find that the 1966 guidelines led to only token levels of faculty desegregation. A significant 1970 legal decision, *Singleton v. Jackson Municipal School District*, required districts to apply an "objective and reasonably nondiscriminatory standard" in teacher employment practices and established concrete guidelines for achieving this, and similar guidelines were adopted by HEW in 1971 (Ethridge 1979; Fultz 2004).³ Unfortunately, the analysis reported below indicates that large-scale reductions in black teacher employment had already occurred by the early 1970s, when these stronger federal protections were put into place.

It is also noteworthy that many of the institutions which could have potentially provided employment protections for black teachers during the desegregation process had been intentionally weakened during the period of "massive resistance" that followed the *Brown* rulings. Likely the most important such institutions were state teacher tenure laws, with a trade publication reporting in 1955 that in the 18 months following the *Brown* ruling Alabama, Florida, Tennessee, South Carolina, North Carolina, Kentucky and Virginia had all made efforts to modify the state tenure laws applicable to black teachers (Southern School News 1955), and a 1965 report noted that "where tenure laws do exist, they are differentially effective in safeguarding employment rights of Negro teachers" (US Office of Education 1965). Several southern states went even further, by abolishing state constitutional requirements for public education, modifying compulsory attendance

³Specifically, the *Singleton* ruling established the so-called "Singleton Ratio" requiring that the ratio of black and white teachers in any individual school must be "substantially the same" as in the district overall.

laws, passing laws revoking the license of any teacher belonging to the NAACP, or closing school districts that were under federal orders to integrate (Fultz 2004; Tillman 2004).

Teacher's unions were also largely passive in representing the interests of black teachers until relatively late in the desegregation process. The main national teachers union, the National Education Association (NEA), declined to even approve any resolution supporting the *Brown* ruling until 1961, and did not desegregate its own southern affiliate organizations until 1966 (Schultz 1970). Ironically, the integration of the NEA led to the dissolution of African American teacher's unions in the South, which had been organized under the umbrella American Teachers Association, leaving black educators without a dedicated organizational voice during the height of the integration and displacement process (Fultz 2004).

On balance, the historical record can be described as indicating that throughout the southern desegregation process, African American teachers faced fierce antagonism and resistance from relevant state and local policy makers, received only modest and belated assistance from federal officials and courts, who were focused strongly on southern African American students, and received minimal support from legal and organizational institutions with the potential ability to protect their interests. These institutional features reduced the chances that student desegregation would be implemented in a manner that substantially considered its impacts on black teachers.

Existing Literature

School desegregation is the subject of a large interdisciplinary literature, with reviews provided by Rivkin & Welch (2006) and Reardon & Owens (2014). Existing empirical research has primarily focused on overall desegregation trends and differences in desegregation patterns across school districts (e.g. Logan et al. 2004; Clotfelter 2011; Cascio et al. 2008, 2010); on the extent to which integration was followed by white enrollment declines, or "white flight" (e.g. Welch 1987; Rivkin 1994; Baum-Snlow & Lutz 2011; Boustan 2012); and on how exposure to desegregated schools impacted the academic, labor market and crime related outcomes of students (e.g. Guryan 2004; Vigdor & Ludwig 2008; Reber 2010; Johnson 2011; Billings et al. 2013). Overall, research on these topics indicate that segregation levels declined rapidly between 1965 and 1980 before stabilizing or moderately increasing thereafter; that desegregation led to significant declines in white enrollments, especially in large urban districts; and that attending desegregated schools improved the outcomes of African American students.

Relative to evaluations of desegregation's impacts on students, there has been very little work on integration's effects on teacher labor markets in general or on black teachers specifically. The only research I am aware of that directly evaluates post-CRA desegregation activity and black teacher employment is an early study by Ethridge (1972), which contains a table "projecting" the number of black teaching positions that would have existed in southern states as of 1972 in the absence of desegregation, then comparing these projections with the actual number of black teachers employed.⁴ Ethridge (1972) concludes that "31,584 teaching positions [have] been lost by black teachers...as a result of desegregation."

Research on more recent desegregation efforts and teacher labor markets includes Oakley et al. (2009), who examine Metropolitan Statistical Areas (MSAs) undergoing court-ordered desegregation between 1970 and 2000. Using Decennial Census data aggregated to the MSA level (in many cases spanning several school

⁴While the method for projecting the number of black teaching positions are not described in detail, they appear to be calculated as the total number of black students in 1972 divided by the overall student-teacher ratio, and therefore give the number of black teachers that would have been needed if black teachers were employed in constant proportion to black student enrollments.

districts), the authors find that the desegregation of elementary schools reduced black teacher employment in southern MSAs, but increased black teacher employment in non-Southern MSAs. Additionally, Jackson (2009) studies changes in teacher characteristics following the 2002 termination of race-based busing in the Charlotte-Mecklenburg school district, which led to sharp increases in black student shares in some schools, and finds that high quality teachers were more likely to leave schools experiencing a policy-induced increase in the number of black students, suggesting important effects of student demographic composition on teacher sorting in a contemporary context of increasing segregation.

I compliment these studies by implementing a research design that accounts for potential district selection into integration, by using newly assembled school-level data for a large sample of southern districts, and by focusing specifically on the South in the post-CRA period, the historical context with the most intensive desegregation activity and highest baseline levels of black teacher employment. The current paper is also novel in investigating the secondary impacts of black teacher employment reductions, such as what happened to African American teachers displaced during integration, and how school districts compensated for their decision to reduce black teacher employment levels.

3 Theoretical Framework

Before turning to estimation, I develop a simple theoretical model of school district’s race-specific teacher employment decisions to help guide the empirical work. Two key features of the local political economy during the study period are relevant for modeling these employment choices.

First, although the Voting Rights Act of 1965 greatly reduced barriers to African American political participation and strongly affected state education financing (Cascio & Washington 2013), actual black representation on elected school boards was vanishingly small well into the 1970s (US Commission on Civil Rights 1968; Joint Center for Political Studies 1977). Given this, I model black teacher employment choices from the perspective of white school boards and administrators with segregationist preferences.

Second, many dimensions of school district decision making were heavily restricted by the legal environment. Most importantly, within five years of the CRA’s implementation, districts were unable to maintain student segregation, or at a minimum faced exceedingly high costs for doing so. Conversely, prior to *Brown*, state laws actually *required* school districts to maintain complete student segregation. Given this, I consider the student desegregation level as being dictated to school districts, rather than itself being a choice variable as in Margo (1990) or Cascio et al. (2010). Additionally, as early as the 1950s successful litigation campaigns by the NAACP Legal Defense Fund had largely eliminated the ability of school districts to vary class sizes or teacher salaries by race (Card & Krueger 1992; Carruthers & Wanamaker 2017), and I therefore treat these factors as parameters rather than choice variable as well.⁵

Given these considerations, I model school districts as choosing the racial composition of their teacher labor force in order to minimize a loss-function that is increasing in cross-racial pairings of students and teachers.⁶ Letting $Exposure_B^W$ denote the fraction of a district’s student-teacher pairings that consist of white students

⁵While teacher pay and class sizes were close to parity by 1964, it is important to note that this was not fully and universally true. For instance Reber (2010) finds a significant increase in per-pupil funding between 1965 and 1970 in the schools attended by black students Louisiana, while Card & Krueger (1992) find that class sizes in segregated black schools were still approximately 10% larger than those in segregated white schools as of 1964.

⁶Districts can equivalently be viewed as maximizing a utility function that is increasing in own-race teacher pairings.

and black teachers, and similarly letting $Exposure_W^B$ denote pairings of black students with white teachers, districts minimize the following:

$$Loss = \gamma_1 Exposure_B^W + \gamma_2 Exposure_W^B. \quad (1)$$

Note that while districts are assumed to have a distaste for all cross-racial exposures, this function allows districts to place different weight on avoiding exposure of white students to black teachers than on avoiding exposure of black students to white teachers. In practice it is highly likely that the former typically took precedent, so that for most districts $\gamma_1 > \gamma_2$.

Under full student segregation, cross-racial student-teacher pairings would only need to occur to the extent that there were deviations between the racial compositions of teachers and students: If the share of white students was greater than the share of white teachers, then the excess white students would need to be assigned to black teachers, and conversely if the share of black students was greater than the share of black teachers. Therefore, under full student segregation, school districts could minimize Equation 1 (at a value of zero) simply by setting black and white teacher shares equal to black and white student shares. Such a solution conforms closely to observed pre-integration empirical patterns: Among the districts analyzed in this paper, the simple correlation between black student share and black teacher share in 1964 was .988.

In contrast, under the type of full student integration that prevailed by the early 1970s, cross-racial exposures would depend on the *overall* racial composition of students and teachers, rather than being fully avoidable by eliminating *deviations* between the racial compositions of students and teachers. In particular, let ω and β respectively denote the share of a school district's student body that is white and black, and let W and B respectively denote the share of a school district's teaching staff that is white and black. With integrated students, the fraction of student-teacher pairings consisting of a white student and a black teacher ($Exposure_B^W$) is simply ωB , while the fraction of student-teacher pairings consisting of a black student and a white teacher ($Exposure_W^B$) is simply βW .⁷ In this case Equation 1 can be written as

$$Loss = \gamma_1(\omega B) + \gamma_2(\beta W). \quad (2)$$

Districts choose W and B to minimize this function, constrained by the identity that $W + B = 1$ (and by the non-negativity of W and B). Substituting $W = (1 - B)$ into this function and reducing produces:

$$Loss = B(\gamma_1\omega - \gamma_2\beta) + K \quad (3)$$

where $K = \beta\gamma_2$. In this equation the marginal effect of a unit increase in a district's black teacher share (B) is given by the expression in parentheses. The first term in the parentheses indicates that when a school district increases their black teacher share by one unit, their loss function increases by an amount equal to the product of their white student share (ω , which also equals the resulting increase in the fraction of pairings that consist of white students and black teachers) and the weight that the district places on avoiding such pairings (γ_1), while second term in the parentheses indicates that their loss function will also fall by

⁷For example consider a district where both the student body and teacher labor force are 50% black and 50% white. If students and teachers are matched without regard to race, $.5 \times .5 = 25\%$ of student-teacher pairings will consist of white students and black teachers, and $.5 \times .5 = 25\%$ of student-teacher pairings will consist of black students and white teachers.

an amount equal to the product of their black student share (β) and the weight that the district places on avoiding pairings of black students and white teachers (γ_2).

Since the expression $\gamma_1\omega - \gamma_2\beta$ consists only of parameters that are not dependent on black teacher employment levels, it has a fixed value for each district, and this value leads districts to adopt one of two possible corner solutions: If $\gamma_1\omega > \gamma_2\beta$ the loss function is minimized at $B = 0$ and the district employs no black teachers, while if $\gamma_1\omega < \gamma_2\beta$ then the loss function is minimized at $B = 1$ and the district employs only black teachers. Given that the white elected school boards in the studied context likely placed a greater weight on avoiding exposure of white students to black teachers than vice-versa ($\gamma_1 > \gamma_2$), and that African American students were the minority in approximately 80% of the studied districts ($\omega > \beta$), it seems likely that for a large majority of the studied districts $\gamma_1\omega > \gamma_2\beta$ and the preferred level of black teacher employment after desegregation was zero.

In summary, a simple theoretical framework predicts that most school districts would have set the black teacher employment share approximately equal to the black student share prior to integration, and then reduced black teacher shares as close to zero as possible after student integration. These predicted reductions in black teacher employment are generally consistent with the main empirical findings presented below. The model additionally predicts that the incentive to reduce black teacher employment levels after integration was weaker in districts with larger black student shares (as well as in districts with a relatively low aversion to pairing white students and black teachers), which is consistent with heterogeneous treatment effect estimates presented in Section 5.5.

4 Data

I draw on multiple archival sources to assemble a data set with information on student desegregation levels and race-specific teacher employment levels for a panel of southern school districts in the 1960s and early 1970s. This section provides an overview of the utilized data, with additional details reported in Online Appendix A.

For the 1968, 1970 and 1972 school years I utilize surveys conducted by the US Office of Civil Rights (OCR).⁸ The OCR surveys were part of the federal government’s efforts to monitor compliance with the CRA, and collected school-level counts of students and teachers, disaggregated by race. The OCR sample for the 1968, 1970 and 1972 school years was quite comprehensive, and included approximately 75,000 individual schools located in 8,000 school districts nationwide. All school districts with enrollment greater than 3,000 were included in the sample, and districts with enrollment between 300 and 3,000 were subject to probability sampling proportionate to their enrollment totals. Additionally, school districts of “special interest” to the OCR were included irrespective of size, typically those with histories of compliance failure, which in practice meant that a large majority of southern school districts were included. Once a school district was selected, all of the schools within the district were surveyed.

The main shortcoming of the OCR surveys is that no data collection occurred prior to the 1968 school year,

⁸These surveys were generously converted from the original binary files and made publicly available by Ben Denckla and Sarah Reber of UCLA, who are gratefully acknowledged. Note that throughout the paper “school years” refer to the calendar year in which an academic year began, so that for instance the “1968 school year” refers to the academic year beginning in the fall of 1968 and ending in the spring of 1969.

when the southern student desegregation process was well underway.⁹ I therefore draw on two additional data sources to extend the series back to the beginning of the desegregation process.

First, for the 1967 school year, I have transcribed information contained in a print publication of the National Center for Education Statistics titled *Directory, Public Schools in Large Districts with Enrollment and Staff, by Race, Fall 1967* (NCES 1967). The foreword of this directory indicates that it was “a single-time publication, developed to meet a specific, timely need for information” and was “conducted for administrative purposes rather than for research, [but] the statistics were deemed to be of sufficient general interest for publication.” The directory contains school-level information on the number of students and instructional staff, disaggregated by race, for a sample of school districts very similar to the districts contained in the OCR surveys from 1968, 1970 and 1972.

Second, for the 1964 school year, which was the last school year before large scale student desegregation occurred, I have transcribed data from print copies of annual reports issued by state departments of education and state superintendent’s offices, which contain race-specific counts of students and teachers at the district level.¹⁰ The required information was contained in reports issued by eight states from the former Confederacy, specifically Alabama, Georgia, Louisiana, Mississippi, South Carolina, Tennessee, Texas and Virginia.

Districts employing no black teachers in 1964 are excluded, as are districts not observed in each of the five available years. After applying these restrictions the working data set is a balanced panel of 781 school districts from eight states. As a robustness check I demonstrate that the results are similar when using a larger sample of 1,263 school districts from all eleven states of the former Confederacy (which includes the states listed above plus Arkansas, Florida, and North Carolina), but with the data series necessarily restricted to the 1967, 1968, 1970 and 1972 school years.

One issue with the state reports used for the 1964 school year is that race-specific enrollment totals are reported at the district level, rather than the school level, so that the number of black students attending school with whites is not directly observable. I therefore impute the level of student desegregation for each district in 1964 using transcriptions of state level student desegregation rates reported in a print publication titled *A Statistical Summary, State by State, of School Segregation Desegregation in the Southern and Border Area from 1954 to the Present, 14th Revision* (Southern Education Reporting Service 1964). These imputations will have minimal practical impact, however, because virtually no student desegregation had taken place at this point within the former Confederacy, with less than 3% of black students attending desegregated schools during the 1964 school year.

I use the described data sources to construct district-year level measures of student desegregation and black teacher employment. Specifically I measure a district’s student desegregation level as the percentage of its black students attending a school where 5% or more of the enrolled students were white, and measure a district’s black teacher employment level using both the share of all teachers in the district that were black

⁹In addition to the utilized 1968, 1970 and 1972 waves, OCR surveys were conducted in 1969, 1971, 1973, 1974, 1976, 1978 and 1980, but in most of these years the number of surveyed districts was much smaller than the 1968, 1970 and 1972 samples, and no surveys were fielded prior to 1968. Additionally, data collection on teachers was not included after 1972 because responsibility for collecting this information was transferred to the Equal Employment Opportunity Commission.

¹⁰The utilized publications are Alabama Department of Education (1964); Georgia State Department of Education (1964); State Department of Education of Louisiana (1965); Mississippi State Department of Education (1963); South Carolina State Department of Education (1964); Tennessee Department of Education (1963); Virginia State Board of Education (1965); and Texas Education Agency (1965). For some states 1964 data was not available because only biennial reports were issued or because race-specific reporting was discontinued in the lead-up to CRA implementation, and in these cases I use the latest available data prior to 1964, which in practice came from either 1962 or 1963. See Online Appendix A.

and the natural log of the number of black teachers in the district.¹¹ I also calculate, for each district-year, the total number of students (of all races), the fraction of students who are black, and the total number of teachers (of all races), and use these measures as control variables or weights in some specifications. Figures 1 and 2 present descriptive statistics for the key variables.

Figure 1 plots the mean student desegregation level and the mean share of teachers who were black for the studied districts in each year. The figure documents a clear, negative time-series association between student desegregation and the black teacher employment share during the study period. Specifically, the share of black students attending desegregated schools in the average district increases from less than 5% in 1964 to just under 40% in 1968, then accelerates after 1968 and reaches approximately 90% by 1970 and is stable thereafter. Trends in the share of black teachers in the studied districts follows a very similar but inverse pattern, falling from 30.6% in 1964, to 28.2% in 1968, to 24.2% in 1972, a total decline of 6.4 percentage points or 21%.

Figure 2 examines cross sectional associations between student integration and black teacher employment for the 1964 school year (before substantive desegregation began), the 1968 school year (when desegregation was approximately half complete) and the 1972 school year (when the vast majority of southern black students attended desegregated schools). The figures indicate that at all stages of the desegregation process, there was a strong cross-sectional association between student desegregation and black teacher employment shares, with more integrated districts employing a smaller share of black teachers. This was the case even in 1964, when only token desegregation had occurred, with districts from states engaging in higher levels of token integration (e.g. 7.2% in Texas rather than .02% in Alabama) also having a lower fraction of black teachers.

In the next section, I utilize difference-in-difference specifications to study the extent to which the descriptive evidence of negative black teacher employment impacts from student desegregation displayed in Figures 1 and 2 reflect a systematic causal relationship.

5 Empirical Strategy and Main Findings

5.1 Empirical Strategy

The paper’s primary research question is how the implementation of student desegregation impacted the employment of black teachers. Figures 1 and 2 provided suggestive evidence of negative employment impacts by examining aggregate trends over time (Figure 1) and cross-sectional associations within particular years (Figure 2). However, standard omitted-variable and selection bias concerns prevent these relationships from having credible causal interpretations.

In particular, the nature of student desegregation varied systematically with numerous school district characteristics (Casco et al. 2008), some of which may be unobserved, and school districts exercised substantial local autonomy in deciding how quickly and completely they implemented the student desegregation required by the CRA. These factors may cause districts with different student desegregation levels or trends to also differ with respect to unobserved characteristics that affected teacher employment practices, for instance the

¹¹The use of a 5% threshold prevents large numbers of black students from being classified as attending desegregated schools in cases where a very small number of white students entered a predominantly black school, although desegregation patterns of this kind were exceedingly rare in practice. In Online Appendix B I show that the results are not sensitive to alternative student integration measures, such as the dissimilarity or exposure index.

prejudicial attitudes of a school district’s parents and administrators, the intensity of real or anticipated federal scrutiny, or the levels of state and local tax revenues and other school funding sources, among other possible confounders. These potential issues are exacerbated by the rapidly evolving social and economic policy environment of the study period.

To help address these issues and isolate the impact of student desegregation on the employment of black teachers, I estimate regression models of the following form:

$$\ln(\text{BlackTeachers}_{dy}) = \alpha + \beta \text{StudentDesegregation}_{dy} + \gamma_d + \delta_y + X'_{dy}\rho + \varepsilon_{dy} \quad (4)$$

where $\ln(\text{BlackTeachers}_{dy})$ denotes the natural log of the total number of black teachers in school district d and year y ; $\text{StudentDesegregation}_{dy}$ denotes the fraction of black students in district d and year y who are attending desegregated schools; γ_d and δ_y are district and year fixed-effects, respectively; and X'_{dy} is a vector of time-varying school district level characteristics.¹² The primary coefficient of interest is β , which estimates the conditional percent change in the size of a school district’s black teacher labor force that is associated with a school district’s student body going from fully segregated to fully integrated.

In the baseline estimates, the X_{dy} vector includes variables measuring the total number of teachers (of both races) in each district year, and the fraction of students that are black in each district-year. Controlling for the overall size of the teacher labor force in each district-year is critical, since some overall teacher disemployment due to the desegregation process was highly likely simply because operating dual education systems was typically more labor-intensive than operating a single integrated system. Equation 4 estimates the effect of student desegregation on black teacher employment *conditional on overall teacher employment levels*, and therefore isolates the extent to which black teacher employment was affected by student desegregation above and beyond any general teacher disemployment effects from integration.¹³ The fraction of students in each district-year who are black is included as a control because, as discussed above, the black enrollment share is very strongly correlated with black teacher employment. Results excluding these controls are reported and discussed below.

Equation 4 is a difference-in-difference specification with a continuous treatment variable, where the included district fixed-effects account for unobserved time invariant district characteristics and the included year fixed-effects account for unobserved determinants of black teacher employment affecting all school districts in a given year. The main identifying assumption for this model is the so-called common trends assumption, which in the current context requires that school districts executing different student desegregation paths over the study period would have had similar black teacher employment levels in the absence of these policy differences. Below I conduct several tests that probe the accuracy of this identifying assumption, and the results generally support its validity.

¹²To preserve district observations that employed a positive number of black teachers in 1964 but zero black teachers in a subsequent sample year, the dependent variable is transformed as $\ln(\text{BlackTeachers}_{dy} + 1)$. This transformation preserves observations from 14 districts, and in Online Appendix B I show that the results are virtually identical if these districts are instead excluded.

¹³In Online Appendix B I demonstrate that the results are very similar if the fraction of teachers in each district-year who were black is used as the dependent variable, which implicitly accounts for total teacher employment in the denominator of the dependent variable, or if this specification is estimated with the (level) count of black teachers as the dependent variable.

5.2 Baseline Results

The results of estimating Equation 4 are reported in Column 1 of Table 1. Since each school district is a distinct entity making decisions about its levels of student desegregation and black teacher employment, I follow Cascio et al. (2010) and give equal weight to each district. Models that weight districts by their pre-desegregation number of black teachers are reported below and are qualitatively similar to the baseline results. Standard errors are clustered at the district level and reported in parentheses.

The estimated coefficient for the student desegregation variable in the model reported in Column 1 is $-.287$, which after exponentiation indicates that a school district going from fully segregated to fully integrated reduced black teacher employment by 25.0%, conditional on the overall teacher employment level, the racial composition of the student population, and all district and year specific determinants of black teacher employment. This estimate is highly statistically significant ($P < .01$).

To make the interpretation of the results in Column 1 more concrete, it is useful to consider the specific practices that may have been used to reduce the number of black teaching positions during desegregation.

As discussed above, school districts faced substantially less scrutiny of their employment practices than their student integration practices. But in most cases districts were still constrained in their ability to simply fire the totality of their black teachers immediately after student integration by factors such as Title VII of the CRA, which prohibited race-based employment discrimination, and eventually by judicial rulings holding that the CRA's school desegregation provisions had some applicability to faculty as well. Furthermore, below I document that the operational efficiencies from operating unified school systems, combined with white-flight induced student enrollment, declines substantially decreased the overall staffing needs of many southern districts during this period, which would decrease the need to terminate existing teachers.

Given these considerations, it is unsurprising that historical accounts indicate that while outright firings did occur, less overt mechanisms of reducing black teacher employment were common as well. Changing the racial composition of new hires appears to have been one important method of eliminating black teaching positions, with a 1970 report prepared by the Race Relations Information Center noting that "it is in the [non] hiring of black teachers - rather than the firing - that the biggest catastrophe for blacks probably lies" (Hooker 1970).

Accounts of policies designed to hasten the departure of black teachers after integration are common as well. For instance Fultz (2004) notes that many black teachers faced various forms of demotion after integration, such as downgrading veteran black teachers to substitute teacher or subordinate "co-teacher" positions and re-assigning black high school teachers to the elementary level. These demotions led some black teachers to resign, while others protested and were dismissed for insubordination, and their positions could then be filled by white teachers or simply left vacant as operations were scaled down. The use of the National Teacher Examination expanded in southern states in this period as well, and was sometimes used as a pretext for dismissing or not hiring black teachers. This occurred to a sufficient extent that in the early 1970s courts ruled against school districts in Louisiana and Mississippi that had dismissed black teachers on the basis of NTE scores.¹⁴

¹⁴The relevant cases were *Carter v School Board of West Feliciana Parish* and *Baker v. Columbus*. See discussion in Ethridge (1972).

5.3 The Validity of the Identifying Assumptions

As noted, the main identifying assumption underlying the results in Column 1 of Table 1 is the so-called common trends assumption, which in the current context holds that school districts with different student desegregation paths would have had similar black teacher employment levels in the absence of these differences in student integration. Columns 2-4 of Table 1 present the results of several tests that evaluate the validity of this key assumption.

One method of allowing for limited departures from the common trends assumption is to add interactions between a linear year variable and school district indicators to the baseline specifications. The inclusion of these interactions allows any underlying trends in black teacher employment to vary linearly across each individual school district. This flexibility comes at the cost reduced precision, since much of the variation in student desegregation within school districts will be absorbed by the linear trends.

The results of a specification with district specific linear time trends are reported in Column 2 of Table 1, and are very similar to the baseline results in Column 1, with complete student integration estimated to reduce black teacher employment by .335 log points. As expected, the standard errors in this specifications increase substantially, but the estimate remains statistically significant at the 1% level. These results suggest that the main findings in Column 1 are not an artifact of different underlying trends in black teacher employment practices for school districts implementing different student desegregation policies.¹⁵

The validity of the identifying assumptions can also be tested by examining the extent to which the timing of changes in black teacher employment levels corresponded to changes in student desegregation. In particular, if reductions in the employment of black teachers are a causal result of student desegregation, then current period levels of black teacher employment should be (conditionally) independent of student desegregation occurring in future periods. For instance black teacher employment levels during the 1968 school year are expected to be influenced by student desegregation levels during the 1968 school year, and perhaps more weakly by student desegregation levels in earlier school years, but not by student desegregation levels in school years *after* 1968. Substantively or statistically significant relationships between black teacher employment outcomes and leading values of student desegregation would raise concerns that the estimates reported in Column 1 reflect unobserved characteristics of desegregating districts rather than student integration itself.

Column 3 of Table 1 reports the results of a model that contains two leading values of the student desegregation variable in addition to its contemporaneous value. Note that the inclusion of each leading value eliminates one year of data, so that the model in Columns 3 excludes the teacher employment data from 1970 and 1972, with a corresponding reduction in sample size.¹⁶ The estimated effect of the contemporaneous student desegregation variable remains similar to the baseline specification, and most importantly for present purposes the coefficients on the leading values are small and statistically insignificant.¹⁷ This lack

¹⁵A limitation of district specific linear time trends is that any underlying district trends are only allowed to vary in a linear fashion, which is a restrictive assumption in a context of highly discontinuous change such as the Civil Rights era South. An alternative approach is to include state-year interactions, which allows for geographically specific and non-linear time effects, but only at a state (rather than school district) level of aggregation. When state-year interactions are added to the baseline specification (not shown), the coefficient on the student desegregation variable is virtually unchanged at -.293, with a standard error of .024.

¹⁶Also note that given the data structure, the number of actual calendar years contained in a two period lead varies. Specifically, the model in Column 3 estimates how black teacher employment in 1964 is influenced by student desegregation in 1967 and 1968; how black teacher employment in 1967 is influenced by student desegregation in 1968 and 1970; and how black teacher employment in 1968 is influenced by student desegregation in 1970 and 1972.

¹⁷While the coefficient in Column 3 is substantially larger than the baseline estimate from Column 1, this is due to the restricted sample used in the models that include leads. Specifically, when the baseline specification with only contemporaneous effects is estimated using the same sample as Column 3, the coefficient on student desegregation is -.534.

of conditional associations between current black teacher employment levels and future levels of student desegregation suggests that the baseline results in Column 1 reflect causal relationships rather than the effects of unobserved district characteristics.¹⁸

Additional threats to identification come from the fact that school desegregation took place within a rapidly changing policy environment, most notably the introduction of War on Poverty and Great Society programs such as Medicare, Medicaid, Head Start, and the Food Stamp program, many of which were rolled out in 1964 or 1965. This raises the potential concern that the effects of student desegregation on black teacher employment reported above may partially reflect these other policy changes rather than school integration itself. However, for concurrent policies to confound the impacts of school desegregation, the timing of their implementation would need to corresponded with the timing of desegregation *within school districts*, and the other policies would also need to have a negative impact on the employment of black teachers specifically, both of which seem unlikely for the listed policy changes.¹⁹

The concurrent policy change that does appear to have the potential to confound the estimated effects of school desegregation is Title I of the 1965 Elementary and Secondary Education Act (ESEA), which allocated approximately \$7 billion of new federal funds (in current dollars) for distribution to local school districts. The funding formula used to allocate Title I funds sent more dollars to school districts located in counties with higher numbers of low income 5-17 year-olds as of the 1960 Census, which in practice favored more heavily African American districts. Additionally, Title I funds could be denied to school districts not meeting desegregation requirements, and previous research indicates that districts did indeed change their desegregation policies in response to these funding incentives (Cascio et al. 2008, 2010).²⁰ These features of Title I funding policy cumulatively led to significant associations between the desegregation policies of southern school districts and their levels of Title I funds, raising the possibility that the impacts of student desegregation identified above actually reflect the impacts of federal education funding levels.

One ex-ante reason to be skeptical of this explanation is that because desegregating districts and districts with higher black enrollment shares typically received *more* Title I funding, if anything Title I funds would be expected to have *positive* effects on black teacher employment, as additional funding flowed to districts with more progressive desegregation policies and higher black enrollment shares. This point notwithstanding, it is possible to evaluate the potential role of Title I more directly by including controls for district financing levels from various sources, with the required data collected and generously made available by Cascio et al. (2013) for a subset of the districts and years studied here.²¹ Column 4 of Table 1 uses this school finance data to estimate a model that includes controls for total district revenue from federal, state and local sources, and the estimates are almost identical to the baseline estimates in Column 1.²² This suggests that the estimated

¹⁸Models that include two *lagged* values of the student desegregation variable (not shown) find that the contemporaneous effect of student desegregation was -.095 log points ($P < .01$), the effect of student desegregation in the previous period was -.071 log points ($P < .01$), and that student desegregation two periods prior did not have a statistically or substantively significant effect on current black teacher employment.

¹⁹The estimated effects of school desegregation may also be confounded by other provisions of the CRA, most importantly Title VII, which prohibited racial discrimination in employment settings, and changing regional migration patterns in this period are also a potential issue. These topics are addressed in detail in Section 5 below.

²⁰The withholding of Title I funds for noncompliance with the CRA's school desegregation provisions ended when President Nixon took office in 1969, but by this time a great deal of desegregation activity had already taken place and federal courts had established more vigorous and enforceable desegregation requirements (Cascio et al. 2013).

²¹Cascio et al. (2013) entered these data by hand from print reports by state departments of education. The most important differences in the utilized samples of school districts is that the school finance data is not available for Texas or for the 1972 school year.

²²Measures of state and local revenue are included in addition to federal revenues because state and local funding levels may have changed in response to increased federal revenue under Title I.

impacts of student desegregation from Column 1 were not an artifact of the introduction of Title I.

5.4 Alternative Specifications

The baseline analysis was primarily concerned with how the *average* school district responded to student desegregation, and therefore gave each school district in the sample equal weight. But since school districts are of highly variable sizes and racial compositions, it is arguably preferable to give greater weight to districts with a larger potential impact on total black teacher employment.

Column 5 of Table 1 reports results that weight districts by the number of black teachers they employed in 1964, prior to substantive student desegregation, and when these weights are applied the estimated effect of full student integration is reduced to .207 log points, or 18.7%, which is moderately smaller than the baseline estimate of 25.0%. While both the unweighted and weighted estimates are of interest, the baseline unweighted estimates are a better measure of how the average school district responded to integration, while the weighted estimates are preferable if the objective is to assess the effect of integration on total black teacher employment. With respect to the latter, the studied districts employed 56,364 black teachers in the 1964 school year, so that an 18.7% reduction represents the elimination of over 10,500 black held teaching positions. Since the current sample includes only eight of the eleven states in which intensive student desegregation activity was occurring in this period, and has less than full coverage within these eight states, this is a lower bound for the actual number of eliminated black held teaching positions in the region.

Another noteworthy modeling choice was that thus far all of the specifications have controlled for the share of the student population that was black, but previous research has shown that desegregation reduced white enrollments (Welch 1987; Baum-Snow & Lutz 2011), and as a result controlling for the black enrollment share arguably abstracts away from an important aspect of how the desegregation process affected black teacher employment. Similarly, the baseline specification controlled for the log of total teacher employment, but this covariate could also be impacted by desegregation, for instance through declining total enrollments or improvements in operational efficiency, so that specifications without this covariate are arguably more insightful.

The results of a model that excludes these covariates, and therefore contains only district and year fixed-effects, is reported in Column 6 of Table 1, and the estimated treatment effect increases in magnitude to -.382 log points. This larger estimate primarily reflects the fact, discussed further below, that black enrollment shares were increasing over the study period, which based on existing associations would be expected to increase black teacher employment, all else constant.²³

A series of additional robustness and specification checks are presented in Online Appendix B. These include specifications that use alternative measures of black teacher employment; specifications that use a Negative Binomial estimator to account for the over-dispersion of black teacher counts; specifications that utilize an eleven state sample available from 1968-1972 rather than the eight state sample from 1964-1972; specifications that exclude districts that may have undergone a split or a merger during the study period and specifications that aggregate to the county level to account for possible district reorganizations; and specifications that use dissimilarity and exposure indices to measure student desegregation levels. In all cases the qualitative findings from Table 1 are unchanged.

²³When the total teacher labor force covariate is included but the black enrollment share control is excluded (not shown), the estimated treatment effect is -.346 log points.

5.5 Heterogeneity

Additional insight into the nature of black teacher displacement due to integration can be gained from examining the extent to which this displacement varied across different types of school districts.

The theoretical framework developed above suggested that one potentially important dimension of heterogeneity is a district's black student share, since in school districts with larger white student shares there is a greater marginal effect of black teacher employment on the exposure of white students to black teachers. Figure 3A reports the results of estimating Equation 4 separately within each quintile of the initial (1964) share of black students. The figure indicates that the relative level of displacement was indeed stronger in districts with a relatively large share of black students prior to desegregation. For instance in districts from the first quintile of 1964 black student share distribution, where on average just 6% of the students were black prior to integration, desegregation resulted in a .46 log point reduction in black teacher employment. In contrast, for districts in the fifth quintile of 1964 black student share, where on average 64% of the students were black prior to integration, the analogous reduction was approximately .15 log points. Indeed if the sample is restricted to districts where at least 80% of the student were black in 1964 (not shown) there was actually a small, statistically insignificant *increase* in black teacher employment due to the student integration process, consistent with the theoretical framework presented above in which some districts wish to employ only black teachers after integration.²⁴

Another potentially relevant dimension of heterogeneity is a district's overall size. For instance very large urban districts that were already operating both black and white systems at very large scales (e.g. Atlanta, Dallas, Memphis or New Orleans) may have experienced minimal gains in labor efficiency from transitioning to a single integrated system, whereas for smaller rural districts integration may have substantially reduced the total number of necessary teachers, with a disproportionate share of any layoffs falling on black teachers. Differing racial attitudes among parents and elected school boards in larger, more urban districts could have plausibly led to lower levels of aversion to cross-racial student teacher pairings as well (reflected in the γ terms in the model above), implying smaller reductions in black teacher employment after integration, and large urban districts may have also been under greater federal and judicial scrutiny.

Figure 3B reports the results of estimating the baseline specification separately for each quintile of the pre-integration total student distribution. The figure indicates that within the smallest quintile of districts, enrolling an average of 970 students in 1964, complete student desegregation resulted in a .41 log point reduction in black teacher employment. The magnitude of black teacher disemployment falls as progressively larger districts are analyzed, and for districts in the top quintile of total enrollment, enrolling over 21,000 students on average in 1964, black teacher employment was reduced by .24 log points due to integration.

6 Secondary Impacts of Black Teacher Displacement

The large scale of the reductions in black teacher employment documented above imply that the impacts of displacement were unlikely to be confined specifically to southern African American teachers, but instead

²⁴In practice, district level black student shares were very closely correlated with black teacher shares prior to integration. Given this, an alternative but not mutually exclusive interpretation of the results in Figure 3A is that districts with relatively large numbers of black *teachers* prior to integration found it logistically or politically difficult to fill the necessary teaching positions without absorbing substantial numbers of existing black teachers into the integrated schools.

engendered a significant overall restructuring of the labor market for teachers in the South, and potentially into other labor markets and regions.

From the perspective of school districts, hiring white replacement teachers was one possibility, potentially including whites from other regions or occupations. The combination of efficiencies from operating a unified school system and white-flight induced enrollment reductions also may have allowed districts to simply reduce their overall teacher employment level rather than hire white replacements. Conversely, from the perspective of southern African Americans who lost their teaching positions during desegregation, most such individuals presumably sought alternative employment opportunities, and the employment outcomes of these individuals have important implications both for the welfare of displaced teachers and the extent to which displacement generated spillovers into other labor markets and regions.

Below I use the administrative data from the baseline models as well as data from the 1960 and 1970 Decennial Censuses to quantify the broader impacts of the documented elimination of black held teaching positions in the South. I first examine changes in school district operations and staffing practices during the desegregation process, then turn to the question of what subsequent employment outcomes occurred among displaced southern African American teachers.

6.1 Changes in District Operations and White Teacher Recruitment

To better understand how districts modified their operations after student desegregation, Table 2 reports the results of estimating models that are similar to Equation 4, but that replace black teacher employment levels with various other district characteristics as the dependent variable. The most important finding is reported in Column 1, which uses the log of total teacher employment (of all races) as the dependent variable and finds that student integration caused a statistically significant reduction in total teacher employment of 4.7%.

A district's total teacher employment level is mechanically equal to the product of its total student enrollments and its student-teacher ratio. Given this, the second and third columns of Table 2 report results that use the log of total student enrollment and the log of the student-teacher ratio as dependent variables. The results in Column 2 indicate that going from fully segregated to fully integrated reduced total student enrollment by 3%. Notably, this overall enrollment decline is driven at least in part by relative reductions in white enrollment, with the share of students in the studied districts who were white falling from 71.4% in 1964 to 68.7% in 1972. The results in Column 3 indicate that desegregation was also associated with a 1.8% increase in the student-teacher ratio, although this estimate is not statistically significant at conventional levels ($P=.142$). The final column of Table 2 uses the log of total operational school buildings as the dependent variable, since the closure of previously all-black school buildings is commonly reported in historical accounts, although I caution that this variable is only available from 1967 onward, with a corresponding sample size reduction. The results indicate that a statistically significant 17.4% reduction in the total number of schools occurred during integration, and the resulting operational efficiencies may partially explain the documented changes in total teacher employment and student-teacher ratios.

Given the reductions in overall teacher labor demand documented in Column 1 of Table 2, a significant portion of the eliminated teaching positions previously held by African Americans could have simply gone unfilled. However, in many cases the black teacher employment reductions documented above would have still necessitated the recruitment of substantial numbers of new white teachers. For example in 1964, the

average district in my sample employed 276 teachers, 72 of whom were black. Even if the 4.7% reduction in total teacher employment reported in Column 1 of Table 2 was achieved solely by eliminating black held teaching positions, this would have eliminated only $.047 \times 276 \approx 13$ black held teaching positions in the average district, a reduction of approximately 18%, substantially less than the 25% reduction found above. The overall impacts of integration-induced black teacher employment reductions therefore include a corresponding increase in white teacher recruitment, and it is important to understand this recruitment process, for instance the qualifications, age and gender composition, and region of origin of new white teachers.

Panel A of Table 3 explores this issue by using data from the 1960 and 1970 Decennial Censuses to measure changes in the characteristics of white Census respondents who resided in the South, were currently employed and reported their occupation as “teacher.”

The first row of Table 3 indicates that the share of white teachers in the South who were born outside of the region increased substantially after desegregation, from 18.1% in 1960 to 24% in 1970, an increase of 5.8 percentage points or 32%, suggesting that southern districts filled the positions of displaced black teachers in part by recruiting white replacements from outside of the region. The next two rows of Table 3 indicate that southern districts also increased their recruitment of younger white teachers and male white teachers after integration. Specifically, the average age of southern white teachers fell from 42.13 years in 1960 to 39.39 years in 1970, a reduction of 2.74 years or 6.5%, while the fraction of southern white teachers who were male rose from 22.9% in 1960 to 25.8% in 1970, an increase of 2.8 percentage points or 12.2%. These increases could represent younger and male white workers transitioning into teaching from other professions, or an increase in the choice of teaching as an occupation among white workers entering the labor force for the first time, plausibly in response to a larger number of teaching positions available for whites. P-values from a hypothesis test of whether the 1960 and 1970 means are equal are reported in the final column of Table 3, and the reported changes in region of birth, age and gender among white teachers are all highly statistically significant.

The final row of Table 3 Panel A shows the average years of education completed by white teachers in the South, and indicates that at least in terms of formal educational attainment southern school districts did *not* recruit less qualified white teachers after desegregation, as the average years of education completed increased modestly from 15.96 years in 1960 to 16.04 years in 1970, an increase of .08 years ($P < .10$).

For purposes of comparison, Panel B Table 3 reports changes in the same characteristics among southern black teachers between 1960 and 1970. In strong contrast to their white counterparts, the southern black teacher workforce became modestly older, less male, and less likely to have been born outside of the region between 1960 and 1970, and the education levels of black teachers modestly declined in this period as well, although only the change in average black teacher age is statistically significant at conventional levels. This contrast suggests that the documented changes in the characteristics of the southern white teacher labor force did not simply reflect changes in the overall composition of the profession, but were rather due to unique aspects of the southern labor market for white teachers in this period.²⁵

²⁵Online Appendix Table A2 reports the results of difference-in-difference style regression specifications that estimate changes in the characteristics of southern white teachers between 1960 and 1970 relative to changes in the characteristics of southern black teachers over the same period, and these regressions lead to conclusions that are qualitatively similar to those in Table 3.

6.2 What Happened to Displaced Black Teachers?

The main estimates from Table 1 are not informative with respect to the subsequent labor market outcomes of southern black teachers who lost their positions during desegregation, but this question is critical for understanding the full impacts of integration-induced displacement, including spillovers into other labor markets and the welfare of displaced black teachers.

For instance, it is possible that many displaced southern black teachers readily entered into other types of professional employment in the South. Indeed, it is plausible that some of the documented black teacher employment reductions were voluntary, given that the concurrent implementation of Title VII led to general improvements in the employment opportunities of southern blacks. Alternatively, displaced southern black teachers may have entered non-professional occupations within the South, may have been forced to migrate out of the region in order to continue their teaching careers, or may have become unemployed or withdrawn from the labor force, and these possibilities have substantially different implications for the welfare of displaced teachers and the broader labor market effects of the documented black teacher employment reductions.

Ideally these various possibilities would be evaluated with longitudinal data that follows a sample of southern African Americans who were teachers prior to desegregation into the post-integration period and observes their employment outcomes in detail. While no such data is available, the fact that southern school desegregation occurred almost entirely between 1960 and 1970 does allow me to observe cross-sections of employment outcomes before and after integration using Decennial Census data. Because the Censuses do not track individuals across surveys, I analyze changes in employment outcomes at a group level using a synthetic cohort approach similar to Lleras-Muney (2005).

Specifically, I first draw a sample of non-Hispanic black and white respondents from the 1960 and 1970 Censuses who were (1) born in one of the eleven states of the former Confederacy; (2) had completed at least one year of post-secondary education and; (3) were from the 1904-1935 birth cohorts, such that they were ages 25-55 in 1960 and ages 35-65 in 1970. Next, I divide these individuals into “groups” defined by their birth cohort, state of birth, gender, educational attainment and race. This produces a total of 5,978 populated groups from 41,522 individual Census respondents. I then estimate race-specific changes in relevant employment outcomes occurring within each group between 1960 and 1970. Because the groups are constructed using time-invariant individual characteristics, this approach allows me to observe employment outcomes before and after desegregation within groups of very similar individuals, even if the actual respondents within a given group differed between the 1960 and 1970 Censuses.²⁶

With respect to employment outcomes, I classify individuals as being in one of six exhaustive and mutually exclusive employment categories based on their employment status, occupation, and region of residence, with the six categories chosen to capture to the broad classes of employment outcomes that could have occurred among individuals who were southern teachers prior to desegregation. The six utilized categories are (1) southern teachers; (2) southern professionals other than teachers; (3) southern non-professionals; (4) teachers outside of the South; (5) non-teachers outside of the South and; (6) unemployed or out of the labor force.

²⁶The only utilized grouping characteristic that is plausibly time-variant is educational attainment, and educational attainment tends to be quite stable for older individuals like those studied here, especially at the post-secondary level, and I also show in Online Appendix B that the results are not sensitive to excluding education as a grouping characteristic. For purposes of forming groups, educational attainment is categorized as less than four years of college, exactly four years of college, and more than four years of college.

For each group, I calculate the fraction of individuals in each of these six employment categories, then analyze which employment categories became more and less common within groups between 1960 and 1970 for blacks versus whites by estimating regressions of the following form:

$$EmploymentCategory_{gy} = \alpha + \beta_1 Black_g + \beta_2 Y1970 + \beta_3 (Black_g \times Y1970) + \gamma_s + \mu_c + \delta_m + \lambda_e + \varepsilon_{gy}. \quad (5)$$

In this specification $EmploymentCategory_{gy}$ is the fraction of individuals in group g and year y whose employment situation fell into the specified category; $Black_g$ and $Y1970$ are respectively indicators of whether group g includes blacks (rather than whites) and whether the observation came from 1970 (rather than 1960); and the remaining terms are fixed effects for state of birth, birth cohort, male, and educational attainment (i.e. the non-race characteristics used to define the groups).²⁷

The main parameter of interest in this specification is the coefficient on the interaction of the black indicator and the 1970 indicator, β_3 , which estimates the *within-group* change in the fraction of African Americans in each employment category occurring between 1960 and 1970, relative to the within-group change among whites over the same time period. Intuitively, this approach observes the prevalence of a given employment outcome within a group in 1960, then “finds” the same group in 1970 and measures the change in the prevalence of that employment outcome. For example, it uses the 1960 Census to observe the prevalence of being a teacher in the South among, say, African American females with four years of college who were born in Alabama in 1925, then finds individuals with the identical characteristics in the 1970 Census and calculates the change in the prevalence of being a teacher in the South. The included sets of fixed-effects are therefore conceptually similar to an individual fixed-effect if data were available to estimate a similar specification using individual-level panel data.

The results of estimating Equation 5 for each of the utilized employment categories are reported in the top panel of Table 4. Groups containing no individuals in one or both survey years are excluded, and all other groups are weighted by the number of individual observations that they contain (summed across 1960 and 1970), so that sparsely populated cells are given less weight. I demonstrate in Online Appendix B that the results are not sensitive to excluding sparsely populated groups or to giving each group equal weight. The number of populated group cells and the number of underlying individual observations are also reported. Standard errors are clustered at the group level.

The results in Column 1 of Table 4 indicate that the share of African Americans in the utilized sample who were teachers within the South declined by 3.8 percentage points between 1960 and 1970, relative to whites. The 1960 prevalence of southern teachers among African Americans in the utilized sample is 19.6%, so that a 3.8 percentage point reduction represents a decline of $3.8/19.6 \approx 19.4\%$, which is highly consistent with the changes in black teacher employment estimated above using administrative school district records. Unlike the analysis using administrative records, the current approach is also able to observe which employment categories experienced corresponding relative increases among southern blacks (note that because the utilized employment outcomes are exhaustive and mutually exclusive, the coefficients on the interaction term of interest in Table 4 sum to zero by construction). Estimates for the other employment outcomes are reported in the remaining Columns of Table 4.

²⁷Note that because each group is observed only once in each year, the inclusion of fixed effects for each grouping variable is numerically equivalent to the use of a group fixed effect that contains an indicator for each possible permutation of birth cohort, birth state, race, gender, and educational attainment.

Column 2 reports the results of a specification that uses the prevalence of non-teaching professional employment within the South as the dependent variable. The results indicate that there was virtually no relative change in non-teaching professional employment among blacks in the South, with a statistically insignificant coefficient of .2 percentage points, suggesting that displaced southern black teachers were not readily able to enter other professional occupations within the region. The models in Columns 3 and 4 respectively use the prevalence of *non*-professional employment within the South and the prevalence of teaching employment *outside* of the South as dependent variables. The results suggest that displaced southern black teachers transitioned into these other categories in approximately equal shares. Specifically, the relative share of African Americans in non-professional occupations within the South increased by 2.0 percentage points, and the relative share of African Americans employed as teachers outside of the South increased by 2.2 percentage points, although the former effect is not statistically significant at conventional levels ($P=.119$).

The increase in southern born African Americans working as teachers outside of the region is especially notable given that net black migration into the South was actually positive between 1964 and 1970, reversing decades of large-scale out-migration (see Wright 2013). The results in Column 4 suggest that regional out-migration continued among African American *teachers* between 1960 and 1970, even as it reversed for the African American population overall. This finding is also consistent with the black teacher employment trends outside of the South that are observed in the Office of Civil Rights surveys used in the baseline analysis above, with the number of non-southern black teachers in this data increasing from 67,264 (1.7%) in 1968, to 74,439 (1.8%) in 1970, and to 80,269 (1.9%) in 1972.

The final two columns of Table 4 Panel A use the prevalence of non-teaching employment outside of the South and the prevalence of being unemployed or out of the labor force as dependent variables. The results indicate that there were no statistically significant changes in the relative share of African Americans within these employment categories between 1960 and 1970, although the magnitude of the coefficient in the model for not working in Column 5 is non-negligible at -.013.

In Online Appendix B I demonstrate the robustness of the findings in Panel A of Table 4 to various reasonable alternative modeling choices such as the use of alternate age ranges, excluding education as a “grouping” characteristic, excluding sparsely populated group cells, and alternative weighting approaches.

In addition to observing a broader set of employment outcomes, an advantage of the utilized synthetic cohort approach is that it allows for the analysis of heterogeneous effects by demographic characteristics such as gender and age, and the remaining panels of Table 4 re-estimate Equation 5 separately by gender (Panels B and C) and by whether respondents were older or younger than age 40 in 1964 (Panels D and E).

The gender specific estimates in the first column of Panels B and C indicate that there were larger absolute reductions in teacher employment among southern black females than among southern black males. In particular, the results in the first column of Panel B estimate that the relative share of African American females who were teachers within the South declined by 5.4 percentage points between 1960 and 1970, while the analogous decline among African American males was only 2.5 percentage points. However, a Chi-Square test of the hypothesis that the coefficients are equal across genders indicates that this difference is not statistically significant at conventional levels ($P=.143$), and the baseline prevalence of southern teaching employment in the utilized sample was higher among black females (26.3%) than among black males (10.8%), so that the reported percentage point declines translate into a smaller percent reduction for females.

The gender specific results from Columns 3 and 4 indicate that African American females were significantly *less* likely than males to enter non-professional employment within the South (female coefficient of -.024

versus male coefficient of .045, P-value of difference = .012), but were significantly *more* likely than males to migrate outside of the South and remain in teaching (.035 versus .005, P=.011). Speculatively, these differences could reflect more extensive non-teaching labor market opportunities for African American men in the South, especially after 1964, leading black men to exit teaching but remain in the region when their positions were eliminated, while African American women had few desirable non-teaching options in the region and were therefore more likely to migrate.

Finally, Column 5 of Panels B and C indicates that there were substantial gender differences in the prevalence of non-work within the studied African American population. Specifically, there was large a *increase* in the fraction of African American women who were unemployed or out of the labor force between 1960 and 1970, but a large *decrease* in the fraction of African American men in this category over the same period, and the difference in these coefficients by gender is statistically significant ($P < .01$). The increase in non-work among African American females is consistent with a lack of labor force opportunities for black women outside of teaching, while the relative decrease among black men could plausibly reflect general improvements in employment opportunities associated with reduced discrimination in blue-collar labor markets over this period (see Wright 2013). More generally, declines in labor force participation among southern African American women and corresponding increases among southern African American men could reflect changing household labor supply choices associated with post-CRA changes in the southern labor market.

Turning to the age specific estimates in Panels D and E, the results in Column 1 indicate that among African Americans who were ages 40 or below in 1964, the proportion who were teachers in the South declined by 5.6 percentage points between 1960 and 1970, relative to whites, while the analogous decline among African Americans who were over age 40 in 1964 was just 2.2 percentage points. These differences may reflect greater job security for more senior teachers, but the estimated difference is again modestly below conventional levels of statistical significance ($P = .114$), warranting a cautious interpretation.

As was the case for gender, there are also statistically and qualitatively significant differences by age with respect to changes in the fraction of individuals working as teachers outside of the South and working in non-professional occupations within the South. Specifically, African Americans who were over age 40 in 1964 were substantially more likely to transition to non-professional occupations within the South between 1960 and 1970 than were younger African Americans (.055 versus -.018, $P = .005$). Conversely, African Americans who were ages 40 or below in 1964 were substantially more likely to transition to being a teacher outside of the South between 1960 and 1970 than were older African Americans (.031 versus .007, $P = .072$).²⁸ These differences likely reflect the greater willingness of younger workers to migrate for economic reasons, relative to older workers with stronger ties to their current community and fewer working years remaining in their careers.

In summary, the results in Table 4 corroborate the baseline finding that large-scale reductions in black teacher employment occurred within the South over the course of the integration process, and suggest that approximately half of the southern black teachers whose positions were eliminated entered lower skill occupations within the South, while the other half migrated from the region to continue working as teachers. Women and younger teachers appear to have experienced the most severe employment reductions, and were also more likely to have left the region to continue teaching, while men and older teachers were more likely to transition to other occupations within the South.

²⁸Column 5 of Panel D also finds a quantitatively large but statistically insignificant increase in the fraction of younger African Americans who were working as non-teachers outside of the South, which is suggestive evidence that younger displaced teachers may have been relatively likely to migrate to pursue non-teaching opportunities in addition to teaching positions specifically.

A final point on the subsequent employment outcomes of southern black teachers displaced during student integration is that the methodology in Table 4 is only able to analyze effects within the stock of individuals who were already teachers in 1960. However, eliminating large numbers of black held teaching positions may have also affected whether subsequent cohorts of southern African Americans chose to enter the teaching profession. Direct evidence on black teacher entry is scarce, but the evidence that is available does suggest a reduced supply of new black teachers. For instance an unscientific 1968 survey of placement directors at seven predominantly black teacher training programs in the South found that the number of education graduates at these institutions had declined by more than 10% between 1965 and 1968 (Southern Education Report 1968), while Hudson & Holmes (1994) report a 66% decline in the number of African American students majoring in education nationwide between 1975 and 1985.²⁹ While it is difficult to distinguish the effects of displacement on the entry of new black teachers from the effects of expanded professional employment opportunities outside of teaching, at a minimum the large-scale elimination of black held teaching positions during desegregation did not encourage young African Americans to enter the profession.

7 Discussion and Conclusion

The present paper has been primarily concerned with changes in the teacher labor market occurring in the 1960s and early 1970s, but the findings additionally have some relevance for more contemporary issues in education research and policy.

One such area is the effects of own-race teachers on student outcomes, with a growing literature indicating that exposure of black students to black teachers has positive impacts on academic and behavioral outcomes. For instance Dee (2004) exploits the random assignment of students to classrooms in Tennessee’s Project STAR experiment to estimate that being assigned to an own-race teacher increased the math and reading test scores of black students by approximately 5 percentile points, with larger cumulative effects for students having own-race teachers for multiple years. Likewise, Lindsay & Hart (2017) use administrative data from North Carolina and student fixed-effects models and find that full exposure to own-race teachers reduced the probability that black students were suspended or expelled by 18%.

In an historically salient anecdote on the potential benefits of own-race teachers even in the segregation era, Leola Brown, the named plaintiff in *Brown v. Board*, described the teachers at the segregated school she was suing to integrate as “Qualified...fantastic teachers. [And] they were good to us, more like an extended family, like mothers and so forth, because they took an interest in you” (Kansas State Historical Society 1991).³⁰ Likewise Everett Dawson, an African American teacher in North Carolina during the desegregation process, noted that “I got disillusioned with integration because... I could not get to my people and tell them all the things that they needed to know” (Foster 1997).

Since black students in segregated southern schools had virtually all black teachers, a substantial decline in black student’s exposure to own-race teachers was an unavoidable consequence of student desegregation, and few would argue that it was desirable for African American students to have exclusively own-race teachers. However, the magnitude of the reductions in exposure of black students to black teachers was

²⁹Consistent with the findings in Table 4, the surveyed placement directors also reported that their graduates were increasingly taking positions outside of the South.

³⁰Leola Brown was actually the mother of Linda Brown, who is the student named in the *Brown* case, but is speaking here in the first-person because she had attended the same elementary school herself as a child, when it was fully segregated.

clearly increased by the disproportionate elimination of black held teaching positions documented above, with potentially deleterious impacts on African American students.

A related point relevant to contemporary policy debates is that there is currently a widespread perception among educational practitioners and many academics that African Americans and other racial and ethnic minorities are problematically underrepresented within the teaching profession. For instance Villegas & Davis (2008) report that 36 states have adopted policies intended to increase the recruitment of minority teachers since the 1990s, a recent report from the National Education Association (Dilworth & Coleman 2014) is devoted to examining “the compelling need to recruit and retain teachers of color” and Villegas & Irvine (2010) summarize an interdisciplinary academic literature arguing that increased recruitment of minority teachers would be beneficial to students and communities. While the findings of the present study do not speak directly to the contemporary recruitment of minority teachers, the documented dismissal of large numbers of experienced black educators during desegregation provides important context for these ongoing discussions.

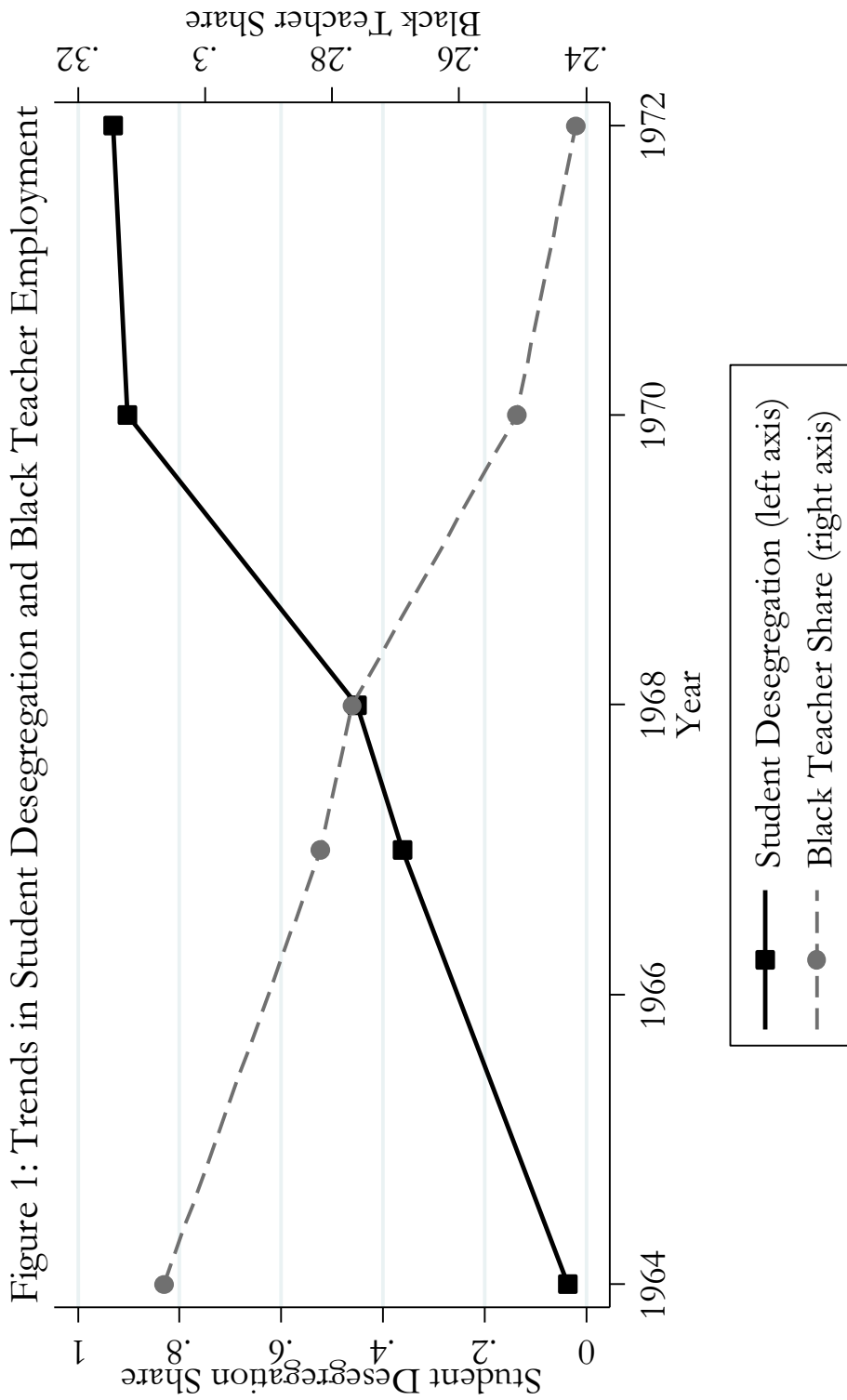
The dismantling of de-jure segregation in southern schools was arguably the signature accomplishment of the Civil Rights Movement, and a generational victory for the cause of racial equality in the United States. Desegregation generated large benefits for many groups, ranging from students in the South who received an education formally free of racial considerations, to the broader population that gained the ability to live in a society that better reflected democratic principles of equal citizenship. But such a fundamental reform of a major institution also inevitably comes with disruption and costs. The results of the present study indicate that the costs associated with transitioning to a more equitable educational system were in large part paid by African American teachers.

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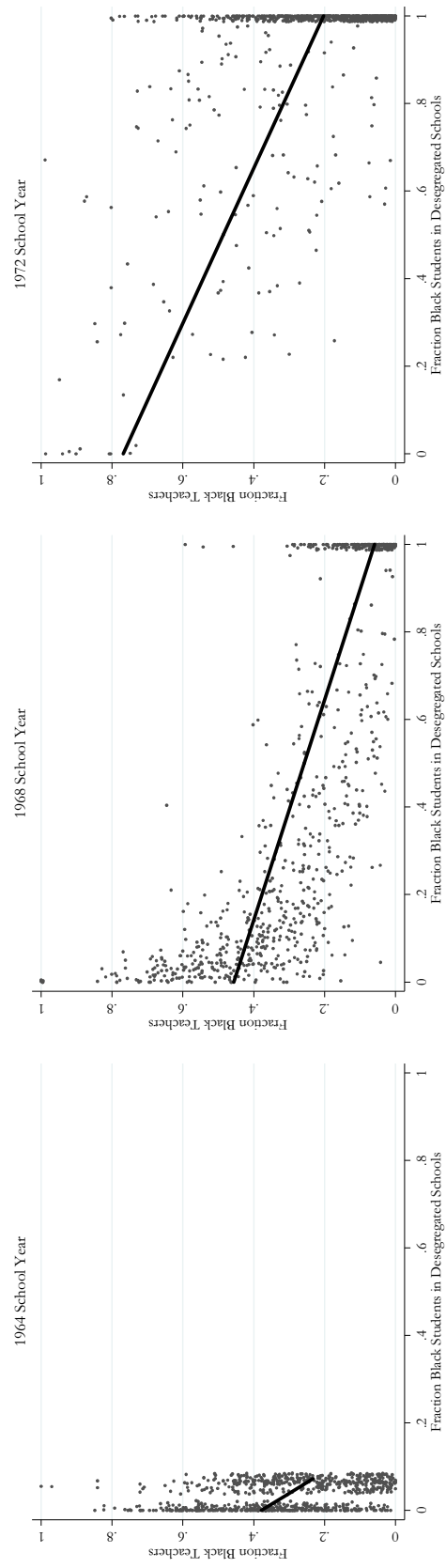
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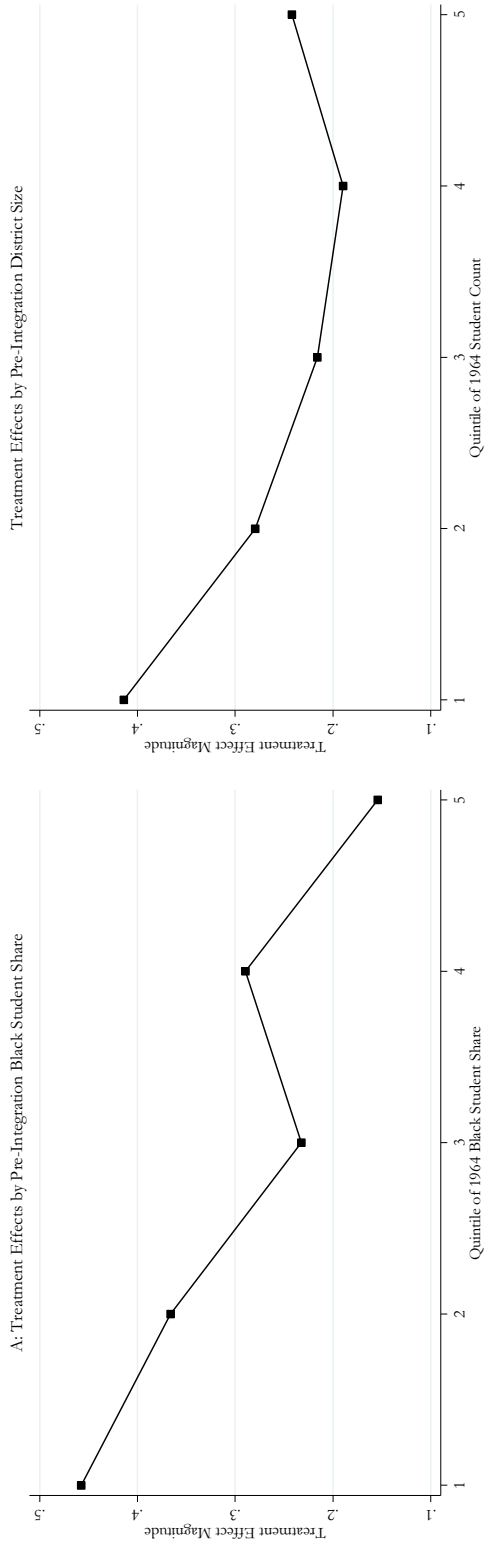
Notes: The student desegregation share is the district level mean of the fraction of black students attending a school where 5% or more of the enrolled students were white. The black teacher share is the district level mean of the fraction of all teachers in the district that were black. Means are calculated within a sample of 781 school districts in eight Southern states. See Section 4 of the text for a detailed description of the utilized data.

Figure 2: Student Desegregation and Black Teacher Employment by Year



Notes: Each scatterplot displays student desegregation and black teacher employment shares for the indicated school year across 781 school districts in eight southern states, as well as a linear fit line. The horizontal axes measure the fraction of black students attending a school where 5% or more of the enrolled students were white. The vertical axes measure the share of teachers in each district that were black.

Figure 3: Treatment Effect Heterogeneity



Notes: Reported treatment effect magnitudes are the coefficient on the student desegregation variable when Equation 4 is estimated using a sample consisting of the districts within the specified quintile of black student share as of 1964 (Panel A) or total number of students as of 1964 (Panel B).

Table 1: The Effect of Student Desegregation on Black Teacher Employment

	(1)	(2)	(3)	(4)	(5)	(6)
	Baseline	District Trends	Leads	Finance Controls	Weighted	No Controls
Fraction of Black Students in Desegregated Schools	-0.287*** (0.023)	-0.335*** (0.032)	-0.493*** (0.057)	-0.276*** (0.031)	-0.207*** (0.018)	-0.382*** (0.031)
Ln(All Teacher Count)	1.887*** (0.232)	1.554*** (0.497)	1.708*** (0.416)	1.388*** (0.276)	1.502*** (0.165)	
Fraction of Black Students	0.912*** (0.059)	0.963*** (0.084)	1.005*** (0.075)	0.936*** (0.083)	0.913*** (0.037)	
Fraction Students Desegregated, 1-period lead			0.016 (0.031)			
Fraction Students Desegregated, 2-period lead			0.049 (0.049)			
District-Year Observations	3,905	3,905	2,343	1,586	3,905	3,905
Number of Unique Districts	781	781	781	478	781	781

Notes: The dependent variable is the natural log of the number of African American teachers. All models contain school district and year fixed-effects, and all models except for Column 6 additionally control for the natural log of total district teacher employment (of all races) and the fraction of the district's student body that is African American. Additionally, the model in Column 2 contains interactions of school district indicators and a linear year variable; the model in Column 3 contains two leading values of the student desegregation variable; and the model in Column 4 contains controls for district revenues from federal, state and local sources. All observations are given equal weight, except for in the model in Column 5, where each observation is weighted by the number of black teachers the district employed during the 1964 school year. Standard errors, clustered at the school district level, are in parentheses. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Table 2: The Effect of Student Desegregation on District Operations

	(1)	(2)	(3)	(4)
	Log Teachers	Log Students	Log Student-Teacher Ratio	Log School Buildings
Fraction of Black Students in Desegregated Schools	-0.047*** (0.015)	-0.030* (0.018)	0.018 (0.012)	-0.174*** (0.022)
District-Year Observations	3,905	3,905	3,905	3,124
Number of Unique Districts	781	781	781	781

Notes: The dependent variables in Columns 1-4 are respectively the log of total teacher employment (of all races), the log of total student enrollments (of all races), the log of the ratio of the district's total student count to its total teacher count, and the log of total operational school buildings. All models contain school district and year fixed-effects. All observations are given equal weight. Standard errors, clustered at the school district level, are in parentheses. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Table 3: Characteristics of Southern Teachers by Year

	<u>A: Southern White Teachers</u>			
	<u>1960</u>	<u>1970</u>	<u>Change</u>	<u>P</u>
Born Outside of South	0.181	0.240	0.058	0.000
Age	42.13	39.39	-2.74	0.000
Male	0.229	0.258	0.028	0.004
Years of Education	15.96	16.04	0.08	0.085
Observations	8,126			

	<u>B: Southern Black Teachers</u>			
	<u>1960</u>	<u>1970</u>	<u>Change</u>	<u>P</u>
Born Outside of South	0.042	0.032	-0.010	0.250
Age	38.40	39.45	1.06	0.041
Male	0.255	0.229	-0.026	0.170
Years of Education	16.01	15.88	-0.12	0.173
Observations	2,121			

Notes: Table entries report means of the indicated characteristic in the 1960 and 1970 Decennial Censuses. Sample consists of non-Hispanic whites (Panel A) and blacks (Panel B) who were employed, lived in one of the eleven states of the former Confederacy, and reported their occupation as "teacher". The final column reports the P-value from a test of whether the 1960 and 1970 means are equal. Individual sampling weights are applied.

Table 4: Group-Level Changes in Employment Categories

	(1)	(2)	(3)	(4)	(5)	(6)
	Southern Teacher	Other Southern Professional	Southern Non-Professional	Teacher Outside of South	Non-Teacher Outside of South	Not Working
<i>A: Full Sample</i>						
Black × Y1970	-0.038*** (0.011)	0.002 (0.008)	0.020 (0.013)	0.022*** (0.007)	0.008 (0.015)	-0.013 (0.012)
Number of Groups	5,978	5,978	5,978	5,978	5,978	5,978
Individual Observations	41,522	41,522	41,522	41,522	41,522	41,522
<i>B: Females</i>						
Black × Y1970	-0.054*** (0.017)	0.001 (0.011)	-0.024 (0.016)	0.035*** (0.010)	-0.005 (0.019)	0.047** (0.019)
Number of Groups	2,992	2,992	2,992	2,992	2,992	2,992
Individual Observations	17,414	17,414	17,414	17,414	17,414	17,414
<i>C: Males</i>						
Black × Y1970	-0.025** (0.012)	-0.002 (0.012)	0.045** (0.021)	0.005 (0.007)	0.013 (0.023)	-0.037*** (0.012)
Number of Groups	2,986	2,986	2,986	2,986	2,986	2,986
Individual Observations	24,108	24,108	24,108	24,108	24,108	24,108
<i>D: ≤ Age 40 in 1964</i>						
Black × Y1970	-0.056*** (0.014)	0.002 (0.012)	-0.018 (0.016)	0.031*** (0.008)	0.023 (0.019)	0.018 (0.016)
Number of Groups	2,474	2,474	2,474	2,474	2,474	2,474
Individual Observations	24,108	24,108	24,108	24,108	24,108	24,108
<i>E: > Age 40 in 1964</i>						
Black × Y1970	-0.022 (0.017)	0.000 (0.013)	0.055*** (0.021)	0.007 (0.011)	-0.018 (0.024)	-0.023 (0.016)
Number of Groups	3,504	3,504	3,504	3,504	3,504	3,504
Individual Observations	21,496	21,496	21,496	21,496	21,496	21,496

Notes: Data drawn from 1960 and 1970 Decennial Census 1% samples, and restricted to non-Hispanic black or white respondents who were born in one of the eleven states of the former Confederacy, had completed one or more years of college, and were from the 1904-1935 birth cohorts. Reported regressions are estimated using these samples collapsed into groups defined by each possible permutation of birth cohort, state of birth, gender, educational attainment and race. The dependent variable in each specification is the proportion of the group falling into the indicated employment category, and the reported coefficients estimate the within-group change in the fraction of blacks in each employment category occurring between 1960 and 1970, relative to the within-group change among whites over the same time period. Groups are weighted by the number of individual observations that they contain, summed across 1960 and 1970. Standard errors, clustered at the group level, are in parentheses. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Online Appendices: School Desegregation and Black Teacher Employment

Appendix A: Data Appendix

As discussed in Section 2 of the main paper, data on race-specific teacher employment counts and student desegregation for the 1968, 1970 and 1972 school years was drawn from surveys conducted by the US Office of Civil Rights (OCR) that were generously converted from the original binary files and made publicly available by Ben Denckla and Sarah Reber of UCLA. The OCR data was merged across these three school years using unique numerical identifiers created by OCR. These OCR district codes appear to be equivalent to the district codes currently used by the National Center for Educational Statistics (NCES), except that (1) NCES district codes lead with a state identifier defined with standard state FIPS codes, while OCR district codes lead with a state code of their own creation and (2) the OCR codes contain an additional leading zero between the state prefix and the district identifier.

The OCR data also contains a string variable giving the name of each school “system” (district). These names were used to match the districts included in the OCR surveys to data from 1967 contained in NCES (1967) and to data from state department of education reports from around 1964. Within the eight states included in the working sample used above, over 98% of the districts from the OCR data had an unambiguous match in the 1967 and 1964 data based on district name.

As noted, state department of education and superintendent annual reports were used to construct race-specific enrollment and teacher employment totals for the period prior to non-token desegregation, which in the studied districts began with the 1965 school year. Some complications arise because some states issued biannual rather than annual reports, while other states stopped reporting race-specific information in the years leading up to 1964, perhaps in anticipation of increased scrutiny of racial segregation in their systems. As a result, not all states have valid data for the 1964 school year specifically, and in these cases I use the latest available school year prior to 1964. The last available academic year for Alabama, Georgia and South Carolina was 1963, and the last available academic year for Mississippi and Tennessee was 1962. All other states had data available for the 1964 academic year.

Additionally, South Carolina only reported data by county for 1964, not by school district. Given this, I restrict the South Carolina sample to the 25 counties that contained only one school district, out of 95 total school districts in the state.

Appendix B: Robustness

Robustness of Main Findings

To preserve district observations that employed a positive number of black teachers in 1964 but zero black teachers in a subsequent sample year, the dependent variable in the main analysis was transformed as $\ln(\text{BlackTeachers}_{dy} + 1)$. This transformation preserved observations from 14 districts, and in Column 1 of Table A1 I report results that instead exclude these districts. The estimated effect of student desegregation on black teacher employment is virtually unchanged.

Because the analysis above measured black teacher employment in logs, a given reduction in the number of black teachers had a larger impact on the estimates within districts that had smaller initial levels of black teacher employment, since a particular level reduction in black teaching positions constitutes a larger percentage reduction in districts with smaller baseline black teacher employment. Two reasonable alternative dependent variables that do not have this feature are the share of each district's teacher labor force that is black and the level count of black teachers, and the results of models with these alternative dependent variables are shown in Columns 2 and 3 of Table A1, respectively.¹ The estimates indicate that fully implementing student desegregation reduced the share of the typical school district's teacher labor force that was black by 6.5 percentage points and reduced the number of black teachers in the typical district by 15.8. In 1964, the average school district in the sample had a black teacher employment share of 30.6% and employed 72 black teachers, so that the estimates reported in Columns 2 and 3 both translate to black teacher employment reductions of approximately 20%.

The fact that these percent reductions are somewhat lower than the baseline estimate from Column 1 of Table 1, and are more similar to the weighted estimates from Column 5 of Table 1, reflects the fact that relative black teacher disemployment effects were stronger in districts with smaller initial black teacher employment levels. Because of this, modeling choices that put less weight on districts employing relatively few black teachers, whether explicitly through applying weights or implicitly through the choice of dependent variable, lead to somewhat smaller (though still normatively large) treatment effect estimates. Which type of estimate is preferred will depend on the context and question of interest.

A methodological issue arises from the fact that the number of black teachers in a district is an overdispersed count variable: A district can employ no fewer than zero black teachers, while a relatively small number of districts employ very large numbers of black teachers, causing the variance of black teacher employment to well exceed its mean. Given these features of the dependent variable, a Negative Binomial specification may be more appropriate than using the log of the black teacher count as the dependent variable, and the results of such a specification are reported in Column 4 of Table A1. The coefficient on the student integration variable in this specification, which can be interpreted as a semi-elasticity, is -.290, and therefore leads to very similar conclusions as the baseline specification in Table 1.²

The sample used above consisted of 781 school districts from eight southern states for which the required data components could be constructed for the 1964, 1967, 1968, 1970 and 1972 school years. However, as noted in Section 4 above, it is also possible to assemble a data set for a larger sample of 1,123 school districts from all eleven states of the former Confederacy, but information on black teacher employment in this larger set of districts is only available beginning in the 1967 school year, when the student desegregation process was approximately half complete. Column 5 of Table A1 reports results using this expanded sample of districts

¹Note that the denominator of the ratio used as the dependent variable in the model from Column 2 implicitly controls for any changes in overall teacher employment levels, while the model in Column 3 includes a control for the level count rather than the log of total teachers employed by each district.

²The Negative Binomial model in Column 4 replaces the log of total teacher employment with the level of total teacher employment, and reports bootstrapped standard errors with 400 repetitions. The results are virtually identical if a Poisson model is used in place of a Negative Binomial model.

observed over a shorter span of school years, and the estimated treatment effect falls to -.205 log points. To determine the extent to which this reduction is attributable to using an expanded set of school districts versus using a shorter span of school years, I have estimated models (not shown) that use the baseline sample of 781 school districts but exclude data from the 1964 school year. The estimated treatment effect in this sample falls to -.178 log points, which suggests that the reduced magnitude of the estimate in Column 5 of Table A1 is due to the truncation of years, not the expanded set of districts, and also suggests that the most severe black teacher employment reductions likely occurred in the earlier stages of the student desegregation process.

Another robustness related issue is how to account for school district consolidations and splits. As noted, the main data set was constructed by matching school districts across years using school district names, but if a school district absorbed a neighboring district or split off from an existing district, while maintaining the same name, it is possible that the actual school district boundaries and composition changed over the course of the study period. It is also possible that district re-organizations were themselves a response to the imposition of desegregation, for instance by intentionally packing African American students into a newly created municipal district while creating a predominantly white district in the balance of the county.

One approach to accounting for district reorganizations is to restrict the sample to districts that did not undergo a merger or split during the study period. Cascio et al. (2013) use data from state school finance reports to identify districts undergoing a re-organization between 1961 and 1969, and their sample includes all eight of the states used in the analysis above except for Texas. In Column 6 of Table A1 I re-estimate the baseline specification with the set of districts used in Cascio et al. (2013), which excludes 52 districts believed to have undergone a reorganization during the study period (as well as all Texas districts). The estimated effect of student desegregation on black teacher employment is -.243 log points, very similar to the baseline findings.

Another method of accounting for district reorganizations is to estimate models with the data aggregated to the county level. This approach takes advantage of the fact that when district consolidations or splits did occur, they typically involved a municipal district joining or leaving the school district operated by the county in which the municipality was located. The 781 school districts in the current sample were located in 563 unique counties. Column 7 of Table A1 reports the results of estimating the main specification with these counties as the unit of analysis, and the estimated treatment effect is -.259 log points. While county aggregation may introduce or exacerbate measurement error, in general the effect of aggregating measures of school characteristics are ambiguous and case-specific (Hanushek et al. 1996; Carruthers & Wanamaker 2017), and for present purposes the most important point is that the large estimated effect of desegregation when using county level data make bias due to district consolidations or mergers an unlikely explanation for the main findings from Table 1.

The paper's main findings measured student desegregation as the fraction of African American students in each district attending a school where 5% or more of the enrolled students were white. While this measure is intuitive and has easily interpretable units, alternative desegregation measures are available, and these alternative measures may be especially useful in districts with very large or very small African American student shares, where the baseline desegregation measure could conflate racial integration with the racial composition of a school district.

The two most widely used measures of segregation are the exposure index and the dissimilarity index (Massey & Denton 1988). The exposure index (formally defined as $\sum_s \frac{B_s}{B_d} \times \frac{W_s}{B_s + W_s}$, where B_s and B_d denote the

number of black students in a given school and in a given district and similarly for W_s and W_d) calculates the probability that a randomly drawn schoolmate of a black student will be white. Notably, the minimum value for the exposure index is the overall share of the district's students who are black, which is a particularly useful feature for measuring desegregation in districts with very large or very small African American student shares. The dissimilarity index, defined as $\frac{1}{2} \sum_s \left| \frac{B_s}{B_d} - \frac{W_s}{W_d} \right|$, calculates the share of black (or white) students who would need to change schools in order to make the racial composition of each school match that of the district overall.

Results of estimating the baseline model while using these alternative segregation measures are reported in Columns 8 and 9 of Table A1. In both cases, the estimated effect of student segregation on black teacher employment remain substantively and statistically significant: A one unit increase in the exposure index is estimated to increase black teach employment by .515 log points, while a one unit increase in the dissimilarity index is estimated to increase black teacher employment by .351 log points. The average district in the current sample experienced a .60 point decline in the exposure index and a .75 point decline in the dissimilarity index between 1964 and 1972, so that the coefficients from Columns 8 and 9 suggest that the full post-CRA student desegregation process reduced black teacher employment by approximately 25-30%, similar to the baseline estimates above.

Difference-in-Difference Version of Table 3

Table A2 reports the results of a specification that uses the data from Table 3 of the main body of the paper and regresses the indicated teacher characteristic onto a white indicator, a 1970 indicator, and their interaction. The coefficient on the interaction term estimates the change in the mean of the characteristic occurring among southern white teachers between 1960 and 1970, relative to changes among southern black teachers over the same period. The results suggest similar conclusions as Table 3 in the main body of the paper: After integration, there were increases in the likelihood that southern white teachers were born outside of the region, were younger, were male, and had completed more years of schooling, relative to changes in these characteristics among southern black teachers. All of these relative changes were statistically significant at conventional levels.

Robustness of Grouped Census Estimates

Table A3 presents the results of various alternatives to the grouped Census estimates from Panel A of Table 4.

One issue is that some of the groups formed by the utilized characteristics (birth cohort, state of birth, gender, educational attainment and race) are sparsely populated, containing only a few individual observations. The baseline estimates accounted for this by giving greater weight to more heavily populated cells, but it may still be misleading to base the analysis in part on groups containing a very small number of individuals. Panel A of Table A3 excludes groups containing 5 or fewer individual observations. The results are qualitatively similar, although somewhat attenuated within this restricted sample.

Alternatively, it is arguably preferable to give each group equal weight regardless of the number of individuals it contains, since the experiences of each group represents the changing employment dynamics within a unique, well-defined sub-population regardless of how many Census respondents that sub-population contains. Results of models that apply no weights are presented in Panel B of Table A3, and the results are again qualitatively similar to those in the baseline specification, although in this case all of the key estimates are somewhat larger in magnitude.

The baseline analysis restricted the sample to individuals who were ages 25-55 in 1960 and ages 35-65 in 1970. The lower bound of age 25 was chosen so that respondents were sufficiently old to reliably observe their occupations, while the upper bound of 65 was chosen to prevent confounding normal retirement choices with any effects of the desegregation process. However, the exact age thresholds were largely arbitrary, and reasonable alternative age ranges can be used. Panel C of Table A3 uses a less restrictive age range, consisting of individuals who were ages 20-60 in 1960 or 30-70 in 1970, while Panel D uses a more restrictive age range, consisting of individuals who were ages 30-50 in 1960 or 40-60 in 1970. In both cases the key estimates are qualitatively similar to the baseline findings, although in the less restricted sample greater migration out of the South for non-teaching positions and larger reductions in non-work are observed.

A final robustness related issue is that one of the characteristics used to form the groups was educational attainment, and although completing additional post-secondary education after age 25 was very rare in this period, educational attainment can in principle vary over time. Panel E of Table A3 reports the results of models that use groups formed with each possible permutation of birth cohort, state of birth, gender, and race, but exclude educational attainment as a grouping variable. The results are again qualitatively similar to the baseline findings.

Appendix References

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Table A1: Additional Robustness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Excluding Districts with no Black Teachers	Black Teacher Share	Black Teacher Count	Negative Binomial	Eleven-State Sample	Reorganizing Districts Excluded	County Level Data	Exposure Index	Dissimilarity Index
Student Desegregation	-0.282*** (0.021)	-0.065*** (0.005)	-15.819*** (2.404)	-0.290*** (0.026)	-0.205*** (0.025)	-0.244*** (0.025)	-0.259*** (0.024)	0.515*** (0.039)	0.351*** (0.029)
Total Teacher Employment	0.900*** (0.056)		0.171*** (0.039)	0.806*** (0.188)	0.943*** (0.099)	0.879*** (0.063)	0.917*** (0.072)	0.934*** (0.057)	0.885*** (0.059)
Fraction of Black Students	1.725*** (0.170)	0.575*** (0.064)	67.038*** (19.471)	0.000*** (0.000)	2.092*** (0.341)	1.459*** (0.193)	1.780*** (0.249)	1.543*** (0.229)	2.041*** (0.247)
District-Year Observations	3,835	3,905	3,905	3,905	4,492	2,390	2,815	3,905	3,905
Number of Unique Districts	767	781	781	781	1,123	478	563	781	781

Notes: The model in Column 1 uses a sample that excludes 14 districts that employed at least one black teacher in 1964, but employed no black teachers in at least one observed year after 1964. The models in Columns 2 and 3 respectively use the fraction of the teachers in each district-year who were black and the level count of black teachers in each district-year as dependent variables. The model in Column 4 uses a Negative Binomial estimator rather than OLS. The model in Column 5 uses an expanded sample of school districts from all eleven states of the former Confederacy, but excludes data from the 1964 school year. The model in Column 6 uses the sample of districts from Cascio et al. (2013), which excludes districts that underwent a split or a merger between 1961 and 1969, as well as Texas districts. The model in Column 7 uses data collapsed to the county level, and the reported sample sizes refer to counties rather than school districts. The models in Columns 8 and 9 respectively use the Exposure Index and the Dissimilarity Index as the measure of student desegregation, while all other models use the share of black students attending desegregated schools. All models contain school district (or county) and year fixed-effects. Total teacher employment is measured in logs in all models except Column 3, where it is measure in levels. All models give each district equal weight. Standard errors, clustered at the school district (or county) level, are in parentheses. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Table A2: Relative Changes in Southern White Teacher Characteristics

	Born Outside of South	Age	Male	Years of Education
White	0.139*** (0.010)	3.736*** (0.441)	-0.026 (0.016)	-0.045 (0.068)
Year = 1970	-0.010 (0.008)	1.058** (0.517)	-0.026 (0.019)	-0.122 (0.089)
White × (Year = 1970)	0.068*** (0.012)	-3.801*** (0.597)	0.054** (0.021)	0.197** (0.099)
Observations	10,247	10,247	10,247	10,247

Notes: Column headings indicate the dependent variable. Sample consists of respondents to the 1960 and 1970 Decennial Censuses who were non-Hispanic white or black, were currently employed, lived in one of the 11 states of the former Confederacy, and reported their occupation as "teacher." Clustered standard errors are in parentheses. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively. Individual level sampling weights applied.

Table A3: Robustness of Group-Level Census Estimates

	(1)	(2)	(3)	(4)	(5)	(6)
	Southern Teacher	Other Southern Professional	Southern Non-Professional	Teacher Outside of South	Non-Teacher Outside of South	Not Working
<i>A: Small Cells Excluded</i>						
Black × Y1970	-0.025** (0.012)	0.001 (0.009)	0.015 (0.015)	0.020*** (0.007)	0.024 (0.018)	-0.035** (0.014)
Number of Groups	4,566	4,566	4,566	4,566	4,566	4,566
Individual Observations	39,344	39,344	39,344	39,344	39,344	39,344
<i>B: Unweighted</i>						
Black × Y1970	-0.059*** (0.014)	0.004 (0.011)	0.027* (0.014)	0.024*** (0.008)	0.005 (0.017)	-0.002 (0.013)
Number of Groups	5,978	5,978	5,978	5,978	5,978	5,978
Individual Observations	41,522	41,522	41,522	41,522	41,522	41,522
<i>C: Ages 20-70</i>						
Black × Y1970	-0.028*** (0.009)	0.002 (0.008)	0.010 (0.011)	0.022*** (0.006)	0.029** (0.013)	-0.035*** (0.011)
Number of Groups	7,400	7,400	7,400	7,400	7,400	7,400
Individual Observations	52,841	52,841	52,841	52,841	52,841	52,841
<i>D: Ages 30-60</i>						
Black × Y1970	-0.039*** (0.014)	0.000 (0.010)	0.017 (0.016)	0.016** (0.008)	-0.005 (0.019)	0.011 (0.013)
Number of Groups	4,186	4,186	4,186	4,186	4,186	4,186
Individual Observations	28,505	28,505	28,505	28,505	28,505	28,505
<i>E: Not Grouped by Educ.</i>						
Black × Y1970	-0.030** (0.012)	0.002 (0.008)	0.011 (0.012)	0.023*** (0.006)	0.002 (0.013)	-0.007 (0.012)
Number of Groups	2,666	2,666	2,666	2,666	2,666	2,666
Individual Observations	42,998	42,998	42,998	42,998	42,998	42,998

Notes: Relative to the baseline results in Panel A of Table 4, the models in Panel A exclude groups containing fewer than five individual observations; the models in Panel B give equal weight to each group; the models in Panel C include individuals who were ages 20-60 in 1960 or 30-70 in 1970; the models in Panel D include individuals who were ages 30-50 in 1960 or 40-60 in 1970; and the models in Panel E use groups formed with each possible permutation of birth cohort, state of birth, gender, and race, but exclude educational attainment as a grouping variable. Standard errors, clustered at the group level, are in parentheses. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.