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School Segregation under Color-blind Jurisprudence: The Case of North Carolina

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Abstract

Using detailed administrative data for the public K-12 schools of North Carolina, we measure racial segregation in the public schools of North Carolina. With data for the 2005/06 school year, we update previously published calculations that measure segregation in terms of unevenness in racial enrollment patterns both between schools and within schools. We find that classroom segregation generally increased between 2000/01 and 2005/06, continuing, albeit at a slightly slower rate, the trend of increases we observed over the preceding six years. Segregation increased sharply in Charlotte-Mecklenburg, which introduced a new choice plan in 2002. Over the same period, racial and economic disparities in teacher quality widened in that district. Finally, we compare our basic measure to two alternative measures of segregation.

Keywords: K-12 education, race, segregation, teacher quality

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1. Introduction

Despite the abolition of state-sponsored school segregation, American public schools continue to exhibit enrollment patterns by which students of the same racial and ethnic group are often concentrated in schools together. Today such patterns of concentration and unevenness are generally referred to as "segregation," a term that was used in the era of *Brown v. Board of Education* (1954) to refer to legally-enforced separation of the races. In the May 2003 issue of this *Review*, we presented calculations showing patterns and changes in segregation in North Carolina's public schools. In the current article, we update our earlier calculations, presenting findings extending to the 2005/06 school year.

Far from being a routine or purely academic exercise, updating our previous work has real significance, both for law and for the implementation of public policy. Since our previous study, the Supreme Court has ruled, in *Parents Involved in Community Schools v. Seattle School District, No. 1* (127 S.Ct. 2738 (2007)), that school districts may not assign students to schools based on race, even if for the purpose of reducing racial segregation. Added to previous decisions in *Board of Education of Oklahoma v. Dowell* (1991) and *Freeman v. Pitts* (1992),[2] which ruled

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[2] *Board of Education of Oklahoma v. Dowell*, 498 U.S. 237 (1991); *Freeman v. Pitts*, 503 U.S. 467 (1992).

that school districts declared "unitary" have no obligation to offset de facto segregation in schools resulting from residential segregation, this newest decision has raised concerns that districts will be left with few policy tools, should they be so inclined, to thwart the "resegregation" of their schools.[3] At present, there exists only limited evidence to determine how seriously these concerns should be taken. In Clotfelter, Ladd and Vigdor (2006) we examined segregation trends in the 100 largest school districts in the South and Border states. In addition to an analysis of the effect of declarations of unitary status, we sought to measure the effect of judicial prohibition of race-conscious assignment policies such as those struck down in *Parents Involved*. A series of decisions issued in the Fourth Circuit Court of Appeals beginning in 1999 enunciated this very prohibition.[4] To assess the effect, if any, of a ban on race-conscious pupil assignment policies, we compared school districts under the jurisdiction of the Fourth Circuit with school districts in other judicial circuits. Although some of our findings suggested that the prohibition was associated with increased segregation, our sample period ended too soon for us to be confident that the prohibition of race-conscious policies had a statistically significant effect.

Because North Carolina is one of the states in the Fourth Circuit, its public schools have now been subject to the ban on race-conscious student assignment policies for several years. Like the canary taken into the coal mine, its schools can be viewed as an early warning of the possible consequences of the 2007 *Parents Involved* decision. Although the lack of comparison data for states under different rules makes it impossible to isolate statistically the causal effect of this ban,

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[3] See, for example, Orfield and Lee (2004).

[4] *Capacchione v. Charlotte-Mecklenburg Schools*, 57 F. Supp. 2d 228 (W.D.N.C. 1999); *Eisenberg v. Montgomery County Public Schools*, 197 F.3d 123 (4th Cir. 1999); *Tuttle v. Arlington County School Board*, 195 F.3d 698 (4th Cir. 1999). For an analysis of these decisions, see Boger (2000).

we believe there is compelling circumstantial evidence to suggest that the ban has had the effect of increasing racial segregation in North Carolina schools.

We have addressed in two previous studies the question of whether public schools are becoming more segregated. In our 2003 article in this *Review* covering North Carolina public schools, we found that segregation between white and nonwhite students had in fact increased between 1994/95 and 2000/01. We observed increases across the board, in districts large and small and urban and rural, in elementary as well as secondary schools, and within schools as well as between schools. However, a second study extending beyond North Carolina produced a different result. In it, we analyzed segregation trends using data from the largest 100 districts in the South and Border states, over the period 1993/94 to 2003/04. In contrast to our findings for North Carolina, we did not observe a general increase in segregation as understood in the conventional sense of unevenness in racial composition across schools. The only measure that showed any trend over time was the percentage of nonwhite students attending schools that were 90 to 100% nonwhite in composition, a widely used measure of racial isolation. We believe this increase reflects the purely demographic increase over time in the nonwhite share of students, however, rather than any rise in the unevenness that is central to the notion of segregation. Although we include in our results this measure of racial isolation, we use as our basic indicator of segregation an index that measures unevenness in the racial composition of classrooms and schools.

The remainder of the paper is organized as follows. Section 2 describes the variety of student assignment and transfer policies in North Carolina and how they changed as a result of the Fourth Circuit's rulings against race-conscious assignment policies. Section 3 gives a brief

description of our data and methodology. Section 4 describes our new findings and compares the levels of segregation in North Carolina with those in similar districts in other states. In section 5 we address the possibility that increasing segregation may reduce the quality of schools attended by disadvantaged or minority students. We explore this link by focusing on one noteworthy North Carolina district – Charlotte-Mecklenburg – and on recent changes there in the distribution of school resources. Section 6 addresses a potential shortcoming of our measure of segregation by comparing our basic segregation measure to two alternative measures. We conclude in section 7 with a brief summary of our findings and some speculation concerning future trends in segregation.

2. Student Assignment Policies following the Fourth Circuit's Prohibition

The experiences of a few of the state's largest districts illustrate how the ban on race-conscious student assignments might affect local decisions. We note in particular the policies adopted by Winston-Salem/Forsyth, Charlotte-Mecklenburg, and Wake County. From 1971 to 1995, Winston-Salem/Forsyth operated a robust desegregation plan that assigned and transported students to maintain racially balanced schools throughout that large district. A newly elected school board in 1995 scrapped this plan in favor of a "controlled-choice" plan that divided the county into eight subsections and then allowed parents to choose from among the schools in their subsection. Although the school board enunciated the goal that no school would deviate more than 20 percentage points from the district's overall composition, no controls were ever put in place to bring that about. Complaints about racial imbalances were made to the U.S. Office for Civil Rights, which eventually approved the plan in 2000 after the district agree to establish

several magnet schools.[5]

Like Winston-Salem/Forsyth, Charlotte-Mecklenburg Schools had operated under a district-wide busing plan throughout most of the 1970s and 1980s. The district began to modify this plan in 1992 with the introduction of magnet schools designed to attract white students voluntarily to downtown schools. Racial balance was maintained with the use of quotas. It was a challenge to these quotas (*Capacchione v. Charlotte-Mecklenburg Schools* (1999)) that resulted in one of the Fourth Circuit's signal decisions banning race-conscious assignments. In the fall of 2002 the district dramatically revamped its student assignment policy by adopting a school choice plan guaranteeing that all children – including the children of suburban parents living in predominantly white neighborhoods – could attend their neighborhood school.[6] Although the plan allowed students from Charlotte's predominantly black downtown neighborhoods to request suburban schools, capacity limits rendered many of these requests infeasible. Some critics complained that this plan led to increased segregation in the district's schools.[7]

Unique in the state and virtually so in the nation, Wake County (the county including Raleigh) responded to the Fourth Circuit's ban on race-conscious assignments in a different way. Until 2000 it had balanced its schools by revising school assignments every few years with the

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[5] For descriptions of the plan, the complaint, and the outcome, see Susan Abramson, "Redistricting Plan is Completed," *Winston-Salem Journal*, March 26, 1995, p. A1; Kristin Scheve, "Proposed Changes to School Plan Get Cool Reply," *Winston-Salem Journal*, March 31, 1999, p. A1; Clotfelter, Ladd and Vigdor 2006, pp. 369-70.

[6] In 1992 the district had replaced its *Swann*-sanctioned policy of wholesale racial balance through busing with a plan that utilized magnet schools and racially-conditioned transfer rules. It was a challenge of these rules that resulted in the *Capacchione* ruling.

[7] School board chairperson Wilhelmenia Rembert stated, "We have guaranteed convenience for the most able and the most advantaged in our community" ("Choice: 'My Worst Fear was Realized,'" *Educate!*, November 13, 2003). See also Godwin, Leland, Baxter, and Southworth (2006).

aim of keeping the racial compositions of all schools within a narrow band of racial composition.[8] In 2000 the school board decided to retain its practice of periodic reassignments but to jettison race as a basis for making them, substituting socioeconomic status and academic performance in its place. From 2000 to 2007, the district's stated objective was to have no more than 40% of the students in any school on free or reduced price lunch or more than 25% scoring below grade level.[9] Owing to the district's rapid growth, this policy of socioeconomic balancing has resulted in wholesale reassignments every few years, which in turn have unleashed periodic firestorms of criticism and protest.[10]

Meanwhile, the state's other 114 districts, most of which were subject to the same Court of Appeals prohibition, also grappled with school assignment policies over this period in different ways. In Orange County, for example, the school board debated through much of 2007 what to do about two neighboring elementary schools with markedly different racial and socioeconomic profiles.[11] In Durham County, a controlled choice plan allowed parents to choose among an array of magnet schools, special programs, and year-round schools. In 1999 Durham dropped racial guidelines as a factor in approving school assignments, using instead race-blind

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[8] Wake eliminated in 1999 the racial preference mechanism previously used to fill its magnet schools.

[9] Anand Vaishnav, "Desegregation by Income Gets Wary Reception in N.C.," *Boston Globe*, June 3, 2002; Wake County Public School System, Student Assignment Process, district Web Page, http://www.wcpss.net/growth-management/student-assign-process.html, accessed 10/8/07.

[10] For example, families in the Farmington Woods neighborhood in Cary staged a march to protest planned reassignments in December 2007 (T. Keung Hui, "Parents, Students Protest Reassignment," *Raleigh News and Observer*, December 20, 2007.) The PTA at another school in Cary, Davis Drive, passed a resolution opposing the proposed reassignments. One school board member stated, "We're dealing with affluent parents, who are talking about having an attorney on retainer." (T. Keung Hui, "Cary Families Fight Schools Reassignment," *Raleigh News and Observer*, January 17, 2008.)

[11] Cheryl Johnston Sadgrove, "Orange to Keep School Separate," *Raleigh News and Observer*, December 15, 2007, p. 3B.

lotteries to fill spaces in over-subscribed magnet schools.[12] Many districts simply allowed transfers between schools if space was available. But a few districts, operating under the continuing supervision of various federal desegregation orders, continued to take race into account in making assignments or approving transfers. One of these was Franklin County, which, under a consent decree emanating from a federal district court, provided for majority-to-minority transfers.[13] Beyond such explicit student assignment policies, school boards across the state and nation routinely face scores of decisions – from new construction to year-round schools – that have implications for racial segregation.

3. Data and Methodology

We employ detailed enrollment data covering all the public schools in North Carolina, including charter schools.[14] Unlike most research on school segregation, this study uses information collected at the classroom level, which enables us to measure segregation within schools as well as between schools. This feature of our approach makes it possible to assess the

[12] Between 1999 and 2001 the district took into account location and socioeconomic status of applicants, but made the lotteries random thereafter, except for preferences given to siblings, those within walking distance to the school, or those whose previous program linked to the magnet school's program (personal communication, Bill Bartholomay, Durham Public Schools, January 15, 2008). See also Bifulco, Ladd, and Ross (2007, p. 11).

[13] Under this policy, a student in racial group X could transfer to another school in the district if the percentage of X students in his previous school was greater than the district's overall percentage of X students and the school to which he planned to transfer had a percentage of X students less than the district average. *Coppedge v. Franklin County Board of Education*, U.S. District Court for the Eastern District of North Carolina, Western Division, Civil Action No. 1796 (2004). Other districts whose Web sites in November, 2004 mentioned racial preferences in rules for assignments or transfers were Bertie and Rockingham.

[14] Charter schools are part of the public school system. But, because charter schools are not under the direction of the school district where they are located, the degree of segregation calculated for districts clearly cannot therefore be attributed entirely to the policies of those districts. In our previous study of school segregation in North Carolina (Clotfelter, Ladd and Vigdor 2003), we found that, because charter schools in the state tend not to be as racially diverse as conventional public schools, their existence tends to raise the degree of segregation in the public schools as a whole.

effects of academic tracking and other types of grouping within schools that are often identified as culprits in contemporary segregation (Oakes and Guiton 1995). Identifying the classroom grouping is not straightforward, however, because students rarely spend all their time in a single classroom over the course of a school day, even in elementary schools. For this reason, we use the detailed data available for each school to identify representative classroom assignments, focusing in middle schools and high schools on English classes, since English is a required subject for all students.[15] We identify classrooms containing any students in 1st, 4th, 7th, and 10th grades and then use all students in those classrooms for our calculations. Besides their grade level, students are classified as white or nonwhite in the basic measures of segregation.[16]

The segregation index we use is based on the concept of interracial exposure. If one had data only at the school level, as is typically the case, the exposure of white students to nonwhite students (E_k*) would be the weighted average of nonwhite shares in various schools, where the weights are each school's white enrollment. This exposure rate answers the question, "what is the nonwhite share in the school attended by the average white student?" The segregation index we use is defined as the percentage gap between the nonwhite percentage in the district (n_k) (which is the maximum exposure rate that could ever be attained – if all schools in the district were

[15] To recapitulate our approach briefly, we sought to identify the courses in grades 1 and 4 and the English courses in grades 7 and 10 that enrolled a number of students in each school closest to the school's total enrollment for that grade level. When the selected course yielded sections of 30 or less, we counted all students, whether or not they were in the designated grade. For sections over 30, we counted only those from the designated grade, on the assumption that that school's records did not explicitly distinguish among truly separate sections of the same course that were in fact designed for different grade levels. A more detailed description is given in Clotfelter, Ladd, and Vigdor (2003, pp. 1475-1477, 1508-1511). The methodology used in the current paper utilizes a slightly modified approach in programming making the choice of the course to use in forming classrooms in middle school and high school, which leads to small changes from the previous article in many of the calculations for 2000/01.

[16] In one alternative measure to this basic segregation measure, we divide students into four groups (white, black, Hispanic, and other) and calculate an index based on how evenly all four of those groups are distributed. This measure is described and applied in section 6.

exactly balanced racially) and the actual exposure rate of white students to nonwhite students. This index S_k^B measures the degree to which the actual distribution of students diverges from a racially balanced distribution. For district k, this gap-based segregation index is calculated as

$$S_k^B = (n_k - E_k^*) / n_k . \qquad (1)$$

For a district in which all schools were racially balanced and thus each school reflected the overall racial composition of students in the district, S_k^B would take on its minimum value of zero. By contrast, if schools were completely segregated, so that white and nonwhite students attended no schools in common, the exposure rate E_k^* would be zero, and the index would take on its maximum value of 1.

This same approach can be applied to segregation at the classroom level by calculating exposure rates using classrooms rather than schools as the unit of measurement. Furthermore, segregation can be decomposed into a portion attributable to racial disparities within schools and a portion due to disparities between schools.[17]

Table 1 presents some summary statistics for the year 2005/06. Statistics are given for the state's five largest school districts and for the remaining districts, classified by region (Coastal, Piedmont, and Mountain) and by urban and rural.[18] As indicated in the top row of the table, the state's public school population of 1.4 million students was quite diverse in terms of racial and ethnic minority representation. Black students comprised 31% of the total, Hispanic students 8%, and other nonwhite students another 4%. Total enrollment grew at a rate of 1.9% a year over the

[17] For an explanation of this decomposition, see Appendix A.

[18] All districts in counties that were 45% or more urban in 1990 were classified as urban, as were all city districts in any county with enrollments of at least 2,000 in 2001/02, not counting charter school enrollments. The boundaries between Coastal, Piedmont, and Mountain counties were taken from North Carolina Division of Travel and Tourism, *Yours to Discover: North Carolina State Parks and Recreation Areas* (1998).

five-year period. Dwarfing this overall rate, however, was the explosion in Hispanic enrollment, which swelled at a rate of 14.8% a year, reflecting the rapid influx of Mexican immigrants into the state over this period. In addition to state totals, the table also gives figures for the state's five largest districts and for urban and rural districts, each divided into the state's three geographic regions.[19] As indicated by the breakdowns, most districts across the state were racially and ethnically diverse, although the districts in the western mountain districts tend to be predominantly white.

4. Trends in School Segregation in North Carolina

Because most measures of school segregation are by necessity based on school-level rather than classroom-level enrollment data, we begin by calculating those more common measures, as shown in Table 2. The first three columns show segregation indices measuring the unevenness within districts in the racial composition of entire schools. These calculations reveal that segregation continued the upward trend established in the previous six-year period, though at a slightly reduced rate of increase. Whereas the average school-level segregation rate in the previous period had risen from 0.10 to 0.13, it increased to 0.15 over the next five years. Among the five largest districts, by far the biggest change occurred in Charlotte-Mecklenburg, where the index increased sharply, from 0.20 to 0.33. Thus the district's choice plan introduced in 2002 appears to have markedly increased segregation. No other large district or district group experienced a change as dramatic as Charlotte's.

Table 2's last three columns employ a widely-used index, the percentage of nonwhite

[19] See Clotfelter, Ladd and Vigdor (2003) for sources and definitions underlying these geographic and size classifications.

students attending schools with very few or no white students. Although this measure is not a reliable indicator of segregation in the sense of unevenness – in part because it is necessarily influenced by a district's overall racial composition – it remains a readily understood metric of racial isolation. Like the segregation index, this measure also increased in most districts. Statewide, the percentage of nonwhite students attending schools that were 90-100% nonwhite in composition rose from 10.3% to 15.8% over the five years. The jump was especially large again in Charlotte-Mecklenburg, which saw a five-fold increase in this measure. Thus Charlotte's rise in segregation manifested itself in a big jump in the proportion of minority students who attended racially isolated, all- or mostly-nonwhite schools. Interestingly, Guilford saw a sizable 12.9 percentage point increase while its segregation index hardly changed.

We turn to our classroom level analysis of segregation in Table 3. As noted above, we calculated segregation indices based on disparities not only between schools in a district, but also among classrooms within schools. We performed these calculations at four grade levels – 1st, 4th, 7th, and 10th . Table 3a presents state-wide averages of segregation at each grade level based on classifying all students as either white or nonwhite. Like the trends based on the school-wide measures shown in Table 2, these indices show that average segregation in North Carolina's schools and classrooms increased between 2000/01 and 2005/06, continuing the general upward trend that we observed in the earlier period. In grades 1 and 4, average segregation rose from 0.20 to 0.22 between 2000/01 and 2005/06. Segregation also increased in the two upper grades, rising by 0.01 in grade 7 and by 0.04 in grade 10. Note that in every year the calculated indices at every grade exceed the corresponding ones in Table 2 calculated at the school level. Such differences are to be expected, since the classroom-based figures shown in Table 3a reflect not only the

racial disparities across schools, as those in Table 2 do, but also those across the classrooms within a school.

Table 3b goes beyond the white-nonwhite dichotomy to analyze segregation between different pairs of racial or ethnic groups. In each two-way comparison, all students not in one of the two analyzed groups are ignored. With one exception (white-black segregation in grade 10), segregation indices in 2005/06 were higher between the more detailed groups than between white and nonwhite students. From 2000/01 to 2005/06, segregation rose as much or more between white and black students and between white and Hispanic students than between white and nonwhite students. Significantly, white-Hispanic segregation rose markedly in the elementary grades, grades that have seen the most rapid rise in numbers of Hispanic students. One possible explanation for this correspondence is that newly arriving Hispanic students may have been clustered together in a relatively few schools. Over the same period, we observe virtually no change in Hispanic-black segregation in elementary grades, a decline in grade 7, and an increase in grade 10.

In Table 4 we return to the white-nonwhite dichotomy and show how segregation measured at the classroom level can be attributed to racial disparities of two kinds: those between the schools in a district and those across classrooms within schools. As we showed in our previous study, within-school segregation is quite minimal in elementary schools, but grows more important in middle school and high school. In grade 10, within-school segregation explains roughly half of total school segregation. As the table shows, these patterns by grade are also reflected in most of the districts and district groups shown.

Comparing segregation across the highlighted districts and district groups, the patterns of

between-school segregation shown in Table 4 closely track those shown of the school-level calculations shown in Table 2. The highest rates of between-school segregation are observed in Charlotte-Mecklenburg, Guilford, and Winston-Salem/Forsyth. The lowest rates occur in the Mountains and rural districts in the Coastal region. Patterns of within-school segregation are less amenable to summary. Particularly at grade 10 the extent of within-school segregation varies noticeably, often being highest where between-school segregation is lowest. This pattern suggests that within-school segregation may be used by school authorities to impose a degree of segregation not attained through school assignments.

How does segregation in North Carolina compare to that elsewhere? To give some perspective on this question, we note three pieces of comparative data. First, Orfield and Lee (2004, Tables 11 and 14) present comparisons among states based on a measure of racial isolation – the percentage of black students who attended racially isolated schools (those with 90% or more nonwhite enrollments).[20] They used data for the 2001/02 year for the 33 states where black students constituted at least 5% of the state's total. North Carolina ranked 28th on this list, making it one of the least segregated states. By this measure the six states with the highest rates of racial isolation in public schools were all in the Northeast and industrialized Midwest, topped by Michigan with 62.7% of its black students attending these racially isolated schools. Next were Illinois (61.0%), New York (60.8%), Maryland (52.1%), New Jersey (50.8%), and Pennsylvania (48.1%). Rates of isolation in states of the former Confederacy ranged

[20] In Clotfelter, Ladd and Vigdor (2006) we argue that measures such as this are imperfect measures of segregation as usually understood because such measures necessarily depend on the overall racial composition the school population being examined. This weakness does not apply to a measure of segregation such as that used in this paper.

from 44.3% in Alabama to 11.3% in North Carolina. The main reason why the urbanized states of the Northeast and Midwest have such high rates of racial isolation is the large number of predominantly black school districts in those regions, not necessarily because of segregation within school districts.

To put North Carolina in national perspective according to the segregation of school districts, we computed segregation indices for a number of similar districts outside the state and compare those districts to similarly-sized North Carolina districts, shown in Table 5. To make the calculations as comparable as possible, we used school-level data and excluded charter schools. For each of three enrollment ranges, we selected comparison districts with racial makeups between 30 and 70% nonwhite.[21] Among the biggest districts, the average of the two North Carolina districts, Charlotte and Wake, is quite close to the median for comparable districts outside of the state. In the other two size categories, however, the median segregation among North Carolina districts in the category exceeds those of corresponding districts outside of the state, suggesting the opposite conclusion from that implied by the Orfield-Lee calculations. Whereas their results show that black students in the Northeast and Midwest are generally more isolated from white students than those in the South, the comparisons shown in Table 5 in the present paper show that, *within districts*, disparities among schools actually tend to be greater in the South than in otherwise similar districts elsewhere. The large differences in isolation highlighted by Orfield and Lee for the Northeast and Midwest arise largely from disparities *between districts.*

[21] We include Buncombe and Cabarrus Counties although their racial compositions fall outside the band used to select comparison districts.

A third comparison is with a study of segregation in New York City using methodology and classroom-level data very similar to that used in the present study. Conger (2005, Table 3, p. 231) finds that white-nonwhite enrollment patterns in New York City in 2000/01 yield a segregation index of 0.419 between schools and 0.036 within schools. At grade 5 the corresponding indices are 0.419 and 0.028, respectively. Although the enormous size of the New York system makes the between-school indices incommensurate, there is every reason to compare the within-school figures, and they in fact are virtually identical to those we observe in North Carolina.

5. Resegregation and Resource Disparities in Charlotte-Mecklenburg

While racial segregation in public schools may be of interest in its own right – for legal, historical, or philosophical reasons – such segregation may also have tangible consequences for the education of students. For example, segregation may affect achievement due to peer effects on learning, or it may affect attitudes and friendship patterns due to the importance of propinquity. But the most readily documented of the educational consequences of segregation is its effect on the distribution of teachers and other school resources, which may in turn affect achievement. Previous research has established the widespread systematic differences in American public schools between those attended by relatively affluent students compared to those attended by less advantaged students. These kinds of disparities also exist between historically advantaged and disadvantaged racial and ethnic groups, such as between white and African American students.[22] The main reason these disparities exist is that teachers in the U.S. have traditionally tended to gravitate toward schools with larger shares of white and affluent

[22] See, for example, Phillips and Chin (2004).

students.[23]

Segregation is a necessary ingredient for such disparities to exist, because if students were distributed randomly across schools and teachers, no category of students could enjoy systematically better resources. In a study of how common it is for 7th graders in North Carolina to have a teacher with no previous teaching experience, we demonstrated the close link between segregation and disparities in this one important measure of teacher quality.[24] In math, for example, 11.3% of black 7th graders in North Carolina had novice teachers, compared to only 7.9% of whites. Some 43% of this difference can be explained by the fact that white and black students attend different schools, and another 31% is due to the fact that these groups tend to be in different classrooms within schools.[25] To be sure, racial segregation is not a sufficient reason for disparities of this kind, but in a world where schools attended by white and middle class students tend to have better resources and more qualified teachers than schools populated by low-income and disadvantaged students, segregation leads directly to resource disparities.

In light of this potential link between segregation and resource distribution, we sought to determine whether *changes* in school segregation result in measurable *changes* in resource disparities. To our knowledge, no previous study has examined this dynamic question. Owing to its large size and its precipitous shift in student assignment policy in 2002, the Charlotte-Mecklenburg district offers an interesting case in point. We chose to focus on four measures of

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[23] Among the studies showing teachers' preferences for such schools, see, for example, Lankford et al. (2002).

[24] Research offers strong support for the superiority of experienced teachers over novice teachers. See, for example, Clotfelter, Ladd and Vigdor (2006).

[25] In English, the white-black gap in exposure is 2.7 percentage points. The portion of the difference due to schools is 33% and that for classrooms is 35% (Clotfelter, Ladd and Vigdor 2005, Table 3).

average teacher quality, all of which have been associated with gains in student achievement. We determined for each school the percentage of its teachers: (1)with three or more years of experience, (2)who scored in the top quartile on standardized teacher tests; (3)who had attained National Board certification; and (4)who were fully certified as teachers.

To compare the exposure of white and black students to such teachers in their schools, we calculated weighted averages of the percentage of a school's teachers in each category using as weights, successively, the number of white and black students in each school. To compare the prevalence of such teachers in more affluent versus less affluent schools, we first divided schools in the district into quartiles based on the percentage of students receiving free or reduced price lunches. Because the take-up rates for subsidized lunches typically differ by level of school, we formed these quartiles using different break points for elementary, middle, and high schools.[26] We then simply calculated the percentage of all teachers with the four selected characteristics in each income quartile of schools. To indicate differences by income, we compared the rates between the top and bottom quartile schools.

Table 6 shows how resource disparities changed in Charlotte-Mecklenburg in the wake of the district's new student assignment plan and accompanying increase in racial segregation. Focusing first on the differences by race, the table indicates that, for every one of the teacher quality indicators, white students were more likely than black students to attend schools with these teachers. For example, in 2000/01 the percentage of teachers with three or more years

[26] The lower bound value percentage free lunch for quartiles 1, 2, and 3, respectively, where each category is inclusive of the lower bound value, are: elementary: 2000/01: 53.3, 37.3, and 26.9; 2005/06: 75.5, 51.5, and 22.0; middle school: 2000/01: 44.0, 32.6, and 23.4; 2005/06: 69.4, 47.3, and 24.0; high school: 2000/01: 28.0, 17.5, and 11.1; 2005/06: 50.5, 37.6, and 16.9. for the district as a whole, the percentage of students eligible for free lunch increased rather steadily over the period, rising from 34.8% in 2000/01 to 43.2% in 2005/06.

teaching experience was 76.6% in schools attended by white students but only 73.7% in schools attended by black students, for a gap of 2.9 percentage points. The white-black gap for high-scoring teachers was 8.4 percentage points, and so on. These disparities mirror those found in previous studies.

What is new and striking here is how these disparities changed in the wake of the district's increase in segregation. For three of the four measures, the extent of white advantage increased over the period spanning Charlotte-Mecklenburg's change in student assignment policy in 2002. For exposure to experienced teachers, the disparity rose from 2.9 to 4.2 percentage points; for high-scoring teachers it rose from 8.4 to 8.6 percentage points; and for certified teachers it rose from 2.2 to 3.8 percentage points. Only for National Board Certified teachers did the disparity not increase; instead it remained constant. Thus the cross-section patterns of disparity noted in previous research has a dynamic element as well, at least in the Charlotte case. For the most part, therefore, more segregation begat larger racial disparities.

The bottom part of the table paints a similar picture by comparing high- and low-income schools. For each of the four measures of teacher quality, teachers in the most affluent schools (those in the lowest quartile of percent free lunch) were more likely to possess them than were teachers in the poorest schools. And, for every one of the four measures, these disparities widened over the period spanning the district's marked rise in racial segregation. These increases ranged from 2.1 percentage points (for the percentage of teachers scoring in the top quartile of test takers) to 5.4 percentage points (for the percentage of National Board certified teachers).

The growing racial disparities among schools in the Charlotte/Mecklenburg district, therefore, appears to have resulted in real consequences beyond the racial makeup of schools. As

a result, disparities in teacher quality that had existed between white and black students grew more pronounced, as did the majority of disparities between high- and low-income schools.[27]

6. Two Alternative Measures of Segregation

The measure of segregation that we use in this and previous papers, like the more widely used dissimilarity index, has at least two qualities that may expose it to criticism. One is that our measure simplifies the measuring of racial and ethnic diversity by designating all students as either white or nonwhite. The other is that the racial balance benchmark it employs may be unrealistic. We discuss each aspect in turn.

The first potential drawback of our segregation index is its dichotomous racial/ethnic division – white and nonwhite. Given the growing numerical importance of racial and ethnic groups other than white and black, it is instructive to go beyond this simplified dichotomy to see if different findings emerge. One segregation measure that can account for multiple groups is the entropy index.[28] We divide students into four groups: white, black, Hispanic, and other nonwhites. This index measures the extent to which students of these groups are distributed evenly across classrooms in a district. Like our basic segregation index, the entropy index has a maximum value of 1, indicating that classrooms that are completely separated by race, and a minimum value of 0, indicating racial balance across all classrooms.

Table 7 presents the calculated entropy measure for the state, the five largest districts, and the six district groups. Although the indices are not comparable in magnitude to the basic two-

[27] In an apparent attempt to limit teacher transfers that would aggravate existing disparities, Charlotte-Mecklenburg in 2003 barred transfers of teachers into some 26 schools deemed sufficiently stocked with experienced teachers. [cite] xxx

[28] Equations A-8 to A-10 in Appendix A provide a precise definition of the entropy index.

group measure, the patterns and changes in this measure paint a similar picture as that conveyed by the basic measure. For the state as a whole, segregation increased at each grade level, as with the basic measure. Among the five largest districts, both measures show Charlotte-Mecklenburg, Guilford and Winston-Salem/Forsyth as the most segregated large districts at each of the four grade levels, and both show that segregation increased by the largest amount in Charlotte-Mecklenburg. Among the district groups the entropy measure indicates that segregation is highest in the Piedmont, a regularity not evident with the basic measure. Nevertheless the two measures are highly correlated. Across the state's districts the correlation between them in 2005/06 was 0.90 in grades 1 and 4, 0.72 in grade 7, and 0.62 in grade 10.[29]

The second potential shortcoming of the segregation index we use in the current paper is its reliance on precise racial balance as the benchmark for judging unevenness of distributions rather than the arguably more realistic benchmark of a random assignment of students. In order to achieve zero segregation under the segregation index we employ, a district would need to distribute students so that not only every school would have the same nonwhite percentage, every classroom would as well. Although the first of these can be achieved to a high degree of precision in almost any school district, this outcome will be less feasible in classrooms, owing to the indivisibility of students and thus the limited number of possible classroom racial distributions. In other words, perfect racial balance, the requirement for measured segregation to reach its minimum value of zero, strictly speaking, is unrealistic. By this reasoning, it might be more realistic to compare actual school assignments to a random distribution of students within

[29] Correlations calculated by weighting by district enrollment in the corresponding grade.

each school.[30]

To see how actual segregation compares to a random rather than a perfectly balanced distribution, we apply our segregation measure to a hypothetical distribution of students wherein the racial composition of each school remains the same but students are distributed randomly among the classrooms. We then compare the resulting segregation index to our basic measure based on actual classroom assignments. In terms of our decomposition, whatever difference this variation makes will occur in the within-school portion of total segregation. If the net effect of in-school assignments – such as those that would arise from racially-non-neutral tracking – is to raise within-school segregation above what it would have been had students simply been assigned randomly, our basic measure will exceed the index based on a random assignment. If, however, school administrators have racially balanced their classrooms so effectively that they are more balanced than random, we will observe just the opposite, a negative difference.

Table 8 shows this side-by-side comparison of within-school segregation indices for the state and the five largest districts for 2005/05 and 2000/01. For the two elementary grades, the differences are quite small, and in some cases negative, indicating that most elementary schools assigned their 1st and 4th graders to classrooms so as to be nearly racially balanced. The within-school segregation at grade 1 that would have resulted from students being randomly assigned in 2005/06 for the state as a whole was 0.033, just below the actual rate of 0.034. In four of the five largest districts, actual segregation was *lower* than it would have been had students been assigned to classrooms randomly. In grade 4, actual segregation remained very close to the random

[30] For a discussion of this point and references to other studies to it, see Carrington and Troske (1997) and Conger (2005).

standard.[31] Only in grades 7 and 10 was actual within-school segregation consistently higher than what would have occurred randomly, with the differences in high school being the largest, an apparent result of academic tracking. What these calculations show is that the observed levels of within-school segregation in North Carolina, already quite low in elementary grades, would be judged even smaller if the comparison were made to a random distribution of students rather than to strict racial balance.

7. Conclusion

Racial segregation in North Carolina's schools continued to increase in the first five years of the new millennium, albeit at a somewhat reduced rate compared to the previous six-year period. Among the state's 117 school districts, the large and racially diverse district that includes Charlotte stood out for the rapid rise in measured segregation following its adoption of a new student assignment policy that made it easier for parents to send their children to neighborhood schools. One consequence of this rise in segregation in Charlotte-Mecklenburg was larger racial and economic disparities in measured teacher quality. Notably, large jumps in segregation over the period studied were the exception, with most districts experiencing gradual increases. In terms of explicit student assignment policy, Wake County served as the bookend, with its policy of periodic rebalancing based on students' socioeconomic status.

What of the future? Since North Carolina operated under a judicial ban on race-conscious student assignments, similar to that now mandated for the nation by the 2007 decision in

[31] In comparison, Conger's (2005, Table 5, p. 233) calculations for New York City schools show within-school segregation slightly higher than that which would have obtained with random assignment. For 2000/01, she obtains actual within-school segregation of 0.036 and 0.028 for grades 1 and 5, respectively, compared to 0.021 and 0.016 for the corresponding random outcomes.

Concerned Parents, we take these results to be indicative of trends that might be expected to occur more broadly in the years to come. In the absence of assignment plans similar to Wake County's use of socioeconomic status, we expect the ban on race-conscious assignments to have a short-run and a long-run effect on school segregation. In the short run, we expect that school segregation will tend to rise to approximate the level of residential segregation. As we showed in our 2003 article by comparing school and census data for 2000, schools in North Carolina were less segregated than the corresponding residential areas. But now that neighborhood schools appear to be the default basis for student assignment, we would expect school composition increasingly to resemble neighborhood composition, at least among elementary schools, whose sizes are typically no larger than that of a few neighborhoods. In the long run, we would anticipate this newly created dependence of schools on neighborhoods to heighten the importance of school racial composition in families' choices about where to live. The newly mandated policy of neighborhood schools will, we believe, tend to lead to more residential segregation if white and middle class parents seek to avoid schools with significant numbers of nonwhite students, as has been the pattern in the past. One need only look to the urban areas of the Northeast and Midwest, where neighborhood schools have been the rule for many years, to imagine the future for school segregation. Pending marked changes in the preferences of parents, only school districts that make a point to adopt policies that unhook the close relationship between neighborhood racial composition and school racial composition can hope to avoid a creeping increase in segregation.

Appendix A

Calculated exposure rates and segregation indices presented in the paper employ data on classrooms (denoted i), schools (j), and districts (k).

Segregation index

At the school level the segregation index is defined as:

$$S_k^B = (n_k - E_k^*) / n_{k,} \qquad \text{(A-1)}$$

where n_j is school j's nonwhite percentage and the exposure rate of white to nonwhite students in district k is:

$$E_k^* = [\sum W_j \; n_j \,] / \sum W_j, \qquad \text{(A-2)}$$

where W_j is the number of white students in school j.

These measures can be applied at the classroom level. For most calculations, students are divided into white and nonwhite, where W_{ij} is, for example, the number of white students in classroom i, school j in a particular grade in a given district. For any district k, the exposure rate of white students to nonwhite students for a particular grade is

$$E_k = [\sum \sum \; W_{ij} \; n_{ij} \,] / \sum \sum \; W_{ij} \qquad , \qquad \text{(A-3)}$$

where n_{ij} is the percentage nonwhite in classroom i, school j. This rate is equal to the percentage nonwhite in the typical white student's classroom. As noted in the text, we performed these calculations for classes that contained any students in grades 1, 4, 7, or 10, counting all students in those classrooms regardless of grade level.

This exact exposure rate can be compared to the exposure rate based on school-wide racial composition:

$$E_k^* = [\sum W_j \; n_j \,] / \sum W_j, \qquad \text{(A-4)}$$

where W_j is the number of white students in all the school's classrooms corresponding to each grade level in school j and n_j is its nonwhite percentage. Whereas E_k gives the racial composition of the typical white student's classroom, E_k^* gives the racial composition of that student's *school*. Unless the classrooms in each school are racially balanced at that school's racial composition, this exposure rate will be lower than the exposure rate defined above, using school racial compositions (E_k^*). Thus,

$$E_k \leq E_k^* \leq n_k .$$

Segregation in district k is defined as the percentage gap between the maximum exposure rate, that which would result from racial balance throughout all schools and classrooms in a district, and actual exposure E_k:

$$S_k = (n_k - E_k) / n_k . \qquad \text{(A-5)}$$

This segregation can be decomposed into two components: (1) the portion due to racial disparities at the classroom level, within schools:

$$S_k^W = (E_k^* - E_k) / n_k , \qquad \text{(A-6)}$$

and (2) the portion due to racial disparities between schools, within a district (as defined in the text):

$$S_k^B = (n_k - E_k^*) / n_k . \qquad \text{(A-7)}$$

Note that S_k^B is the conventional measure of segregation, based on school-level data alone.

Entropy index

The entropy measure is defined as follows. Where *g* indexes racial groups and *j* indicates schools, a district's entropy index is

$$H_k = \sum_j t_j (F_k - F_j) / F_k \qquad \text{(A-8)}$$

where t_j is school j's proportion of district enrollment,

$$F_j = \sum_g p_{gj} \ln (1/p_{gj}), \text{ and} \qquad \text{(A-9)}$$

$$F_k = \sum_g p_g \ln (1/p_g), \qquad \text{(A-10)}$$

where p_{gj} is group *g*'s proportion in school *j*, and p_g is group *g*'s proportion of district enrollment.[32]

[32] For further discussion of this index, see Clotfelter, Ladd, and Vigdor (2006).

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Table 1. Enrollment and Racial Composition in North Carolina Public Schools, 2005/06, State and District Groups

		Percentage of students				Growth rate for enrollment, 2000/01-2005/06	
	Total enrollment	Black	Hispanic	Other nonwhite	All nonwhite	All	Hispanic
State of NC	1,405,670	31.4	8.3	3.6	43.3	1.9	14.8
Five largest districts							
Charlotte-Mecklenburg	126,720	45.4	11.7	4.8	61.9	3.9	19.2
Wake	125,501	30.5	8.9	5.0	44.4	4.7	18.3
Guilford	70,237	44.6	6.8	4.9	56.3	2.0	16.5
Cumberland	52,514	51.5	6.3	3.6	61.4	0.6	4.5
Winston-Salem/Forsyth	51,474	37.7	13.5	1.8	53.0	2.3	17.3
Other urban							
Coastal	141,045	42.0	6.0	1.4	49.4	1.1	13.3
Piedmont	140,422	37.3	11.5	2.8	51.6	1.9	14.9
Mountain	94,415	17.0	6.8	3.0	26.8	-0.5	14.5
R*ural*							
Coastal	82,694	33.9	7.0	0.6	41.5	0.8	14.6
Piedmont	323,598	28.8	8.3	5.4	42.5	1.5	16.0
Mountain	197,050	10.0	6.2	2.2	18.4	1.8	13.0

Source: North Carolina Department of Public Instruction, North Carolina Research Data Center, Membership Data 2000/01; National Center for Education Statistics, Common Core of Data, Public School Universe, 2005/06; authors' calculations.
Note: Only K-12 students, includes charter schools, sums uses only total of students with race indicators in each school as enrollment, does not include state-run schools.

12/11/07cc

Table 2. Segregation in School Districts in North Carolina, 1994/95, 2000/01 and 2005/06, Using Two Measures Based on School-Level Data

	School-Level Segregation Index			Percentage of nonwhite students in 90-100% nonwhite schools		
	1994/95	2000/01	2005/06	1994/95	2000/01	2005/06
State of NC	0.10	0.13	0.15	8.1	10.3	15.8
Five largest districts						
Charlotte-Mecklenburg	0.12	0.20	0.33	2.2	6.9	38.5
Wake	0.06	0.09	0.12	0.0	0.9	2.3
Guilford	0.24	0.29	0.28	11.8	18.0	30.9
Cumberland	0.11	0.13	0.15	3.5	2.8	9.4
Winston-Salem/Forsyth	0.07	0.25	0.28	0.0	20.0	23.9
Other urban						
Coastal	0.11	0.14	0.14	3.6	13.8	12.4
Piedmont	0.11	0.11	0.12	16.6	11.0	13.1
Mountain	0.07	0.09	0.10	0.0	0.4	1.0
Rural						
Coastal	0.06	0.07	0.07	2.2	4.2	4.0
Piedmont	0.11	0.12	0.12	17.0	16.3	16.6
Mountain	0.06	0.07	0.08	0.0	0.3	0.3

Sources: North Carolina Department of Public Instruction, North Carolina Research Data Center, Membership Data 1994/95, 2000/01; National Center for Education Statistics, Common Core of Data, Public School Universe; 2000/01 (for charter schools) and 2005/06; North Carolina Public Schools Statistical Profile 2001; authors' calculations.

Note: Average segregation indices for the state and district groups are weighted averages of district statistics where weights are district enrollments. State and district group figures for the percentage of nonwhite students in 90-100% nonwhite schools give percentage of all nonwhite students attending such schools; state and district group figures for 1994/95 and 2000/01 are corrected from Clotfelter, Ladd and Vigdor (2003), which instead presents district rates weighted by total enrollment. All figures include charter schools.

2/18/08cc

Table 3a. Segregation Rates in Grades 1, 4, 7, and 10 in North Carolina, 1994/95, 2000/01 and 2005/06, Using Classroom-Level Data

	1994/95	2000/01	2005/06
Grade 1	0.15	0.20	0.22
Grade 4	0.14	0.20	0.22
Grade 7	0.18	0.20	0.21
Grade 10	0.20	0.21	0.25

Source: North Carolina Department of Public Instruction, North Carolina Education Research Data Center, School Activity Report Data, 1994/95, 2000/01 and 2005/06; authors' calculations. r:\teachqra\NCLawReview\; program Copyofctcseg4types4grades0506b.
Note: Indices shown are averages weighted by district enrollment in corresponding grade.

2/22/08cc

Table 3b. Segregation Rates in Grades 1, 4, 7, and 10 in North Carolina, 1994/95, 2000/01 and 2005/06, Using Classroom-Level Data, Three Alternative Racial Divisions

Segregation Measures	1994/95	2000/01	2005/06
1) Black and white only			
Grade 1	0.16	0.23	0.26
Grade 4	0.15	0.22	0.26
Grade 7	0.18	0.20	0.23
Grade 10	0.20	0.19	0.24
2) Hispanic and white only			
Grade 1	0.11	0.22	0.27
Grade 4	0.09	0.18	0.25
Grade 7	0.16	0.23	0.25
Grade 10	0.17	0.32	0.40
3) Hispanic and black only			
Grade 1	0.18	0.28	0.28
Grade 4	0.17	0.26	0.27
Grade 7	0.25	0.29	0.25
Grade 10	0.22	0.35	0.38

Source: North Carolina Department of Public Instruction, North Carolina Education Research Data Center; School Activity Report Data, 1994/95, 2000/01 and 2005/06; authors' calculations. r:\teachqra\NCLawReview\; program Copyofctcseg4types4grades0506b.
Note: Indices shown are averages weighted by district enrollment in corresponding grade.

2/22/08cc

Table 4. Segregation Between and Within Schools in North Carolina, Districts, Grades 1, 4, 7 and 10, 2000/01 and 2005/06

	Grade 1		Grade 4		Grade 7		Grade 10	
	2000/01	2005/06	2000/01	2005/06	2000/01	2005/06	2000/01	2005/06
State of NC								
Total	0.20	0.22	0.20	0.22	0.20	0.21	0.21	0.25
Between schools	0.17	0.19	0.16	0.19	0.12	0.13	0.10	0.12
Within schools	0.03	0.03	0.04	0.04	0.08	0.07	0.11	0.13
Five largest districts								
Charlotte - Mecklenburg								
Total	0.28	0.41	0.27	0.41	0.25	0.36	0.23	0.34
Between schools	0.25	0.39	0.24	0.38	0.19	0.33	0.15	0.29
Within schools	0.03	0.02	0.03	0.03	0.06	0.03	0.08	0.05
Wake								
Total	0.14	0.18	0.15	0.18	0.26	0.21	0.18	0.24
Between schools	0.11	0.15	0.10	0.15	0.11	0.12	0.08	0.10
Within schools	0.03	0.03	0.05	0.04	0.16	0.09	0.10	0.14
Guilford								
Total	0.37	0.36	0.36	0.36	0.28	0.29	0.33	0.39
Between schools	0.34	0.32	0.32	0.33	0.26	0.25	0.26	0.27
Within schools	0.03	0.03	0.04	0.03	0.03	0.04	0.07	0.12
Cumberland								
Total	0.18	0.20	0.20	0.21	0.17	0.19	0.17	0.24
Between schools	0.14	0.16	0.16	0.17	0.13	0.15	0.11	0.16
Within schools	0.04	0.04	0.04	0.04	0.04	0.03	0.06	0.08
Winston/Salem -Forsyth								
Total	0.36	0.41	0.38	0.37	0.36	0.35	0.23	0.34
Between schools	0.35	0.38	0.33	0.33	0.23	0.23	0.13	0.23
Within schools	0.01	0.02	0.04	0.04	0.13	0.12	0.10	0.11
Other urban								
Coastal								
Total	0.22	0.22	0.23	0.22	0.22	0.24	0.21	0.22
Between schools	0.18	0.18	0.18	0.19	0.13	0.13	0.13	0.10
Within schools	0.04	0.03	0.05	0.04	0.10	0.11	0.09	0.12
Piedmont								
Total	0.18	0.19	0.20	0.20	0.18	0.15	0.23	0.24
Between schools	0.15	0.16	0.16	0.16	0.07	0.08	0.08	0.10
Within schools	0.03	0.03	0.04	0.04	0.11	0.07	0.15	0.14
Mountain								
Total	0.18	0.19	0.15	0.19	0.11	0.16	0.17	0.24
Between schools	0.14	0.14	0.12	0.15	0.06	0.08	0.05	0.06
Within schools	0.04	0.04	0.03	0.05	0.05	0.08	0.12	0.18
Rural								
Coastal								
Total	0.16	0.14	0.14	0.13	0.14	0.16	0.15	0.19
Between schools	0.11	0.10	0.10	0.09	0.09	0.08	0.05	0.07
Within schools	0.05	0.04	0.04	0.05	0.05	0.08	0.09	0.12
Piedmont								
Total	0.20	0.20	0.19	0.20	0.19	0.17	0.20	0.20
Between schools	0.17	0.17	0.16	0.16	0.11	0.10	0.08	0.08
Within schools	0.03	0.03	0.03	0.03	0.07	0.07	0.11	0.12
Mountain								

	Grade 1		Grade 4		Grade 7		Grade 10	
	2000/01	2005/06	2000/01	2005/06	2000/01	2005/06	2000/01	2005/06
Total	0.15	0.16	0.12	0.16	0.13	0.16	0.22	0.26
Between schools	0.12	0.12	0.09	0.12	0.07	0.09	0.05	0.06
Within schools	0.04	0.04	0.03	0.03	0.06	0.07	0.17	0.21

Note: Components may not add to total due to rounding.
Source: North Carolina Department of Public Instruction, North Carolina Education Research Data Center, School Activity Reports; National Education Data Center, Public School Universe Data, 2000/01 and 2005/06; authors' calculations.
Table 4 data- based on Stata output put in spreadsheets at segbetwithin4grades0001.xls and segbetwithin4grades0506.xls.

2/22/08ctc

Table 5. Segregation in Comparable School Districts in and out of North Carolina, 2005/06 (Median segregation index among comparable districts in each of three size categories)

	North Carolina	Comparable districts	
Enrollment (thousands)	districts	Other South	Outside of South
90-140	.210	.212	.216
	(2)	(4)	(4)
40-70	.275	.148	.159
	(2)	(8)	(9)
20-35	.154	.135	.115
	(12)	(19)	(36)

Note: Comparable districts outside of North Carolina in each enrollment band are those between 30% and 70% nonwhite. Number of districts in each group shown in parentheses.
Source: Appendix Table A2.

1/24/08

Table 6. Teacher Quality by Race and Income in the Charlotte/Mecklenburg School District, 2000/01 and 2005/06

	Percentage of Teachers							
	3+ years experience		Top 1/4 of test scores		National Board Certified		Certified teacher*	
	2000/01	2005/06	2000/01	2005/06	2000/01	2004/05	2000/01	2005/06
By race:								
Black	73.7	71.2	22.4	21.4	4.1	6.9	89.7	88.4
White	76.6	75.4	30.8	30.0	5.5	8.3	91.9	92.2
Difference	2.9	4.2	8.4	8.6	1.4	1.4	2.2	3.8
By SES:								
Lowest	74.9	68.3	23.7	21.7	4.9	4.7	89.4	86.0
Highest	79.0	77.1	31.9	31.0	6.6	11.8	94.0	94.5
Difference	4.1	8.8	7.2	9.3	1.7	7.1	4.6	8.5

Note: Exposure rates of students by race to teachers in various categories are calculated as the average of teacher characteristics across schools weighted by the number of black and white students, respectively, in each school. Percentage of teachers by income quartile is the percentage of all teachers in the top and bottom income quartile of schools who fall into each category, where schools were divided into quartiles by school level according to the percentage of students receiving free price lunch. NBCT data not available for 2005/06. Top 1/4 of test score is assigned where normalized test score >.76 for 2000/01 and >.79 for 2005/06.
* Teachers with initial or continuing certification in LicSal licensure data.

Source: North Carolina Department of Public Instruction, North Carolina Education Research Data Center, LicSal Licensure file; NCES, Common Core of Data, Public School Universe; authors' calculations. Data output for this table stored on r:\Teachqra\NCLawReview\chartab6fv01128.log & chartab6fv06128.log.

1/28/08bm

Table 7. Entropy Measure of Segregation, 2000/01 and 2005/06, by Grade Level

	Grade 1		Grade 4		Grade 7		Grade 10	
	2000/01	**2005/06**	**2000/01**	**2005/06**	**2000/01**	**2005/06**	**2000/01**	**2005/06**
State	.158	.179	.143	.168	.097	.171	.075	.099
Charlotte-Mecklenburg	.186	.289	.176	.275	.123	.289	.092	.199
Wake	.128	.158	.105	.147	.082	.146	.052	.084
Guilford	.265	.270	.234	.253	.167	.250	.181	.173
Cumberland	.116	.126	.128	.136	.089	.149	.070	.099
Winston-Salem/Forsyth	.267	.309	.236	.256	.156	.267	.084	.142
Other urban								
Coastal	.138	.154	.127	.149	.102	.147	.091	.081
Piedmont	.167	.170	.160	.177	.070	.151	.074	.096
Mountain	.121	.130	.104	.124	.050	.120	.041	.049
Rural								
Coastal	.084	.090	.075	.076	.061	.090	.039	.050
Piedmont	.164	.166	.143	.157	.110	.174	.062	.068
Mountain	.107	.106	.088	.100	.059	.104	.036	.050

Note: Other Urban and Rural region figures weighted by district enrollment in the corresponding grade.
12/11/07; 2/22/08ctc

Table 8. Actual Within-School Segregation Indices Compared to Alternative Based on Random Assignment within Schools, State and Largest Five Districts, 2000/01 and 2005/06

School Year and Grade	State	Charlotte-Mecklenburg	Wake County	Guilford County	Cumberland County	Winston-Salem/ Forsyth
2005/06						
Grade 1						
Actual	.034	.022	.030	.034	.038	.023
Random	.033	.028	.036	.031	.040	.028
Difference	.001	-.006	-.006	.003	-.002	-.005
Grade 4						
Actual	.037	.035	.037	.033	.044	.042
Random	.028	.019	.029	.025	.037	.027
Difference	.009	.016	.008	.008	.007	.015
Grade 7						
Actual	.073	.029	.087	.041	.032	.122
Random	.022	.014	.019	.008	.021	.027
Difference	.051	.015	.068	.033	.009	.095
Grade 10						
Actual	.123	.054	.136	.120	.078	.106
Random	.040	.019	.047	.040	.049	.036
Difference	.083	.035	.089	.080	.029	.070
2000/01						
Grade 1						
Actual	.033	.028	.029	.030	.039	.014
Random	.032	.031	.035	.027	.038	.026
Difference	.001	-.003	-.006	.003	.001	-.012

Grade 4						
Actual	.037	.031	.049	.044	.039	.043
Random	.022	.032	.030	.024	.031	.028
Difference	.015	-.001	.019	.020	.008	.015
Grade 7						
Actual	.079	.062	.156	.026	.044	.131
Random	.029	.023	.041	.008	.028	.026
Difference	.050	.039	.115	.018	.016	.105
Grade 10						
Actual	.112	.084	.105	.070	.063	.097
Random	.039	.020	.039	.036	.043	.058
Difference	.073	.064	.066	.034	.020	.039

Note: Figures denoted “random" are segregation indices based on a random assignment of students to classrooms within each school. Difference is baseline minus random.

2/22/08ctc

Appendix Table A1. Enrollment, Racial Composition, 2005/06, Growth Rate, and Segregation by District 2000/01 and 2005/06

County	School district	District grouping	Enrollment	Percentage of students			Growth rate	2005/06 Segregation in schools				2000/01 Segregation in schools			
								4th Grade		10th Grade		4th Grade		10th Grade	
				Black	Hispanic	Other NW	01-06*	Within	Between	Within	Between	Within	Between	Within	Between
Alamance	Alamance-Burlington	UP	22,970	25.8	14.2	1.4	1.9	0.03	0.28	0.12	0.31	0.01	0.19	0.13	0.15
Alexander	Alexander	RM	5,752	6.5	5.7	2.7	1.1	0.05	0.14	0.03	0.00	0.02	0.12	0.18	0.00
Alleghany	Alleghany	RM	1,524	2.4	9.4	0.0	1.5	0.00	0.01	0.61	0.00	0.04	0.04	0.08	0.00
Anson	Anson	RP	4.230	62.8	1.9	2.1	-1.2	0.02	0.24	0.02	0.03	0.04	0.16	0.08	0.02
Ashe	Ashe	RM	3,266	1.9	3.9	0.4	0.4	0.06	0.02	0.55	0.00	0.03	0.01	0.46	0.00
Avery	Avery	RM	2,399	1.3	4.7	0.2	-0.3	0.03	0.04	0.55	0.00	0.03	0.02	0.05	0.00
Beaufort	Beaufort	RC	7,504	38.9	7.6	0.0	0.3	0.09	0.14	0.11	0.04	0.04	0.12	0.13	0.05
Bertie	Bertie	RC	3,240	85.8	1.3	0.3	-2.3	0.03	0.11	0.04	0.00	0.07	0.30	0.07	0.00
Bladen	Bladen	RP	5,563	49.1	6.8	1.1	-0.5	0.05	0.17	0.08	0.11	0.06	0.19	0.10	0.07
Brunswick	Brunswick	RC	11,856	22.4	5.4	0.9	2.8	0.05	0.07	0.07	0.06	0.04	0.05	0.06	0.07
Buncombe	Buncombe	UM	26,340	9.5	6.6	1.1	1.0	0.04	0.11	0.23	0.02	0.03	0.13	0.12	0.04
Buncombe	Asheville City	UM	3,847	43.5	5.6	0.9	-0.9	0.08	0.07	0.27	0.00	0.05	0.03	0.11	0.00
Burke	Burke	RM	14,530	9.3	5.4	8.5	0.0	0.07	0.08	0.12	0.05	0.03	0.07	0.17	0.02
Cabarrus	Cabarrus	UP	24,283	18.4	9.4	1.7	4.8	0.04	0.05	0.14	0.06	0.05	0.10	0.20	0.02
Cabarrus	Kannapolis City	UP	4,713	31.7	16.8	1.4	1.9	0.03	0.01	0.10	0.00	0.03	0.04	0.14	0.00
Caldwell	Caldwell	RM	13,015	9.1	4.9	0.6	0.7	0.02	0.20	0.15	0.05	0.02	0.09	0.16	0.06
Camden	Camden	RC	1,798	16.1	1.1	0.6	6.8	0.01	0.00	0.05	0.00	0.01	0.00	0.10	0.00
Carteret	Carteret	RC	8,698	11.1	3.1	1.0	0.6	0.05	0.07	0.23	0.03	0.05	0.06	0.12	0.02
Caswell	Caswell	RP	3,318	42.4	4.2	0.2	-1.5	0.02	0.03	0.04	0.00	0.03	0.03	0.12	0.01
Catawba	Catawba	UM	17,169	9.5	7.4	7.3	0.9	0.06	0.13	0.27	0.06	0.03	0.04	0.06	0.01
Catawba	Hickory City	UM	4,532	29.2	14.0	5.9	-0.2	0.05	0.13	0.11	0.00	0.02	0.08	0.25	0.00
Catawba	Newton-Conover City	UM	2,901	21.4	15.9	6.0	0.9	0.12	0.01	0.14	0.02	0.01	0.05	0.22	0.00
Chatham	Chatham	RP	8,019	20.5	19.8	0.2	1.9	0.01	0.31	0.13	0.16	0.02	0.31	0.19	0.17
Cherokee	Cherokee	RM	3,777	3.5	2.0	1.9	0.7	0.02	0.05	0.05	0.04	0.01	0.04	0.05	0.01
Chowan	Edenton-Chowan	RC	2,470	47.2	2.3	0.1	0.1	0.05	0.00	0.20	0.00	0.05	0.14	0.08	0.00
Clay	Clay	RM	1,323	1.1	0.8	0.2	1.0	0.04	0.00	0.02	0.00	NA	NA	0.03	0.00
Cleveland	Cleveland	RM	17,156	29.9	2.6	0.8	0.0	0.02	0.13	0.09	0.12	0.02	0.04	0.12	0.04
Columbus	Columbus	RP	7,051	39.3	5.2	5.6	-0.7	0.03	0.25	0.14	0.07	0.06	0.15	0.09	0.08
Columbus	Whiteville City	UP	2,634	47.3	3.0	1.1	-0.9	0.03	0.00	0.10	0.01	0.09	0.00	0.06	0.00
Craven	Craven	UC	14,712	36.2	4.8	1.3	0.0	0.04	0.13	0.11	0.02	0.03	0.12	0.05	0.00
Cumberland	Cumberland	-	52,514	51.5	6.5	3.6	0.6	0.04	0.17	0.08	0.16	0.04	0.16	0.06	0.11
Currituck	Currituck	RC	4,069	10.5	2.5	0.4	4.7	0.03	0.01	0.07	0.00	0.04	0.03	0.06	0.00
Dare	Dare	RC	4,944	5.2	6.1	0.7	1.2	0.07	0.09	0.17	0.05	0.05	0.07	0.04	0.01
Davidson	Davidson	RP	20,079	3.6	3.5	0.8	1.1	0.03	0.03	0.06	0.01	0.04	0.05	0.06	0.02
Davidson	Lexington City	UP	3,089	45.6	22.5	5.7	-0.9	0.08	0.12	0.09	0.00	0.11	0.00	0.19	0.00
Davidson	Thomasville City	UP	2,617	48.5	21.1	1.0	1.7	0.05	0.00	0.10	0.00	0.11	0.00	0.05	0.00
Davie	Davie	RM	6,421	9.7	8.3	0.3	2.3	0.01	0.10	0.37	0.00	0.04	0.05	0.30	0.00
Duplin	Duplin	RC	9,010	32.6	25.6	0.0	1.0	0.05	0.18	0.17	0.13	0.04	0.18	0.16	0.12

County	School district	District grouping	Enrollment	Percentage of students			Growth rate	2005/06 Segregation in schools				2000/01 Segregation in schools			
								4th Grade		10th Grade		4th Grade		10th Grade	
				Black	Hispanic	Other NW	01-06*	Within	Between	Within	Between	Within	Between	Within	Between
Durham	Durham	UP	33,401	59.5	13.4	2.2	1.6	0.05	0.28	0.13	0.13	0.04	0.26	0.10	0.15
Edgecombe	Edgecombe	UC	7,644	58.3	5.7	0.0	0.2	0.03	0.16	0.07	0.09	0.09	0.06	0.09	0.07
Forsyth	Winston/Salem - Forsyth	-	51,474	37.7	13.7	1.8	2.3	0.04	0.33	0.11	0.23	0.04	0.33	0.10	0.13
Franklin	Franklin	RP	8,308	37.2	8.8	0.5	1.6	0.03	0.08	0.11	0.03	0.06	0.06	0.07	0.08
Gaston	Gaston	UM	33,047	21.8	6.0	1.4	1.6	0.03	0.24	0.12	0.10	0.02	0.20	0.13	0.08
Gates	Gates	RC	2,050	40.6	1.9	0.0	0.2	0.00	0.00	0.14	0.00	0.01	0.00	0.10	0.00
Graham	Graham	RM	1,218	1.1	0.7	10.8	0.2	0.01	0.00	0.14	0.00	0.05	0.00	0.07	0.00
Granville	Granville	RP	8,748	38.9	7.0	0.6	1.5	0.07	0.10	0.15	0.07	0.02	0.11	0.10	0.09
Greene	Greene	RC	3,258	49.3	17.1	0.0	1.6	0.01	0.00	0.17	0.00	0.03	0.00	0.06	0.00
Guilford	Guilford	-	70,237	44.6	6.1	4.9	2.0	0.03	0.33	0.12	0.27	0.04	0.32	0.07	0.26
Halifax	Halifax	RP	4,975	88.5	1.4	5.4	-3.8	0.04	0.07	0.11	0.00	0.03	0.13	0.05	0.02
Halifax	Roanoke Rapids City	UP	2,988	22.0	2.4	1.5	-0.5	0.02	0.00	0.08	0.00	0.03	0.01	0.06	0.00
Halifax	Weldon City	RP	1,018	95.7	0.9	0.0	-2.2	0.02	0.00	0.12	0.00	0.02	0.00	0.03	0.00
Harnett	Harnett	RP	17,561	32.7	10.4	1.2	1.3	0.04	0.04	0.13	0.01	0.02	0.06	0.12	0.01
Haywood	Haywood	RM	7,898	2.5	3.4	0.8	0.3	0.01	0.03	0.33	0.00	0.01	0.03	0.04	0.00
Henderson	Henderson	RM	12,960	7.7	12.8	1.1	2.0	0.05	0.11	0.38	0.01	0.05	0.08	0.35	0.03
Hertford	Hertford	RC	3,551	81.8	1.4	0.8	-2.0	0.03	0.09	0.07	0.00	0.04	0.01	0.14	0.00
Hoke	Hoke	RP	7,019	45.9	9.9	14.7	2.5	0.03	0.12	0.07	0.00	0.02	0.10	0.04	0.00
Hyde	Hyde	RC	634	41.6	10.4	0.0	-1.5	0.01	0.00	0.08	0.28	0.02	0.11	0.07	0.18
Iredell	Iredell-Statesville	RM	20,944	17.3	7.4	2.6	3.4	0.03	0.25	0.20	0.13	0.04	0.19	0.18	0.15
Iredell	Mooresville City	UM	4,775	17.3	4.1	1.4	3.5	0.05	0.00	0.20	0.00	0.01	0.00	0.15	0.00
Jackson	Jackson	RM	3,850	2.5	3.7	10.5	0.8	0.03	0.18	0.46	0.01	0.04	0.17	0.05	0.03
Johnston	Johnston	RP	27,621	21.9	13.3	0.6	5.2	0.03	0.14	0.18	0.08	0.03	0.16	0.14	0.04
Jones	Jones	RC	1,349	54.9	4.2	0.2	-1.5	0.01	0.12	0.05	0.00	0.04	0.14	0.11	0.00
Lee	Lee	RP	9,345	27.8	22.5	1.0	1.0	0.01	0.11	0.17	0.01	0.02	0.05	0.22	0.00
Lenoir	Lenoir	UC	10,346	52.2	6.5	0.4	0.0	0.06	0.28	0.08	0.27	0.07	0.33	0.09	0.20
Lincoln	Lincoln	RM	12,573	9.4	8.6	0.5	2.6	0.05	0.14	0.14	0.20	0.02	0.11	0.12	0.15
Macon	Macon	RM	4,266	2.2	6.1	1.0	1.2	0.03	0.04	0.22	0.01	0.04	0.02	0.09	0.00
Madison	Madison	RM	2,621	1.0	2.3	0.1	0.7	0.01	0.01	0.05	0.00	0.04	0.02	NA	NA
Martin	Martin	RC	4,337	54.1	3.0	0.0	-1.9	0.01	0.18	0.07	0.25	0.04	0.24	0.09	0.28
Mcdowell	McDowell	RM	6,504	4.7	7.0	1.8	0.2	0.02	0.09	0.19	0.00	0.02	0.08	0.08	0.00
Mecklenburg	Charlotte - Mecklenburg	-	126,720	45.4	12.0	4.8	3.9	0.03	0.38	0.05	0.29	0.03	0.24	0.08	0.15
Mitchell	Mitchell	RM	2,293	0.7	5.8	0.0	-0.7	0.03	0.05	0.17	0.00	0.04	0.01	0.03	0.00
Montgomery	Montgomery	RP	4,507	27.2	22.4	2.4	0.1	0.01	0.13	0.09	0.09	0.01	0.13	0.09	0.02
Moore	Moore	RP	12,390	23.9	7.4	1.3	1.9	0.02	0.18	0.21	0.05	0.02	0.13	0.10	0.03
Nash	Nash-Rocky Mount	UP	19,084	54.7	6.1	1.5	0.4	0.02	0.24	0.15	0.07	0.03	0.27	0.14	0.05
New Hanover	New Hanover	UC	24,435	29.5	4.5	1.5	2.4	0.03	0.17	0.14	0.07	0.07	0.15	0.14	0.14
Northampton	Northampton	RP	3,484	81.8	1.4	0.0	-0.7	0.00	0.29	0.05	0.09	0.01	0.19	0.12	0.05
Onslow	Onslow	UC	22,946	30.1	6.0	1.9	1.1	0.02	0.14	0.06	0.10	0.04	0.13	0.05	0.08
Orange	Orange	UP	7,020	22.8	6.7	1.0	2.6	0.02	0.07	0.11	0.01	0.03	0.04	0.10	0.00

County	School district	District grouping	Enrollment	Percentage of students			Growth rate	2005/06 Segregation in schools				2000/01 Segregation in schools			
				Black	Hispanic	Other NW		4th Grade		10th Grade		4th Grade		10th Grade	
							01-06*	Within	Between	Within	Between	Within	Between	Within	Between
Orange	Chapel Hill - Carrboro	UP	10,936	19.0	9.0	11.6	1.8	0.04	0.02	0.22	0.01	0.06	0.04	0.29	0.00
Pamlico	Pamlico	RC	1,951	27.2	3.1	0.6	-1.5	0.03	0.04	0.14	0.00	0.01	0.04	0.05	0.00
Pasquotank	Elizabeth City - Pasquotank	UC	6,126	49.5	2.0	0.7	0.6	0.05	0.14	0.08	0.01	0.03	0.12	0.11	0.00
Pender	Pender	RC	7,407	25.5	7.6	0.1	2.4	0.05	0.09	0.12	0.16	0.05	0.07	0.12	0.08
Perquimans	Perquimans	RC	1,780	35.3	2.0	0.7	0.0	0.05	0.00	0.09	0.00	0.05	0.00	0.02	0.00
Person	Person	RP	6,169	37.2	4.2	0.7	0.7	0.04	0.23	0.18	0.00	0.02	0.24	0.08	0.00
Pitt	Pitt	UC	22,115	52.3	5.5	1.1	2.0	0.03	0.16	0.19	0.08	0.02	0.11	0.09	0.11
Polk	Polk	RM	2,481	10.4	7.3	0.2	0.6	0.05	0.06	0.10	0.00	0.02	0.05	0.09	0.00
Randolph	Randolph	RP	18,641	6.7	9.2	1.1	1.6	0.04	0.11	0.25	0.02	0.04	0.10	0.27	0.02
Randolph	Asheboro City	UP	4,583	18.0	28.8	2.0	1.4	0.03	0.06	0.30	0.00	0.03	0.04	0.43	0.00
Richmond	Richmond	RP	8,340	41.9	5.5	4.1	0.1	0.04	0.10	0.14	0.01	0.05	0.04	0.09	0.00
Robeson	Robeson	RP	24,440	30.3	7.1	43.4	0.4	0.04	0.21	0.09	0.11	0.04	0.26	0.10	0.12
Rockingham	Rockingham	RP	14,707	27.1	5.7	0.5	0.2	0.02	0.16	0.08	0.11	0.02	0.15	0.09	0.07
Rowan	Rowan-Salisbury	RP	20,959	23.3	7.4	1.4	0.6	0.01	0.23	0.09	0.25	0.04	0.24	0.08	0.23
Rutherford	Rutherford	RM	10,413	17.2	3.9	0.1	0.5	0.03	0.20	0.07	0.04	0.02	0.23	0.11	0.02
Sampson	Sampson	RP	8,237	29.9	21.3	1.3	0.9	0.03	0.11	0.11	0.07	0.03	0.09	0.14	0.08
Sampson	Clinton City	UP	3,023	46.7	12.6	4.3	3.0	0.04	0.00	0.16	0.00	0.04	0.00	0.18	0.00
Scotland	Scotland	RP	7,092	48.8	1.5	13.8	-0.1	0.02	0.19	0.10	0.09	0.06	0.15	0.07	0.08
Stanly	Stanly	RP	9,802	16.1	4.7	3.8	-0.7	0.07	0.18	0.14	0.16	0.05	0.21	0.15	0.13
Stokes	Stokes	RP	7,412	6.7	2.3	0.1	0.2	0.02	0.07	0.07	0.01	0.06	0.09	0.05	0.05
Surry	Surry	RM	9,090	4.8	12.9	0.3	1.5	0.04	0.08	0.23	0.04	0.02	0.08	0.36	0.01
Surry	Elkin City	RM	1,226	5.9	14.7	0.2	1.9	0.01	0.00	0.30	0.00	0.04	0.00	0.39	0.00
Surry	Mount Airy City	UM	1,804	14.3	9.5	3.2	-1.0	0.05	0.00	0.07	0.00	0.05	0.00	0.04	0.00
Swain	Swain	RM	1,968	1.4	2.7	22.1	2.4	0.07	0.15	0.10	0.00	0.02	0.09	0.06	0.00
Transylvania	Transylvania	RM	4,035	9.4	2.7	0.6	-0.2	0.04	0.05	0.08	0.02	0.03	0.04	0.05	0.04
Tyrrell	Tyrrell	RC	615	42.0	11.7	0.0	-3.3	0.00	0.00	0.09	0.00	0.16	0.00	0.04	0.00
Union	Union	RP	32,051	17.0	9.7	1.2	6.6	0.03	0.31	0.08	0.24	0.03	0.34	0.08	0.33
Vance	Vance	RP	8,519	64.3	7.1	0.3	0.5	0.04	0.26	0.12	0.01	0.01	0.15	0.15	0.02
Wake	Wake	-	125,501	30.5	9.1	5.0	4.7	0.04	0.15	0.14	0.10	0.05	0.10	0.10	0.08
Warren	Warren	RP	3,074	70.8	3.5	8.2	-1.1	0.09	0.04	0.05	0.01	0.03	0.04	0.06	0.00
Washington	Washington	RC	2,173	74.5	3.2	0.0	-1.0	0.20	0.06	0.06	0.08	0.10	0.14	0.07	0.05
Watauga	Watauga	RM	4,580	2.9	2.6	0.8	-1.3	0.01	0.05	0.38	0.00	0.01	0.06	0.01	0.00
Wayne	Wayne	UC	19,383	43.2	9.3	1.0	0.0	0.03	0.26	0.12	0.19	0.03	0.29	0.06	0.31
Wilkes	Wilkes	RM	10,235	6.6	6.7	0.5	-0.3	0.04	0.18	0.29	0.11	0.03	0.12	0.28	0.17
Wilson	Wilson	UC	13,338	52.1	10.2	0.8	1.2	0.05	0.29	0.13	0.06	0.03	0.33	0.11	0.07
Yadkin	Yadkin	RM	6,181	5.2	14.4	0.3	1.1	0.01	0.07	0.23	0.00	0.02	0.06	0.36	0.00
Yancey	Yancey	RM	2,551	1.8	6.7	0.0	0.4	0.04	0.04	0.65	0.00	0.07	0.02	0.11	0.00
State of NC			1,405,670	31.4	8.3	0.7	1.9	0.04	0.19	0.13	0.12	0.04	0.16	0.11	0.10

*** Exponential growth rate in enrollment 2000/01-2005/06.**
Source: North Carolina Department of Public Instruction, North Carolina Education Research Data Center, School Activity Reports; National Education Data Center, Public School Universe Data, 2000/01 and 2005/06; authors' calculations. Segregation data based on spreadsheets s:\teachqra\NCLawReview\Districtsxth0001.xls and Districtsxth0506.xls where x is either 4 or 10, the grade number. 2005/06 Enrollments, racial percentages and growth rate based on spreadsheet growth0106.xls in the same directory.

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Appendix Table A2. Segregation in Comparable Districts, 2005/06

District	Enrollment	% nonwhite	Segregation index	% black in 90-100% nonwhite schools
90,000-140,000 enrollment				
North Carolina				
Charlotte-Mecklenburg	124,005	62.4	0.316	39.9
Wake County	121,710	44.5	0.103	0.4
Non-South				
Baltimore County (MD)	107,043	47.7	0.354	44.3
Albuquerque (NM)	94,022	66.0	0.241	14.9
Montgomery County (MD)	139,398	57.8	0.191	4.8
Jefferson County (KY)	92,090	41.6	0.069	0.0
Other South				
Duval County (FL)	126,662	54.4	0.568	23.6
Cobb County (GA)	106,724	49.9	0.296	19.5
Pinellas County (FL)	112,174	31.6	0.128	0.0
Polk County (FL)	124,005	42.6	0.083	0.1
40,000-70,000 enrollment				
North Carolina				
Guilford County	69,186	56.9	0.278	33.2
Winston-Salem/Forsyth	50,848	52.6	0.275	22.6
Cumberland County	53,201	61.3	0.152	10.8
Non-South				
Columbus city (OH)	61,097	69.5	0.305	40.6
Tucson Unified (AZ)	61,986	66.2	0.231	9.2
Portland city (OR)	44,538	42.5	0.209	11.4
Washoe County (NV)	64,367	42.7	0.193	0.8

Omaha city (NE)	46,686	55.9	0.159	9.4
Anchorage city (AK)	49,714	42.1	0.147	2.8
Elk Grove Unified (CA)	42,416	69.8	0.145	19.9
Howard County (MD)	48,596	38.0	0.099	0.0
Wichita city (KS)	48,155	54.6	0.096	0.2
Other South				
Mobile County (AL)	65,615	54.5	0.495	58.5
Arlington ISD (TX)	63,397	65.2	0.232	10.6
Fort Bend ISD (TX)	66,104	72.8	0.198	46.7
Prince William County (VA)	68,458	55.6	0.153	0.0
North East ISD (TX)	59,817	57.5	0.143	4.5
Greenville County (SC)	67,551	38.0	0.142	0.4
Garland ISD (TX)	57,425	65.3	0.093	1.6
Plano ISD (TX)	53,238	43.2	0.075	0.1
20,000-35,000 enrollment				
North Carolina				
Union	31,580	28.2	0.278	4.6
Alamance County	22,184	42.8	0.258	4.2
Rowan-Salisbury	20,983	32.1	0.239	0.0
Robeson County	24,379	80.8	0.179	42.0
Durham Public	31,719	74.8	0.177	27.2
Gaston County	32,498	29.1	0.168	0.0
New Hanover County	24,112	35.8	0.140	0.0
Onslow County	22,977	38.1	0.111	0.0
Johnston County	27,624	35.8	0.110	0.0
Pitt County	22,296	59.0	0.103	3.4

Buncombe County	25,533	17.3	0.077	0.0
Cabarrus County	23,946	29.5	0.071	0.0
Non-South				
Chaffey Joint Union High (CA)	24,982	73.6	0.567	11.1
Newport-Mesa Unified (CA)	22,122	47.9	0.327	3.7
Osseo (MN)	21,791	38.7	0.279	0.0
Akron city (OH)	27,093	56.2	0.273	22.1
Salt Lake City (UT)	24,355	52.2	0.255	0.3
Placentia-Yorba Linda Unified (CA)	26,757	44.2	0.253	4.2
Desert Sands Unified (CA)	27,565	72.1	0.238	32.4
Escondido Union Elementary (CA)	28,673	68.4	0.197	12.4
St. Vrain Valley (CO)	23,260	31.8	0.193	0.0
Lodi Unified (CA)	30,911	67.6	0.175	26.0
Washington Elementary (AZ)	24,832	58.0	0.174	0.9
Green Bay Area (WI)	20,314	34.0	0.161	0.0
Kenosha city (WI)	22,131	33.9	0.160	0.0
Chandler Unified (AZ)	31,879	42.2	0.151	1.4
Grossmont Union High (CA)	24,444	45.5	0.136	0.0
South Bend Community SC (IN)	21,973	53.4	0.130	3.7
Antelope Valley Union High (CA)	25,312	67.6	0.124	4.1
Vista Unified (CA)	26,207	64.3	0.120	25.4
Charles County (MD)	26,406	53.2	0.110	0.0
Syracuse city (NY)	22,123	66.9	0.107	13.5

Visalia Unified (CA)	26,105	64.7	0.100	7.1
Kent city (WA)	27,415	42.7	0.099	0.0
Manteca Unified (CA)	23,781	67.0	0.089	14.2
Rockford city (IL)	29,145	57.7	0.083	4.3
Racine city (WI)	21,175	46.5	0.080	0.0
Redlands Unified (CA)	21,326	58.9	0.079	5.7
Madison Metropolitan (WI)	24,452	43.9	0.070	0.0
Torrance Unified (CA)	25,428	61.0	0.058	0.0
Simi Valley Unified (CA)	21,454	33.9	0.057	0.0
Fairfield-Suisun Unified (CA)	23,377	70.3	0.054	3.0
Federal Way (WA)	22,978	48.5	0.051	0.0
Glendale Unified (CA)	28,002	44.2	0.050	2.7
Worcester city (MA)	24,008	55.7	0.035	0.0
Temecula Valley Unified (CA)	27,298	43.5	0.034	0.0
Irvine Unified (CA)	25,496	55.9	0.027	0.0
William S. Hart Union High (CA)	23,439	41.3	0.027	0.0
Other South				
Huntsville city (AL)	22,968	49.9	0.404	40.1
Rapides Parish (LA)	23,976	47.5	0.348	33.2
Lubbock ISD (TX)	28,298	64.1	0.293	48.6
Amarillo ISD (TX)	30,198	53.5	0.287	0.3
Hall County (GA)	24,083	39.9	0.231	0.2
Humble ISD (TX)	29,706	40.1	0.215	4.4
Spring ISD (TX)	31,389	76.9	0.185	36.3
Lafayette Parish (LA)	30,731	46.1	0.179	13.4

Alachua County (FL)	29,109	47.7	0.178	13.7
Henry County (GA)	35,367	45.8	0.135	0.0
Hampton city (VA)	22,799	67.2	0.134	12.2
Mansfield ISD (TX)	25,623	47.1	0.112	0.0
Midland ISD (TX)	19,891	60.4	0.110	10.1
Berkeley County (SC)	27,649	43.5	0.103	2.0
Birdville ISD (TX)	22,509	40.0	0.097	0.0
Carrollton-Farmers Branch (TX)	26,231	72.0	0.095	1.5
Ector County ISD (TX)	26,505	66.4	0.073	0.0
Houston County (GA)	24,608	42.9	0.070	0.0
Aiken County (SC)	24,799	41.2	0.062	5.9

Note: Comparable districts outside of North Carolina in each enrollment band are those between 30% and 70% nonwhite. Districts are ordered by segregation index from highest to lowest, within each subheading.

Source: NCES, CCD Public Universe Data, 2005/06; authors' calculations. Calculations do not account for charter schools.

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