

CHARTER SCHOOLS AND SEGREGATION: THE CASES OF MICHIGAN AND NORTH CAROLINA

by

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Dedication

To J. Michael Ross

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Chapter I Introduction

This dissertation brings together three essays around the topic of school choice and its impact on the racial and ethnic distribution of students across schools. The first essay, Chapter II, describes the various forms of school choice policies operating nationwide, reviews the literature on the effects of school choice on school segregation, and discusses the policy implications of various manifestations of school choice. Chapter III focuses on the racial and ethnic composition of the traditional public school system in Michigan, addressing the question of whether charter school policies have led to increased segregation of schools independent of trends in residential segregation. Chapter IV uses longitudinal, student-level data for North Carolina to predict which types of students switch to charter schools, and evaluates the effect of moves on peer composition at the classroom and school levels.

Two of the chapters presented here have since been published, and are reprinted with permission from RAND and The Brookings Institution, respectively. Chapter II, “The Effect of Contemporary School Choice Policies on Public School Segregation: A Review of the Research” is an early version of Chapter of Six of *Rhetoric Versus Reality: What We Know and What We Need to Know About Vouchers and Charter Schools* (2007). Chapter III has been published as “Charter Schools and Integration: The Experience in Michigan” in Julian Betts and Tom Loveless (Eds.), *Getting Choice Right: Ensuring Equity and Efficiency in Education Policy*. Washington, DC: The Brookings Institution.

Chapter II
**The Effect of Contemporary School Choice Policies on Public School Segregation:
A Review of the Research**

The History of Choice and the Racial Politics of Schooling

It is critical to begin any discussion of issues surrounding school integration by acknowledging the multiple forces that have created a school system that has historically been, and continues to be today, highly stratified by race and class. By far the most important factor in creating stratification in our school system is residential segregation, given that public school attendance is largely determined by residence. In particular, school segregation, as seen in the pattern of predominantly minority and poor central cities surrounded by predominantly white suburbs, has been the result of the differential residential patterns of white and minority families dating back many decades. A critical consequence of these patterns has been the creation and maintenance of racially separate school districts.¹

The issue of residential segregation became central to education beginning in 1954 when *Brown v. Board of Education* overturned the notion of “separate but equal” schools for black and white Americans. This decision was the first step in creating federal policies designed to integrate public schools, although true progress did not begin for another 10 to 15 years. Of central importance here is the role of school choice within the context of the struggle to desegregate schools. Immediately following the *Brown* ruling, choice was used in the form of “Freedom of Choice” plans to bypass desegregation orders, particularly in the South. After school districts dropped the formal requirement of separate school systems for black and white students, many used “minority-to-majority” transfer plans as a method of maintaining segregated schools that was legitimated by choice. Under this type of plan, any student who was assigned to a school where she constituted a racial minority could transfer to a school where she would be in the majority. Freedom of choice also took the form of government support of private segregationist academies in several Southern states. By providing partial tuition grants for nonsectarian

¹ Farley, Schuman, Bianchi, Colasanto and Hatchett, 1978; Orfield and Yun, 1999.

private schools, white students were aided in escaping integrated public schools. Not only did this create a separate, entirely white school system, but it also drained a great deal of resources from the public school system.²

In 1968, the Supreme Court ruled against freedom of choice plans (*Green versus County School Board of New Kent County*) in districts with a history of segregation. This decision was a key turning point in terms of how policymakers framed issues of race and education. During the late 1960s and early '70s, the use of choice as a policy instrument took an about-face: rather than functioning as an escape route from integrated schools, choice was adopted as a tool for achieving school desegregation. Magnet schools and other forms of controlled choice programs were designed to provide positive incentives for students to attend integrated schools (as an alternative to achieving integration through mandatory busing).

While these and other forms of desegregation proliferated through the 1980s, the 1990s witnessed a great deal of resegregation in American schools. For example, in 1996-97, most of the largest city school districts enrolled more than 85 percent non-white students.³ Few of these districts enroll a sizeable proportion of white students, and practically none served middle-class white families. Schools that are racially segregated are extremely likely to be economically segregated as well. In schools with more than 90 percent Black or Latino enrollments, 87 percent of students are poor. Compared to students in schools with less than 10 percent minority students, students in intensely segregated schools are 11 times more likely to attend a school with a high concentration of poverty.⁴

Given this state of American schooling, many scholars have argued vociferously for or against school choice as a reform that could transform the education system. While most voucher and charter proponents today view them primarily as tools to improve academic achievement, consequences of choice for the integration of schools may be dramatic.

Theoretical arguments

² see Henig, 1994; Orfield and Eaton, 1996.

³ Orfield and Yun, 1999.

⁴ Ibid. Table 13.

Opponents of school choice often object on the grounds that choice will lead to increased stratification along a variety of dimensions, including race, income, parental education, and academic ability. Commonly referred to as “skimming” or “creaming”, some claim that choice will function as a sorting machine, redistributing students across schools in inequitable ways.⁵ According to this argument, schools will select students rather than vice versa, seeking out the ‘best and brightest’ and avoiding students who are socially disadvantaged or costly to educate (disabled, non-English speaking, special education). The problem will be most severe in programs (e.g. California’s Proposition 38) which give schools the discretion to set admission standards, and in programs which permit schools to charge additional tuition above the level of public subsidy.

These potential pitfalls are not solely problems of program design; even if schools are required to admit by lottery, and even if tuition add-ons are forbidden, stratification will likely increase as a result of differences in parental information and motivation. Families of higher socioeconomic status have greater access to social networks and richer sources of information upon which to base schooling decisions.⁶

Low-income families living in segregated areas, especially those with low levels of education, will be particularly disadvantaged in the decision-making process. Given that social networks are a key method of obtaining information on educational options, families living in segregated areas are closed off from many information channels and tend to belong to social networks that are highly segregated.⁷ Ironically, these are the very families that advocates argue will benefit the most from choice.

Proponents of school choice, by contrast, point to the fact that the education system is already highly segregated at several levels. As discussed previously, due to residential patterns, many school systems are characterized by predominantly low-income and minority central city districts surrounded by more affluent suburban districts with higher proportions of white students. Schools are further stratified at the classroom level due to tracking and other forms of curricular differentiation. Therefore it is unlikely that choice would make matters worse; in

⁵ Lee, Croninger and Smith, 1994; Levin, 1998; Moore and Davenport, 1990; Wells, 1993.

⁶ Levin, 1998; Wells, 1993.

⁷ Schneider, Teske, Roch and Marschall, 1997

contrast, choice may even improve the situation by opening up traditionally white private schools to minority students (in the case of vouchers) and by promoting smaller, untracked schools.

The strongest argument for choice is that it bypasses the primary mechanism that creates segregated schools: residential segregation. By detaching school attendance from residence, choice may provide options for many families who are 'trapped' in segregated central city districts or attendance areas. Providing low-income and minority families with access to schools that were traditionally predominantly white may therefore improve integration throughout the educational system, both public and private. Moreover, choice might help to slow or reverse residential segregation as families are no longer constrained in residential choice by a system of mandatory assignment based on residence and thus less likely to flee to private or suburban schools.

Conceptual and Measurement Issues

Several thorny issues arise when attempting to evaluate the effects of choice programs on integration. Addressing the "skimming" argument, or the "stratification critique" of school choice opponents, Archbald (2000) argues that stratification is not a one-dimensional phenomenon. In evaluating the impact of choice on stratification it is important to take into account the multidimensional nature of student and family characteristics that are likely to play a role in school choice. It is possible, if not likely, that choice policies will increase stratification on one dimension while reducing it on another. For example, while levels of parents' education and income are highly correlated, choice programs may increase stratification by parental education but reduce it by income, especially in the case of targeted programs.

An additional issue that is critical to this discussion is defining the appropriate comparison against which to measure the impacts of school choice programs. As many have argued, the issue is not whether schools within choice systems are stratified relative to some ideal, but rather which student assignment policy stratifies the least.⁸ For example, a school choice program can be compared to a traditional neighborhood school assignment policy or an

⁸ Archbald, 2000; Levin, 1998; Moe, 1995

attendance area realignment aimed at desegregating schools (which may involve numerous methods). It is not sufficient to ask if choice stratifies; one must specify what form of choice compared to what other assignment policy. The issue is not whether segregation would occur, but whether it would be worse than it currently is in neighborhood public schools.⁹

Another key conceptual point concerns the distinction between access to voucher and charter programs and the segregation of voucher/charter schools. Comparing the demographic characteristics of choosers to non-choosers tells us only part of the story. It does not tell us how choosers and non-choosers are distributed to individual schools. In order to accurately evaluate the effect of choice on segregation it is essential to have at least school-level data on both voucher-charter schools and public schools from which voucher-charter students depart. Do minority students leave segregated public schools for more integrated voucher/charter schools, or do they choose highly-segregated voucher/charter schools which have programs designed to appeal to a particular minority group? Do white students leave integrated public schools for voucher/charter schools with higher proportions of white students? Demographic data that are reported at the city, state, or national level cannot answer these questions. It is possible, for example, that across a state, charter schools might enroll an identical proportion of minority students as conventional public schools, even while every individual charter school is 100 percent segregated.¹⁰

A final conceptual problem concerns the definition and interpretation of segregation. Defining segregation, distinguishing among varieties of segregation, and determining what constitutes an improvement in segregation are tasks that are neither simple nor value-free. For example, what constitutes a perfectly integrated school? Should it reflect the demographic mix of the local public school district, the metropolitan area, the state, or the nation? If inner-city African-American parents choose to pull their children out of a public school that is fairly well-integrated in favor of a neighborhood charter school which has few white children (and perhaps an Afro-centric curriculum), is that objectionable? Given the recent Supreme Court rulings against the

⁹ Terry Moe, among others, has made the same point (Moe, 1995).

¹⁰ An example might help to illustrate this possibility. Assume that the state's school-age population is 60 percent white and 40 percent minority. Assume further that the state has ten charter schools, and in the aggregate their enrollment is also 60 percent white and 40 percent minority. It is possible that six of the charter schools enroll all of the white students while the other four charter schools enroll all of the minority students.

use of race in student assignment to schools, whatever trends we discover here are likely to continue unabated. Therefore it is critical to understand the potential impacts of current school choice policies on the sorting of students across schools.

This exploration of the evidence is framed by several key questions about the effect of vouchers and charters on segregation. First, we want to know how participating students are affected. Do choice students attend schools that are more or less integrated than their local public schools? Second, how do the choice students affect the segregation of the voucher/charter schools they have chosen? Third, how do the transfers to choice schools affect segregation in the conventional public schools left behind? Finally, segregation at the classroom level is also important. Due to tracking and other forms of school organization, students in integrated schools may still be educated in predominately segregated classrooms. This is problematic in that the benefits of integration are prevented by a lack of true exposure to others of different backgrounds. Further, if choice students are to benefit academically from peer effects, classroom level integration is critical. Unfortunately, the type of data necessary to answer all of these questions is difficult to come by, and is just beginning to be used in addressing these questions. However, evidence from existing voucher programs, charter schools, and other forms of school choice in the U.S. do shed some light on these issues.

How do families choose?

The arguments of both choice proponents and opponents depend indirectly on assumptions regarding how families will choose schools, given the opportunity to do so. Those that argue that choice will increase segregation by race and class expect that choosing families, who are assumed to be more advantaged, will be highly sensitive to the nonacademic characteristics of schools.

Several studies of private school choice have found that families are sensitive to multiple school characteristics, including racial composition. Goldhaber, for example, finds that while parents are sensitive to differences in academic achievement, they are also highly sensitive to racial composition.¹¹ Similarly, an analysis of private school choice in New York by Lankford and

¹¹ Goldhaber, 1996.

Wyckoff finds that white families prefer to send their children to schools which lack substantial minority populations.¹² When the proportion of minority students in the public schools rises by one standard deviation, the likelihood of white, college-educated parents sending their children to private schools increases by one-third.¹³ The authors conclude that: “White families have a strong preference to avoid minorities and other socioeconomic attributes associated with minorities.”¹⁴ Fairlie has reached similar conclusions with nationally representative data, finding that a 10 percent increase in the proportion of black students in the local public school corresponds to a 19 percent increase in the likelihood of private school attendance for whites in the 8th grade, and 26 percent in the 10th grade.¹⁵

Both Fairlie and Lankford & Wyckoff conclude that these findings suggest that a voucher program which is widely available to white families will lead to increased segregation. As we explore in the pages below, however, the available evidence on the integration/segregation effects of existing voucher and charter programs is mixed, depending on the specifics of the policy and the local context.

Integration in existing choice programs

Existing evidence on the integration effects of operating voucher and charter programs is regrettably limited. This is partly because, as noted in the pages above, assessing effects on integration is far more complicated than simply identifying the demographic characteristics of voucher and charter users. Data must be available not only on the students, but also on the demographic characteristics of the voucher/charter school and the school that the student would otherwise attend. While many studies have collected demographic information on the students participating in voucher and charter programs, far fewer have collected school-level data on the integration of voucher and charter schools, and fewer still permit a direct comparison with the integration of local public schools. Nevertheless, some evidence is

¹²Lankford and Wyckoff, 2000.

¹³ The likelihood of minority parents leaving, however, seems unrelated to the racial composition of the school Ibid..

¹⁴ Ibid., p. 16.

¹⁵ Interestingly, there is no evidence that African American families are responding to racial composition, while Latino families respond similarly to white families. Fairlie, Ibid..

available to assess the integration of both voucher and charter schools on the dimensions of family income and race/ethnicity.

Integration in voucher schools

Income

By targeting low-income families, the existing voucher programs have likely reduced stratification on the dimension of income (i.e., low-income voucher kids are attending private schools with tuition-paying students). Unfortunately, we lack good information about the SES levels of the classmates of voucher students that might confirm the probable hypothesis that targeted voucher programs have increased integration by SES.¹⁶ Moreover, segregation outcomes under a more universal (non-targeted) program might be quite different.

Race and Ethnicity

Evidence from the two largest voucher programs, Milwaukee and Cleveland, suggests that voucher students may experience less segregated school environments than their local public-school counterparts. The findings from privately-funded voucher programs are inconsistent, although it is difficult to ascertain whether this is due to differences among cities or data collection methods.¹⁷ In some instances, however, voucher programs may not only give students access to more integrated schools, but also may increase the integration of the schools that voucher students attend.

Voucher schools in Milwaukee are somewhat less segregated by race than are the Milwaukee Public Schools (MPS). Examining data on 86 of the 91 private schools participating in the program in 1999-2000, Fuller and Mitchell find that one half of Milwaukee public-school (MPS) students attend racially segregated schools, defined as 90 percent or more minority or white enrollments, compared to 43 percent of students in voucher schools.¹⁸ However, there are

¹⁶ The only evidence on the proportion of poor students in voucher schools comes from Cleveland, where Jay Greene finds that voucher students attend schools that on average have 59 percent of students below the poverty line compared to 64 percent for the city Greene, 1999. Unfortunately, however, this does not tell us about school-level integration.

¹⁷ The evaluations of these programs use parental responses to gauge differences in segregation at the classroom level between public and participating private schools; parents are asked "What percentage of students in this child's class are minority?"

¹⁸ Fuller and Mitchell, 1999; Fuller and Mitchell, 2000

pronounced differences in the racial compositions of participating religious schools and secular schools; while only 30 percent of students in religious schools are racially isolated, 83 percent of voucher students attending secular schools are racially isolated in schools serving populations that are over 90 percent minority.¹⁹ Thirty percent of Milwaukee voucher students are in secular schools.²⁰

As in Milwaukee, voucher students in Cleveland are somewhat less likely to attend segregated schools than their public-school counterparts: while 41 percent of Cleveland city public school students attend schools that are less than 10 percent white, 36 percent of voucher students do so. Further, looking across the entire metro area (including the suburbs), 61 percent of public-school students attend segregated schools, defined as schools that are either more than 90 percent white or less than 10 percent white, compared to 50 percent of voucher students.²¹ Voucher students are also more likely than public-school students to attend schools that are representative of the Cleveland metropolitan area, meaning that these schools have a proportion of minority students that is within 10 percent of the average for the metro area. Nineteen percent of voucher students attend a school that is racially representative of the Cleveland area, versus 10 percent of city public-school students and 3 percent of suburban public-school students.

Evidence on racial segregation in the privately-funded voucher programs in New York City, Washington, DC, and Dayton, Ohio is limited and indirect, based on parent perceptions of classroom segregation rather than actual enrollment data. In New York City, 30 percent of voucher parents report that their children are in classrooms that are 100 percent minority, compared to 38 percent of the public-school control group.²² In Washington, DC, 40 percent of parents of both voucher students and the control group reported that their children were in classes that were 100 percent minority.²³ Interestingly, in Dayton, parents of voucher students

¹⁹ Fuller and Mitchell, 1999; Fuller and Mitchell, 2000.

²⁰ Wisconsin Legislative Audit Bureau, 2000.

²¹ Greene, 1999.

²² Myers, Peterson, Mayer, Chou and Howell, 2000. The control group consists of voucher applicants who did not win the lottery and were attending public schools. The first year results were similar, with 28 percent of the parents of choice students reporting that their children were in segregated classrooms compared to 37 percent of the control group.

²³ Wolf, Howell and Peterson, 2000

were more likely to report that their children were in 100 percent-minority classrooms, (14 percent of voucher students versus 5 percent of the control group), but they were also more likely to be in classrooms where less than 50 percent of the students were minority (52 percent of voucher students versus 30 percent of the control group).²⁴ In sum, the available data on the privately-funded voucher experiments do not show a clear integration advantage for either voucher schools or public schools. Unfortunately, we do not know whether these inconsistencies are due to differences between the cities in terms of the racial makeup of public and private school populations, or simply a result of inaccuracies associated with using parental responses to measure the racial composition of schools. Overall, these data tell us little about the effects of privately-funded programs on racial integration.

Concluding note on integration in voucher programs

While the limited evidence available to date suggests that existing voucher programs may move some low-income, nonwhite children into more-integrated voucher schools, we are left with several unanswered questions. To appropriately gauge the impact on participating students, it is essential to have school-level data on the composition of the student body in both participating choice schools and the public schools that are impacted. To date, few evaluations of voucher programs have collected this information. Therefore we know very little about the composition of individual voucher schools. This leaves us unable to answer questions about the effect of vouchers on the integration of voucher schools. Moreover, these data do not address the question of whether segregation is increasing in the public schools that choice students are departing. Given the dominance of minority students in the enrollments of most of the voucher programs, however, it is unlikely that the programs have adversely affected racial integration in the public schools.

Finally, it is important to remember that most of the existing voucher programs are targeted to low-income students, most of whom are nonwhite, and that they are small enough that they can rely largely on existing private schools. Wide-eligibility programs that are implemented on a larger scale could produce very different integration effects.

²⁴ Howell and Peterson, 2000.

Integration in charter schools

Income

At the national level, charter schools and traditional public schools are serving comparable proportions of low-income students, indicated by the proportion of their students who are eligible for free or reduced-price lunch.²⁵ A further analysis at the national level compares the populations being served by charter schools to those of their host districts using data collected from 801 charter schools operating in 33 districts in 26 states in the 1997-98 school year.²⁶ Charter schools were defined as 'distinct' if their proportion of students eligible for free or reduced-price lunch differs from that of the district by more than 20 percent. Using this definition, Ascher and colleagues find that 48 percent of all charter schools are not distinct from their districts in terms of the proportion of their students who are eligible for free or reduced-price lunch. Of the distinctive schools, 14 percent serve a higher proportion of low-income students and the remaining 38 percent serve a lower proportion. However, fully one-third of all charter schools reported that no students were eligible, suggesting the possibility of that low-income students were underreported in some charter schools.²⁷ Nevertheless, these data suggest that a sizable number of charter schools are serving almost exclusively middle- and upper-income populations.²⁸

Race and Ethnicity

At the national level charter schools appear to be serving populations that are similar to those served by traditional public schools with respect to student race and ethnicity. To date the only national level data on the composition of charter schools relative to their surrounding districts comes from the second of the U.S. Department of Education's four national reports. Using data from sixteen states during the 1996-97 school year, charter schools were defined as racially distinct if their proportion of white students differs from that of the district by more than 20

²⁵RPP International, 2000.

²⁶Ascher and Wamba, 2000. Due to missing data, the analysis of charter school demographics includes 535 schools from this database plus 349 schools from the RPP database RPP International, 1998.

²⁷The authors believe that this is due to the 'bureaucratic obstacles to becoming part of the federal free and reduced-price lunch program'.

²⁸In California, for example, in more than one-third of charter schools the proportion of low-income students was more than 20 percentage points lower than in non-charter schools in the sponsoring district (SRI International, 1997).

percent.²⁹ Overall, 60 percent of charter schools were not racially distinct from their districts, 5 percent had higher percentages of white students, and 36 percent had substantially lower proportions of white students relative to their districts.

Unfortunately, this data is less definitive than it may appear. Comparisons to district averages cannot tell us whether charter schools are more or less integrated than *individual* public schools. Consider a school district which has a total enrollment that is 50 percent black and 50 percent white, divided among ten schools. If a local charter school enrolls a population which is 70 percent black and 30 percent white, we might be tempted to conclude that the charter school is more segregated than the conventional public schools. Without further information, however, such a conclusion would be unwarranted. The problem is that district-level demographic information does not tell us anything about the composition of individual schools. Each of this district's ten schools might be 50 percent white and 50 percent black—or the district might include five all-white schools and five all-black schools. Without knowing the racial composition of individual schools in the district, we cannot know whether the charter school is more or less integrated than other local schools.

Although statewide demographic data on charter enrollments is plentiful, and district comparisons are fairly common, very few studies have directly compared *school-level* data on charter and public-school integration. We have seen only two studies providing detailed, school-level data. Both studies suggest that many charter schools are relatively segregated, at least in the two states examined.

In Minnesota, a 1998 study found that the state's charter schools served populations that were either heavily minority or heavily white. Nineteen charter schools were operating in Minnesota at the time, and the authors collected data on 16 of the 19. In half of the charter schools (8 of 16), enrollments were over 80 percent white. The other half of the Minnesota charter schools served populations that included over 60 percent minority group members; three of 16 schools enrolled 60-80 percent nonwhite students, while five of 16 enrolled 80-100 percent nonwhite students.³⁰ In comparison, the districts in which these schools are located are 84 percent white

²⁹ RPP International, 1998.

³⁰ Center for Applied Research and Educational Improvement, 1998.

on average, ranging from 37 percent to 98 percent white. Overall, these data strongly suggest that Minnesota charter schools are racially polarized. Not one charter school in the survey had an enrollment including 20-60 percent minority students.

A similar pattern is evident in North Carolina, where a substantial number of schools are serving either very high or very low proportions of minority students. In 1997-98, of the state's 34 charter schools, 14 (or 41 percent) had more than 88 percent minority students, and another 10 (or 29 percent) had less than 20 percent minority students.³¹ Moreover, the North Carolina study included comparative data about the local public schools in districts served by charters. Ten charters had higher proportions of minority students than any of the conventional public schools in their districts, five charters had lower proportions than any of the public schools in their districts, and 18 were within the range of local public-school demographic variation. In other words, nearly half of the charter schools in North Carolina enroll student populations that are more racially segregated than every conventional public school in their local district.

The relative segregation of North Carolina charter schools is particularly interesting given that the state's charter schools are subject to a legal requirement to "reasonably reflect" the demographics of local school enrollments.³² Neither of the two studies examining the relationship between charter school demographics and racial balance provisions has found any consistent relationship between the racial composition of charter schools and charter law provisions regarding admissions policies or racial balance.³³ Racial balance provisions in charter laws may be largely symbolic. In California, for example, although the law states that charter schools are to reflect the racial composition of the school district in which they are located, Amy Stuart Wells and her colleagues have found that this provision is not being monitored or

³¹ North Carolina Department of Public Instruction, 1998.

³² The law declares that "Within one year after the charter school begins operation, the population of the school shall reasonably reflect the racial and ethnic composition of the general population residing within the local school administrative unit in which the school is located or the racial and ethnic concentration of the special population that the school seeks to serve residing within the local school administrative unit in which the school is located. The school shall be subject to any court-ordered desegregation plan in effect for the local school administrative unit." § 115C-238.29F. General requirements. It is not clear whether a "special population" might be defined in ethnic terms (e.g., for a charter school with an Afro-centric curriculum).

³³ Ascher, Jacobowitz and McBride, 1998; Wells, Vasudeva, Holme and Cooper, 2000.

enforced.³⁴ In consequence, it is not surprising that in 1996, more than one-third of California charter schools had average Latino enrollments that were more than 10 percentage points below the district average, and close to 40 percent had average white enrollments that were more than 10 percentage points higher.³⁵

Amy Stuart Wells and her colleagues have reanalyzed the national data described in the Department of Education's annual descriptive report on charter schools, examining trends across states in the proportions of minority students served by charter schools relative to state averages during the 1998-99 school year.³⁶ The eight states in which charter schools serve higher proportions of white students are all located in the South, West, or Southwest, where districts tend to be larger (often countywide). In contrast, the states with higher proportions of students of color tend to be located in the North and East where school districts tend to be smaller and more homogeneous. Wells and colleagues note that one possible explanation is that in largely white Northeastern areas with highly segregated and unequal school districts, dissatisfaction with public schools may be concentrated among poor and minority families, whereas in more southern and western states dissatisfaction may be more dispersed. White and middle class families in these areas may perceive that these less segregated school districts are not as good, and no longer see public schools as places "for people like them." Overall, through an analysis of more than 20 evaluations of charter schools, Wells and her colleagues conclude that the composition of charter schools is strongly related to the local context and "the wide range of local reactions to racial inequality and the national confusion about race and educational policy."³⁷

Evidence from Other Choice Plans

Magnet schools & Controlled Choice

Proponents of school choice often use evidence that magnet schools and other forms of controlled choice have improved integration in public schools to bolster their claim that choice

³⁴ UCLA Charter School Study, 1998.

³⁵ SRI International, 1997.

³⁶ Wells, Holme, Lopez and Cooper, 2000. States with less than 1,000 students in charter schools were dropped, resulting in a final sample of 21 states. The national charter school report is RPP International, 2000.

³⁷ Wells, Holme, Lopez and Cooper, 2000, p. 218.

will not lead to greater segregation of students by race and class.³⁸ For example, data from a national study shows that magnet schools and programs have aided integration in public schools by increasing the representation of white students in predominantly minority districts and vice-versa.³⁹ However, studies of magnet schools and other controlled-choice programs have also found that families that choose tend to be more advantaged than others, consistent with the evidence presented in Chapter Five regarding voucher and charter families.⁴⁰

While a good deal of evidence supports the claims that magnet schools are successful in aiding racial integration, it is important to keep in mind that these programs are carefully designed to use choice as a mechanism of voluntary desegregation, and in many cases are a substitute for desegregation techniques such as mandatory busing. Particular magnet programs are crafted to appeal to certain demographic groups, in order to entice them to attend schools in areas where they are a racial or ethnic minority. Further, magnet programs have admissions processes that are designed to ensure racial balance across schools within a district.⁴¹ In consequence, evidence on magnet programs, controlled choice, and voluntary transfer programs has little relevance in evaluating the likely effects of vouchers and charter schools on integration.⁴²

One study which examined the preferences of parents in a magnet system, however, has relevance. In Montgomery County, Maryland white families were more likely to request transfers to schools with fewer minority students, while minority students tended to request transfers into schools with higher proportions of minority students. Further, minority families were also more likely to seek transfers into neighborhoods with higher levels of poverty and lower incomes.⁴³ Although magnet systems often impose constraints which prevent parents

³⁸ Controlled choice programs involve a balance of parental choice of schools and district oversight of racial balance. Typically parents rank-order their preferences, and a centralized agency assigns students to schools in a way that ensures the racial balance of all schools in the district or geographic area. Examples include Cambridge, MA, and Minneapolis, MN. See *Ibid.*.

³⁹ Blank, Levine and Steel, 1996.

⁴⁰ Levin, 1999; Wells, 1993.

⁴¹ Lamdin and Mintrom, 1997, p. 233.

⁴² As a few experts have pointed out, however, it is possible to design a voucher program that explicitly promotes integration. The value of a voucher might be tied to the demographic characteristics of a school: a student who will improve integration could be worth more than a student who will not. See, e.g., Epple, Figlio and Romano, 1998. Although such a policy has been proposed by academics, we are unaware of any examples in which it has been enacted or even proposed in the policy arena.

⁴³ Henig, 1996.

from exercising requests in a way that would increase segregation, these findings about parental preferences suggest that unconstrained choice in a voucher or charter program could lead to higher levels of segregation.

Interdistrict Choice

Michigan and Massachusetts are two of the few states that allow interdistrict choice without the expressed purpose of desegregation. Students and their families may choose to attend public schools in any district in the state, provided the district has opted to accept students. Massachusetts began its interdistrict choice program in 1991. In the 1995-96 school year, 92 percent of interdistrict choice students were white, compared to 52 percent of charter school students and a statewide average of 79 percent.⁴⁴ In general, receiving districts were more advantaged than sending districts, but the differences were small.⁴⁵ Despite the fact that the analyses do not uncover any substantial effects on the racial balance of participating districts, this may be a result of measuring impacts at the district rather than the school level. Given variation across schools within a district, large impacts on individual schools resulting from choice maybe lost in these analyses.

In Michigan, students take advantage of interdistrict choice to leave less affluent districts to attend schools with higher test scores, graduation rates, and family incomes, and lower proportions of African-American students. Unfortunately the demographics of participating students is not known, so it is not possible to evaluate the degree to which white students are using interdistrict choice to leave more integrated districts, or whether minority students are able to use this form of choice to gain access to districts with higher proportions of white students. Clearly, these two processes would have divergent impacts on integration across the public school system.⁴⁶

Summary

⁴⁴ Armor and Peiser, 1998, p. 166.

⁴⁵ Ibid.; see also Fossey, 1994. An updated study, using data from the 1998-99 school year, again shows differences in the socioeconomic characteristics of sending and receiving districts in terms of poverty and race, but these differences are rather small Aud, 1999.

⁴⁶ Arsen, Plank and Sykes, 2000.

Evidence on the effects of voucher and charter programs on segregation is regrettably weak. Although we know quite a lot about the extent to which voucher and charter schools provide access to children of various ethnic, racial, income, and ability groups, we know far less about how students are distributed across individual schools—the key piece of information that is necessary to determine integration. Still, enough evidence is available to make a few tentative conclusions. With respect to voucher programs, a number of the existing programs (publicly and privately funded) have helped minority children move into voucher schools that are frequently less segregated than local public schools (by class and race/ethnicity), because the voucher schools include middle-class and white students who are paying tuition. Overall, these programs may have led to a small increase in the integration of private schools in their cities. However, the impact of existing voucher programs on integration in local public schools is less clear. Given the demographics of voucher users, however, it is unlikely that the existing programs have caused any substantial increase in the segregation of local public schools.

In charter schools, the picture is also murky. Good data have been produced in only two states, where most charter schools appear to be segregated (though whether they are more segregated than local public schools is unknown). Charter policies, unlike voucher policies, create a tension between a focus on at-risk students and integration. In the case of vouchers, targeting at-risk students may increase integration by putting such students in private schools alongside tuition-paying students. In the case of charters, targeting at-risk students encourages the creation of schools that focus entirely on at-risk students.

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Chapter III

Charter Schools and Integration: The Case of Michigan

When President Bush signed No Child Left Behind into law on January 8, 2002, an already highly charged debate over school choice got an extra boost. The most contentious debates previously surrounded the issue of vouchers for private (and often religious) schooling. The new education law has, however, brought charter schools and other forms of public school choice to the center of the debate. Although much of the controversy over school choice revolves around the ability of school choice to improve student achievement, the impact of increased choice on the integration of schools may be dramatic. Opponents argue that choice will lead to increased segregation via “cream-skimming”, but in the abstract it is possible that increased choice may lead to greater integration by easing the historically tight link between residence and school attendance.

Although there has been a tremendous amount of both academic and political debate over the consequences of increased school choice, there is much we do not know about the actual consequences of the school choice policies that are operating today. Both voucher programs and charter school laws vary considerably across cities and states, making it impossible to definitively answer the many questions we have with one national study.¹ However, this variation also serves as an important source of information about the potential impact of policy design, particularly when it comes to investigating the effects of the charter school movement on public school segregation. Three states (Connecticut, North Carolina, and California) include racial balance provisions in their charter school legislation, but most states do not. Combine this lack of legislative oversight with declining support for school desegregation plans and high levels of residential and school segregation, and one can see why there is cause for concern over the impact of unrestrained public school choice.

1. For a review of the literature, see Brian P. Gill and others, *Rhetoric versus Reality: What We Know and What We Need to Know about Vouchers and Charter Schools* (Santa Monica, Calif.: RAND, 2001).

The state of Michigan is a prime example: it is unique in allowing public state universities and community colleges to authorize charter schools, which has led to a boom in the supply of new schools that are unconstrained by traditional bureaucratic structures. In addition, its metropolitan areas are among the most segregated in the nation. The combination of these demographic and legislative characteristics makes Michigan a promising context in which to uncover the potential effects of the charter school movement on segregation.

This chapter aims to take advantage of Michigan's unique policy context to address the following three research questions:

1. How does the racial composition of charter schools compare to nearby traditional public and private schools? Is there any evidence that charter schools may be serving distinct populations with respect to race-ethnicity, and poverty status?
2. Which characteristics of school districts predict charter school location? How do the locational decisions of charter schools relate to the demographic characteristics of the district's residents and the attributes of their traditional public schools? Do charter schools choose to locate in districts that are more or less racially segregated in the years preceding their opening?
3. Are charter schools leading to greater racial segregation among traditional public schools within districts?²

Background

Michigan's charter school law was signed on January 1, 1994. Relative to other states with active charter school legislation, Michigan's charter school law is unique in several respects, leading it to rather closely resemble a voucher-like system of education. First off, when a student leaves a traditional public school for a charter school, 100 percent of the per pupil funding for that student is transferred from the traditional public school to the charter school. Taken in tandem with Michigan's efforts to equalize per pupil revenues across districts, the financial incentives of the charter school movement work to create a truly competitive environment, which many

2. While much research shows that a majority of school segregation lies between districts rather than within, I have chosen to focus on within-district segregation as a first step in beginning to understand how the charter school movement may be altering how students are sorted across schools. For a focus on the former, see Sean F. Reardon, John T. Yun, and Tamela McNulty Eitle, "The Changing Structure of School Segregation: Measurement and Evidence of Multiracial Metropolitan School Segregation, 1989--1995," *Demography* 37 (2000): 351--64.

argue is required to induce systemic educational improvement.³ Second, Michigan allows a variety of groups to authorize charter schools, including public state universities and community colleges, and allows private schools to convert charter school status. By expanding the list of potential authorizers beyond school districts and state education boards, Michigan has encouraged a strong supply response from groups that are not entrenched in the bureaucracy of public education. This supply response is critical to the ability of charter schools to impact the system as a whole, given that the parents most likely to benefit from public school choice are those that cannot afford private schools or cannot afford to move to a district with higher quality public schools. Therefore, the schools must come to them. At least from a legislative standpoint, it appears as if Michigan has succeeded in making this more likely to occur.

As of the 2002--03 school year, there were 196 charter schools in Michigan, enrolling 60,236 students.⁴ Several researchers have done extensive work on the nature of Michigan charter schools, covering critical areas such as student demographics, school resources and governance, and student and parent satisfaction, among others.⁵ With respect to the racial composition of charter schools relative to traditional public schools, all groups of researchers find that, as of 1996--97, charter schools were enrolling higher proportions of minority students. Similarly, David Arsen and colleagues' examination of the geography of school choice illustrates that charter schools are much more likely to locate in central-city districts.⁶ However, as Jerry Horn and Gary Miron show, it is important to consider the context in which the schools are located; in comparison to their host districts, charter schools were actually enrolling slightly higher proportions of white students.⁷

3. Michigan reformed its system of school finance in 1994. The legislation, Proposal A, removed local property taxes as a determinant of local public school revenues and replaced them with a block grant from the state in an effort to equalize per pupil spending across districts. For more information see Paul N. Courant and Susanna Loeb, "Centralization of School Finance in Michigan," *Journal of Policy Analysis and Management* 16 (1997): 114--36.

4. Center for Education Reform, "Charter School Highlights and Statistics" (Washington: 2003).

5. David Arsen, David Plank, and Gary Sykes, "School Choice Policies in Michigan: The Rules Matter" (School Choice and School Change, Michigan State University, 2000); Jerry Horn and Gary Miron, "Evaluation of the Michigan Public School Academy Initiative" (Evaluation Center, Western Michigan University, 1999); Jerry Horn and Gary Miron, "An Evaluation of the Michigan Charter School Initiative: Performance, Accountability, and Impact" (Evaluation Center, Western Michigan University, 2000); Public Sector Consultants and Maximus, "Michigan's Charter School Initiative: From Theory to Practice" (Lansing: Michigan Department of Education, 1999).

6. Arsen, Plank, and Sykes, "School Choice Policies in Michigan."

7. Horn and Miron, "Evaluation of the Michigan Public School Academy Initiative."

Descriptive analyses, while important in understanding the context of choice in Michigan, are not evidence of segregation per se. One of the most potentially misleading paths of the school choice debate is the tendency to accept discrepancies in the racial composition of schools and districts as evidence of segregation. For example, a charter school may serve primarily black students even though it is located in a district with a percentage of black students substantially lower than average. However, this comparison ignores the fact that there is tremendous variation in the racial composition of schools within districts, which is masked by using the district average as a benchmark. A district may serve 50 percent white students, but this may average be a result of a cluster of predominantly white schools balanced out by a cluster of predominantly black schools.

It is also critical to take into account the location of charter schools. To date there is little work that analyzes the locational decisions of charter schools.⁸ Given that charters are more likely to locate in central cities, one might infer that they are more likely to serve higher proportions of minority students without creating higher levels of segregation. Yet mere descriptive differences, even based on appropriate comparisons, do not capture the spatial dynamics that are critical to segregation. Further, in assessing the impacts of choice on segregation, one must acknowledge that the supply response of choice schools may be affected by the demographic composition of neighborhoods and districts, which in turn structures the potential impacts of parental choice of schools.

Data and Methods

The analyses presented here rely on observations of Michigan schools and districts in the 1989--90 through 1999--2000 school years. For the sake of consistency and policy relevancy, the analyses exclude public schools of a specialized nature, such as special education schools, vocational schools, and alternative schools. In addition, schools reporting enrollments of fewer

8. Notable exceptions are Jeffrey R. Henig and Jason A. MacDonald, "Locational Decisions of Charter Schools: Probing the Market Metaphor," *Social Science Quarterly* 83 (2002): 962--80; and Natlie Lacireno-Paquet and others, "Creaming versus Cropping: Charter School Enrollment Practices in Response to Market Incentives," *Educational Evaluation and Policy Analysis* 24 (2002): 145--58.

than ten students and districts with a single school are excluded. The final sample includes approximately 489 districts in each year.⁹

I rely on the U.S. Department of Education's *Common Core of Data* for school-level measures of racial composition, student eligibility for free or reduced-price lunch, student-teacher ratios, and school size.¹⁰ These data have been aggregated to provide district-level averages of these measures.¹¹ Measures of school segregation are also derived from the *Common Core of Data*, relying on information on the racial composition of individual traditional public schools to provide an indicator of segregation at the district level.¹² Therefore, even though a great deal of school-level data have been used in these analyses, the district is the unit of analysis for the most of the results presented here.

An often ignored yet critical component of the racial dynamics of public education is the racial and socioeconomic composition of the population residing in the school district. I use decennial census data for 1990 and 2000, based on school district boundaries, to capture relevant characteristics of the residential population.¹³ I base measures of racial composition, poverty status, and percentage of district residents enrolled in private schools on the population of school-aged children enrolled in public or private schools and residing in the district. Measures of urbanicity, median income, and homeownership are based on the entire population of the district, while educational attainment is calculated for the population over age twenty-five.

Further information regarding public school districts is derived from the Michigan Department of Education's online databases, including average teacher salary, district per pupil revenues, and student achievement in mathematics and reading. Student achievement is measured by the percentage of students in a district scoring satisfactorily on the state's educational assessment,

9. There were 561 districts in 1990 and 555 in 2000.

10. National Center for Education Statistics, *Common Core of Data*, 1989--90 through 1999--2000 (U.S. Department of Education).

11. Each charter school in Michigan is treated as its own district. To accurately locate charter schools within a district, I geocoded the 1999--2000 addresses for each charter school and reassigned them to the district in which they are physically located.

12. Charter schools are excluded from these calculations in order to construct measures that reflect the experiences of the students remaining in traditional public schools.

13. Referred to as the 1990 and 2000 School District Data Book. U.S. Bureau of the Census, 1990 Decennial Census School District Special Tabulation; U.S. Bureau of the Census, 2000 Decennial Census School District Special Tabulation.

the Michigan Educational Assessment Program. To capture the effect on districts of the 1994 school funding reform, I use data on the amount of per pupil revenue each district received from state and local sources in 1993--94, before the change, and compared it to the 1994--95 amounts.¹⁴ Given that the reform was intended to equalize spending across districts by replacing local funding based on property taxes with a state block grant, the net effect on districts' per pupil revenues will be crudely captured by the change in state plus local revenues over these two periods. Finally, I use data from the *Private School Survey* to gauge the racial composition of Michigan's private schools relative to charter and traditional public schools.¹⁵

The first stage of the analysis aims to assess the extent to which charter schools may be racially distinct from comparable traditional public schools. The 1999--2000 data were analyzed using the techniques of the geographic information sciences, which enabled me to compare charter schools to private and traditional public schools located within a particular distance. This relatively simple descriptive analysis is powerful in enabling one to make the appropriate comparisons among schools that could potentially serve the same student populations.

The next step of the analysis seeks to understand the locational decisions of charter schools, using precharter characteristics of districts to predict their likelihood of having a charter school by the 1999--2000 school year. Given the uneven distribution of the count of charter schools at the district level, the most reasonable measurement of charter presence was zero, one, or multiple charter schools. Preliminary investigations indicated that quite different processes led to single versus multiple charter schools. Therefore I chose to use a multinomial logit specification to allow a district's precharter characteristics to have different impacts on the likelihood of having a single charter school or multiple charter schools, each versus zero charter schools. These models allow for clustering of schools within districts, and standard errors are adjusted accordingly.

The goal of the final stage of the analysis is to estimate the effect of charter school presence on the segregation of traditional public schools within districts. One of the most stubborn problems

14. All financial variables were adjusted for inflation using the consumer price index and are expressed in dollars corresponding to the 1999--2000 school year.

15. National Center for Education Statistics, *Private School Survey, 1999--2000* (U.S. Department of Education).

in this type of analysis is the issue of endogeneity of charter location. Given that charter schools are not randomly distributed across Michigan's school districts, estimates of their impact on segregation may be biased. This analysis, unlike research that uses an instrumental variable approach, relies on a difference-in-differences approach.¹⁶ By taking the difference of pre- and post-charter measures, the potential influence of time-invariant omitted factors that may have impacted both a district's level of segregation and their likelihood of having a charter school are differenced out, leaving unbiased estimates of the effect of charter presence on changes in segregation.

Results

Table 3.1 shows the characteristics of Michigan's charter schools as of 1999, compared to both private and traditional public schools. These results clearly show that charter schools are serving a distinct population: with respect to race and ethnicity, 47 percent of charter school students are black, compared to 17 percent of traditional public school students. This gap mirrors the discrepancy in the percentage of white students served by charter and traditional public schools (47 and 77 percent white, respectively). Michigan's student population is becoming more diverse over time, even though the percentages of other racial and ethnic groups remain small. Latino students make up nearly 4 percent of the traditional public school population, and Asian and American Indian each make up less than 2 percent. Charter schools serve slightly higher percentages of Latino and American Indian students, and a lower percentage of Asian students, relative to traditional public schools. Private schools appear to be the least diverse: 84 percent of their students are white, 11 percent black, and the remaining 5 percent are either Latino, Asian, or American Indian.

[Table 3.1 here]

With respect to socioeconomic status, measured by the percentage of students eligible for free or reduced-price lunch, it appears that fewer charter students are eligible, about one-quarter

16. Bettinger, Eric (1999). The Effect of Charter Schools on Charter Students and Public Schools. National Center for the Study of Privatization in Education. Bettinger (1999) developed an instrumental variable based on a school's distance to one of Michigan's public state universities for which Governor Engler appointed the board. However, in my analyses, the instrument failed on two fronts: first, as noted by Bettinger, it only operates effectively before 1999; and second, it did not accurately predict the differences in the number of charter schools per district.

versus one-third for traditional public schools.¹⁷ However, an examination of the schools that report having at least one student participating in the free lunch program indicates that more than half of charter school students are eligible, compared to slightly more than one-third of traditional public school students.¹⁸ Relative to traditional public schools, charter schools are also substantially smaller by approximately 200 students, have similar student-teacher ratios, and are slightly more likely to serve elementary grades or alternative combinations of grades.

Overall, these results alleviate the fear that charter schools serve largely white and affluent student populations. However, the size of the discrepancy in the proportion of black students drawn into charter schools does raise some questions. Are charter schools explicitly targeting black populations through their curricula and recruitment strategies? Or are black parents less satisfied with their current educational options and most likely to seek new opportunities? These questions are difficult to answer with existing data, but one may start by analyzing the locational decisions of charter schools. Other researchers note that, since charter schools must accept all applicants, one way that they may shape their populations is through their choice of location. There may also be more practical considerations involved in these decisions, such as cost and building availability to name just two. However, one can learn quite a bit from a simple comparison of schools within a geographic area. Table 3.2 shows the racial composition of charter schools relative to other types of schools within their immediate vicinity.

[Table 3.2 here]

Local Contexts

The data in table 3.2 show that the higher percentage of black students in charter schools is based in large part on their physical location: in 1999--2000, 49 percent of charter elementary students were black; the corresponding figure was 52 percent for traditional public schools within two miles. Interestingly, when one examines a five-mile radius, one sees a large drop in the percentage of black students in traditional public schools, down to 37 percent, reflecting the tremendous variation in the racial composition of schools within limited geographic areas. In

17. Other researchers note that many Michigan charter schools do not participate in the federal school lunch program, accounting for the large number of charter schools reporting that none of their students are eligible; see Horn and Miron, "Evaluation of the Michigan Public School Academy Initiative."

18. Zero eligible students were reported by 90 charter schools (53 percent) and 207 traditional public schools (6 percent).

contrast, charter schools seem to be serving smaller percentages of Latino students, 3 percent versus 5 percent for traditional public schools within two miles and within five miles. The same patterns are seen in the racial composition of private schools, with those within two and five miles of charter schools serving 37 and 23 percent black students, respectively, double and triple the percentage of black students in private schools statewide. With respect to socioeconomic status, it appears at first as if charter schools are only serving half the percentage of poor students as traditional schools nearby (27 versus 55 percent); however, once we consider only schools reporting participation in the lunch program, we see that charter schools are serving only slightly fewer poor students (53 versus 62 percent).

The table also compares schools located within two miles of a private school serving elementary grades. Charter schools located within two miles of private schools (approximately two-thirds of charter schools serving the elementary grades) have black populations that are 10 percentage points higher than all charter schools, yet again they look quite similar---with respect to racial composition---to traditional public schools that are also within two miles of a private school. This similarity of charter and traditional public schools located within a two-mile radius of a private school suggests that charter schools are targeting students in public rather than private schools, although this issue requires far more rigorous investigation.

In conclusion, these descriptive data based on the physical location of schools imply two trends. First, charter schools are enrolling disproportionately high proportions of black students, a result of their choice to locate in areas with large black populations. Second, the similarities in the makeup of charter schools and local traditional public schools suggest that charter schools are not creating racially distinct schools relative to their local contexts and are likely drawing students of similar socioeconomic backgrounds as well.

Predicting Charter Presence

The goal of this analysis is to determine whether charter schools are significantly more likely to locate in districts where public school segregation is high. This is an important policy question in its own right, in that the locational decisions of charter schools provide a measure of the supply response to the charter school movement, but the answer is also critical in understanding the nature of the relationship between charter schools and trends in public school segregation. The

previous section illustrates that charter schools are choosing to locate in areas with larger black populations; whether these areas are significantly more segregated than districts without charter schools is another question.

Tables 3.3 through 3.9 present a series of multinomial logit models that examine the influence of district characteristics on charter school presence.¹⁹ (The means and standard deviations of the measures used in the model are presented in table 3.10.) The first column of each model shows the marginal effect of each predictor on the probability of a positive outcome (a single charter school or multiple charter schools), followed by the coefficient and its standard error. These models use characteristics of schools and districts that predate the charter movement to predict a district's likelihood of having a single charter school or multiple charter schools versus no charter schools by the 1999--2000 school year. Characteristics of the residential population, which come from the decennial census, are only available for 1990, while the other predictors represent averages over the period of 1989--90 through 1993--94, except for teacher salary and achievement, which each span 1991--92 through 1994--95.

[Tables 3.3 through 3.10 here]

The first model (the baseline model, table 3.3) includes no controls for segregation, while the following models (tables 3.4 through 3.9) examine isolation and exposure in traditional public schools within districts. Tables 3.4 through 3.6 examine exposure rates; black-white exposure (table 3.5), for example, indicates the percentage of white students in the school attended by an average black student. Isolation measures (tables 3.7 through 3.9) capture the extent to which students attend schools primarily with students of their own racial or ethnic group; for example, Latino isolation represents the average percentage of Latino students in schools attended by an average Latino student.

One of the most interesting things to note about these results is that the array of factors leading to a district housing multiple charter schools is quite different from that leading to a single charter school. The only factor that is consistently related to a district's likelihood of having both single charter school and multiple charter schools is district size, indicated by the count of

19. Charter presence was first modeled as an ordered logit, but the impact of relevant factors varied considerably in predicting one versus multiple charters.

traditional public schools located in the district: larger districts are significantly more likely to have both single and multiple charter schools by 1999. Districts that were more favorably impacted by Michigan's school finance reform were more likely to get a single charter school but not multiple charters, while higher poverty districts had significantly lower probabilities of having a single charter. Relative to districts without charter schools, districts with multiple charters had marginally significantly lower homeownership rates and higher private school attendance rates, possibly representing less affluent populations that place a high priority on education; alternatively, there may be a high concentration of families desiring religious education for their children. Interestingly, few of the factors we tend to think of as associated with school quality are predictive of charter school presence, such as student achievement, student-teacher ratios, and average teacher salaries.

With respect to race, these models show an interesting pattern. In districts where black students are more exposed to white students, there is a significantly lower likelihood of both single and multiple charter schools. The sizes of these effects are not trivial; for example, a district that is one standard deviation higher than the mean for black-white exposure faces a .17 drop in the probability of having a single charter school and a .09 drop in the probability of having multiple charter schools.²⁰ Further, greater black isolation increases the likelihood of both a single charter and multiple charters; districts with higher levels of black isolation (one standard deviation above the mean) have .15 and .06 higher probabilities of having a single charter and multiple charters, respectively. The same pattern is found with respect to Latino-white exposure, with both single and multiple charter schools being less likely in districts where Latino-white exposure is high. Further, districts with high levels of Latino isolation are significantly more likely to house multiple charter schools. With respect to exposure, districts that are one standard deviation above the mean face a decline of .13 in the probability of a single charter school. The marginal effects of isolation on charter school presence are not substantial.

In contrast, in districts where white students are more exposed to black students, there is a significantly higher probability of having a single charter but no higher likelihood of multiple

20. The marginal effects presented here were estimated using the mfx command in Stata and estimate the marginal effects of the independent variables at their respective means.

charter schools. Similarly, districts with higher levels of white isolation have lower probabilities of a single charter but are no more or less likely to house multiple charter schools. In terms of magnitude, a district has a .11 higher probability of a single charter school if their white-black exposure rate is one standard deviation above the mean and a .13 lower probability for a comparable level of white isolation.

These results cannot tell us the true reasons, but clearly there is a desire for alternative educational options in districts where both Latino and black students are more segregated from white students. Further, there appears to be less motivation toward charter schools in districts where white isolation is high and exposure to black students is low, although these results are not as robust. Given these findings---that charter school location is far more responsive to racial composition than to other characteristics of school districts---the next step of the analysis assesses the extent to which the presence of charter schools works to worsen or ameliorate levels of segregation within their chosen districts.

Changes in Segregation over Time

Tables 3.11 through 3.16 present difference-in-difference estimates of the effects of charter presence on the segregation of traditional public schools within districts. The outcomes are changes in within-district segregation between 1990 and 2000.²¹ In these models, charter school presence is first measured as it was in the previous analysis, comparing districts with a single or multiple charter schools to those without. Although these models control for the size of district, the share of public school population enrolled in charter schools may be a better indicator of charter school presence. Therefore districts are also categorized based on their percentage of public school students that are enrolled in charter schools in 1999: zero, below the median of 7 percent, or at or above the median.²² Many demographic characteristics are likely to influence changing segregation patterns, such as the racial composition of the resident population, levels of poverty, and educational attainment. Changes in these characteristics of the resident population are controlled for in these models, as are changes in the size of the private school

21. The scale of the measures of segregation have been transformed from 0--1 to 0--100 to make the coefficients easier to interpret. As a result, the means and standard deviations reported in table 8-5 need to be multiplied by 100 in order to obtain the values used in the difference-in-difference analysis.

22. The median is based on districts having at least one charter school in 1999.

population, the percentage of white residents attending private schools, and characteristics of traditional public schools in the district.

[Tables 3.11 through 3.16 here]

The results are consistent with the findings of the analysis of locational decisions, in that the same dimensions of segregation are sensitive to charter school presence: black-white exposure, Latino-white exposure, and white isolation. However, the additional consideration of charter schools' share of the public population adds much to our understanding of the conditions under which charter schools may impact the larger public school system with respect to segregation. In only one instance does the quantity of charter schools impact segregation (multiple charter schools reduce white isolation); in most cases, districts do not experience significant effects of the charter school movement unless a sizable percentage of their public school students are enrolled in charters (at or above the 1999 median of nearly 7 percent). Under these conditions, black and Latino exposure to white students declined significantly. The average black student was exposed to nearly 2 percent fewer white students, and the average Latino student was exposed to about 3 percent fewer white students. The magnitude of these changes is relatively large, given that the models control for the changing racial composition of districts.

Although charter school presence did not significantly impact black or Latino isolation, districts with multiple charters experienced a significant decline in white isolation, with the effect being the largest in districts where charter schools enroll more than the median percentage of public students. Relative to districts without charter schools, districts with multiple charters and districts with a large share of their public students in charters experienced approximately a 2-point drop in white isolation, and those with a high percentage of students in charters experienced slightly more than a 1.5-point drop.

Aside from the impacts of charter school presence, there are some additional interesting findings with respect to characteristics of public schools and districts. In models examining the impacts of charter enrollment share, increases in student-teacher ratios led to marginally significant declines in black and Latino exposure to whites and increases in black and Latino isolation, although the effects are small. Increases in average teacher salary seemed to influence the segregation of black students, through significant positive impacts on black exposure to

whites and negative impacts on black isolation. Improvements in reading achievement also benefited black students with respect to segregation, although these effects were small. Aspects of Latino segregation seemed more sensitive to the educational attainment of district residents; increases in the percentage of residents with some college or higher lead to significant increases in Latino exposure to white students and declines in Latino isolation.

In contrast to these more complex results for black and Latino segregation, changes in segregation for whites was impacted by only two factors: the racial and the economic composition of the district's residential population. Increases in poverty led to increased white isolation and reduced exposure to black students. Further, these models of changing segregation experienced by whites explained a substantial proportion of the variance in these changes, 67 percent of changes in white exposure to blacks and 73 percent of changes in white isolation. These models also explain a great deal of the variance in changes in Latino isolation and Latino exposure to whites (68 and 73 percent, respectively), yet the models for dimensions of black segregation did not accomplish as much, explaining only slightly more than half of the variation.

In sum, these results describe complex relationships between racial segregation and public schooling that cannot easily be explained by a single model. Most important, they show that where charter schools have enrolled a sizable proportion of the public school population, black and Latino students have become more isolated from white students in traditional public schools. Under these conditions white isolation also declined, which is consistent with charter schools drawing relatively higher proportions of white students in these districts. This would lead to fewer white students in traditional public schools, which would lower white isolation as well as lower exposure to whites for black and Latino students remaining in these schools. However, this is merely a possible explanation, and the processes involved require further investigation.

Another important complexity is the differences in factors relevant to segregation for different racial groups. Segregation for black students is strongly influenced by the characteristics of public schools, but segregation for Latinos seems more sensitive to the characteristics of the residential population. These results suggest a need for analyses using measures of mutual

segregation among several racial and ethnic groups, which may succeed in better illuminating these complex relationships.

Conclusion

The main goal of this study is to understand the racial context of the charter school movement in Michigan. The results discussed above indicate that, although at first glance charter schools appear to be serving distinct populations, the racial composition of charter schools is not dramatically different from traditional public schools located in their vicinity. However, charter schools are significantly more likely to locate in districts where black and Latino students are more isolated from white students in traditional public schools. Even though this trend can be seen in a positive light in that the supply of charter schools is responding to a desire for greater educational options on the part of black and Latino families, there is also a down side: in districts with high proportions of students in charter schools, several forms of public school segregation have been exacerbated. The precise mechanism by which this has occurred has not been clearly defined by these analyses and certainly requires further investigation.

Limitations

Forms of choice---whether of residence or school attendance---are complex social phenomena that defy simple explanation. Therefore there is often the possibility that a researcher has failed to take into account a relevant factor in explaining the consequences of individual choices. In this case, there may be many political and ecological factors that influence the locational decisions of charter schools; further work is clearly needed to more fully understand the supply responses of choice schools. In addition, we know relatively little about how charter schools change the sorting mechanisms within districts: are charters disproportionately drawing students of one racial or ethnic group from local schools? Are they primarily drawing students from private schools or from traditional public schools? These questions are certainly worthy of further investigation.

Segregation is also a multifaceted phenomenon, and dichotomous measures such as those used here are incapable of telling the full story of the racial dynamics of school districts. Further work with more complex measures of mutual segregation may shed more light on the relationship between race and the charter school movement.

Policy Implications

Most of the controversy surrounding charter schools focuses on their ability to improve academic achievement, but their potential effects on segregation remain critical to today's policy debate. The implications of the results presented here are both positive and negative, in that good intentions seem to be having some unintended yet negative consequences. The fact that charter schools are aiming to serve more disadvantaged districts is important, given that some feared that they would target more affluent or white populations. However, in order to reach their target populations, in many cases these schools must locate in more highly segregated school districts. One cannot fault them for trends that have likely been operating for decades before their arrival; however, the results presented here show that, when they enroll a large share of the public school population, they are significantly increasing several dimensions of segregation.

From a policy standpoint, these results do not point to a simple solution. Some states have racial balance provisions in their charter school legislation, such as requiring that the racial composition of charter schools reflect that of the district in which they are located; these results, however, suggest that such provisions would not be effective in Michigan. As we see, Michigan's charter schools closely resemble nearby traditional public schools with respect to race, and the trends in segregation in their districts certainly predate their arrival. Given that the main effects occur when charter schools serve large proportions of the public school population, it is possible that a more appropriate policy instrument for managing segregation levels may be a cap on the percentage of a district that charter schools may serve. In sum, while Michigan prides itself on having one of the most liberal charter school laws in the country, some retooling may be needed to address the increasing segregation for students remaining in traditional public schools.

Appendix: Exposure and Isolation by Race and Ethnicity: Equations

---Exposure of blacks or Latinos to whites = $\sum [(x_i/X) * (y_i/t_i)]$.

---Exposure of whites to blacks = $\sum [(y_i/Y) * (x_i/t_i)]$.

---Isolation of black or Latinos from whites = $\sum [(x_i/X) * (x_i/t_i)]$.

---Isolation of whites = $\sum [(y_i/Y) * (y_i/t_i)]$.

Where

x_i = black or Latino population of school i ,

X = black or Latino population of district,

y_i = white population of school i ,

Y = white population of district, and

t_i = total population of school i .

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Table 3.1 Characteristics of Michigan Schools, by School Type, 1999
Percent except as noted

<i>Characteristic</i>	<i>Charter schools</i>	<i>Traditional public schools</i>	<i>Private schools</i>
<u>Racial composition</u>			
American Indian	1.63	1.25	0.44
Asian	0.72	1.58	1.46
Black	46.62	16.89	11.38
Latino	4.14	3.56	2.74
White	46.89	76.72	83.97
Student-teacher ratio	17.77	18.10	15.63
<u>Free or reduced price lunch</u>			
All schools	25.09	33.59	n.a.
Schools reporting at least one student eligible	53.32 ^a	35.80 ^b	n.a.
Size (number of students)	270.50	479.26	181.09
<u>Level</u>			
Elementary	64.12	59.23	82.66
Middle/junior high	3.53	19.03	0.00
High school	13.53	18.79	0.00
K-12	7.06	1.79	17.34
Other grade spans	11.76	1.16	0.00
<i>N, schools</i>	170	3358	692
<i>N, districts</i>	75	484	272

Source: National Center for Education Statistics, Common Core of Data, 1999-2000 (U.S. Department of Education); National Center for Education Statistics, Private School Survey, 1999-2000 (U.S. Department of Education)

a. Based on 47 percent of schools.

b. Based on 94 percent of schools.

Table 3.2 Racial Composition of Schools, by Physical Proximity^a
Percent except as noted

Characteristic	Charter schools	Traditional public schools	Private schools
<u>Racial composition</u>			
American Indian	2.01	1.25	0.44
Asian	0.84	1.63	1.46
Black	48.96	20.48	11.38
Latino	3.31	3.82	2.74
White	44.88	72.82	83.97
Student-Teacher Ratio	17.91	18.23	15.63
% Free-Reduced Lunch			
All Schools	25.09	33.59	n.a.
Schools reporting at least one student eligible	53.37 ^b	40.58 ^c	n.a.
Size	295.30	374.98	181.09
N	121	2170	692

Source: See table 3.1.

^a To capture the appropriate comparison groups, only schools serving elementary grades, including K-12, are included.

^a Based on 51 percent of schools.

^b Based on 94 percent of schools.

^c Based on 89 percent of schools.

^d Based on 93 percent of schools.

^e Based on 55 percent of schools.

^f Based on 54 percent of schools.

Table 3.2 Racial Composition of Schools, by Physical Proximity^a
Percent except as noted

Characteristic	Charter	Traditional within	Traditional within	Private within	Private within
	Schools	2 Miles of Charter	5 Miles of Charter	2 Miles of Charter	5 Miles of Charter
Racial composition					
American Indian	2.01	1.00	0.97	0.65	0.49
Asian	0.84	1.54	1.99	1.63	1.82
Black	48.96	52.12	37.43	36.66	22.88
Latino	3.31	5.28	4.93	3.79	3.59
White	44.88	40.06	54.68	57.28	71.22
Student-teacher ratio	17.91	17.63	17.99	16.85	16.66
<u>Free or reduced price lunch</u>					
All Schools	27.35	55.35	47.44	n.a.	n.a.
Schools reporting at least one student eligible	53.37 ^a	61.94 ^c	50.94 ^d	n.a.	n.a.
Size	295.30	390.68	385.64	202.27	225.42
N	121	583	1061	140	316

Source: See table 3.1.

^a To capture the appropriate comparison groups, only schools serving elementary grades, including K-12, are included.

^a Based on 51 percent of schools.

^b Based on 94 percent of schools.

^c Based on 89 percent of schools.

^d Based on 93 percent of schools.

^e Based on 55 percent of schools.

^f Based on 54 percent of schools.

Table 3.2 Racial Composition of Schools, by Physical Proximity^a
Percent except as noted

Characteristic	Charter Schools	Charter within		Traditional within		Traditional within 5 Miles of Private & Charter
		2 Miles of Private	5 Miles of Private	2 Miles of Private & Charter	5 Miles of Private & Charter	
<u>Racial composition</u>						
American Indian	0.84	0.9	0.91	1.61	2.02	
Asian	2.01	1.44	1.31	0.96	0.97	
Black	48.96	59.2	55.79	57.41	38.29	
Latino	3.31	3.85	3.6	5.73	5.01	
White	44.88	34.62	38.38	34.29	53.71	
Student-teacher ratio	17.91	18.28	18.27	17.71	18.01	
<u>Free or reduced price lunch</u>						
All Schools	27.35	31.44	29.56	59.21	47.91	
Schools reporting at least one student eligible	53.37 ^a	56.99 ^e	54.88 ^f	64.92 ^c	51.08	
Size	295.30	306.26	309.85	400.83	388.01	
N	121	87	104	500	1031	

Source: See table 3.1.

^a To capture the appropriate comparison groups, only schools serving elementary grades, including K-12, are included.

- ^a Based on 51 percent of schools.
- ^b Based on 94 percent of schools.
- ^c Based on 89 percent of schools.
- ^d Based on 93 percent of schools.
- ^e Based on 55 percent of schools.
- ^f Based on 54 percent of schools.

Table 3.3 Predicting Charter Presence, Baseline Model

	<i>Zero vs. 1 charter</i>			<i>Zero vs. 2+ charters</i>		
	$\partial y/\partial x$	Coef.	SE	$\partial y/\partial x$	Coef.	SE
Constant		-3.343			-1.362	
<i>Demographics of school district residents, 1990</i>						
Poor (relevant children in poverty)	-0.004	-0.026	0.035	0.001	0.022	0.054
Housing in urban areas	0.001	0.004	0.007	#####	-0.008	0.014
Some college or higher	-0.001	-0.003	0.025	0.003	0.057	0.032 *
Homeowners	-0.002	-0.018	0.018	-0.002	-0.058	0.033 *
Enrolled in private school	-0.002	-0.016	0.018	0.006	0.126	0.067 *
<i>Characteristics school districts, 1989-1994</i>						
Number of traditional public schools	0.014	0.110	0.037 *	0.008	0.202	0.040 ***
Average student-teacher ratio	0.000	-0.007	0.090	-0.006	-0.125	0.161
Satisfactory in math, 4th grade students	-0.001	-0.008	0.042	0.000	0.004	0.070
Satisfactory in reading, 4th grade students	0.003	0.015	0.044	-0.005	-0.098	0.083
Average teacher salary (1999 dollars)	0.004	0.032	0.077	0.002	0.048	0.115
Net effect of finance reform (1999 dollars)	0.279	2.039	0.617 ***	0.051	1.500	1.057

Addendum

Model X^2 (df): 120.05 (22)

R^2 / psuedo - R^2 : 0.3893

N - schools (districts): 2638 (484)

Source: U.S. Bureau of the Census, 1990 Decennial Census School District Special Tabulation (National Center for Education Statistics); U.S. Bureau of the Census, 2000 Decennial Census School District Special Tabulation (National Center for Education Statistics); Michigan K - 12 Student Database, 1989-1994 (Michigan Department of Education); National Center for Education Statistics, Common Core of Data, 1989 - 1994 (U.S. Department of Education)

* $p < .10$ ** $p < .05$ *** $p < .01$

^a Predictors are averages for the period of 1989-90 through 1993-94.

Table 3.4 Predicting Charter Presence, White - Black Exposure

	<i>Zero vs. 1 charter</i>				<i>Zero vs. 2+ charters</i>		
	$\partial y / \partial x$	Coef.	SE		$\partial y / \partial x$	Coef.	SE
Constant		-2.089				-1.111	
<i>Dimensions of segregation^a</i>							
Exposure of white to black	0.600	4.330	1.817	**	0.041	1.655	2.483
<i>Demographics of school district residents, 1990</i>							
Poor (relevant children in poverty)	-0.011	-0.074	0.038	**	0.001	0.006	0.057
Housing in urban areas	0.000	0.002	0.007		0.000	-0.009	0.014
Some college or higher	-0.003	-0.020	0.027		0.002	0.050	0.033
Homeowners	-0.002	-0.020	0.017		-0.003	-0.061	0.033 *
Enrolled in private school	-0.005	-0.029	0.034		0.006	0.126	0.066 *
<i>Characteristics school districts, 1989-1994</i>							
Number of traditional public schools	0.016	0.123	0.038	***	0.009	0.206	0.041 ***
Average student-teacher ratio	0.001	-0.003	0.089		-0.005	-0.114	0.162
Satisfactory in math, 4th grade students	0.001	0.006	0.043		0.000	0.004	0.070
Satisfactory in reading, 4th grade student	0.003	0.017	0.043		-0.004	-0.090	0.083
Average teacher salary (1999 dollars)	0.001	0.010	0.074		0.002	0.045	0.110
Net effect of finance reform (1999 dollar:	0.262	1.935	0.610	**	0.052	1.462	1.090
<u>Addendum</u>							
Model X^2 (df): 146.27 (24)							
R^2 / psuedo - R^2 : 0.3975							
N - schools (districts): 2638 (484)							
Source: see table 3.3							

* $p < .10$ ** $p < .05$ *** $p < .01$

a. Predictors are averages for the period of 1989-90 through 1993-94.

Table 3.5 Predicting Charter Presence, Black - White Exposure

	<i>Zero vs. 1 charter</i>				<i>Zero vs. 2+ charters</i>			
	$\partial y/\partial x$	Coef.	SE		$\partial y/\partial x$	Coef.	SE	
Constant		1.965			#####			
<i>Dimensions of segregation^a</i>								
Exposure of black to white	-0.579	-4.295	1.860	**	-0.312	-7.132	2.597	***
<i>Demographics of school district residents, 1990</i>								
Poor (relevant children in poverty)	-0.012	-0.086	0.044	**	-0.003	-0.083	0.077	
Housing in urban areas	0.000	-2E-04	0.007		-0.001	-0.016	0.014	
Some college or higher	-0.004	-0.022	0.028		0.002	0.032	0.037	
Homeowners	-0.003	-0.026	0.018		-0.002	-0.053	0.029	*
Enrolled in private school	-0.005	-0.025	0.035		0.006	0.109	0.069	
<i>Characteristics school districts, 1989-1994</i>								
Number of traditional public schools	0.015	0.1161	0.038	**	0.010	0.220	0.045	***
Average student-teacher ratio	0.004	0.0157	0.094		-0.006	-0.121	0.168	
Satisfactory in math, 4th grade students	-0.001	-0.005	0.041		0.001	0.017	0.075	
Satisfactory in reading, 4th grade students	0.005	0.0296	0.044		-0.004	-0.084	0.091	
Average teacher salary (1999 dollars)	0.004	0.0242	0.075		0.000	0.002	0.107	
Net effect of finance reform (1999 dollars)	0.285	1.9617	0.617	***	0.038	1.141	1.049	
<u>Addendum</u>								
Model X^2 (df): 126.15 (24)								
R^2 / psuedo - R^2 : 0.4055								
N - schools (districts): 2600 (417)								
Source: see table 3.3								

* p < .10 ** p < .05 *** p < .01

a. Predictors are averages for the period of 1989-90 through 1993-94.

Table 3.6 Predicting Charter Presence, Latino - White Exposure

	<i>Zero vs. 1 charter</i>				<i>Zero vs. 2+ charters</i>		
	$\partial y/\partial x$	Coef.	SE		$\partial y/\partial x$	Coef.	SE
Constant		2.022				4.607	
<i>Dimensions of segregation^a</i>							
Exposure of Latino to white	-0.596	-4.335	1.877	**	-0.203	-4.983	2.448 **
<i>Demographics of school district residents, 1990</i>							
Poor (relevant children in poverty)	-0.011	-0.079	0.042	*	-0.001	-0.035	0.067
Housing in urban areas	0.000	0.001	0.007		-0.001	-0.013	0.014
Some college or higher	-0.004	-0.022	0.028		0.002	0.036	0.035
Homeowners	-0.003	-0.022	0.018		-0.002	-0.054	0.031 *
Enrolled in private school	-0.005	-0.027	0.035		0.006	0.114	0.067 *
<i>Characteristics school districts, 1989-1994</i>							
Number of traditional public schools	0.016	0.120	0.038		0.010	0.222	0.044 ***
Average student-teacher ratio	0.002	0.004	0.086		-0.006	-0.126	0.164
Satisfactory in math, 4th grade students	0.000	-0.001	0.041		0.001	0.024	0.073
Satisfactory in reading, 4th grade students	0.005	0.024	0.044		-0.005	-0.098	0.089
Average teacher salary (1999 dollars)	0.003	0.020	0.075		0.001	0.024	0.108
Net effect of finance reform (1999 dollars)	0.276	1.943	0.623	**	0.042	1.237	1.107
<u>Addendum</u>							
Model X^2 (df): 133.52 (24)							
R^2 / psuedo - R^2 : 0.3997							
N - schools (districts): 2607 (445)							
Source: see table 3.3							

* $p < .10$ ** $p < .05$ *** $p < .01$

a. Predictors are averages for the period of 1989-90 through 1993-94.

Table 3.7 Predicting Charter Presence, Black Isolation

	<i>Zero vs. 1 charter</i>				<i>Zero vs. 2+ charters</i>		
	$\partial y/\partial x$	Coef.	SE		$\partial y/\partial x$	Coef.	SE
Constant		-1.837				0.761	
<i>Dimensions of segregation^a</i>							
Black isolation	0.525	3.854	1.693	**	0.219	5.078	2.444 **
<i>Demographics of school district residents, 1990</i>							
Poor (relevant children in poverty)	-0.011	-0.080	0.040	**	-0.002	-0.052	0.069
Housing in urban areas	0.000	0.001	0.007		-0.001	-0.013	0.015
Some college or higher	-0.003	-0.020	0.027		0.002	0.042	0.035
Homeowners	-0.003	-0.026	0.018		-0.003	-0.058	0.030 *
Enrolled in private school	-0.005	-0.025	0.035		0.006	0.115	0.067 *
<i>Characteristics school districts, 1989-1994</i>							
Number of traditional public schools	0.015	0.113	0.038	**	0.010	0.211	0.043 **
Average student-teacher ratio	0.001	0.002	0.096		-0.006	-0.120	0.169
Satisfactory in math, 4th grade students	0.000	-0.002	0.042		0.001	0.016	0.073
Satisfactory in reading, 4th grade students	0.005	0.025	0.044		-0.005	-0.090	0.087
Average teacher salary (1999 dollars)	0.003	0.019	0.075		0.000	0.007	0.110
Net effect of finance reform (1999 dollars)	0.275	1.926	0.604	***	0.042	1.212	1.123
<u>Addendum</u>							
Model X^2 (df): 135 (24)							
R^2 / psuedo - R^2 : 0.3991							
N - schools (districts): 2600 (417)							
Source: see table 3.3							

* $p < .10$ ** $p < .05$ *** $p < .01$

a. Predictors are averages for the period of 1989-90 through 1993-94.

Table 3.8 Predicting Charter Presence, White Isolation

	<i>Zero vs. 1 charter</i>				<i>Zero vs. 2+ charters</i>		
	$\partial y/\partial x$	Coef.	SE		$\partial y/\partial x$	Coef.	SE
Constant		1.778				2.242	
<i>Dimensions of segregation^a</i>							
White isolation	-0.613	-4.464	1.858	**	-0.114	-3.237	2.477
<i>Demographics of school district residents, 1990</i>							
Poor (relevant children in poverty)	-0.011	-0.077	0.040	*	0.000	-0.011	0.061
Housing in urban areas	0.000	0.001	0.007		0.000	-0.010	0.014
Some college or higher	-0.003	-0.021	0.028		0.002	0.043	0.034
Homeowners	-0.002	-0.019	0.018		-0.003	-0.058	0.032 *
Enrolled in private school	-0.005	-0.027	0.034		0.006	0.121	0.066 *
<i>Characteristics school districts, 1989-1994</i>							
Number of traditional public schools	0.016	0.125	0.039	***	0.009	0.216	0.043 ***
Average student-teacher ratio	0.002	0.010	0.086		-0.005	-0.113	0.160
Satisfactory in math, 4th grade students	0.000	0.003	0.042		0.001	0.015	0.071
Satisfactory in reading, 4th grade students	0.004	0.021	0.044		-0.005	-0.094	0.086
Average teacher salary (1999 dollars)	0.002	0.015	0.075		0.002	0.035	0.110
Net effect of finance reform (1999 dollars)	0.270	1.961	0.620	**	0.046	1.335	1.091
<u>Addendum</u>							
Model X^2 (df): 137.76 (24)							
R^2 / psuedo - R^2 : 0.3991							
N - schools (districts): 2638 (484)							
Source: see table 3.3							

* $p < .10$ ** $p < .05$ *** $p < .01$

a. Predictors are averages for the period of 1989-90 through 1993-94.

Table 3.9 Predicting Charter Presence, Latino Isolation

	<i>Zero vs. 1 charter</i>			<i>Zero vs. 2+ charters</i>		
	$\partial y/\partial x$	Coef.	SE	$\partial y/\partial x$	Coef.	SE
Constant		-3.118			-1.607	
<i>Dimensions of segregation^a</i>						
Latino isolation	0.020	0.810	5.758	0.517	11.015	4.279 **
<i>Demographics of school district residents, 1990</i>						
Poor (relevant children in poverty)	-0.004	-0.026	0.037	0.001	0.013	0.055
Housing in urban areas	0.001	0.004	0.007	0.000	-0.007	0.014
Some college or higher	-0.001	-0.003	0.025	0.002	0.051	0.033
Homeowners	-0.002	-0.020	0.018	-0.003	-0.060	0.033 *
Enrolled in private school	-0.003	-0.016	0.035	0.006	0.117	0.069 *
<i>Characteristics school districts, 1989-1994</i>						
Number of traditional public schools	0.014	0.110	0.037 **	0.008	0.195	0.042 ***
Average student-teacher ratio	0.000	-0.011	0.091	-0.007	-0.142	0.161
Satisfactory in math, 4th grade students	-0.001	-0.009	0.042	-0.001	-0.017	0.070
Satisfactory in reading, 4th grade students	0.003	0.017	0.044	-0.003	-0.067	0.086
Average teacher salary (1999 dollars)	0.004	0.030	0.078	0.003	0.069	0.109
Net effect of finance reform (1999 dollars)	0.282	2.025	0.611 ***	0.055	1.536	1.070
<u>Addendum</u>						
Model X^2 (df): 123.27 (24)						
R^2 / psuedo - R^2 : 0.3956						
N - schools (districts): 2607 (445)						
Source: see table 3.3						

* $p < .10$ ** $p < .05$ *** $p < .01$

a. Predictors are averages for the period of 1989-90 through 1993-94.

Table 3.10 Summary Statistics

Factor	Pre-Charter					
	1990		Average ^a		2000	
	Mean	SD	Mean	SD	Mean	SD
<i>Charter school presence</i>						
Number of schools	...	...	...	...	3.72	10.70
Percentage of district enrollment	...	...	...	...	0.02	0.04
Percentage of district enrollment, conditional on charter	...	...	...	...	6.46	5.33
<i>Dimensions of segregation</i>						
Exposure of black to white	0.78	0.30	0.78	0.30	0.75	0.31
Exposure of white to black	0.11	0.19	0.11	0.19	0.12	0.20
Exposure of latino to white	0.83	0.22	0.82	0.22	0.78	0.26
Black isolation	0.17	0.30	0.17	0.29	0.19	0.31
White isolation	0.84	0.21	0.84	0.22	0.80	0.24
Latino isolation	0.05	0.08	0.05	0.08	0.08	0.14
<i>Demographics of school district residents, 1990</i>						
<i>Racial composition</i>						
American Indian	0.86	0.02	...	...	0.79	0.02
Asian	1.30	0.02	...	...	1.57	0.02
Black	12.88	0.25	...	...	14.31	0.26
Latino	2.91	0.03	...	...	4.27	0.04
White	81.93	0.26	...	...	76.31	0.28
Other races	0.13	0.00	...	...	2.76	0.02
Poor (relevant children in poverty)	16.98	0.13	...	...	12.93	0.10
housing in urban areas	53.00	0.47	...	...	58.12	0.46
some college or higher	43.63	0.13	...	...	50.08	0.13
Homeowners	65.35	0.13	...	...	75.04	0.12
Enrolled in private school	11.45	0.06	...	...	11.01	0.05
White residents enrolled in private schools	14.05	0.10	...	...	13.82	0.09
Population size	22,358	54,499	...	...	24,818	60,504
<i>Characteristics of schools districts</i>						
Number of traditional public schools	28.56	61.23	28.00	59.26	30.88	66.12
Average student-teacher ratio	15.54	2.49	18.97	2.45	18.24	2.18
Satisfactory in math, all students	43.60	13.09	51.75	12.23	72.37	13.33
Satisfactory in reading, all students	37.35	11.49	41.40	10.99	59.83	12.78
Average teacher salary (1999 dollars)	49,619	7,146	32,679	4,682	48,448	6,979
Net effect of finance reform, 1993 - 94 (1999 dolla	...	...	578.17	326.32	...	...
<i>N (schools)</i>	2778 - 2852		2814 - 2852		2787 - 2852	

Source: see table 3.3

a. Pre-charter averages are based on data from 1989-93, except for teacher salary and achievement, which are based on 1991-94 data.

Table 3.11 Difference-in-Difference Estimates of Segregation ^a

Variable	Change in Black-White Exposure			
	Count		Median	
	Coef.	SE	Coef.	SE
Intercept	-2.138		-2.149	
<i>Charter school presence</i>				
Zero charters	exc.	exc.	...	...
One charter	0.072	0.701	...	...
Multiple charters	-0.565	1.304	...	...
<i>Charter share of public enrollment</i>				
Zero charters	...	...	exc.	exc.
Less than median (6.6%)	...	...	0.659	0.756
Median or greater	...	...	-1.937	0.984 **
<i>1990-2000 Changes in residential population of school districts</i>				
Δ Residential population enrolled in school	-0.812	0.336 **	-0.844	0.338 **
Δ Percent residents enrolled in private schools	0.323	0.221	0.238	0.218
Δ Percent white residents enrolled in private schools	-0.205	0.223	-0.139	0.214
Δ Percent black	-0.980	0.149 ***	-0.949	0.150 ***
Δ Percent Latino	-0.765	0.120 ***	-0.743	0.114 ***
Δ Percent housing units in urban areas	0.012	0.016	0.015	0.016
Δ Percent poor	-0.043	0.072	-0.046	0.070
Δ Percent homeowners	0.025	0.022	0.024	0.022
Δ Percent residents with some college or higher	0.033	0.073	0.035	0.069
<i>1990-2000 Changes in characteristics of schools and districts</i>				
Δ Number of traditional public schools in district	0.158	0.091 *	0.111	0.086
Δ Average student-teacher ratio	-0.142	0.101	-0.165	0.097 *
Δ Percent students scoring satisfactory				
Satisfactory in math, 4th grade students	-0.025	0.032	-0.021	0.033
Satisfactory in reading, 4th grade students	0.073	0.036 **	0.066	0.038 *
Δ Average teacher salary	0.088	0.048 *	0.097	0.049 **
Net effect of finance reform	-0.487	0.843	-0.384	0.825
N (schools, districts)	2464 (417)		2464 (417)	
R ²	0.513		0.523	

Source: see table 3.3

* p < .10 ** p < .05 *** p < .01

a. The scale of all outcomes have been transformed from 0-1 to 0-100.

Table 3.12 Difference-in-Difference Estimates of Segregation ^a

Variable	Change in Latino-White Exposure			
	Count		Median	
	Coef.	SE	Coef.	SE
Intercept	-2.072		-2.026	
<i>Charter school presence</i>				
Zero charters	...	...	...	...
One charter	-0.626	0.510	...	...
Multiple charters	-0.950	1.091	...	...
<i>Charter share of public enrollment</i>				
Zero charters	...	...	...	...
Less than median (6.6%)	...	...	0.069	0.653
Median or greater	...	...	-2.502	0.811 **
<i>1990-2000 Changes in residential population of school districts</i>				
Δ Residential population enrolled in school	-0.354	0.172 **	-0.390	0.166 **
Δ Percent residents enrolled in private schools	0.124	0.242	0.026	0.221
Δ Percent white residents enrolled in private schools	-0.158	0.242	-0.077	0.218
Δ Percent black	-1.059	0.123 ***	-1.029	0.122 ***
Δ Percent Latino	-0.851	0.118 ***	-0.832	0.112 ***
Δ Percent housing units in urban areas	0.013	0.008	0.016	0.009 *
Δ Percent poor	0.073	0.053	0.068	0.053
Δ Percent homeowners	0.010	0.018	0.009	0.018
Δ Percent residents with some college or higher	0.111	0.052 **	0.108	0.051 **
<i>1990-2000 Changes in characteristics of schools and districts</i>				
Δ Number of traditional public schools in district	-0.199	0.063 **	-0.240	0.059 ***
Δ Average student-teacher ratio	-0.133	0.081	-0.154	0.080 *
Δ Percent students scoring satisfactory				
Satisfactory in math, 4th grade students	0.034	0.025	0.038	0.024
Satisfactory in reading, 4th grade students	-0.005	0.031	-0.012	0.032
Δ Average teacher salary	0.028	0.040	0.038	0.040
Net effect of finance reform	-0.128	0.761	-0.040	0.758
N (schools, districts)	2543 (445)		2636 (484)	
R ²	0.656		0.730	

Source: see table 3.3

* p < .10 ** p < .05 *** p < .01

a. The scale of all outcomes have been transformed from 0-1 to 0-100.

Table 3.13 Difference-in-Difference Estimates of Segregation ^a

Variable	Change in White-Black Exposure			
	Count		Median	
	Coef.	SE	Coef.	SE
Intercept	0.426		0.515	
<i>Charter school presence</i>				
Zero charters	...	...	...	...
One charter	0.231	0.293	...	...
Multiple charters	0.867	0.752	...	...
<i>Charter share of public enrollment</i>				
Zero charters	...	...	...	...
Less than median (6.6%)	...	...	0.392	0.464
Median or greater	...	...	0.674	0.669
<i>1990-2000 Changes in residential population of school districts</i>				
Δ Residential population enrolled in school	-0.013	0.101	-0.014	0.111
Δ Percent residents enrolled in private schools	-0.088	0.159	-0.102	0.154
Δ Percent white residents enrolled in private schools	0.082	0.165	0.098	0.158
Δ Percent black	1.050	0.109	1.047	0.111
Δ Percent Latino	0.100	0.084	0.098	0.083
Δ Percent housing units in urban areas	0.002	0.003	0.002	0.003
Δ Percent poor	-0.084	0.048	-0.088	0.048
Δ Percent homeowners	-0.011	0.009	-0.011	0.009
Δ Percent residents with some college or higher	-0.023	0.033	-0.031	0.032
<i>1990-2000 Changes in characteristics of schools and districts</i>				
Δ Number of traditional public schools in district	0.025	0.043	0.038	0.044
Δ Average student-teacher ratio	0.024	0.048	0.028	0.046
Δ Percent students scoring satisfactory				
Satisfactory in math, 4th grade students	-0.002	0.015	-0.002	0.016
Satisfactory in reading, 4th grade students	-0.011	0.016	-0.013	0.017
Δ Average teacher salary	0.018	0.033	0.019	0.033
Net effect of finance reform	0.473	0.468	0.439	0.465
N (schools, districts)	2636 (484)		2636 (484)	
R ²	0.731		0.730	

Source: see table 3.3

* p < .10 ** p < .05 *** p < .01

a. The scale of all outcomes have been transformed from 0-1 to 0-100.

Table 3.14 Difference-in-Difference Estimates of Segregation ^a

Variable	Change in Black Isolation			
	Count		Median	
	Coef.	SE	Coef.	SE
Intercept	0.497		0.490	
<i>Charter school presence</i>				
Zero charters	...	...	...	...
One charter	-0.317	0.565	...	...
Multiple charters	0.001	1.112	...	...
<i>Charter share of public enrollment</i>				
Zero charters	...	...	...	...
Less than median (6.6%)	...	...	-0.696	0.666
Median or greater	...	...	0.881	0.794
<i>1990-2000 Changes in residential population of school districts</i>				
Δ Residential population enrolled in school	0.472	0.303	0.491	0.301
Δ Percent residents enrolled in private schools	-0.302	0.185	-0.247	0.184
Δ Percent white residents enrolled in private schools	0.236	0.182	0.193	0.178
Δ Percent black	0.935	0.128	0.916	0.129
Δ Percent Latino	0.112	0.080	0.099	0.078
Δ Percent housing units in urban areas	0.000	0.013	-0.002	0.013
Δ Percent poor	0.043	0.064	0.046	0.062
Δ Percent homeowners	-0.015	0.013	-0.015	0.013
Δ Percent residents with some college or higher	-0.016	0.063	-0.016	0.063
<i>1990-2000 Changes in characteristics of schools and districts</i>				
Δ Number of traditional public schools in district	-0.095	0.077	-0.068	0.075
Δ Average student-teacher ratio	0.106	0.072	0.120	0.071
Δ Percent students scoring satisfactory				
Satisfactory in math, 4th grade students	0.029	0.026	0.026	0.028
Satisfactory in reading, 4th grade students	-0.050	0.025	-0.045	0.029
Δ Average teacher salary	-0.080	0.039	-0.086	0.041
Net effect of finance reform	1.281	0.625	1.220	0.611
N (schools, districts)	2464 (417)		2464 (417)	
R ²	0.539		0.546	

Source: see table 3.3

* p < .10 ** p < .05 *** p < .01

a. The scale of all outcomes have been transformed from 0-1 to 0-100.

Table 3.15 Difference-in-Difference Estimates of Segregation ^a

Variable	Change in Latino Isolation			
	Count		Median	
	Coef.	SE	Coef.	SE
Intercept	-0.603		-0.579	
<i>Charter school presence</i>				
Zero charters	...	...
One charter	-0.187	0.294		
Multiple charters	-0.150	0.501		
<i>Charter share of public enrollment</i>				
Zero charters			...	...
Less than median (6.6%)			-0.029	0.271
Median or greater			-0.484	0.580
<i>1990-2000 Changes in residential population of school districts</i>				
Δ Residential population enrolled in school	-0.073	0.085	-0.080	0.082
Δ Percent residents enrolled in private schools	-0.117	0.116	-0.139	0.109
Δ Percent white residents enrolled in private schools	0.145	0.117	0.165	0.111
Δ Percent black	-0.002	0.047	0.003	0.050
Δ Percent Latino	0.700	0.079 ***	0.703	0.079 ***
Δ Percent housing units in urban areas	0.000	0.005	0.001	0.005
Δ Percent poor	-0.041	0.030	-0.042	0.028
Δ Percent homeowners	0.001	0.013	0.001	0.013
Δ Percent residents with some college or higher	-0.066	0.031 **	-0.068	0.031 **
<i>1990-2000 Changes in characteristics of schools and districts</i>				
Δ Number of traditional public schools in district	0.436	0.059 ***	0.430	0.056 ***
Δ Average student-teacher ratio	0.158	0.051 **	0.155	0.051 **
Δ Percent students scoring satisfactory				
Satisfactory in math, 4th grade students	-0.008	0.015	-0.007	0.015
Satisfactory in reading, 4th grade students	0.015	0.020	0.013	0.019
Δ Average teacher salary	-0.007	0.026	-0.005	0.025
Net effect of finance reform	0.530	0.364	0.542	0.365
N (schools, districts)	2543 (445)		2543 (445)	
R ²	0.677		0.678	

Source: see table 3.3

* p < .10 ** p < .05 *** p < .01

a. The scale of all outcomes have been transformed from 0-1 to 0-100.

Table 3.16 Difference-in-Difference Estimates of Segregation ^a

Variable	Change in White Isolation			
	Count		Median	
	Coef.	SE	Coef.	SE
Intercept	-1.926		-2.144	
<i>Charter school presence</i>				
Zero charters	...	...	...	...
One charter	-0.592	0.431	...	...
Multiple charters	-2.121	0.909	**	...
<i>Charter share of public enrollment</i>				
Zero charters	...	...	...	...
Less than median (6.6%)	...	...	-0.983	0.650
Median or greater	...	...	-1.628	0.717
			**	
<i>1990-2000 Changes in residential population of school districts</i>				
Δ Residential population enrolled in school	-0.065	0.158	-0.061	0.179
Δ Percent residents enrolled in private schools	0.080	0.162	0.116	0.154
Δ Percent white residents enrolled in private schools	-0.048	0.161	-0.088	0.151
Δ Percent black	-1.113	0.106	***	-1.106
Δ Percent Latino	-0.632	0.109	***	-0.628
Δ Percent housing units in urban areas	0.005	0.007	0.005	0.008
Δ Percent poor	0.111	0.050	**	0.121
Δ Percent homeowners	0.009	0.015	0.010	0.015
Δ Percent residents with some college or higher	0.050	0.046	0.069	0.046
<i>1990-2000 Changes in characteristics of schools and districts</i>				
Δ Number of traditional public schools in district	-0.059	0.064	-0.091	0.065
Δ Average student-teacher ratio	-0.065	0.067	-0.075	0.070
Δ Percent students scoring satisfactory				
Satisfactory in math, 4th grade students	0.019	0.021	0.018	0.023
Satisfactory in reading, 4th grade students	0.017	0.024	0.021	0.026
Δ Average teacher salary	0.013	0.034	0.011	0.034
Net effect of finance reform	0.240	0.686	0.320	0.680
N (schools, districts)	2636 (484)		2636 (484)	
R ²	0.674		0.670	

Source: see table 3.3

* p < .10 ** p < .05 *** p < .01

a. The scale of all outcomes have been transformed from 0-1 to 0-100.

Chapter IV

Charter Schools and Race in North Carolina: The Relationship between Choice and Segregation

The last fifty years have witnessed dramatic changes in education policy in the United States, which together have the potential to dramatically alter the educational landscape for decades to come. The advent of *No Child Left Behind* has introduced the notion of greater parental choice in education to the national level, and the exponential increase in the number of charter schools operating has furthered the spread of school choice in practice. Most recently, as the era of *No Child Left Behind* comes to an end, the focus of education policy appears to be shifting its focus from accountability to innovation, and charter schools are a key component of this next phase of education reform. President Obama's new education initiative, Race to the Top, an open competition among states that provides large financial awards for committing to reform initiatives designed to improve student achievement. One criterion on which Race to the Top applicants are awarded is the spread of charter schools, which is encouraging many states to lift the cap on the number of charter schools allowed under their charter school legislation. While much of the debate over school choice focuses primarily on its merits with respect to student achievement, the impact of increased choice on the integration of schools may be dramatic, especially if large, diverse states begin dramatically expanding their charter school populations. Combine these trends toward greater choice with the demise of long-standing court ordered desegregation plans, and the potential for significant changes to the racial composition of public schools is great.

The debate over the merits and potential unintended consequences of greater choice in education have been discussed in Chapter II, but with respect to issues of segregation, the major arguments revolve around the tension between the rights of parents to choose and the consequences of expressed parental preferences on the composition of public schools. In the last several years, a great deal of studies have emerged to increase our knowledge of the effects of charter schools on a variety of outcomes, yet the variation in charter school laws across states make it virtually impossible to definitively answer the many questions we have with a single

national study. However, this variation also serves as an important source of information about the potential impact of policy design, particularly when it comes to investigating the effects of the charter school movement on public school segregation.

This essay builds upon the previous two by taking advantage of student-level longitudinal data to fill several knowledge gaps that cannot be addressed with solely school level data, including the factors that drive students to move to charter schools and the nature of students' peer environments in both charter and non-charter schools.¹ The analyses that follow complement existing research in North Carolina on the effects of charter schools on student achievement and build upon work on trends in racial segregation at the school and classroom levels. Below I first provide an overview of the research on charter schools in North Carolina, followed by a detailed look at the characteristics of North Carolina schools and districts, and a comparison of the racial composition of charter schools compared with public and private schools located within five miles. Next, I discuss trends in school segregation since 1987, taking into account current degrees of school choice at the district level. I then present results of student-level logit models that predict which students switch to charter schools from non-charter schools, both for the full population and separately by student race. Finally, I provide a descriptive overview of the changes in peer environment for students moving into charter schools in the 2005-06 school year.

The results indicate that a sizeable share of charter schools are racially isolated, serving populations that are 90 percent or more black or white, far higher than the rates for other public schools. The primary factors driving students to switch to a charter school are low levels of achievement, higher levels of parental education, classroom racial composition, and a larger charter presence in the district. Black and white families appear to respond similarly to the racial composition of non-charter classrooms, as a predictor of a move to a charter school. However, black and white families appear to both be making self-segregating moves to charter schools, at least in recent years. While North Carolina's cap on the number of charter schools allowed to operate in the state likely functions to prevent these trends from dramatically

¹ Given the importance of magnet schools in North Carolina, they are included in all analyses in this chapter. Therefore I often use the term 'non-charter' to refer to both traditional public and magnet schools.

increasing levels of school segregation, the removal of this provision could lead to dramatic changes in the segregation of North Carolina's public schools.

Background on North Carolina's Charter School Legislation

North Carolina passed its charter school law in 1996, and the first charter schools—25 of them—opened in 1997. As of this writing, the number of schools has reached one hundred, the maximum number allowed under the state law, serving nearly 35,000 students. North Carolina's law is flexible in that it allows for several entities to grant charters, including local districts, the state university, or the State Board of Education, yet final approval of a charter must be granted by the State Board.² Charter schools receive the same per pupil funding as traditional public schools, are held to the same student achievement testing requirements, and are subject to *No Child Left Behind*. However, charter schools are exempt from many regulations, and are free to define their own educational missions. As of February 2009, 27 percent of approved charter school applications have been closed or never opened, primarily for financial reasons.

The most interesting aspect of North Carolina's charter law for the study of school segregation is its stipulation that:

Within one year after the charter school begins operation, the population of the school shall reasonably reflect the racial and ethnic composition of the general population residing within the local school administrative unit in which the school is located or the racial and ethnic composition of the special population that the school seeks to serve residing within the local school administrative unit in which the school is located.

However, the legislation does not include any description of possible sanctions for failure to adhere to these guidelines. Charter schools are not required to provide transportation to students living within one and a half miles, but they may offer a transportation plan for students living within the district if they so choose. Overall, North Carolina's law can be considered fairly restrictive in contrast to those of other states, especially in terms of the cap on the total number of schools allowed and the limit to five charters per district, although like the racial balance provision, this limit does not seem to have been enforced.

² As of February 2009, 27 percent of approved charter school applications have been closed or never opened, primarily for financial reasons or inadequate enrollment.

Charter Schools and Race in North Carolina

Several recent studies have taken advantage of the phenomenal data available to improve our understanding of the educational landscape in North Carolina. First, a set of studies by Clotfelter and his colleagues is the first in decades to examine segregation at the classroom level (Clotfelter, Ladd, & Vigdor, 2005). The authors examine the segregation of classrooms, looking at students in the first, fourth, seventh, and tenth grades, in the 1995-96, 2000-01, and 2005-06 school years. Using standardized measures of exposure, they find increases in white-nonwhite, black-white, Latino-white, and Latino-black segregation. While a larger share of the increases in segregation occurred over the first period, 1995-96 to 2000-01, the authors do find small increases from 2000-01 to 2005-06. While this analysis of classroom-level segregation is important to furthering our understanding of the multiple dimensions of segregation, they do not explicitly examine segregation in charter schools or directly assess the impact of charter schools on segregation in traditional public schools.

Bifulco & Ladd have investigated one of the most critical questions surrounding charter schools: do they improve student achievement? They find that on average, students who transferred to charter schools are learning at a slower rate than when they were in traditional public schools (Robert Bifulco & Ladd, 2004). Given that black students are disproportionately represented in charter schools, the authors conducted a follow-up study to examine the impact charter schools are having on black students in particular and the black-white test score gap (Robert Bifulco & Ladd, 2006). The authors follow successive cohorts of 3rd graders in 1996 through 2000 through 8th grade or 2001-02, whichever comes first.³ Within this group, their analyses focus on two samples: those who have data on achievement gains in both traditional public and charter schools; and those who are observed moving from a traditional public school to a charter school. The authors find that charter students are more likely to be in racially unbalanced schools in 2000-01, defined as schools in which the percentage of black students is 20 percent higher or lower than the district average. Additional descriptive analyses examine the changes in a student's peer environment upon a move to a charter school for their sample of switchers, comparing the characteristics of students in the same grade in their traditional public schools and charter schools, using the year immediately preceding the switch and the year immediately

³ By following full cohorts, rather than using the full sample of students, this analysis is likely missing the more highly mobile population as well as losing many potential switchers to a charter school.

afterwards. They also find that highly educated parents are moving their children to charter schools with higher levels of achievement in reading, and slightly higher levels of achievement in mathematics. This group is also moving to schools with slightly lower shares of black students (about 6 percentage points). The same trend is seen for white switchers, although the decline in the percentage of black students in their new schools is twice as large, nearly 11 percentage points. In contrast, black switchers are increasing their share of black schoolmates by nearly 19 percent, while also moving to schools that are far lower achieving in both reading and mathematics than the traditional public schools they left.

The authors conclude that charter schools are leading to greater segregation, based on the finding that, given a choice of more than one charter school, black and white families choose charter schools in which the racial and socioeconomic makeup of the student body is most similar to their own. This finding is based on the sample of students switching to a charter school in 2000-01 in the following areas: Durham/Chapel Hill, Forsythe, Guilford, Mecklenburg, and Wake. They also conclude that this increased sorting on the basis of race and socioeconomic status is contributing to the relatively poor performance of charter schools and widening the black-white test score gap.

However, while it is important to understand these descriptive differences in the environment experienced by students upon switching to a charter school, the analysis simply compares a single characteristic at a time, and does not truly capture classrooms. A multivariate analysis is needed to understand the relative importance of student, school, and district characteristics that influence a student's probability of switching to a charter school. There are also limitations to their sample as used to analyze changes in racial segregation: first, it is based on sequential cohorts of switchers in grades 3-8, and does not include all students observed in both charter and traditional public schools. This approach likely captures the most stable student population, and does not take into account the highly mobile student population that may be highly likely to move to charter schools. It is also unclear whether magnet schools and students are included in these analyses. Further, their multivariate analysis supporting the finding of self-segregation is based on a subset of the largest districts, includes only students switching in 2001 and 2002, and uses school-level rather than classroom level measures of racial composition.

The group of studies described above has greatly increased our understanding of the effects that charter schools are having on student achievement in North Carolina; however, there are several important areas that have yet to be investigated. First, an understanding of the longitudinal trends in school segregation is an important backdrop to the understanding of the potential role of charter schools in school segregation. Beyond this background, a critical, and yet uninvestigated question is, which students are most likely to switch to charter schools? An understanding of the profile of charter switchers is key to understanding how the existence of charter schools may alter the mechanisms by which students and families sort themselves across public schools. Finally, a multivariate analysis, using classroom level data, will strengthen our understanding of possible trends toward self-segregation by investigating whether students who transfer to charter schools are moving to more or less segregated peer environments, and how these moves may vary by student race. The next section discusses the specific research questions to be addressed in greater detail.

Research Questions

In order to fully understand the effect that North Carolina's charter school policies are having on student sorting mechanisms, I address the following research questions:

- 1) How are students distributed across schools in North Carolina? Do charter schools appear to be serving populations that are distinct in terms of race, ethnicity, parental education, and achievement?
- 2) How have levels of segregation in traditional public schools changed over the last two decades? How do these trends in segregation differ by the degree of choice available in the district as of the 2005-06 school year (extent of charter school presence, magnet school presence, or absence of choice among public schools)?
- 3) Which students are most likely to switch to a charter school? How do student characteristics, such as race, parental education, and achievement affect the likelihood of a student leaving a traditional public or magnet school for a charter school? How does the degree of choice available at the district level affect student movement to charter schools?
- 4) How does a student's switch to a charter school affect their peer learning environment, with respect to classroom racial composition? How do these effects vary by student race?

Data and Methods

The primary source of data for this study is a panel of student and school level data covering the period of 1995 to 2005 obtained from the North Carolina Education Research Data Center. The longitudinal student sample is used to analyze the characteristics of students across types of public schools, as well as to predict the characteristics of students that switch from traditional public schools or magnet schools to charter schools.

Student-level: The primary data source for the student-level analyses is the North Carolina End-of-Grade (EOG) files, which include all students in the third through eighth grades, and are available for 1992-93 through 2005-06.⁴ These data include a wealth of information, including student gender, race, ethnicity, parental educational attainment, free or reduced-price lunch eligibility, limited English proficiency, student exceptionality (including special education status, gifted and talented, and other physical or developmental disabilities), and student performance on the North Carolina end of grade assessments. Students who were ever designed as special education are excluded from the sample. The average annual student sample size ranges from approximately 550,000 in 1996-97 to over 600,000 in 2005-06.

Classroom-level: While the North Carolina data center has classroom-level data files available for all grades (the Student Activity Report, or SAR), they contain classroom counts of students by demographics, rather than actual student-level data. These data also do not contain parental education or achievement test scores. Therefore, I use the End-of-Grade (EOG) files to create third through eighth grade classrooms by aggregating to the classroom level using the unique teacher identification variables. Unfortunately, for charter school students, teacher identifiers are not available until the 2003-04 school year, preventing a longitudinal analysis of the change in classroom composition upon a move to a charter school. I drop the top and bottom one percentile of class sizes, by grade, to ensure that the data capture instructional environments rather than an administrative grouping.⁵

⁴ In 1994-95 only grades 3 and 4 are available.

⁵ This is consistent with Cooley's (2006) approach to creating classrooms with these data.

School and District-level: The school level data is derived primarily from the Common Core of Data, and district level measures are based on aggregations of school-level data to the district level. In North Carolina, each charter school is considered as a single district, therefore charter schools have been assigned to the district they are physically located in. Further, the Common Core of Data designation of magnet schools is not consistent with state records, so magnet school status has been recoded to be consistent with state records.⁶ The sample of schools includes all regular education schools, meaning that special education, vocational, and other specialized schools are excluded from the analyses. This selection reduces the sample of charter schools by a single school, from 99 to 98.

Measures

Student-level: student characteristics are derived from the annual EOG files, and include the following variables: student grade, race, ethnicity, parental education, limited English proficiency (LEP) status, and mathematics and reading achievement in grades 3-8. Student demographics are based on a single time point, with student race, ethnicity, and LEP status based on the first time point in which a student was observed in the data. Parental education is based on the last time point in which a student was observed, given that these data are self-reported by students and are likely more accurately reported when students are older.

Student achievement is standardized within year and grade for all test takers, and then averaged over all time periods in which a student is observed.⁷ However, for students who are observed moving to a charter school, measures of achievement are based only on their time spent in non-charter schools prior to moving to the charter school. For example, if a student attends a non-charter school in grades 3-5 and then transfers to a charter school for grades 6-8, their average achievement is measured as the average of their scores in grades 3-5. In order to capture relative achievement, students are also categorized as high or low achieving in reading or mathematics if on average they are one standard deviation above or below the average achievement levels of their peers.

⁶ These changes are available from the author upon request.

⁷ Measures are averaged over time in order to reduce measurement error and provide more stable estimates.

Classroom-level: measures of classroom composition are derived from aggregating student-level EOG annual files by teacher and grade. Measures include racial and ethnic composition, percentage of students by parental education levels, average reading and mathematics achievement, percentage of students who are limited English proficient or special education, and class size. The models estimated use averages for these measures for all time periods in which students are observed in non-charter schools.

School and district-level: school and district measures are based on the annual CCD files, and include sector (traditional public, magnet or charter), school size, district size, and measures of segregation of non-charter schools within districts, described below. These measures are also based on averages over the time periods in which students are observed in the data. Over the time period studied, the number of districts in North Carolina dropped from 140 in 1987-88 to 115 in 2005-06 as school districts consolidated to represent county boundaries. All analyses presented here use the most recent county-level district boundaries in order to ensure consistency in longitudinal measures of segregation of schools within districts.

Segregation: this study relies on multiple measures of segregation, including the index of dissimilarity and measures of isolation and exposure. Measures of segregation among schools within districts are calculated for non-charter public schools only to reflect the environments experienced by the students remaining in traditional public schools and magnet schools.

Traditional measures of dissimilarity indicate the extent to which racial or ethnic groups are evenly distributed across schools within a districts; ranging from 0 (complete integration) to 100 (complete segregation). The black-white exposure rate indicates the average percent white in the average black student's school; for example, a black-white exposure rate of .02 indicates that the average black student in a traditional public school attends a school that is two percent white. Additionally, measures of isolation show the intent to which students attend school with students of their own racial or ethnic group. For example, a black isolation index of .96 indicates that the average black student attends a school that is 96 percent black.

Results

Racial Composition of North Carolina Schools

Table 4.1 shows the basic characteristics of North Carolina schools at the state level and by sector (traditional public, charter, magnet, and private). Statewide there are slightly more than 1.4 million students enrolled in public schools, and 90 percent of them attend traditional public schools. Two percent attend charter schools and the remaining 8 percent attend magnet schools. Over 71,000 students attend private schools in North Carolina, approximately 5 percent of the total statewide population. As a percentage of public schools, charter and magnet schools represent 4.4 and 6.4 percent, respectively, as a result of the smaller than average size of charters and the relatively large size of magnets. Similarly, while private schools only serve about 5 percent of the state's students, they represent nearly 16 percent of the schools.

[Table 4.1 here]

Statewide, a majority of public schools are elementary schools (80 percent), while 17 percent are high schools and less than 3 percent serve grades kindergarten through 12 or other combinations.⁸ While traditional public schools follow this pattern, charter schools are more likely to serve combined grade levels such as K-12 or K-10 (20 percent), and less likely to serve only elementary (70 percent) or high school grades (10 percent). Magnet schools are most likely to serve elementary grades (86 percent), with 12 percent serving only high school grades and two percent combined grades. Private schools, in contrast, are far more likely to serve grades K-12 (nearly 60 percent), while approximately 5 percent of private schools are high schools and 37 percent are elementary schools. With respect to size, private schools are by far the smallest, serving an average of 180 students, while charters average an enrollment of 279 students, traditional public schools serve an average of 638, with magnets being the largest schools with an average of 739 students (all differences are statistically significant).

Table 4.2 shows the racial composition of North Carolina schools in 2005-06. Statewide, nearly two percent of public school students are American Indian or Asian, 33 percent are black, slightly more than 8 percent Latino, and 55 percent white. Overall 45 percent of public students are non-white. At the state level, charter schools have a significantly higher percentage of black students than traditional public schools (nearly 40 percent versus 31 percent), yet a significantly

⁸ Elementary schools have one of grade K-6 and no grades higher than 8; high schools serve one of grades 9-12 with no grades lower than 7, and combined schools have one of grades K-6 and one of grades 9-12.

lower percentage than magnet schools (51 percent). Interestingly, charter school students serve significantly lower percentages of Latino students (3 percent) than do both traditional public and magnet schools (9 and 10 percent, respectively). The percentages of white and nonwhite students served by traditional public schools and charter schools are similar, on average. Magnet schools are serving the most diverse public school population: magnet schools serve significantly higher percentages of all minority groups than traditional public schools or charter schools, with the exception of American Indian students. Nearly 4 percent of magnet students are Asian, 51 percent black, 10 percent Latino, and 65 percent nonwhite overall. Private schools in North Carolina serve a predominately white population (78 percent), while only 15 percent of private students are black, 3 percent Latino, and less than 2 percent American Indian or Asian.

[Table 4.2 here]

Figure 4.1 shows the 2005-06 geographic distribution of charter and magnet schools across the state, as well as the racial composition of the district. In looking at the distribution of charter schools, they appear to be fairly well-distributed across districts of varying racial composition. The greatest numbers of charter schools are logically located in the largest districts, including Charlotte-Mecklenburg, Wake (Raleigh), Durham, Forsyth (Winston-Salem), and Guilford (High Point). Magnet schools are largely concentrated in the largest, most diverse districts, given their original design as a voluntary desegregation tool.

[Figure 4.1 here]

These averages mask some characteristics of schools, however. Statewide, approximately 4 percent of public schools are racially isolated, enrolling 90 percent or more black students, and 11 percent are 90 percent or more white. However, 19 percent of charter schools are 90 percent or more black, and 21 percent are 90 percent or more white; these percentages are significantly higher than those for all other sectors, with the exception of predominately white private schools. More than half (52 percent) of private schools are predominately white, and 7 percent are predominately black. In contrast, only 2 percent of magnet schools are predominately black and none are predominately white.

The above results indicate that even when the racial composition of charter schools appears to be similar to other public schools on average, a substantial proportion of individual schools are racially isolated. Clearly charter schools are serving more distinct populations with respect to race and ethnicity; further examination is needed to assess whether racially isolated charter schools are consistent with the overall racial composition of the area in which they are located. For example, are predominantly black charter schools located in areas with larger white populations, and therefore serving as escape valves for families with specific preferences? Or, conversely, are they simply more attractive to the local population and therefore attracting a majority of black families in an area with a large black population?

Figure 4.2 maps the racial composition of charter schools in 2005-06, including the racial composition of the district they are located in. A visual inspection clearly indicates a large number of charter schools that are racially isolated, most of which are located in districts that are at or below the statewide average share of black students.

[Figure 4.2 here]

A descriptive analysis of this issue shows that of the 19 charter schools that are predominantly black, four are located in Wake County, four in Durham County, and another three in Charlotte-Mecklenburg (Table 4.2a). To take the example of Charlotte-Mecklenburg, in 2005-06, three of the 9 charter schools are predominantly black, while only one magnet school (out of 53) and five of 85 traditional public schools are predominantly black. The same pattern is seen in Durham County, where four of 8 charters are predominantly black, while less than 3 percent of traditional public schools and no magnet schools are segregated to this degree. Finally, in Wake County, four of 14 charters are predominately black compared with no traditional public or magnet schools. Further, in both Charlotte-Mecklenburg and Wake County, there are a number of predominantly white charter schools, three each, despite that fact that there are no predominantly white traditional public or magnet schools. Clearly, in these districts charter schools are not simply reflecting the local population, but are drawing distinct student populations.

[Table 4.2a here]

To further examine the issue of location, tables 4.3a through 4.3c show the racial composition of schools located within five miles of charter schools, separately for each grade configuration, for the 2005-06 school year. Starting with elementary grades, Table 4.3a shows that charter schools do appear to be serving a different population than local traditional public schools, but in a different respect than indicated by the statewide averages. While at the state level charter schools appear to be serving higher proportions of black students, when compared to proximate traditional public schools there is not a significant difference. At the state level, 31 percent of traditional public school students are black, while in traditional public schools within five miles of charter schools, 42 percent of students are black. However, relative to traditional public schools, charter schools are serving significantly lower proportions of Asian and Latino students and higher proportions of white students. Magnet schools are serving the most diverse population, with enrollments of 54 percent black, 10 percent Latino, 3.5 percent Asian, and 31 percent white. Magnet schools are serving significantly different populations than both charters and magnets, with the exception of the difference in proportion of American Indian students compared to charters and the difference in percent Latino students compared to traditional public. Not surprisingly, private schools are serving significantly lower percentages of black students (20 percent) than all other public schools, and lower percentages of Latino students (5 percent) than magnet or traditional public schools.

Again, these averages mask the existence of racially isolated charter schools: among elementary charter schools, one-quarter are 90 percent or more black, compared to only 7 percent of traditional public, 3 percent of magnets, and 9 percent of private schools located within a five mile radius (all differences are significant). Similarly, 18 percent of elementary charter schools are 90 percent or more white, compared to only 2 percent of nearly traditional public schools and zero predominantly white magnet schools. Forty-five percent of nearby private schools are 90 percent or more white.

[Table 4.3a here]

Tables 4.3b and 4.3c show these comparisons for schools serving combined grades and high schools, and show some interesting differences. The 20 charter schools that serve grades K-12 (or a similar configuration) serve fewer black (36 percent) and Latino students (3 percent) than

nearby traditional public schools (41 and 15 percent, respectively).⁹ Overall, charter schools serving combined grades are 55 percent white, a significantly higher percentage than nearby traditional public or magnet schools. Further, 30 percent of combined-grade charter schools are predominantly white, a significantly higher percentage than traditional public schools (3.6 percent) or magnets (zero). This percentage even nears the level of nearby private schools, 41 percent of which are predominantly white. In contrast, only 5 percent of combined-grade charter schools are predominantly black, a rate similar to other nearby schools, with the exception of private schools (18 percent are predominantly black). While the number of charter high schools is small (10 schools), the differences by sector are similar to the above results.¹⁰ Twenty percent of charter high schools are predominantly white and another 20 percent are predominantly black, while none of the nearby traditional public or magnet high schools are racially isolated. Again, local private schools are more likely to be racially isolated: of the three private high schools within five miles of a charter high school, one is predominantly black and the other two are predominantly white.

[Table 4.3b here]

[Table 4.3c here]

While the above relationships shed much light on the make-up of schools of choice, it is also critical to take into account the fact that neither charter schools nor magnet schools are evenly distributed across districts; the next three columns of Table 4.4 show these distributions by the degree of choice available at the district level in the 2005-06 school year, the most recent year of data available. Of the 115 North Carolina districts, 65 (56.5 percent) had neither charter schools nor magnet schools, while 39 (34 percent) had only charter schools. The remaining 11 districts (nearly 10 percent) had both charter schools and magnet schools.^{11 12} It is important to note that despite the imbalance in the percentage of districts offering choice options, schools are fairly evenly distributed across these districts. For example, just under one-third of public schools are located in districts that do not offer public school choice, while a

⁹ Given the small number of other public schools with K-12 grade spans, all traditional public and magnet schools within 5 miles of these charter schools serving elementary grades are included as comparisons.

¹⁰ Given the small number of high schools significance testing is not performed.

¹¹ No district had magnet schools but not charter schools in the 2005-06 school year.

¹² These 11 districts are: Asheville City, Cabarrus County, Charlotte-Mecklenburg Schools, Durham County, Forsyth County, Franklin County, Gaston County, Guilford County, New Hanover County, Wake County, and Wilson County.

similar proportion are located in districts offering both charter schools and magnet schools (30 percent). The remaining 37 percent of schools are located in districts with only traditional public and charter schools. In districts where charter schools are the only public choice option, 6 percent of public schools are charters, enrolling 2.4 percent of district public students on average. In districts with both charter and magnet schools, nearly 7 percent of public schools are charters, serving 3.1 percent of students. Magnet schools make up quite a large share of public schools and students in these districts, nearly 21 percent on both counts.

[Table 4.4 here]

Segregation of Schools within Districts

Opponents of school choice often claim that it will lead to increases in school segregation. However, this is an empirical question, and in the case of charter schools, it is essentially a state-specific question given the variation in charter school laws across states. Table 4.5 shows the levels of segregation of non-charter schools within districts in the 2005-06 school year. Overall, the data indicate that levels of segregation are lowest in districts without charter schools or magnet schools, while districts with only charter schools are consistent with state averages, and districts with both magnet schools and charter schools have the highest levels of segregation. For example, statewide black-white dissimilarity was .33 in the 2005-06 school year, indicating that 33 percent of black students in a district would have to be reassigned to different schools to achieve a racial balance that is consistent with that district's racial composition. This index in .25 in districts without charters or magnets, .34 in charter districts and .41 in magnet districts. Levels of nonwhite-white dissimilarity are similar, although not identical, indicating that the primary racial discrepancies in North Carolina are between black students and white students, although the growing share of Latino students is playing a role in segregation.

[Table 4.5 here]

At the state level, exposure rates indicate that levels of segregation are not alarmingly high. In 2005-06, the average black traditional public student attended a school that is 50 percent white, while the state was 57 percent white. The average Latino student attended a school that was 51 percent white, while the average white student attended a school that was either 26 percent black or 36 percent nonwhite. Again, students in districts without either charter schools or magnet schools have lower levels of segregation, in terms of black and Latino students having

higher levels of exposure to white students (58 and 59 percent, respectively). Levels of interracial exposure are slightly lower in charter only districts, as compared with districts with no choice options, but rates are far lower in magnet and charter districts: black-white exposure is .38 and Latino-white exposure is .39.

Trends in School Segregation: 1987 - 2005

Figures 4.3 through 4.10 show changes in the segregation of non-charter schools within districts over the period of 1987 through 2005. Each of these figures shows the levels of segregation of non-charter schools within districts for all districts¹³ as well as by the degree of choice available as of 2005-06 (no charters or magnets, charters only, and charters and magnets). Overall, these data show that while levels of segregation were relatively low in 1987, they have been rising over time. Further, increases in segregation seem to follow two trends: first, black-white segregation increases at the state level seem to have taken place in the years preceding the charter school law, while increases in Latino-white segregation are more recent. Secondly, increases in segregation are largest in districts with both charter and magnet schools, smaller in districts with charter schools only, and small to nonexistent in districts without these forms of public school choice.

Beginning with black-white dissimilarity, the data show an overall increase from .25 in 1987 to .33 in 2005 (.08), with most of the increase occurring in the decade prior to the enactment of the charter school law (1987 through 1997). There was virtually no change in districts without public school choice, while districts with charters had changes consistently with the overall numbers reported above. Districts with both charter and magnet schools saw the largest increases in black-white dissimilarity, up from .22 in 1987 to .41 in 2005. In contrast to other districts, these districts saw substantial increases in segregation after 1997 (.08 of the total .18 increase). Trends in nonwhite to white dissimilarity follow the same trends, showing a small increase over the period (from .24 to .31). Again, there was very little increase in districts without choice, a small increase in districts with charters (.07), but most of the increase pre-

¹³ Over the time period studied, the number of districts in North Carolina dropped from 140 in 1987-88 to 115 in 2005-06 as school districts consolidated to represent county boundaries. All analyses presented here use the most recent county-level district boundaries in order to ensure consistency in longitudinal measures of segregation of schools within districts.

dates charters. Larger increases occurred in districts with magnet and charter schools, from .21 to .39 (.166); again more of the increase was pre-charter (.096) versus post (.07).

[Figure 4.3 here]

[Figure 4.4 here]

In examining the extent to which black students attend school with white students, we see steady declines over the period. While in 1987 the average black student attended a school that was 59 percent white, in 2005 the comparable figure was 50 percent. The decline was smallest in charter only districts (-.02), somewhat in between in districts without choice (-.07), and largest in charter and magnet districts (-.16). Interestingly, in choice districts most of increase is post charter; in charter only districts, the black-white exposure rate rose .025 in the pre-charter decade and then dropped .043 in post-charter decade; in charter and magnet districts, the rate declined by .05 in first decade and .107 in the second.

[Figure 4.5 here]

Latino-white exposure rates indicate declining percentages of white students in the schools attended by the average Latino over the period of 1987 to 2005. Overall Latino-white exposure rates fell from .665 to .513, with the declines about evenly split between the pre and post-charter years. The smallest decline occurred in districts without choice (-.089), followed by charter districts (-.12). Districts with both charter and magnet schools saw the largest decline, from .64 in 1987 to .39 in 2005.

[Figure 4.6 here]

Measures of isolation show that minority students are attending school with increasingly higher percentages of students of their own racial group. For example, in 1987 the average nonwhite student in North Carolina attended a school that was 32 percent nonwhite, yet this figure rose to 50 percent in 2005 (Figure 4.5). A majority of the increase occurred in the pre-charter period, but nonwhite isolation continued to increase after 1997. The increase was moderate in districts without choice, rising from 33 to 42 percent, and larger in districts with charter schools only, up from 29 percent in 1987 to 48 percent in 2005. Districts with both charter and magnet schools saw both the highest levels of nonwhite isolation and the largest increases, rising from 34 percent in 1987 to 61 percent in 2005. Statewide, more of the increase in nonwhite isolation

occurred prior to 1997 (11 percent out of a total increase of 17 percent), and both types of choice districts followed this pattern. The increase in districts without charters or magnets was about evenly split between the pre and post-charter periods.

[Figure 4.7 here]

Levels of isolation for black students were lower than those for nonwhite students overall, increasing from 29 percent in 1987 to 38 percent in 2005. There has been virtually no change since the opening of the first charter school, however. Districts without charters or magnets saw no change, while charter only districts increased by ten percentage points. Districts with both charters and magnets increased by 15 percentage points, although most of this increase (12 percentage points) occurred prior to 1997.

[Figure 4.8 here]

Levels of Latino isolation were close to zero in 1987, given that Latino students were such a small percentage of the population. Levels rose to 13 percent in 2005 for all districts, 11 percent in districts without choice, 13 percent in charter only districts, and 15 percent in charter and magnet districts. While more of the increase is in the post-charter era, it is difficult to say whether this is due to the overall rise in the proportion of Latino students in the state or changes in how students are distributed across schools given greater public school choice. Similarly, white isolation has decreased slightly in all types of districts, although this is likely due to the increasing diversity of the state's population.

[Figure 4.9 here]

[Figure 4.10 here]

In sum, trends towards greater segregation—with the exception of white isolation—seem to have begun in the early 1990s and increased steadily through 2005, with no dramatic discontinuities after 1997. The increases in segregation seem to follow two trends: first, black-white segregation increases at the state level seem to have taken place in the years preceding the charter school law, while increases in Latino-white segregation are more recent. Secondly, increases in segregation are largest in districts with both charter and magnet schools, smaller in districts with charter schools only, and small to nonexistent in districts without these forms of public school choice.

Student-level analyses

Characteristics of students by sector

Table 4.6 shows the characteristics of all students for whom data are available over the entire period, including those observed only once and those who do not switch sectors.¹⁴ As noted in the data and measures section, these data represent either a single time point (first or last observation for certain demographics), or averages for all years in which they were observed (student achievement, classroom and school characteristics). Over the period of 1995-2005, 89 percent of North Carolina public school students in grades 3-8 were observed only in traditional public schools, nearly 4 percent attended only magnet schools, approximately one percent (0.84 percent) attended only charters, another 1.4 percent were observed switching to or from a charter school, and the remaining 5.3 percent moved between traditional and magnet schools.¹⁵

[Table 4.6 here]

Several interesting facts appear in these descriptive data, beginning with the fact that students who are observed only in charter schools are demographically rather different than students who are observed switching to charter schools. Compared to students observed only in traditional public schools, students who switch into charter schools are more likely to be black (42 percent of switchers compared with 27 percent of traditional public students), and less likely to be Latino (2 percent compared with 6 percent) or limited English proficient (0.5 percent compared with 4 percent). Charter school switchers also have more highly educated parents, yet are lower achieving than traditional public school students, scoring .21 and .13 standard deviations below the mean in mathematics and reading, respectively. As third-graders, however, charter switchers are not as far behind academically, approximately .14 and .06 standard deviations below the mean in mathematics and reading, respectively. These data suggest that charter switchers may come from families that place a high value on education,

¹⁴ Includes special education students, but only regular schools.

¹⁵ Over this period several districts underwent changes to their magnet programs, Wake County being the most notable, which resulted in many schools 'de-magnetizing'. As a result, many students in these districts appear to have attended both traditional public and magnet schools when in fact the status of their school changed.

based on parental education levels, but who are struggling academically and looking for other options.

Students who are observed only in charter schools look more similar to traditional public students than charter switchers, although charter only students have highly educated parents (nearly one-half have college degrees or higher, compared with 28 percent of parents of traditional public school students). While charter switchers are performing below average in both reading and mathematics, charter only students are only slightly below average in reading but as far behind in mathematics as charter switchers (about one-fifth of a standard deviation, on average). The lack of an achievement gap in reading does not appear to be an artifact of higher parental education levels, as student achievement in reading and mathematics are equally correlated with parental education in the data ($r=0.44$).

Predicting Moves to Charter Schools

Student and family transfer decisions over the period of 1995 through 2005 are predicted by the logit model described below. The outcome is whether the student is ever observed transferring from a non-charter school (traditional public or magnet) to a charter school. The majority of measures are based on averages for students over the years they were observed in non-charter schools, prior to any transfer decisions.¹⁶ Descriptive results for the analytic sample are shown in table 4.7.

$$Y_i = aX_i + bClass_i + cSchool_i + dDistrict_i + error_i \quad (1)$$

X_i is a vector of student characteristics, including the year in which a student was first observed, the grade in which a student is first observed, race, ethnicity, parental education, LEP status, achievement in mathematics and reading, and time spent in magnet schools.¹⁷ $Class_i$ is a vector of classroom composition measures, based on the average over the years a student attended non-charter schools, including racial composition, parental education, percentage of class that is Limited English Proficient, average achievement in mathematics and reading, and class size.

¹⁶ Exceptions are student race and ethnicity, LEP and special education status, which are based on the first time point in which a student is observed in the data. Parental education is based on the last time point in which a student is observed.

¹⁷ This is calculated as the percentage of observations that a student is enrolled in a magnet school.

Student achievement in mathematics and reading are measured as within one standard deviation of the mean, one standard deviation or more below the mean (low achievers), or one standard deviation or more above the mean (high achievers). School size is the average in non-charter schools, expressed in hundreds of students, while district size is expressed in thousands. Additional district measures include segregation of non-charter schools within the district, the availability of charter and magnet schools, and the percentage of district students enrolled in magnet or charter schools. Again, all measures are averages in non-charter schools for the years preceding a move to a charter school for switchers and for all years observed in the data for students remaining in non-charter schools. Standard errors are adjusted for clustering within schools, based on the first school in which students are observed.

[Table 4.7 here]

An understanding of the factors that encourage students to switch to charter schools is central to the issue of charter school effects, especially considering that the state of North Carolina has reached the maximum number of charter schools allowed under its charter law, because a majority of new charter students will likely come from transfers filling spaces vacated as charter students leave rather than a process in which a new charter school opens and fills a kindergarten class.

Factors Associated with Student Moves to Charter Schools

Table 4.8 shows the results for students of all racial and ethnic groups. Beginning with student characteristics, relative to white students, Asian and Latino students are significantly less likely to switch to charter schools, as are limited English proficient students. In contrast, black students are no more likely than white students to switch to charter schools. Among student characteristics, parental education is the strongest predictor of student moves to a charter school. Relative to students whose parents are high school graduates, students whose parents did not complete high school are significantly less likely to switch to a charter school, while those whose parents completed some college or graduated from college (or higher) are significantly more likely to switch to a charter school. Relative to students within one standard deviation of the mean achievement in mathematics, low achieving students (one standard deviation below the mean) are more likely to switch to a charter school, as are students who are low-achieving in reading. Interestingly, students who are high achieving in reading are also

more likely to switch, although high-achieving math students are more likely to remain in a non-charter school. The more years a student attends a magnet school, the less likely they are to switch to a charter school, likely reflecting the high quality of many magnet schools.

[Table 4.8 here]

With respect to the characteristics of classrooms students experienced prior to the opportunity to switch to a charter school, students in classes with higher average mathematics achievement are more likely to stay, but students in higher achieving classes with respect to reading are more likely to move to a charter school. Similarly, students in classes with higher shares of parents with college degrees or higher are also more likely to switch to charter schools, possibly reflecting more involved parents who are more knowledgeable about school choice options through social networks.

The results indicate that, even with controls for parental education and student achievement, families are still responsive to the racial composition of classrooms. Compared with students who were in classrooms with a black population of 40-60 percent, students in classrooms with lower percentages of black students are less likely to switch to charters, and students in classrooms with higher shares are more likely to switch. Students in larger classes are more likely to switch to charter schools, as are students in larger districts, although students are more likely to stay in larger schools.

Charter presence is based on the average share of district students enrolled in charter schools for the period in which potential switchers are enrolled in non-charter schools. Relative to students who experience no charter presence in their districts, students in districts with low charter presence (less than .75 percent of district students enrolled in charters) are no more likely to move to charters. However, as charter presence increases, so does the likelihood of a student switching. Students in districts with a moderate charter presence (between .75 and 2.1 percent enrolled) or a high presence (more than 2.1 percent) are significantly more likely to switch to charter schools.

Finally, there are no effects of measures of segregation of schools within districts, which may suggest that families are more sensitive to student and classroom level factors. Alternatively, it

may be that families of different race and ethnic groups respond differently to school segregation, and effects could be washed out in a model that pools students of all race and ethnic groups. Therefore, the set of models below are run separately for white and black students (Table 4.9).¹⁸

The results of the models estimated separately for students by race mirror those for the full sample with some important exceptions. While the effects of parental education are similar for black and white students, achievement effects are slightly different: students of both racial groups who are low-achieving in reading are more likely to switch to charter school, while white high achievers in reading are also more likely to switch to a charter school. Further, being low achieving in mathematics is only predictive of a move to a charter school for black students. Black and white students appear to respond similarly to the racial composition of their non-charter school classrooms in the years prior to a move to a charter school, with higher shares of black students increasingly the probability of a move; however, the effects are larger for white students. In contrast, the effects of charter presence are larger for black students. For example, the effect of a high charter presence in the district in the years prior to a move to a charter school (2.1 percent of public enrollment or higher) is 0.022 for black students and .007 for white students.

[Table 4.9 here]

In terms of segregation, while the overall models found no effects across a range of measures, the models estimated separately by student race do show evidence of the effects of segregation that diverge for black and white students. While black students in more segregated districts, as measured by black-white dissimilarity, are more likely to move to a charter school, the opposite is true for white students, although the effect is smaller. No other measures of segregation are significant in the models run separately for white students, while the effects of classroom racial composition are stronger, suggesting that white students and their families are more sensitive to classroom-level composition than the overall district composition. In contrast, multiple measures of segregation are influential for black students and their families, including white-nonwhite dissimilarity, which mirrors the effect of black-white dissimilarity, and non-white

¹⁸ Only about 65 Latino students are observed switching to a charter school, so these models are not estimated.

isolation. Higher levels of nonwhite isolation significantly decrease the probability that a black student will move to a charter school, although black isolation and black-white exposure does not have a significant effect.

Taken together, these results suggest that at least with respect to racial composition, black and white families are sensitive to, and possibly express different preferences for, classroom composition after taking into account classroom-level measures of student achievement and parental education. These preferences are critical in understanding the impact that charter schools are having on the racial composition of schools; if black and white families express divergent preferences for school environments, their choices will most likely lead to racially isolated schools. The descriptive analyses below examine the changes in classroom composition experienced by students moving to charter schools.

Characteristics of Movers, 2004-2005

Table 4.10 below examines the changes in peer environment experience by students moving from noncharter to charter schools between 2004-05 and 2005-06.¹⁹ A simple descriptive comparison between a mover's new charter school environment and that in their prior year's non-charter school shows large discrepancies by student race. For example, while for all switchers there is no change in classroom racial composition on average, this masks the fact that white movers experience a 13 percent increase in the share of white students in their classrooms at their new charter schools, while black movers experience a 7 percent drop. Similarly, black movers' new charter classrooms have a share of black students that is 16 percent higher than their previous non-charter school, while white movers experience a 9 percent drop. Movers are, on average, gaining more peers with college educated parents (an 11 percent increase), but this increase is more pronounced for white students (a 17 percent increase) than for black students (a 5 percent increase).

[Table 4.10 here]

The overall levels are noteworthy as well. Black students who move to charter schools are transitioning from classrooms that were on average 59 percent black to those that are 73 percent black. These moves are also accompanied by a dramatic drop in the achievement levels

¹⁹ Racial composition of charter school classrooms is available only in 2003-04 and later.

of their peers, more than one quarter of a standard deviation in mathematics and nearly one fifth of a standard deviation in reading. White switchers are making similarly segregating moves, leaving classrooms that were 65 percent white for classrooms that are 80 percent white, on average. White students who move are gaining peers who are higher achieving in reading but not mathematics, although the change in peer mathematics achievement is not as large as for black switchers.

In order to provide stronger support for the claim that students moving to charter schools are making self-segregating moves, I estimate the following student-level fixed effects model of class racial composition covering the years 2002 through 2005:

$$Y_{it} = Y_{i(t-1)} + \alpha \text{MOVE}_{it} + \beta X_t + \gamma_i + \varepsilon_{it} \quad (2)$$

The model specified includes a lagged dependent variable²⁰ in order to account for the change in peer environment rather than simply the overall level, an indicator for a move to a charter school, a set of student, school, and district characteristics, a student fixed effect, and a random error term. The model also indicates an interaction term for student race and the move to a charter school in order to account for the differential effect of the move on black and white students, respectively. Further, the model includes a lagged measure of black-white dissimilarity. Robust standard errors are estimated using the Huber-White variance estimator given the multilevel nature of the data.

As a result of the use of the within-in student estimator, used to purge the results of unobserved effects of student characteristics on the outcome, all time-invariant characteristics drop out of the model. This provides estimates for the overall effect of a move to a charter school and the effect of the move for a black or white student.

The results show that the overall impact of a move to a charter school on classroom percent black is negative, controlling for a student's prior year classroom racial composition. However,

²⁰ I use a lagged dependent variable here for two reasons. The first is to eliminate serial correlation among residuals ((Keele & Kelly, 2006) The second is that classroom racial composition at time t is most likely a function of classroom racial composition in time t-1, especially for the students who do not switch to charter schools.

for black students who move to charters, the effect of this move is to increase the percentage of black students in their classrooms by nearly 20 percent. These results hold with controls for student achievement, school and district size, and district level segregation in the prior year. The same trend for self-segregation is seen for white students transferring to charter schools: this group increases the share of same-race peers by 15 percent. As with the models predicting a move to a charter school, the impact of school segregation differs in its impact on classroom-level racial composition, leading to a positive impact on the share of black peers and a negative effect on the share of white peers.

[See Table 4.11]

These findings likely support Bifulco and Ladd's 2006 finding that black and white families express asymmetric preferences. Their analysis of students transferring to charter schools in 2001 and 2002 in a subset of districts showed that black and white students chose charter schools with quite different school level racial compositions (Robert Bifulco & Ladd, 2006). While white switchers were most likely to choose charters with a school-level black population of 20 percent or less, black switchers appeared to prefer charter schools that were 40 to 60 percent black. The results presented here support these findings for a much larger sample, all North Carolina students in the years 2002 through 2005, and importantly, using classroom-level measures of racial composition, which are arguably a better indicator of a student's charter school environment.

Conclusion and Policy Implications

The findings presented here suggest that North Carolina charter schools are serving as vehicles of the resegregation of schools now that race-based student assignment policies have been largely struck down. While levels of school segregation began to increase prior to the appearance of charter schools, probably due to the eradication of court-ordered desegregation plans and the increasingly challenges to the use of race in student assignment policies, this trend has been amplified in districts with charter schools. Further, despite the fact that the legislation sets guidelines for the racial composition of charter schools, a large share of charter schools are racially isolated. These levels of isolation do not appear to be a result of location, given that a far higher share of charters are racially isolated than other public schools of the same grade span located within five miles.

As would be expected given these levels of racial imbalance, the populations served by charter schools are rather distinct as compared with non-charter populations in terms of student race and ethnicity; however, charter school populations are distinct in additional ways. Despite drawing students with higher levels of parental education, students in charter schools have significantly lower levels of achievement in mathematics. The analysis presented here of factors motivating a move to a charter school indicate that classroom racial composition is a significant force for families, as both black and white families are more likely to switch as the classroom share of black students increases. However, levels of school segregation at the district level lead to different patterns of behavior for black and white families: in more segregated districts, as measured by black-white dissimilarity, black students are more likely to switch, while families are less likely to do so. Further, the final analyses demonstrate that both black and white families are making self-segregating moves, and the effects are quite large.

The specifics of North Carolina's charter law, specifically the cap on the number of charter schools allowed to operate in the state, likely functions to prevent these trends from dramatically increasing levels of school segregation statewide. However, the finding of such large effects towards self-segregation should function as a major warning for policy makers considering lifting the cap, which Race to the Top pushes for. The results presented here strongly suggest that charter schools, if allowed to grow unabated, could lead to dramatic changes in the segregation of North Carolina's public schools.

APPENDIX A

---Black-white Dissimilarity:

$$D = (1/2) \sum (b_i / B - y_i / Y |$$

---Exposure of black, Latino, or all nonwhite students to white:

$$E = \sum [(x_i/X) * (y_i/t_i)]$$

---Exposure of white students to black, Latino, or nonwhite students:

$$E = \sum [(y_i/Y) * (x_i/t_i)]$$

---Standardized Exposure of white students to black, Latino, or nonwhite students:

$$S = (NW - E_{w, nw}) / NW$$

---Isolation of black, Latino, or nonwhite students:

$$I = \sum [(x_i/X) * (x_i/t_i)]$$

Where

x_i = black, Latino or nonwhite population of school i ,

X = black, Latino or nonwhite population of district,

y_i = white population of school i ,

Y = white population of district, and

t_i = total population of school i .

NW = district percent nonwhite

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Table 4.1 Characteristics of North Carolina Schools, 2005-06
Regular schools only

Characteristics of Schools	All Public Schools		Traditional Public Schools		Charter Schools		Magnet Schools		Private Schools	
	N	%	N	%	N	%	N	%	N	%
Grade Level										
Elementary	1797	80.2	1605	80.3	68	69.4	124	86.1	153	37.1
High	388	17.3	361	18.1	10	10.2	17	11.8	22	5.3
Combined / Other	55	2.5	32	1.6	20	20.4	3	2.1	237	57.5
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
School Size	628.59 ^a	382.82	637.75 ^{b,d,g}	370.04 ^{b,d,g}	279.30 ^{a,b,c,e}	216.50 ^{a,b,c,e}	739.26 ^{c,d,f}	503.46 ^{e,f,g}	179.90 ^{e,f,g}	223.27
Schools (N)	2240		1998		98		144		420 ¹	
Schools, % of public	100%		89.2%		4.4%		6.4%		-	
Schools, % of state	84.20%		75.1%		3.7%		5.4%		15.8%	
Students (N)	1,408,039		1,274,215		27,371		106,453		71,595	
Students, % public enrollment	100.0%		90.5%		1.9%		7.6%		-	
Students, % state enrollment	1,479,634		86.1%		1.8%		7.2%		4.8%	

¹ Only 390 of 420 private schools have data on racial composition

Differences significant at the .05 level, between the following types of schools:

^a charter versus all other public

^b charter versus traditional (non-magnet)

^c charter versus magnet

^d traditional versus magnet

^e charter versus private

^f private versus magnet

^g private versus traditional public

Table 4.2 Racial Composition of North Carolina Schools, 2005-06
Regular schools only

	All Public Schools		Traditional Public Schools		Charter Schools		Magnet Schools		Private Schools	
	%	SD	%	SD	%	SD	%	SD	%	SD
Racial Composition										
American Indian	1.7%	0.08	1.7%	0.08	2.5%	0.12	0.4%	0.00	1.5%	0.07
Asian	1.8%	0.03	1.7%	0.03	1.3%	0.03	3.6%	0.04	1.8%	0.06
Black	32.8% ^{a (ms)}	0.26	31.2%	0.25	39.7%	0.37	53.6%	0.21	15.6%	0.27
Latino	8.4% ^a	0.09	8.6%	0.09	2.9%	0.05	10.1%	0.09	3.1%	0.07
White	55.3%	0.28	56.8%	0.28	53.7%	0.38	32.3%	0.22	78.0%	0.29
Nonwhite	44.7%	0.28	43.2%	0.28	46.3%	0.38	67.7%	0.22	22.0%	0.29
Isolated Schools										
90% or more black	3.6% ^a	0.19	3.0%	0.17	19.4%	0.40	2.0%	0.14	7.2%	0.26
90% or more white	11.3% ^a	0.32	11.6%	0.32	21.4%	0.41	0.0%	0.00	52.3%	0.50
N (schools)	2240		1998		98		144		390	

Differences significant at the .05 level, between the following types of schools:

- ^a charter versus all other public
- ^b charter versus traditional (non-magnet)
- ^c charter versus magnet
- ^d traditional versus magnet
- ^e charter versus private
- ^f private versus magnet
- ^g private versus traditional public

Table 4.2a Racial Composition of Charlotte-Mecklenburg, Durham, and Wake County Schools, 2005-06

Regular schools only

	All Public Schools		Traditional Public Schools		Charter Schools		Magnet Schools		Private Schools	
	%	SD	%	SD	%	SD	%	SD	%	SD
<i>Charlotte-Mecklenburg</i>										
School Racial Composition										
American Indian	0.6%	0.01	0.6%	0.01	0.2%	0.00	0.6%	0.00	0.6%	0.01
Asian	3.6%	0.03	4.1%	0.02	3.8%	0.09	4.0%	0.03	1.7%	0.03
Black	44.9%	0.29	44.1%	0.25	43.3%	0.44	59.2%	0.20	27.8%	0.32
Latino	10.8%	0.11	14.5%	0.13	1.9%	0.02	11.7%	0.10	3.8%	0.06
White	40.2%	0.32	36.7%	0.30	50.9%	0.42	24.4%	0.21	66.1%	0.33
Nonwhite	59.8%	0.32	63.3%	0.30	49.1%	0.42	75.6%	0.21	33.9%	0.33
School Size	741.49	580.14	913.47	539.64	325.7	256.58	858.6	609.91	314.45	397.97
Isolated Schools										
90% or more black	7.5%	0.26	5.9%	0.24	33.3%	0.50	1.9%	0.14	12.5%	0.33
90% or more white	9.1%	0.29	0.0%	0.00	33.3%	0.50	0.0%	0	35.0%	0.48
N schools	196		85		9		53		49	
<i>Durham</i>										
School Racial Composition										
American Indian	0.3%	0.01	0.2%	0.00	0.2%	0.00	0.1%	0.00	0.8%	0.02
Asian	2.7%	0.07	2.3%	0.02	0.6%	0.01	1.2%	0.01	5.5%	0.14
Black	55.3%	0.29	58.9%	0.19	77.1%	0.25	64.7%	0.17	31.7%	0.41
Latino	11.6%	0.11	15.7%	0.11	3.4%	0.05	17.3%	0.13	3.8%	0.07
White	30.0%	0.30	22.9%	0.20	18.8%	0.23	16.7%	0.18	58.1%	0.40
Nonwhite	70.0%	0.30	77.1%	0.20	81.2%	0.23	83.3%	0.18	41.9%	0.40
School Size	531.94	457.64	772.44	458.75	242.38	211.62	473.63	373.38	164.75	171.21
Isolated Schools										
90% or more black	11.8%	0.32	2.8%	0.17	50.0%	0.53	0.0%	0	18.8%	0.40
90% or more white	7.4%	0.26	0.0%	0.00	0.0%	0.00	0.0%	0	31.3%	0.48
N schools	68		36		8		8		16	
<i>Wake County</i>										
School Racial Composition										
American Indian	0.3%	0.01	0.3%	0.00	0.3%	0.00	0.2%	0.00	0.6%	0.02
Asian	4.2%	0.05	4.5%	0.05	2.4%	0.04	5.0%	0.05	2.8%	0.05
Black	30.0%	0.22	29.3%	0.13	41.6%	0.41	37.7%	0.16	15.0%	0.28
Latino	8.5%	0.07	11.1%	0.07	2.8%	0.04	9.0%	0.06	3.2%	0.04
White	57.0%	0.24	54.8%	0.16	52.9%	0.40	48.0%	0.16	78.4%	0.28
Nonwhite	43.0%	0.24	45.2%	0.16	47.1%	0.40	52.0%	0.16	21.6%	0.28
School Size	755.83	523.25	931.60	517.38	361.00	278.50	871.11	480.07	292.57	261.70
Isolated Schools										
90% or more black	3.5%	0.19	0.0%	0.00	28.6%	0.47	0.0%	0.00	6.7%	0.25
90% or more white	10.6%	0.31	0.0%	0.00	21.4%	0.43	0.0%	0.00	50.0%	0.51
N schools	170		81		14		45		30	

Table 4.3a Racial Composition of Schools within 5 Miles of Charter Schools, 2005-06
Elementary Schools Only¹

	All Public Schools		Traditional Public Schools		Charter Schools		Magnet Schools		Private Schools	
	%	SD	%	SD	%	SD	%	SD	%	SD
Racial Composition										
American Indian	0.8%	0.04	0.9%	0.04	0.6%	0.01	0.4%	0.00	1.1%	0.03
Asian	2.7% ^a	0.04	2.7%	0.03	1.6%	0.04 ^{a, b, c}	3.5%	0.04	2.7%	0.08
Black	44.3%	0.27	42.1%	0.26 ^{d, g}	41.8%	0.39 ^{c, e}	54.5%	0.21 ^{c, d, f}	20.1%	0.31 ^{e, f, g}
Latino	10.5% ^a	0.11	11.6%	0.11 ^{b, d, g}	3.2%	0.06 ^{a, b, c}	10.3%	0.10 ^{c, f}	5.0%	0.12 ^{f, g}
White	41.7% ^a	0.29	42.6%	0.28 ^{d, g}	52.8%	0.38 ^{a, b, c, e}	31.3%	0.22 ^{c, d, f}	71.0%	0.32 ^{e, f, g}
Nonwhite	58.3% ^a	0.29	57.0%	0.29 ^{d, g}	47.2%	0.38 ^{a, b, c, e}	67.1%	0.21 ^{c, d, f}	29.0%	0.32 ^{e, f, g}
Isolated Schools										
90% or more black	8.4% ^a	0.28	7.12%	0.26 ^b	25.00%	0.44 ^{a, b, c, e}	3.09%	0.17 ^{c, d (ms), f}	8.97% ^e	0.29
90% or more white	3.5% ^a	0.18	2.04%	0.14 ^{b, g}	18.33%	0.39 ^{a, b, c, e}	0.00%	0.00 ^{c, d, f}	44.87% ^{e, f, g}	0.50
N (schools)	550		393		60		97		78	

¹ School serves one or more of grades K-6 and does not have any grade higher than 8

Differences significant at the .05 level, between the following types of schools:

- ^b charter versus traditional (non-magnet)
- ^c charter versus magnet
- ^d traditional versus magnet
- ^e charter versus private
- ^f private versus magnet
- ^g private versus traditional public

Table 4.3b Racial Composition of Schools within 5 Miles of Charter Schools, 2005-06
 Combined Grade Spans¹

	All Public Schools		Traditional Public Schools		Charter Schools		Magnet Schools		Private Schools	
	%	SD	%	SD	%	SD	%	SD	%	SD
Racial Composition										
American Indian	1.0%	0.07	0.6%	0.037	4.9%	0.196	0.3%	0.003	0.8%	0.019
Asian	1.8% ^a	0.02	2.0% ^b	0.022	0.4% ^{a,b,c}	0.005	1.6% ^c	0.013	1.7%	0.035
Black	42.9%	0.27	41.2% ^{d,g(ms)}	0.260	36.4% ^{c(ms)}	0.330	53.0% ^{c(ms),d,f}	0.233	24.6% ^{f,g(ms)}	0.376
Latino	13.4% ^a	0.14	15.3% ^{b,g}	0.139	2.7% ^{a,b,c}	0.053	11.9% ^{c,f}	0.131	3.5% ^{f,g}	0.067
White	41.0% ^a	0.30	40.8% ^{b,g}	0.291	55.5% ^{a,b,c}	0.366	33.2% ^{c,f}	0.257	69.4% ^{f,g}	0.376
Nonwhite	59.0% ^a	0.30	59.2% ^{b,g}	0.291	44.5% ^{a,b,c}	0.366	66.8% ^{c,f}	0.257	30.6% ^{f,g}	0.376
Isolated Schools										
90% or more black	6.3%	0.24	6.6%	0.25	5.0%	0.22	5.7% ^{c,d(ms),f}	0.24	17.6%	0.39
90% or more white	5.7% ^a	0.23	3.6% ^{b,g}	0.19	30.0% ^{a,b,c}	0.47	0.0% ^{c,d,f}	0.00	41.2% ^{f,g}	0.51
N (schools)	192		137		20		35		17	

Differences significant at the .05 level, between the following types of schools:

- ^a charter versus all other public
- ^b charter versus traditional (non-magnet)
- ^c charter versus magnet
- ^d traditional versus magnet
- ^e charter versus private
- ^f private versus magnet
- ^g private versus traditional public

Table 4.3c Racial Composition of Schools within 5 Miles of Charter Schools, 2005-06
High Schools Only

	All Public Schools		Traditional Public Schools		Charter Schools		Magnet Schools		Private Schools	
	%	SD	%	SD	%	SD	%	SD	%	SD
Racial Composition										
American Indian	2.3%	0.04	3.6%	0.06	1.9%	0.03	0.2%	0.001	0.0%	0.0
Asian	3.2%	0.04	4.2%	0.04	1.0%	0.01	5.8%	0.04	0.6%	0.01
Black	40.0%	0.27	34.3%	0.16	43.0%	0.38	47.9%	0.21	34.2%	0.57
Latino	4.6%	0.05	5.9%	0.04	2.1%	0.03	7.1%	0.08	0.1%	0.00
White	50.0%	0.28	52.0%	0.18	52.1%	0.38	39.1%	0.24	65.0%	0.56
Nonwhite	50.0%	0.28	48.0%	0.18	47.9%	0.38	60.9%	0.24	35.0%	0.56
Isolated Schools										
90% or more black	8.4%	0.28	0.00%	0.00	20.00%		0.00%	0.17	33.33%	0.58
90% or more white	3.5%	0.18	0.00%	0.00	20.00%		0.00%	0.00	66.67%	0.58
N (schools)	25		11		10		4		3	

Significance testing is not performed due to the small number of schools.

Table 4.4 Characteristics of North Carolina Public Schools and Districts, 2005-06
Regular schools only, grades K-12

Distribution of Schools, by Sector	All Districts		Districts with No Choice Options in 2005-06		Districts with Charter Schools in 2005-06		Districts with Charters and Magnets in 2005-06	
	N	Percent	N	Percent	N	Percent	N	Percent
Traditional Public	1998	89.2%	714	31.9%	781	34.9%	503	22.5%
Charter	98	4.4%	0	0.0%	50	2.2%	48	2.1%
Magnet	144	6.4%	0	0.0%	0	0.0%	144	6.4%
All	2240	100.0%	714	31.9%	831	37.1%	695	31.0%
Distribution of Students, by Sector								
Traditional Public	1,274,215	90.5%	410,154	29.1%	472,703	33.6%	391,358	27.8%
Charter	27,371	1.9%	0	0.0%	11,516	0.8%	15,855	1.1%
Magnet	106,453	7.6%	0	0.0%	0	0.0%	106,453	7.6%
Total	1,408,039	100.0%	410,154	29.1%	484,219	34.4%	513,666	36.5%
Racial Composition (school-level)								
American Indian	2%	2.90	1%	0.55	3%	2.78	0%	0.04
Black	31%	8.69	28%	5.53	28%	5.63	39%	2.77
White	57%	9.55	62%	5.76	60%	6.25	48%	3.29
Nonwhite	43%	9.55	38%	5.76	40%	6.25	52%	3.29
School N (%)	2240 (100%)		714 (31.9%)		831 (37.1%)		695 (31.0%)	
District N (%)	115 (100%)		65 (56.5%)		39 (33.9%)		11 (9.6%)	

Table 4.5 Levels of Segregation in Non-Charter Schools, within Districts, 2005-06
Regular schools only

	All Districts		Districts with No Choice Options in 2005		Districts with Charter Schools in 2005		Districts with Charters and Magnets in 2005	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Measures of Segregation¹								
Dissimilarity								
Black-White Dissimilarity	0.33	0.124	0.25	0.111	0.34	0.104	0.41	0.102
Nonwhite-White Dissimilarity	0.31	0.118	0.22	0.095	0.33	0.097	0.39	0.102
Exposure								
Exposure - Black to White	0.50	0.208	0.58	0.215	0.52	0.206	0.38	0.135
Exposure - White to Black	0.26	0.158	0.26	0.193	0.24	0.171	0.29	0.072
Exposure - White to Nonwhite	0.36	0.170	0.35	0.202	0.34	0.186	0.40	0.084
Exposure - Latino to White	0.51	0.201	0.59	0.210	0.54	0.196	0.39	0.131
Standardized Exposure Rate (Gap-based Segregation)								
Black-White, Gap-based segregation	0.14	0.108	0.07	0.055	0.13	0.100	0.23	0.100
White-Nonwhite, Gap-based segregation	0.13	0.092	0.07	0.050	0.14	0.074	0.21	0.092
Schools (N, %), excluding charters	2142 (100%)		714 (33.3%)		781 (36.5%)		647 (30.2%)	
Districts (N, %)	115 (100%)		65 (56.5%)		39 (33.9%)		11 (9.6%)	

¹ Measures of segregation are calculated for traditional public schools only (including magnets).

Table 4.6 Characteristics of North Carolina Students by Type of Sector Switch

	All		TPS Only		Charter Only		Charter and TPS or Magnet		Magnet Only		TPS & Magnet	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Number of students	1,798,159		1,597,086		15,159		24,291		65,570		96,053	
Percentage of students	100		88.82%		0.84%		1.35%		3.65%		5.34%	
Student Characteristics												
Race-ethnicity												
American Indian	1.4%	0.12	1.5%	0.12	1.1%	0.11	2.0%	0.14	0.3%	0.06	0.4%	0.06
Asian	2.1%	0.14	1.9%	0.14	1.4%	0.12	0.9%	0.09	4.6%	0.21	3.3%	0.18
Black	28.8%	0.45	26.9%	0.44	30.9%	0.46	42.1%	0.49	37.8%	0.48	50.7%	0.50
Latino	6.2%	0.24	6.2%	0.24	3.0%	0.17	1.9%	0.14	7.8%	0.27	6.5%	0.25
White	59.7%	0.49	61.7%	0.49	60.9%	0.49	51.0%	0.50	47.0%	0.50	37.1%	0.48
Multiracial	1.9%	0.14	1.9%	0.14	2.5%	0.16	2.2%	0.15	2.4%	0.15	2.1%	0.14
Parental Education												
Less than high school	10.1%	0.30	10.6%	0.31	3.0%	0.17	4.9%	0.22	5.7%	0.23	6.6%	0.25
High school graduate	40.2%	0.49	41.2%	0.49	26.4%	0.44	33.9%	0.47	25.4%	0.44	36.6%	0.48
Some college	20.2%	0.40	20.4%	0.40	23.2%	0.42	22.9%	0.42	16.2%	0.37	18.6%	0.39
College graduate or higher	29.6%	0.46	27.8%	0.45	47.5%	0.50	38.2%	0.49	52.7%	0.50	38.2%	0.49
Limited English proficient (ever)	4.0%	0.19	4.0%	0.19	1.4%	0.11	0.5%	0.06	5.8%	0.23	4.0%	0.18
<i>Student Achievement^a</i>												
Average achievement												
Mathematics	-0.03	0.97	-0.03	0.96	-0.21	0.99	-0.21	0.96	0.21	1.08	-0.13	1.01
Reading	-0.03	0.97	-0.03	0.96	-0.03	1.01	-0.13	0.98	0.21	1.03	-0.13	1.01
Third grade achievement												
Mathematics	0.03	0.98	0.04	0.97	-0.22	1.01	-0.14	1.04	0.27	1.05	-0.06	1.05
Reading	0.04	0.98	0.03	0.97	-0.05	1.03	-0.06	1.03	0.27	1.01	-0.03	1.03
Classroom Composition												
Race-ethnicity												
American Indian	1.4%	0.07	1.5%	0.08	1.2%	0.08	1.7%	0.10	0.3%	0.01	0.4%	0.01
Asian	1.9%	0.03	1.7%	0.03	1.5%	0.04	1.7%	0.03	4.2%	0.06	3.3%	0.04
Black	29.7%	0.24	28.1%	0.24	29.9%	0.34	38.7%	0.27	40.6%	0.25	46.2%	0.21
Latino	5.4%	0.08	5.3%	0.08	3.3%	0.07	4.5%	0.05	6.6%	0.11	6.4%	0.07

Table 4.6 Characteristics of North Carolina Students by Type of Sector Switch

	All		TPS Only		Charter Only		Charter and Magnet		TPS & Magnet	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
White	59.8%	0.27	61.6%	0.26	61.7%	0.35	51.6%	0.28	46.0%	0.26
Other race	1.7%	0.03	1.7%	0.03	2.4%	0.04	1.9%	0.02	2.4%	0.04
Nonwhite	40.2%	0.27	38.4%	0.26	38.3%	0.35	48.4%	0.28	54.0%	0.26
Parental Education										
Less than high school	10.8%	0.11	11.2%	0.11	2.9%	0.07	8.8%	0.09	6.2%	0.11
High school graduate	42.1%	0.19	43.1%	0.18	27.7%	0.23	38.9%	0.19	28.0%	0.22
Some college	19.5%	0.11	19.8%	0.11	25.4%	0.17	19.8%	0.11	16.1%	0.13
College graduate or higher	27.6%	0.22	26.0%	0.20	44.1%	0.28	32.6%	0.23	49.8%	0.27
Average achievement										
Mathematics	-0.02	0.50	-0.03	0.49	-0.15	0.55	-0.09	0.48	0.16	0.65
Reading	-0.02	0.47	-0.03	0.46	0.00	0.53	-0.06	0.45	0.16	0.61
Class size	22.55	4.10	22.63	4.05	19.21	4.76	21.90	3.68	21.91	5.08
Standardized class size	0.34	0.57	0.36	0.56	-0.07	0.81	0.24	0.50	0.29	0.75
School Characteristics										
American Indian	1.4%	0.07	1.5%	0.07	1.1%	0.07	1.8%	0.10	0.4%	0.00
Asian	1.9%	0.03	1.7%	0.02	1.4%	0.03	1.6%	0.02	4.1%	0.03
Black	31.4%	0.22	29.9%	0.22	34.2%	0.34	39.4%	0.26	43.0%	0.20
Latino	5.5%	0.06	5.5%	0.07	2.7%	0.05	4.3%	0.04	6.4%	0.07
White	59.8%	0.25	61.4%	0.24	60.5%	0.35	52.9%	0.27	46.2%	0.22
Nonwhite	40.2%	0.25	38.6%	0.24	39.5%	0.35	47.1%	0.27	53.8%	0.22
School Size	674.33	223	670.43	218	390.81	228	523.27	174	772.15	278
District Characteristics										
Size	35,421	35848	29,495	30968	48,913	44058	45,472	37732	99,014	26514
Segregation measures										
Nonwhite-white dissimilarity	0.30	0.11	0.30	0.11	0.34	0.11	0.33	0.10	0.32	0.10
White isolation	0.66	0.16	0.66	0.17	0.64	0.14	0.63	0.14	0.61	0.06
Black isolation	0.38	0.18	0.37	0.19	0.41	0.18	0.43	0.17	0.44	0.11
Latino isolation	0.08	0.06	0.11	0.05	0.13	0.07	0.11	0.06	0.11	0.05
Nonwhite isolation	0.46	0.19	0.45	0.20	0.52	0.18	0.52	0.17	0.55	0.13
									85,952	31915
									0.33	0.09
									0.60	0.07
									0.46	0.11
									0.10	0.04
									0.56	0.12

Table 4.6 Characteristics of North Carolina Students by Type of Sector Switch

	All		TPS Only		Charter Only		Charter and TPS or Magnet		Magnet Only		TPS & Magnet	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
N	1,777,600		1,597,086		14,500		24,298		65,570		96,053	
Degree of choice in district												
Charter Share	1.06%	0.01	0.93%	0.01	3.54%	0.03	2.36%	0.02	2.05%	0.01	1.87%	0.01
Magnet Share	6.27%	0.11	4.16%	0.09	11.48%	0.14	10.16%	0.13	28.56%	0.08	24.42%	0.10
Sample Information												
Average number of waves	3.49	1.96	3.42	1.96	2.29	1.46	4.84	1.40	2.71	1.77	4.97	1.33
Year first observed	1999.25	3.26	1999.21	3.29	2002.16	2.37	1999.21	2.52	2000.30	3.44	1998.77	2.53
Grade in year first observed	4.17	1.73	4.22	1.76	4.12	1.65	3.42	0.96	4.38	1.89	3.45	0.95
Year last observed	2001.75	3.22	2001.64	3.26	2003.45	2.31	2003.10	2.23	2002.02	3.32	2002.78	2.29
Grade in year last observed	6.62	1.78	6.60	1.80	5.40	1.85	7.16	1.18	6.07	1.97	7.34	1.05
Percentage of observations in TPS	0.93	0.24	1.00	0.00	0.00	0.00	0.51	0.24	0.00	0.00	0.56	0.19
Percentage of observations in Charters	0.01	0.11	0.00	0.00	1.00	0.00	0.42	0.19	0.00	0.00	0.00	0.00
Percentage of observations in Magnets	0.06	0.21	0.00	0.00	0.00	0.00	0.07	0.17	1.00	0.00	0.44	0.19

^a Achievement measures are standardized based on all test takers, including special education students.

Table 4.7 Descriptive Statistics for Analytic Sample

	All		TPS & Magnet Only		Moved to Charter	
	Mean	SD	Mean	SD	Mean	SD
N / Percent of sample	1,369,744	100%	1,351,647	98.68	18,097	1.32
Student Characteristics						
Race-ethnicity						
American Indian	1%	0.12	1%	0.12	2%	0.15
Asian	2%	0.14	2%	0.14	1%	0.09
Black	29%	0.45	29%	0.45	39%	0.49
Latino	6%	0.23	6%	0.23	2%	0.14
White	60%	0.49	60%	0.49	54%	0.50
Multiracial	2%	0.13	2%	0.13	2%	0.14
Parental Education						
Less than high school	9%	0.29	9%	0.29	5%	0.21
High school graduate	40%	0.49	40%	0.49	32%	0.47
Some college	21%	0.40	20%	0.40	23%	0.42
College graduate or higher	30%	0.46	30%	0.46	40%	0.49
Average achievement (standardized)						
Mathematics	-0.01	0.95	-0.01	0.95	-0.08	1.02
Reading	-0.02	0.95	-0.02	0.95	-0.03	1.02
High achieving (+1 SD)						
Mathematics	0.17	0.37	0.17	0.37	0.17	0.38
Reading	0.16	0.37	0.16	0.37	0.18	0.39
Both	0.12	0.32	0.11	0.32	0.12	0.32
Low achieving (-1 SD)						
Mathematics	0.16	0.36	0.16	0.36	0.20	0.40
Reading	0.16	0.37	0.16	0.37	0.19	0.39
Both	0.10	0.31	0.10	0.31	0.13	0.34
Classroom Composition						
Race-ethnicity						
American Indian	1%	0.07	1%	0.07	2%	0.11
Asian	2%	0.03	2%	0.03	2%	0.03
Black	30%	0.24	29%	0.24	38%	0.25
Latino	5%	0.07	5%	0.07	5%	0.06
White	60%	0.26	60%	0.26	52%	0.27
Parental Education						
Less than high school	11%	0.09	11%	0.09	10%	0.10
High school graduate	42%	0.17	42%	0.17	40%	0.19
Some college	19%	0.10	19%	0.10	18%	0.11
College graduate or higher	28%	0.21	28%	0.21	32%	0.23
Average achievement (standardized)						
Mathematics	-0.01	0.95	-0.01	0.95	-0.09	1.00
Reading	-0.02	0.95	-0.02	0.95	-0.04	1.01
Class size	22.76	3.75	22.77	3.75	22.43	3.63

Table 4.7 Descriptive Statistics for Analytic Sample

	All		TPS & Magnet Only		Moved to Charter	
	Mean	SD	Mean	SD	Mean	SD
Percent LEP	3%	0.06	3%	0.06	3%	0.05
School Characteristics						
American Indian	1%	0.07	1%	0.07	2%	0.11
Asian	2%	0.02	2%	0.02	2%	0.02
Black	31%	0.22	31%	0.22	38%	0.25
Latino	5%	0.06	5%	0.06	4%	0.04
White	60%	0.24	60%	0.24	54%	0.27
School Size	677	210.51	678.11	210.42	624.35	210.30
District Characteristics						
Size	34,760	35165.28	34,633	35125.82	44,275	36770.52
Segregation measures						
White-nonwhite dissimilarity	0.30	0.11	0.30	0.11	0.32	0.10
White isolation	0.66	0.16	0.66	0.16	0.63	0.14
Black isolation	0.38	0.18	0.38	0.18	0.43	0.17
Nonwhite isolation	0.46	0.19	0.46	0.19	0.51	0.18
Degree of choice in district						
Charter Share	1.05	1.40	1.04	1.40	1.67	1.68
Magnet Share	6.16	11.36	6.11	11.33	9.95	12.79
Sample information						
Number of observations per student	4.24	1.61	4.23	1.62	4.99	1.36
Student first observed in a magnet school	0.06	0.23	0.05	0.23	0.11	0.31
Grade in which student first observed	3.83	1.38	3.84	1.38	3.40	0.94
Grade in which student last observed	7.01	1.41	7.01	1.41	7.25	1.13
Year in which student first observed	1998.91	2.95	1998.92	2.95	1998.77	2.56
Year in which student last observed	2002.17	2.82	2002.16	2.83	2002.77	2.34
Percentage of observations in TPS	0.93	0.22	0.94	0.21	0.52	0.24
Percentage of observations in magnets	0.06	0.21	0.06	0.21	0.07	0.17
Percentage of observations in charters	0.01	0.05	0.00	0.01	0.41	0.19

Table 4.8 Logit Estimates of a Move to a Charter School, Students of All Racial Groups

	Model I			Model II		
	dy/dx		Std. Err.	dy/dx		Std. Err.
Student race						
American Indian	0.0078	**	0.0031	0.0078	*	0.0031
Asian	-0.0031	***	0.0005	-0.0031	***	0.0005
Black	0.0000		0.0004	0.0000		0.0004
Latino	-0.0025	***	0.0005	-0.0025	***	0.0005
White		—			—	
Multi-racial	0.0017	**	0.0006	0.0017	**	0.0006
Parental education						
Less than high school	-0.0021	***	0.0003	-0.0021	***	0.0003
High school graduate		—			—	
Some college	0.0029	***	0.0003	0.0029	***	0.0003
College graduate or higher	0.0042	***	0.0004	0.0042	***	0.0004
Limited English proficient	-0.0055	***	0.0004	-0.0055	***	0.0004
Student achievement - average in TPS						
Average achievement		—			—	
Low achieving in mathematics	0.0011	***	0.0003	0.0011	***	0.0003
Average achievement		—			—	
High achieving in mathematics	0.0004		0.0003	0.0004		0.0003
Percentage of observations in a magnet school	-0.0109	***	0.0014	-0.0109	***	0.0014
Classroom characteristics - averages in non-charter schools						
Mathematics achievement	-0.0022	***	0.0002	-0.0022	***	0.0002
Reading achievement	0.0013	***	0.0002	0.0013	***	0.0002
Class size	-0.0003	***	0.0001	-0.0003	***	0.0001
Percentage of black students in class						
Less than 20 percent black	-0.0041	***	0.0007	-0.0041	***	0.0007
20-40 percent	-0.0012	**	0.0004	-0.0012	**	0.0004
40-60 percent		—			—	
60-80 percent	0.0012	*	0.0005	0.0012	*	0.0005
80 percent or higher	0.0039	**	0.0013	0.0039	**	0.0013
Percent limited English proficient	0.0029		0.0052	0.0029		0.0051
Percent parents with college degrees or higher	0.0085	***	0.0017	0.0085	***	0.0018
School size (in 100s)	-0.0018	***	0.0002	-0.0018	***	0.0002
District size (in 1000s)	0.0001	***	0.0000	0.0001	***	0.0000
Share of district enrolled in charter schools						
Zero		—			—	
Less than 0.75 percent	-0.0002		0.0006	-0.0002		0.0006
0.75 - 2.1 percent	0.0062	***	0.0008	0.0062	***	0.0009
More than 2.1 percent	0.0110	***	0.0013	0.0110	***	0.0014
Segregation - schools within districts						
Black-white dissimilarity		—		0.0000		0.0021

Table 4.8 Logit Estimates of a Move to a Charter School, Students of All Racial Groups

N	1,114,083	1,114,083
Log pseudo likelihood	-67628.11	-67628.11

*** significant at .001 level

** significant at .01 level

* significant at .05 level

¹ Low achieving is defined as a standard deviation (or more) below the standardized mean, on average during a student's time in non-charter schools. For example, a student whose average reading achievement is -1.05 while in non-charters is considered low achieving.

Table 4.9 Logit Estimates of a Move to a Charter School, by Student Race

Marginal effects	Model I			Model II		
	Black Students			Black Students		
	dy/dx		Std. Err.	dy/dx		Std. Err.
Parental education						
Less than high school	-0.0027	***	0.0005	-0.0027	***	0.0005
High school graduate	exc.			exc.		
Some college	0.0054	***	0.0006	0.0052	***	0.0006
College graduate or higher	0.0062	***	0.0008	0.0059	***	0.0008
Student achievement - average in TPS						
Low achieving in reading ¹	0.0026	***	0.0006	0.0024	***	0.0006
Average achievement	exc.			exc.		
High achieving in reading	0.0021	*	0.0012	0.0020	**	0.0012
Low achieving in mathematics	0.0013	**	0.0005	0.0013	**	0.0005
Average achievement	exc.			exc.		
High achieving in mathematics	0.0015		0.0013	0.0013		0.0013
Percentage of observations in a magnet school						
Mathematics achievement	-0.0043	***	0.0005	-0.0044	***	0.0005
Class size	-0.0002		0.0002	-0.0002		0.0001
Percentage of black students in class						
Less than 20 percent black	-0.0024	**	0.0009	-0.0024	**	0.0009
20-40 percent	-0.0010		0.0006	-0.0006		0.0006
40-60 percent	exc.			exc.		
60-80 percent	0.0022	***	0.0007	0.0016	**	0.0006
80 percent or higher	0.0061	***	0.0017	0.0047	***	0.0015
Class percent limited English proficient						
	0.0203	***	0.0064	0.0166	**	0.0066
Class percent parents with college degrees or higher						
	0.0198	***	0.0031	0.0204	***	0.0030
School size (in 100s)						
	-0.0029	***	0.0003	-0.0028	***	0.0003
District size (in 1000s)						
	0.0001	***	0.0000	0.0001	***	0.0000
Share of district enrolled in charter schools						
Zero	exc.			exc.		
Less than 0.75 percent	-0.0001		0.0010	-0.0017	*	0.0010
0.75 - 2.1 percent	0.0120	***	0.0016	0.0084	***	0.0014
More than 2.1 percent	0.0267	***	0.0026	0.0226	***	0.0024
Segregation of schools within districts						
Black-white dissimilarity	...			0.0177	***	0.0037
N	310,798			310,798		
Log pseudo likelihood	-24441.06			-24385.17		

*** significant at .001 level

** significant at .01 level

* significant at .05 level

¹Low achieving is defined as a standard deviation (or more) below the standardized mean, on average during a student's time in non-charter schools. For example, a student whose average reading achievement is -1.05 while in non-charters is considered low achieving.

Table 4.9 Logit Estimates of a Move to a Charter School, by Student Race

	Model III		Model IV	
	White Students		White Students	
	dy/dx	Std. Err.	dy/dx	Std. Err.
Parental education				
Less than high school	-0.0026	*** 0.0004	-0.0025	*** 0.0004
High school graduate	—		—	
Some college	0.0022	*** 0.0003	0.0022	*** 0.0004
College graduate or higher	0.0038	*** 0.0003	0.0038	*** 0.0005
Student achievement - average in TPS				
Low achieving in reading ¹	0.0033	*** 0.0008	0.0033	*** 0.0009
Average achievement	—		—	
High achieving in reading	0.0009	*** 0.0003	0.0009	*** 0.0003
Low achieving in mathematics	0.0001	0.0005	0.0002	0.0005
Average achievement	—		—	
High achieving in mathematics	0.0001	0.0003	0.0001	0.0003
Percentage of observations in a magnet school	-0.0098	*** 0.0005	-0.0100	*** 0.0017
Mathematics achievement	-0.0017	*** 0.0002	-0.0016	*** 0.0003
Class size	-0.0004	*** 0.0000	-0.0003	*** 0.0001
Percentage of black students in class				
Less than 20 percent black	-0.0048	*** 0.0003	-0.0044	*** 0.0010
20-40 percent	-0.0017	*** 0.0002	-0.0018	*** 0.0005
40-60 percent	—		—	
60-80 percent	0.0026	*** 0.0006	0.0028	** 0.0012
80 percent or higher	0.0082	*** 0.0027	0.0086	** 0.0040
Class percent limited English proficient	-0.0047	* 0.0023	-0.0050	** 0.0076
Class percent parents with college degrees or higher	0.0041	*** 0.0005	0.0034	** 0.0019
School size (in 100s)	-0.0017	*** 0.0001	-0.0016	*** 0.0002
District size (in 1000s)	0.0001	*** 0.0000	0.0001	*** 0.0000
Share of district enrolled in charter schools				
Zero	—		—	
Less than 0.75 percent	-0.0002	0.0003	0.0004	0.0007
0.75 - 2.1 percent	0.0052	*** 0.0004	0.0064	*** 0.0011
More than 2.1 percent	0.0062	*** 0.0004	0.0065	*** 0.0016
Segregation of schools within districts				
Black-white dissimilarity	—		-0.0080	*** 0.0024
N	681,684		681,684	
Log pseudo likelihood	-37513.43		-37450.62	

*** significant at .001 level

** significant at .01 level

* significant at .05 level

¹Low achieving is defined as a standard deviation (or more) below the standardized mean, on average during a student's time in non-charter schools. For example, a student whose average reading achievement is -1.05 while in non-charters is considered low achieving.

Table 4.10 Characteristics of Peer Environments in Charter and Noncharter Schools for Charter Movers, by Student Race-Ethnicity, 2004-2005

	All		Black	
	MEAN	STD	MEAN	STD
Number of years charter open	6.18	1.75	6.34	1.70
School racial composition				
Charter school percent black	0.41	0.36	0.74	0.28
Lagged school percent black	0.40	0.26	0.57	0.24
Difference	0.01	0.30	0.17	0.32
Charter school percent Latino	0.03	0.06	0.04	0.08
Lagged school percent Latino	0.09	0.09	0.11	0.11
Difference	-0.06	0.10	-0.08	0.12
Charter school percent white	0.53	0.37	0.21	0.27
Lagged school percent white	0.47	0.29	0.29	0.24
Difference	0.06	0.29	-0.08	0.30
Charter school percent nonwhite	0.47	0.37	0.79	0.27
Lagged school percent nonwhite	0.53	0.29	0.71	0.24
Difference	-0.06	0.29	0.08	0.30
Classroom characteristics				
Charter classroom percent black	0.38	0.37	0.73	0.28
Lagged classroom percent black	0.38	0.28	0.59	0.26
Difference	0.01	0.31	0.16	0.34
Charter classroom percent Latino	0.03	0.06	0.04	0.07
Lagged classroom percent Latino	0.08	0.10	0.10	0.12
Difference	-0.05	0.11	-0.08	0.13
Charter classroom percent white	0.52	0.38	0.20	0.27
Lagged classroom percent white	0.47	0.31	0.26	0.25
Difference	0.04	0.30	-0.07	0.32
Charter classroom percent nonwhite	0.48	0.38	0.80	0.27
Lagged classroom percent nonwhite	0.53	0.31	0.74	0.25
Difference	-0.04	0.30	0.07	0.32
Charter classroom percent LEP	0.20	0.92	0.32	1.18
Lagged classroom percent LEP	1.00	1.53	1.26	1.78
Difference	-0.85	1.81	-1.09	2.20
<i>Parental Education</i>				
Charter classroom percent parents with college degrees or higher	0.38	0.29	0.26	0.22
Lagged classroom percent parents with college degree or higher	0.29	0.26	0.20	0.22
Difference	0.11	0.31	0.05	0.30
Charter classroom percent parents with some college	0.20	0.16	0.21	0.18
Lagged classroom percent parents with some college	0.07	0.26	0.11	0.28
*missing difference				
Charter classroom percent parents with high school diplomas only	0.31	0.27	0.38	0.27
Lagged classroom percent parents with high school diplomas only	0.42	0.26	0.48	0.26
Difference	-0.13	0.36	-0.10	0.39

Table 4.10 Characteristics of Peer Environments in Charter and Noncharter Schools for Charter Movers, by Student Race-Ethnicity, 2004-2005

Charter classroom percent parents with less than high school diploma	0.04	0.09	0.05	0.10
Lagged classroom percent parents with less than high school diploma	0.09	0.12	0.11	0.13
Difference	-0.06	0.15	-0.06	0.17
<i>Achievement</i>				
Charter classroom average mathematics achievement	-0.25	0.60	-0.61	0.44
Lagged classroom average mathematics achievement	-0.05	0.55	-0.33	0.49
Difference	-0.18	0.63	-0.27	0.64
Charter classroom average reading achievement	-0.11	0.60	-0.47	0.47
Lagged classroom average reading achievement	-0.05	0.51	-0.30	0.47
Difference	-0.03	0.61	-0.17	0.64
Charter classroom size	18.75	5.37	18.72	5.88
Lagged classroom size	22.11	4.18	21.53	4.63
Difference	-3.38	6.77	-3.07	7.78
N	1,711 - 2,101		681-819	
Achievement of Movers versus Peers				
Lagged student mathematics score	-0.01	1.02	-0.58	0.82
Lagged average classroom mathematics score	-0.05	0.55	-0.33	0.49
Difference	0.04	0.85	-0.24	0.79
Lagged student reading score	0.02	1.01	-0.51	0.88
Lagged average classroom mathematics score	-0.05	0.51	-0.30	0.47
Difference	0.06	0.87	-0.23	0.85
N	2,089 - 2,188		815-854	
<i>Student Achievement</i>				
Student mathematics score	-0.14	0.99	-0.61	0.84
Lagged student mathematics score	-0.01	1.02	-0.58	0.82
Difference	-0.13	0.62	-0.03	0.63
Student reading score	-0.05	1.02	-0.56	0.90
Lagged student reading score	0.02	1.01	-0.51	0.88
Difference	-0.06	0.64	-0.04	0.68

Table 4.10 Characteristics of Peer Environments in Charter and Noncharter Schools for Charter Movers, by Student Race-Ethnicity, 2004-2005

	White		Latino	
	MEAN	STD	MEAN	STD
Number of years charter open	5.99	1.76	6.49	1.94
School racial composition				
Charter school percent black	0.17	0.20	0.45	0.27
Lagged school percent black	0.27	0.19	0.48	0.25
Difference	-0.10	0.22	-0.03	0.26
Charter school percent Latino	0.02	0.02	0.12	0.14
Lagged school percent Latino	0.07	0.07	0.14	0.11
Difference	-0.05	0.07	-0.02	0.18
Charter school percent white	0.79	0.21	0.41	0.33
Lagged school percent white	0.63	0.23	0.36	0.28
Difference	0.16	0.24	0.05	0.28
Charter school percent nonwhite	0.21	0.21	0.59	0.33
Lagged school percent nonwhite	0.37	0.23	0.64	0.28
Difference	-0.16	0.24	-0.05	0.28
Classroom characteristics				
Charter classroom percent black	0.13	0.19	0.44	0.27
Lagged classroom percent black	0.24	0.20	0.46	0.25
Difference	-0.09	0.22	-0.04	0.25
Charter classroom percent Latino	0.02	0.04	0.17	0.13
Lagged classroom percent Latino	0.06	0.08	0.17	0.11
Difference	-0.04	0.09	0.01	0.16
Charter classroom percent white	0.80	0.21	0.35	0.31
Lagged classroom percent white	0.65	0.23	0.33	0.28
Difference	0.13	0.26	0.03	0.28
Charter classroom percent nonwhite	0.20	0.21	0.65	0.31
Lagged classroom percent nonwhite	0.35	0.23	0.67	0.28
Difference	-0.13	0.26	-0.03	0.28
Charter classroom percent LEP	0.04	0.19	1.60	2.58
Lagged classroom percent LEP	0.80	1.30	1.64	1.61
Difference	-0.76	1.36	0.27	2.99
<i>Parental Education</i>				
Charter classroom percent parents with college degrees or higher	0.49	0.29	0.30	0.27
Lagged classroom percent parents with college degree or higher	0.36	0.28	0.21	0.24
Difference	0.17	0.31	0.11	0.25
Charter classroom percent parents with some college	0.19	0.15	0.20	0.22
Lagged classroom percent parents with some college	0.05	0.23	0.08	0.30
*missing difference				
Charter classroom percent parents with high school diplomas only	0.25	0.26	0.33	0.26
Lagged classroom percent parents with high school diplomas only	0.36	0.24	0.49	0.31
Difference	-0.15	0.32	-0.18	0.42

Table 4.10 Characteristics of Peer Environments in Charter and Noncharter Schools for Charter Movers, by Student Race-Ethnicity, 2004-2005

Charter classroom percent parents with less than high school diploma	0.01	0.06	0.09	0.12
Lagged classroom percent parents with less than high school diploma	0.08	0.11	0.11	0.13
Difference	-0.07	0.12	-0.01	0.18
<i>Achievement</i>				
Charter classroom average mathematics achievement	0.04	0.54	-0.35	0.60
Lagged classroom average mathematics achievement	0.17	0.50	-0.23	0.50
Difference	-0.10	0.63	-0.08	0.61
Charter classroom average reading achievement	0.22	0.47	-0.26	0.61
Lagged classroom average reading achievement	0.16	0.44	-0.24	0.50
Difference	0.09	0.55	-0.02	0.61
Charter classroom size	19.00	4.96	19.10	5.16
Lagged classroom size	22.52	3.79	21.93	3.89
Difference	-3.36	5.92	-2.79	6.23
N	865-1,088		48-61	
Achievement of Movers versus Peers				
Lagged student mathematics score	0.43	0.94	-0.06	0.96
Lagged average classroom mathematics score	0.17	0.50	-0.23	0.50
Difference	0.27	0.83	0.15	0.81
Lagged student reading score	0.45	0.87	-0.01	1.02
Lagged average classroom mathematics score	0.16	0.44	-0.24	0.50
Difference	0.29	0.81	0.15	0.90
N	1,086-1,130		58-65	
<i>Student Achievement</i>				
Student mathematics score	0.22	0.93	-0.20	1.02
Lagged student mathematics score	0.43	0.94	-0.06	0.96
Difference	-0.21	0.61	-0.15	0.63
Student reading score	0.36	0.89	-0.17	1.11
Lagged student reading score	0.45	0.87	-0.01	1.02
Difference	-0.09	0.60	-0.02	0.70

Table 4.11 Impacts of a Move to a Charter School on Classroom Racial Composition, 2002-2005

	Classroom Percent Black		Classroom Percent White	
	Coef.	Robust Std. Err.	Coef.	Robust Std. Err.
Lagged class percent black	-0.1761 ***	0.0017	-0.1745 ***	0.0016
Moved to charter	-0.0888 ***	0.0057	-0.0213 **	0.0074
Moved to charter * Black	0.1939 ***	0.0106	0.1538 ***	0.0101
Student mathematics achievement	-0.0051 ***	0.0004	0.0054 ***	0.0004
Student reading achievement	0.0011 ***	0.0003	-0.0018 ***	0.0004
School size	-0.0001 ***	0.0000	0.0001 ***	0.0000
District size	0.0000 ***	0.0000	0.0000 ***	0.0000
Lagged black-white dissimilarity	0.0291 ***	0.0053	-0.0238 ***	0.0059
Constant	0.3270 ***	0.0024	0.7139 ***	0.0027
Total number of observations	1,322,133		1,322,133	
Total number of students	681,194		681,194	
Overall R ²	0.1176		0.0687	

*** significant at .001 level

** significant at .01 level

* significant at .05 level

Figure 4.1 Location of Charter and Magnet Elementary Schools, by District Racial Composition, 2005-06

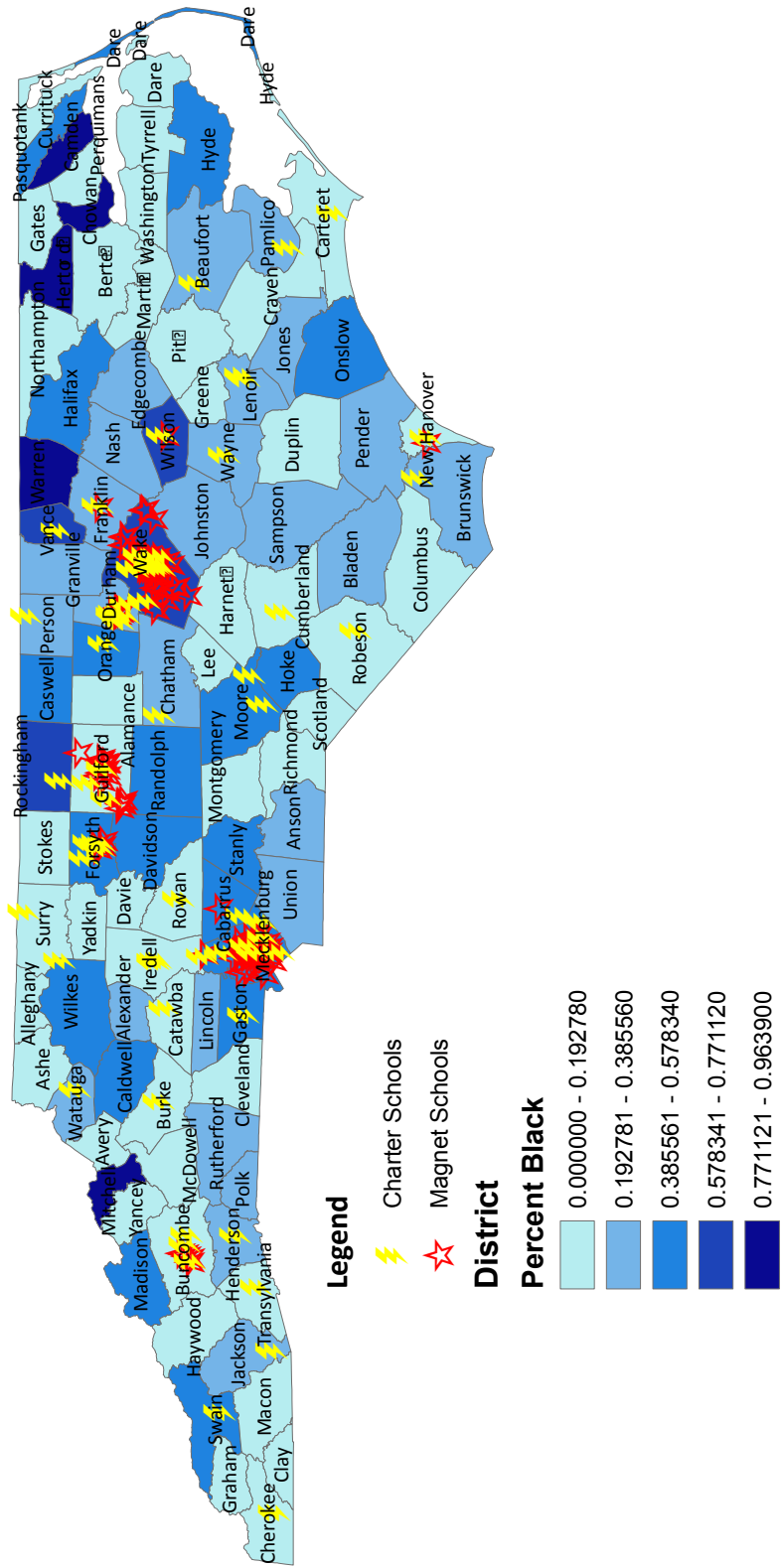


Figure 4.2 Racially Isolated Charter Schools, by District Racial Composition, 2005-06

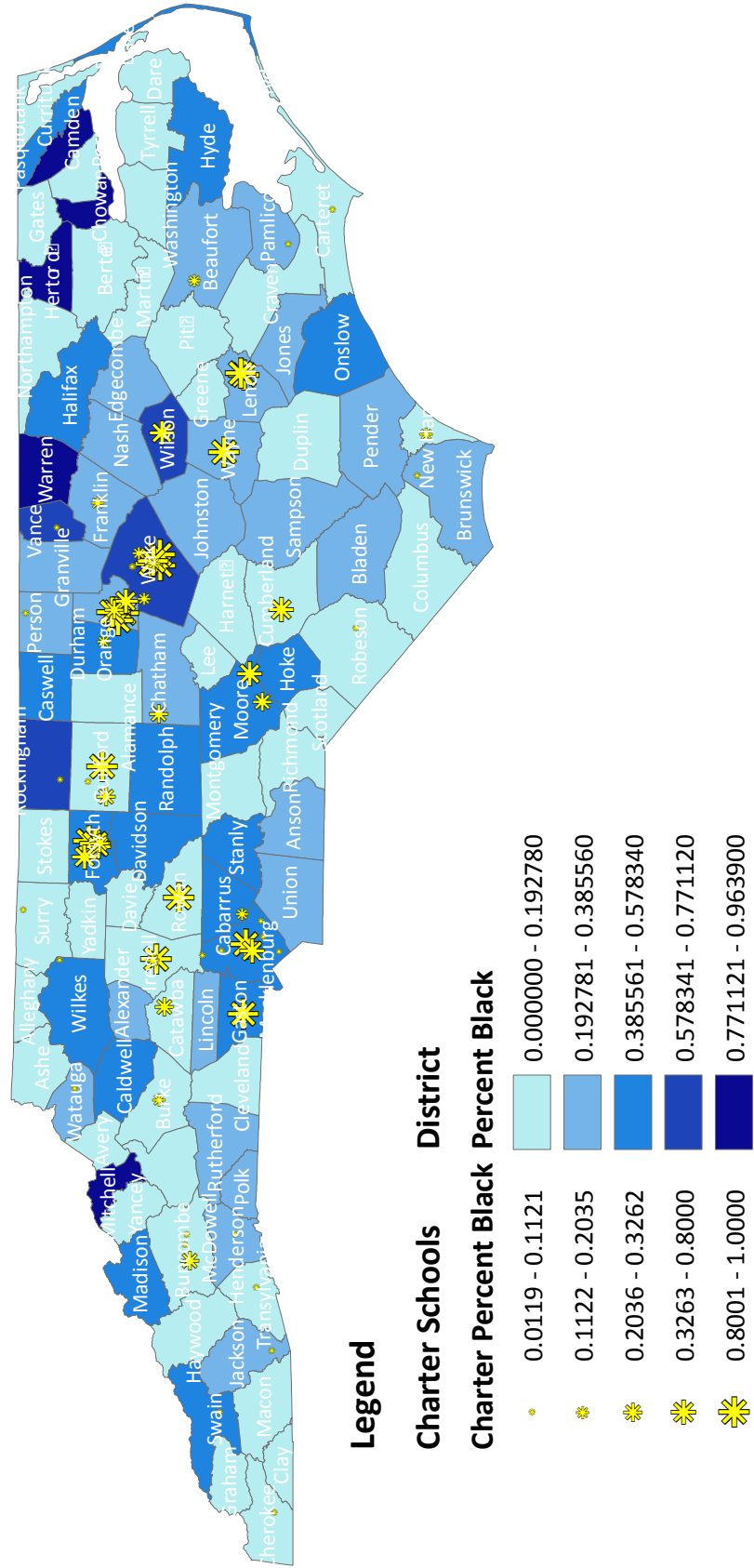


Figure 4.3
Black-White Dissimilarity, 1987-2005, by Degree of Choice in District in 2005-06

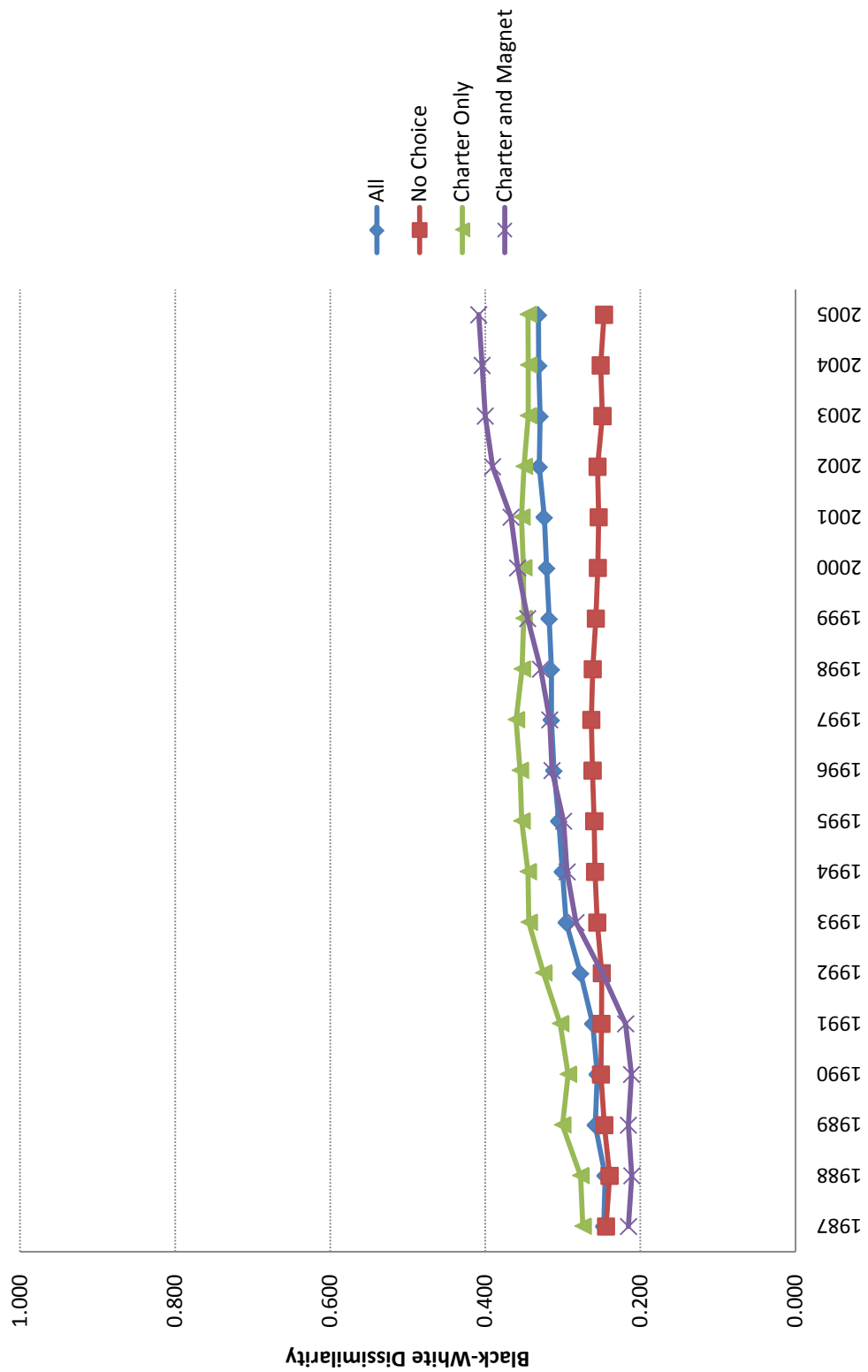


Figure 4.4
Nonwhite-White Dissimilarity, 1987-2005, by Degree of Choice in District in 2005-06

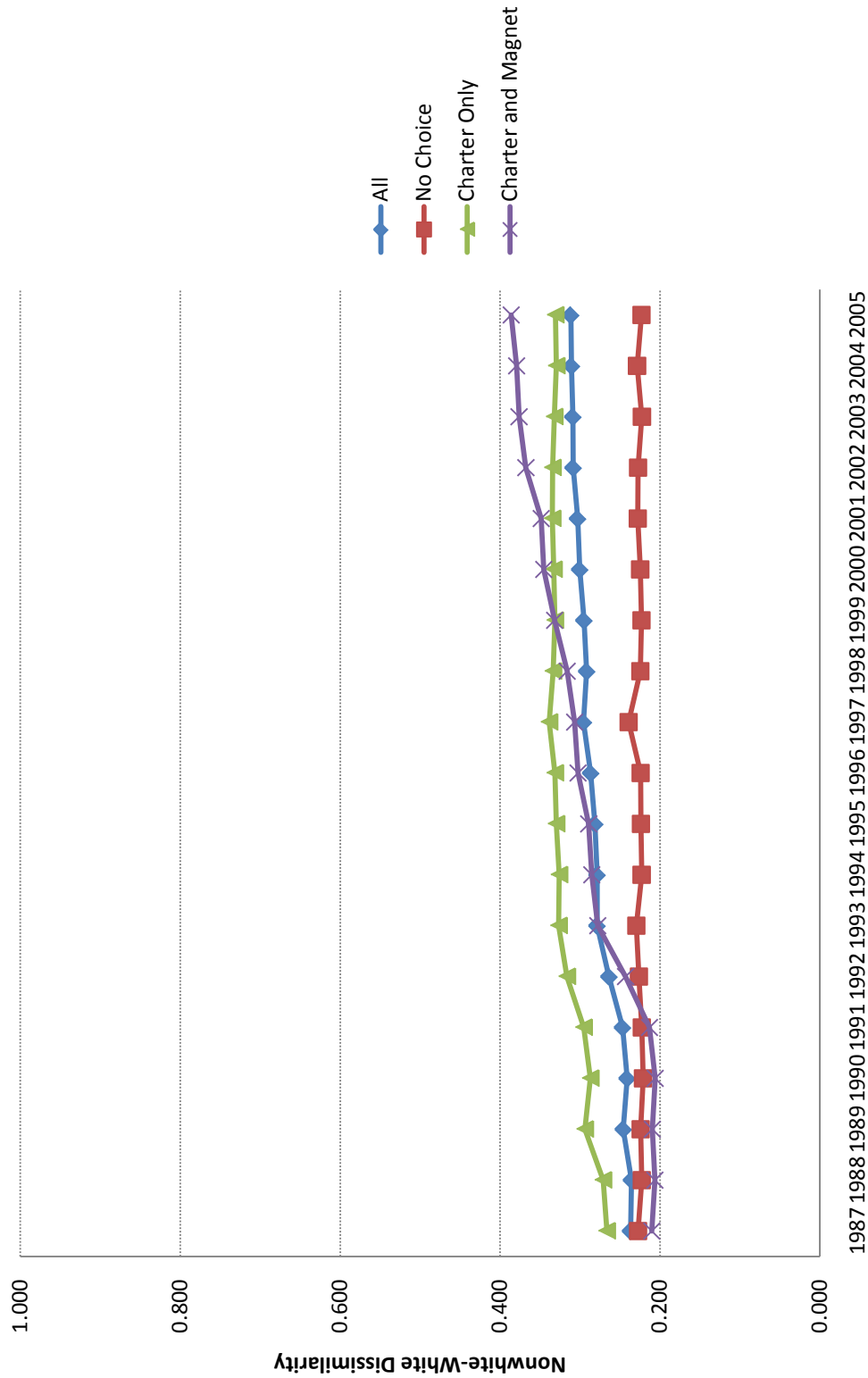


Figure 4.5
Black-White Exposure, 1987-2005, by Degree of Choice in District in 2005-06

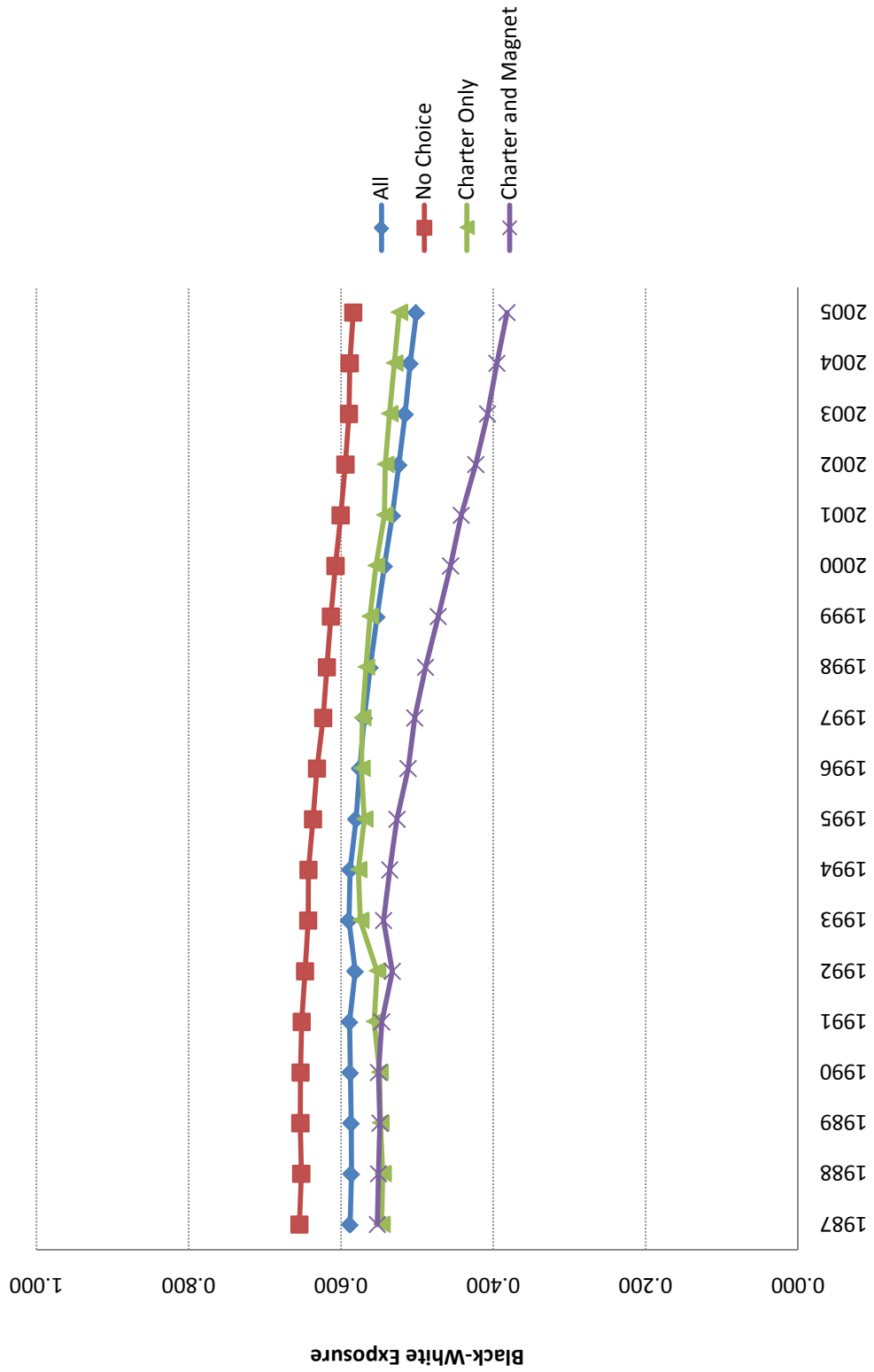


Figure 4.6
Latino-White Exposure, 1987-2005, by Degree of Choice in District in 2005-06

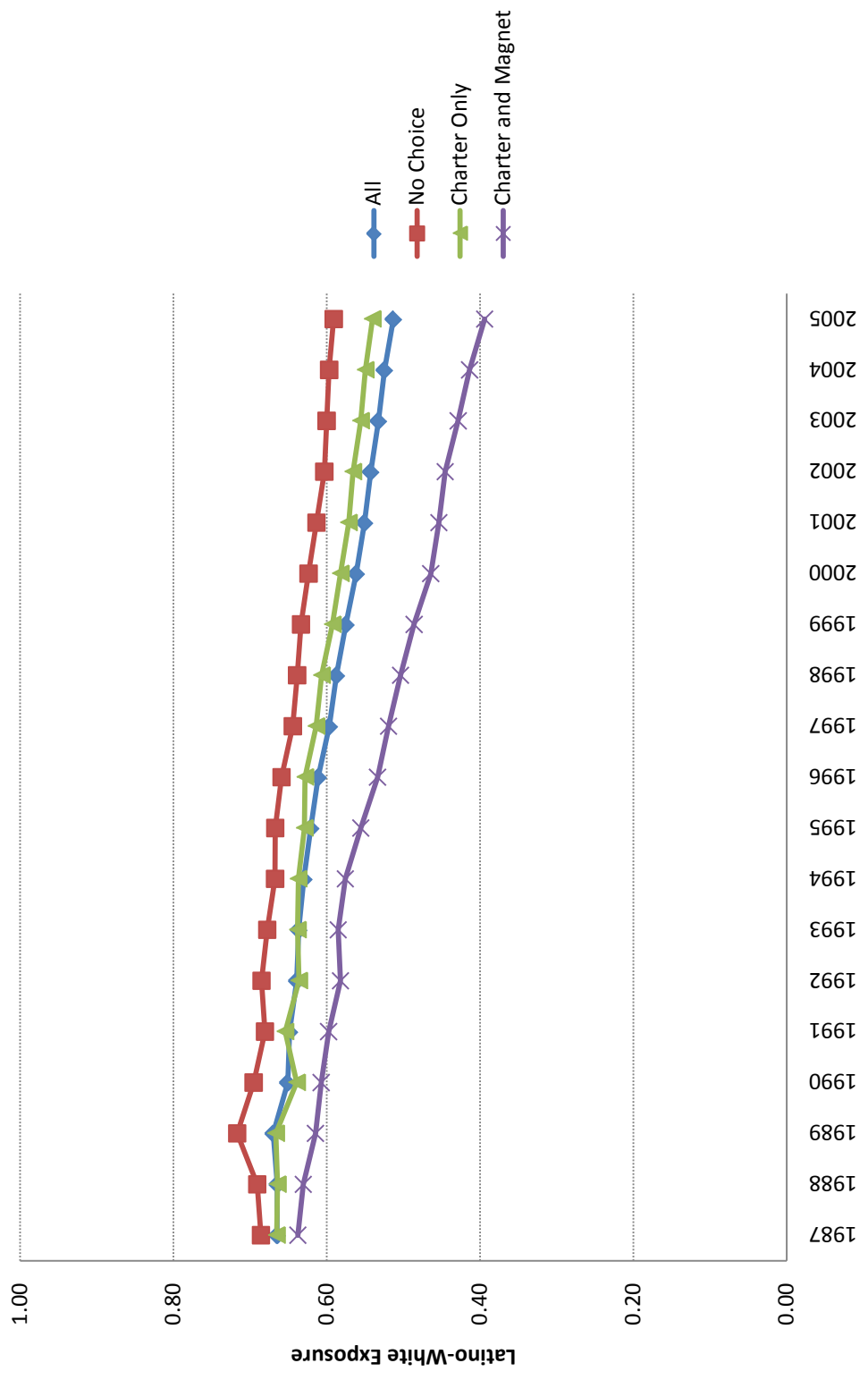


Figure 4.7
Nonwhite Isolation, 1987-2005, by Degree of Choice in District in 2005-06



Figure 4.8
Black Isolation, 1987-2005, by Degree of Choice in District in 2005-06

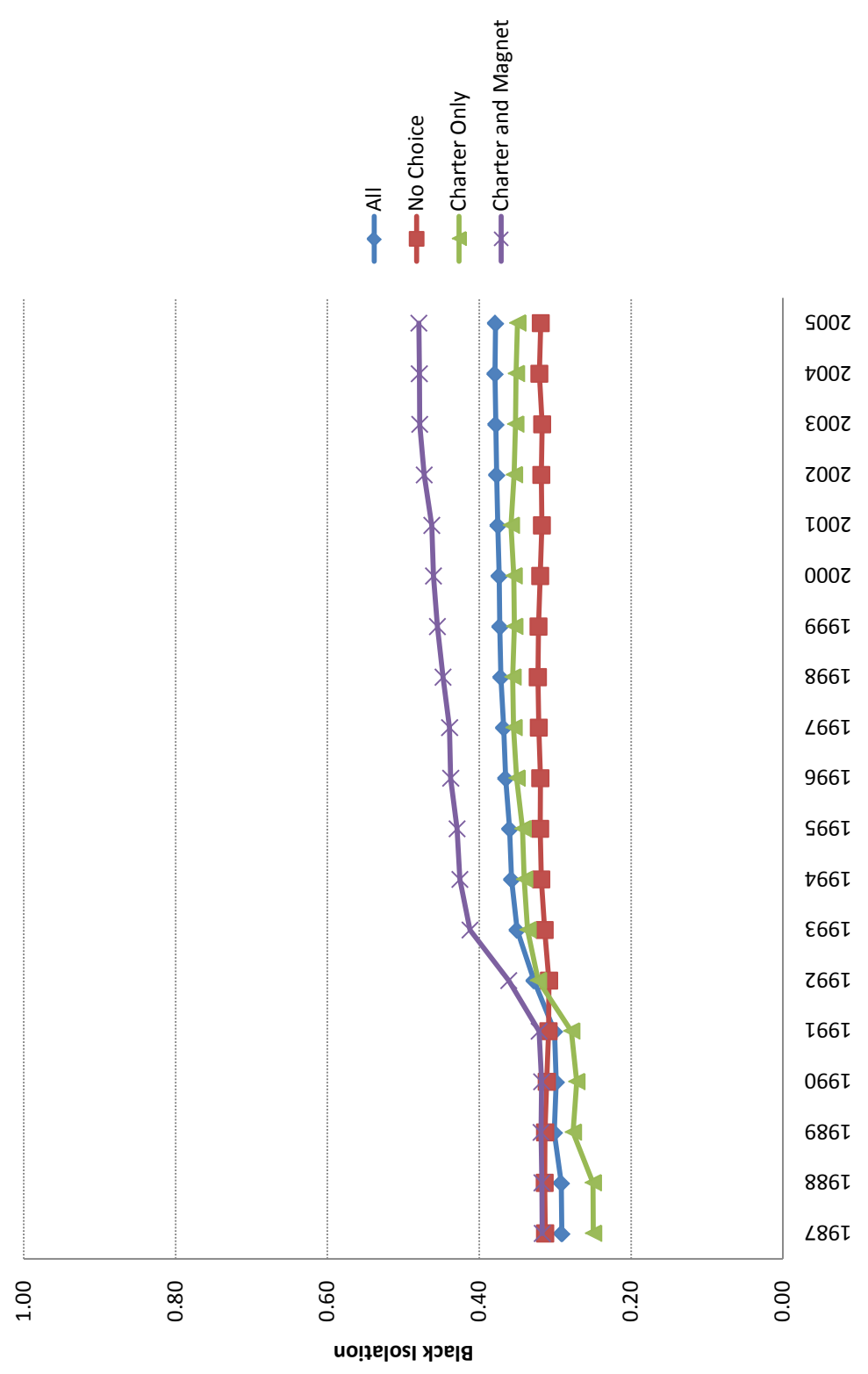


Figure 4.9
Latino Isolation, 1987-2005, by Degree of Choice in District in 2005-06

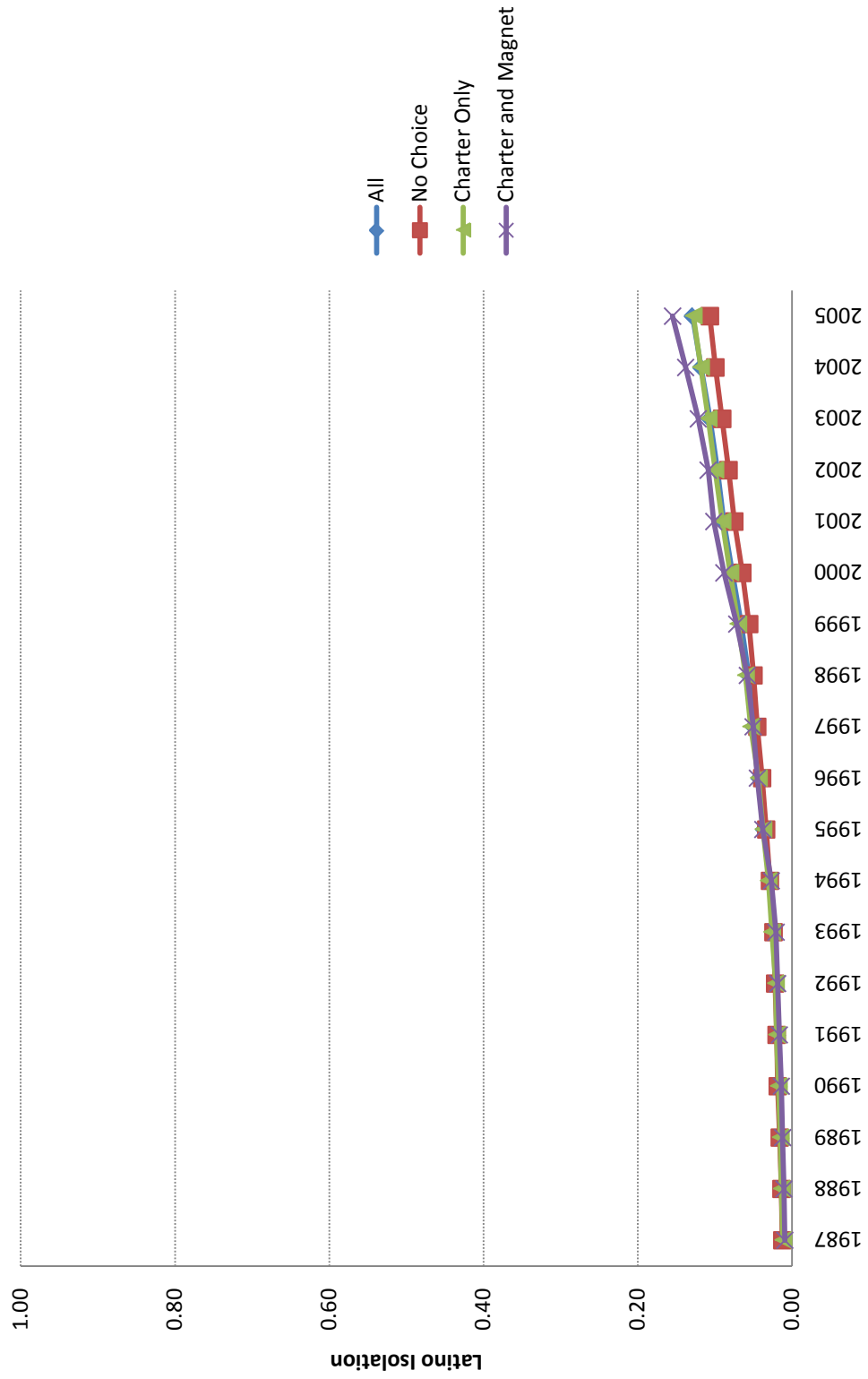
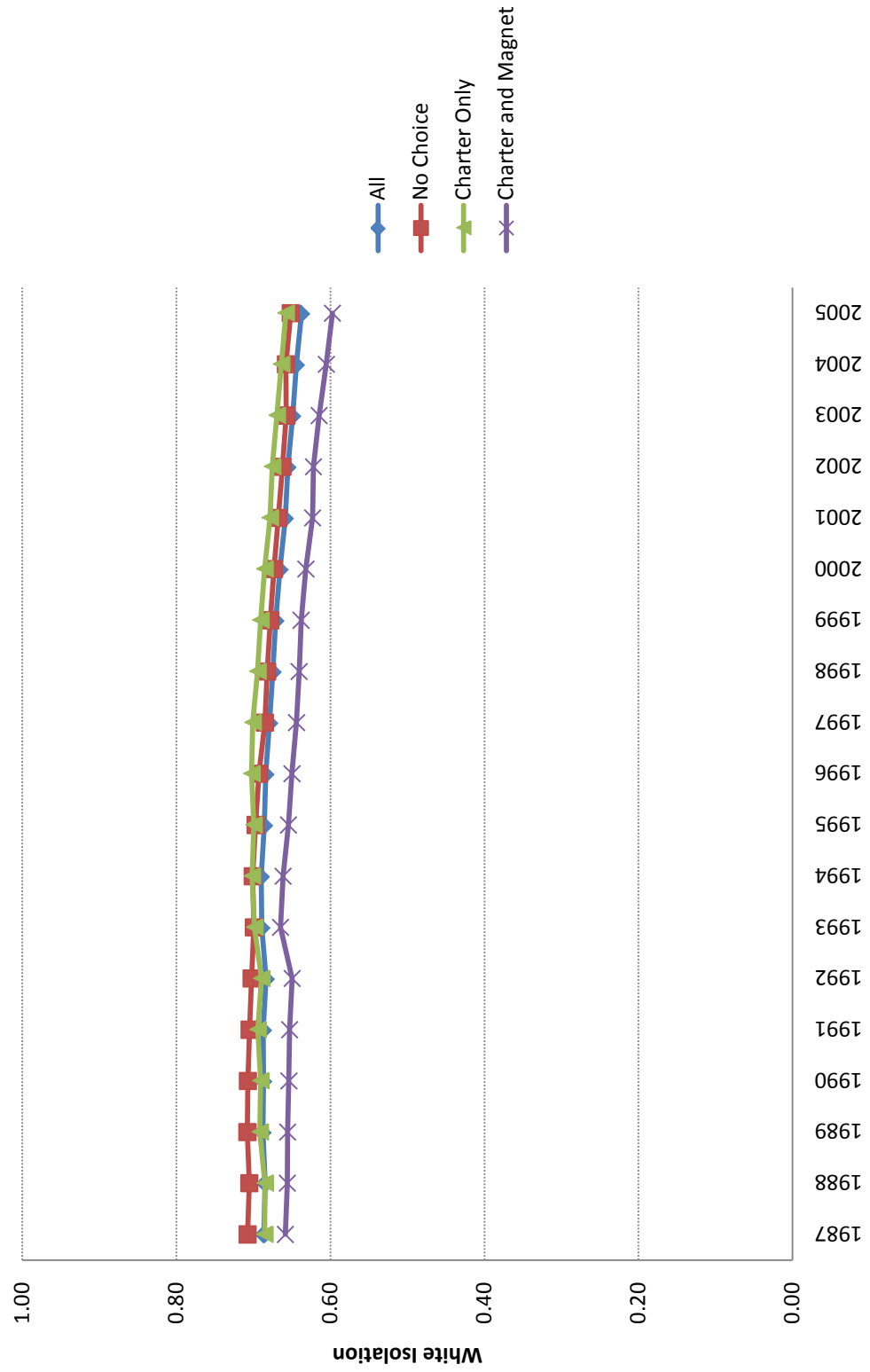


Figure 4.10
White Isolation, 1987-2005, by Degree of Choice in District in 2005-06



Chapter V Conclusion

Overview

The overall research question I address across the chapters of this dissertation is whether charter schools are leading to increased racial segregation in public schools. Chapter II lays out the research base on the relationship between choice and segregation, looking at multiple forms of school choice operating nationwide. The evidence indicates that charter schools are not furthering integration, as is theoretically possible, there is not solid empirical evidence of dramatic segregating effects. However, the evidence on other unrestricted choice plans (such as private school choices) indicates that families tend to choose schools where the student population reflects their own child's race or ethnicity, suggesting that widespread unrestricted choice likely would lead to increases in school segregation. Chapter III focuses on Michigan's charter school program, examining the impact that charter schools are having on students remaining in traditional public schools. The results indicate that, even controlling for residential segregation, charter schools are contributing to increases in school segregation in districts where they have a relatively large presence. Finally, Chapter IV, the North Carolina piece, takes a more micro approach, using student-level data to examine the factors that predict a student's move to a charter school and the effect that move has on the composition of their classrooms. More specifically, the North Carolina piece examines the factors that drive students and families to choose charter schools, and how these factors vary by student race, as well as the consequences of these choices for switchers' new peer environments in terms of classroom level segregation. The results indicate that charter schools in 2005-06 are more likely to be racially isolated, and that despite drawing students with higher levels of parental education, students in charter schools have significantly lower levels of achievement in mathematics. The analysis presented here of factors motivating a move to a charter school indicate that classroom racial composition is a significant force for families, as both black and white families are more likely to switch as the classroom share of black students increases. However, black and white families appear to be expressing asymmetric preferences in their choices for charter schools, as

the final analyses demonstrate that both black and white families are making self-segregating moves.

These issues are critical to two major fields of study, beginning with the sociological issue of social stratification and inequality, in that segregated schools deny students fully equal educational opportunities. A body of research shows that Southern schools have been resegregating since the late 1980s and early 1990s, due largely to the end of most court-ordered desegregation plans and the abandonment of race-based student assignment policies, the latter resulting from years of legal challenges. Michigan and North Carolina are both interesting cases, in that Michigan is characterized by such high levels of residential segregation, which is largely translated into school segregation given that districts are relatively small, and largely reflect neighborhood residential patterns. In contrast, North Carolina school districts are now county wide, which provides good opportunities for school integration independent of residential segregation.

These issues are also extremely relevant to the field of education policy. Currently, the trend in education policy is moving towards innovation, in contrast to accountability as in the No Child Left Behind era, possibly as a result of little rigorous evidence on how to improve chronically failing schools. Obama's new education initiative, Race to the Top, is an example in point. Race to the Top is a nationwide competition for large amounts of education funding, and states' application are scored in part on innovation. A key aspect of this is a state's expansion of charter schools, which in many states requires an amendment to the charter legislation to remove caps on the number of charter schools allowed. The results presented here are directly relevant to the question of the effects of a large charter school presence on segregation in public schools.

There are many advantages to the analyses presented here relative to previous research done with these data. Beginning with the Michigan piece, these analyses are one of the few, if not only, study to date that takes into account residential segregation in measuring the effect of school choice on school segregation. In terms of the North Carolina analyses, other studies of North Carolina have not been based on such an inclusive longitudinal, and therefore generalizable, sample of students and classrooms. For example, other studies on both

classroom level segregation and charter school effects have been done with subsets of the data, and prior analyses of classroom level segregation have used only classroom counts, not true student level data, and therefore have been unable to measure the composition of classrooms with respect to parental education and student achievement. Some have used only a subset of grade levels at two time points, while other studies of charter school effects have used successive cohorts of students, rather than the full sample available. Further, some of these analyses only look at one or two time points to evaluate racial composition, and sometimes in only a handful of districts, and then at the school rather than classroom level. While these results presented here are largely consistent with those of other researchers, the analyses presented here are fully generalizable to the state of North Carolina. This is especially important to the current policy debate, in particular the possible effects of lifting the statewide cap on the number of charter schools.

Results

Chapter II shows that evidence on the effects of voucher and charter programs on segregation is regrettably weak. Although we know quite a lot about the extent to which school choice provides access to children of various ethnic, racial, income, and ability groups, we know far less about how students are distributed across individual schools—the key piece of information that is necessary to determine integration. Still, enough evidence is available to make a few tentative conclusions. Nationwide, charter schools appear to have racial compositions that are within the range of local public schools, based on district averages. However, in some states, charter schools appear to be serving populations that are either largely minority or white, with few being highly integrated. Further, research on private school choice has found that families are sensitive racial composition and that white families prefer to send their children to schools which lack substantial minority populations.

The results of Chapter III show that while, at first glance, charter schools appear to be serving distinct populations, the racial composition of charter schools is not dramatically different from traditional public schools located in their vicinity. However, charter schools are significantly more likely to locate in districts where black and Latino students are more isolated from white students in traditional public schools. Even though this trend can be seen in a positive light in that the supply of charter schools is responding to a desire for greater educational options on

the part of black and Latino families, there is also a down side: in districts with high proportions of students in charter schools, several forms of public school segregation have been exacerbated. The precise mechanism by which this has occurred has not been clearly defined by these analyses and certainly requires further investigation.

Finally, the findings presented here suggest that North Carolina charter schools are serving as vehicles of the resegregation of schools now that race-based student assignment policies have been largely struck down. While levels of school segregation began to increase prior to the appearance of charter schools, probably due to the eradication of court-ordered desegregation plans and the increasingly challenges to the use of race in student assignment policies, this trend has been amplified in districts with charter schools. Further, despite the fact that the legislation sets guidelines for the racial composition of charter schools, a large share of charter schools are racially isolated. These levels of isolation do not appear to be a result of location, given that a far higher share of charters are racially isolated than other public schools of the same grade span located within five miles. In fact, some charter schools resemble private schools more than other public schools in terms of levels of racial isolation.

As would be expected given these levels of racial imbalance, the populations served by charter schools are rather distinct as compared with non-charter populations in terms of student race and ethnicity; however, charter school populations are distinct in additional ways. Despite drawing students with higher levels of parental education, students in charter schools have significantly lower levels of achievement in mathematics. The analysis presented here of factors motivating a move to a charter school indicate that classroom racial composition is a significant force for families, as both black and white families are more likely to switch as the classroom share of black students increases. However, levels of school segregation at the district level lead to different patterns of behavior for black and white families: in more segregated districts, as measured by black-white dissimilarity, black students are more likely to switch, while families are less likely to do so. Finally, the final analyses demonstrate that both black and white families are making self-segregating moves, and the effects are quite large.

Policy Implications

Most of the controversy surrounding charter schools focuses on their ability to improve academic achievement, but their potential effects on segregation remain critical to today's policy debate. The implications of the Michigan results presented here are both positive and negative, in that good intentions seem to be having some unintended yet negative consequences. The fact that charter schools are aiming to serve more disadvantaged districts is important, given that some feared that they would target more affluent or white populations. However, in order to reach their target populations, in many cases these schools must locate in more highly segregated school districts. One cannot fault them for trends that have likely been operating for decades before their arrival; however, the results presented here show that, when they enroll a large share of the public school population, they are significantly increasing several dimensions of segregation.

From a policy standpoint, these results do not point to a simple solution. Some states have racial balance provisions in their charter school legislation, such as requiring that the racial composition of charter schools reflect that of the district in which they are located; these results, however, suggest that such provisions would not be effective in Michigan. As we see, Michigan's charter schools closely resemble nearby traditional public schools with respect to race, and the trends in segregation in their districts certainly predate their arrival. Given that the main effects occur when charter schools serve large proportions of the public school population, it is possible that a more appropriate policy instrument for managing segregation levels may be a cap on the percentage of a district that charter schools may serve. In sum, while Michigan prides itself on having one of the most liberal charter school laws in the country, some retooling may be needed to address the increasing segregation for students remaining in traditional public schools.

The North Carolina results further support the notion that caps on the number of charter schools allowed to operate in the state likely functions to prevent these trends from dramatically increasing levels of school segregation statewide. The finding of such large effects towards self-segregation should function as a major warning for policy makers considering lifting state-level caps on the number of charter schools, which Race to the Top pushes for. The results presented here strongly suggest that charter schools, if allowed to grow unabated, could lead to

dramatic changes in the segregation of North Carolina's public schools, as occurred in Michigan between 1990 and 2000.