THE IMPACT OF NO CHILD LEFT BEHIND PUBLIC SCHOOL CHOICE

ON STUDENT MOBILITY AND ACHIEVEMENT

By

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CHAPTER I

INTRODUCTION

The purpose of this dissertation is to estimate the impact of the public school choice provision of the federal 2001 No Child Left Behind Act (NCLB) on student mobility and performance outcomes. NCLB public school choice widened the availability of public school choice options in the United States by permitting students who attended schools in need of improvement the option to move to a higher performing public school in the district. The intent of NCLB public school choice was to provide opportunities to families who may not have had access to the conventional strategies used to attend higher quality schools, such as moving to a better neighborhood or paying for private schools. At the same time, the choice policy was one component of a larger accountability system designed to put pressure on public schools to increase student performance outcomes.

From the beginning, NCLB public school choice received wide attention due to the large number of schools that had to offer choice. The Center on Education Policy (2006) found that the percentage of districts with at least one school identified for choice was 10 percent in 2002-2003, 11 percent in 2003-2004, 15 percent in 2004-2005, and 14 percent in 2005-2006. Among urban districts, the percent was above 40 in all school years. In districts characterized as very large, the percentage with at least one school offering choice reached 95 percent by the 2005-2006 school year. Even with the large number of schools that had to offer NCLB public school choice, the reported take-up rate among eligible students has been quite low. The U.S. Department of Education (2012) indicated that for five academic years, spanning 2006-2007 to

2010-2011, roughly 120,000 to 160,000 students across the country participated in NCLB public school choice per year, resulting in a national participation rate of roughly two percent of eligible students.

While the percentage of eligible students participating in the federal school transfer policy has been low, students across the country have changed schools in response to NCLB. The types of choices students made and the impact of these choices on student achievement are largely unknown. NCLB public school choice has operated for over a decade, but there are only four studies that have empirically examined the policy's impact on student mobility and performance (Hofstedt, 2007; Kirkland, 2009; McCombs, 2007; U.S. Department of Education, 2007). Moreover, with the exception of a U.S. Department of Education evaluation that included nine school districts, the other three studies were limited to one school district and covered only one or two years shortly after the federal school choice policy was implemented. For a school choice policy with such an extensive reach throughout the public education system, the research on its impact is relatively lean. As a result, questions remain regarding who responded to NCLB public school choice and whether the policy met its intended objective: increases in student performance. This dissertation will contribute to the research base on NCLB public school choice, as well as the larger research debate on the impact of school choice initiatives, by examining whether the opportunity to leave low-performing schools under NCLB lead to changes in patterns of student mobility, the types of schools students selected when switching schools, and performance outcomes.

First and foremost, NCLB public school choice rests on an underlying theory of school choice. Will giving students the option to move from lower performing schools to higher performing schools improve student performance? Even if the federal public school choice

provision goes to the wayside through state waivers from the federal legislation or changes through reauthorization, the question of whether switching schools facilitates improvements in student performance is relevant to a range of school choice policies promoted at the federal, state, and district levels, including inter- and intra-district open enrollment, magnet schools, charter schools, and other enhanced options school choice programs. Three of the studies on the NCLB public school choice policy examined student performance outcomes and essentially found no statistically significant effect of the policy on performance (Kirkland, 2009; McCombs, 2007; U.S. Department of Education). However, the studies included small samples in only the first couple of years of the policy. Further research using a larger sample of school districts over a longer span of the policy could reveal statistically significant results.

Second, NCLB public school choice can be characterized as a very restricted school choice initiative. Under NCLB public school choice, students were not given carte blanche to choose any school as a substitute for their zoned public school. Instead, the federal provision put in place very clear and limited guidelines for who was allowed to change schools, as well as the set of schools that students were permitted to choose from. Specifically, public school choice under NCLB was limited to students in Title I schools identified as in need of improvement after two years of low performance. And students could only select from public schools within their school district that had not been identified as in need of improvement. Virtually all U.S. school choice initiatives are restricted in some sense, whether it be by the type of schools available, geographic or residential boundaries, which students are eligible to participate, or cost restrictions. By examining the theoretical assumptions underpinning NCLB public school choice, the details of how federal school choice operates, and the way in which restrictions in student movement impacted the outcomes of the policy, the analyses in this dissertation can

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provide policymakers and researchers insight for considering the specifics of other school choice programs.

Finally, public school choice was an accountability component of NCLB that directly impacted students. It was an educational accountability policy effort that did not first go through educators or school-level governance structures to facilitate improvements. Analyses in this dissertation will highlight how individuals responded to educational accountability mechanisms. Did the opportunity to transfer schools under NCLB public school choice change the frequency of student movement or impact the mix of schools that students selected when switching schools? In other words, this dissertation will explore whether students responded to educational accountability mechanisms.

Given that there have only been a handful of studies that examine NCLB public school choice and the fact that a better understanding of the federal school choice policy can inform broader education policy and reform efforts, this dissertation will contribute to the growing research base on school choice and outcomes of educational accountability. This dissertation will address the following research questions:

1. What impact did the opportunity to change schools through NCLB public school choice have on student mobility?

2. Did the presence of NCLB public school choice, and the provision that students transfer to higher performing public schools, change student behavior in terms of the types of schools students who moved selected?

3. Did the academic performance of students who moved once schools began offering NCLB public school choice improve?

This dissertation combines seven years of longitudinal student achievement data from the Northwest Evaluation (NWEA) Growth Research Database (GRD) with school-level data from the National Center for Education Statistics' (NCES) Common Core of Data (CCD) and school-level NCLB accountability data from state departments of education. With the combined data, intra-district student mobility can be observed and student performance can be assessed over time. The final sample includes over 550,000 unique student records, with over 1,700 public schools in 176 districts across 28 states.

Students who participated in NCLB public school choice are not identified in the data sources. To estimate the impact of NCLB public school choice on student mobility and performance, this study will take advantage of schools switching choice status in the sample time frame to compare average student behavior and performance before and after schools offered NCLB public school choice. NCLB public school choice presented information to families about the quality of schools and provided opportunities to transfer to better schools. Families did receive other information about the quality of schools in the district that could confound the ability of this dissertation to estimate the effect of NCLB public school choice on student behavior. Schools had to fail to make adequate yearly progress (AYP) in two consecutive years before offering NCLB public school choice. AYP identifications were widely published and provided information about school quality. Additionally, NCLB public school choice identified the schools that were deemed eligible to receive students under the policy. AYP and receiving eligibility designations changed each year providing varying information to families about the quality of the choice set of schools in the district. Therefore, the analytic models will control for these two sources of potential bias to mitigate concerns that other factors lead to the changes in student behavior that were observed when schools offered NCLB public school choice:

designations for schools that failed to make AYP one and two times and information about the set of schools deemed higher performing in the school district.

This dissertation proceeds in the following manner. Chapter two will review research on school choice policies to place the theoretical assumptions and policy intent of NCLB public school choice in context. The chapter will also assess the methods and findings of similar school choice policies to guide the strategies in this dissertation for evaluating the determinants of student mobility and performance outcomes. Chapter three will describe the analytic models that this dissertation will use to estimate the impact of NCLB public school choice, as well as the data and sample. Chapter four will present results from descriptive statistics and school fixed-effects models that address the three research questions. And finally, chapter five will review the findings, discuss the limitations of the study, and provide a discussion of the policy and research implications of this study.

CHAPTER II

LITERATURE REVIEW

This chapter begins by reviewing theories of school choice to place the dual theoretical assumptions for NCLB public school choice, providing options for students in failing schools and putting pressure on schools to improve, in context. The chapter presents a framework for considering the ways in which school choice policies are influenced by theory and elements of the education system. The chapter will then focus on the methods and findings of prior research on the NCLB public school choice policy and other relevant school choice initiatives to provide guidance on strategies to evaluate the factors that predict student mobility and performance outcomes. Overall, this chapter will look to the previous literature to inform hypotheses about what can be expected from NCLB public school choice, as well as methods for analyzing student mobility.

School choice policies: From theory to practice

School choice policies generate considerable debate in the United States, even as school choice is being incrementally assimilated into the public education system. Over the past several decades school choice initiatives have become a growing part of public education, including magnet schools, intra-and inter-district open enrollment, charter schools, and voucher programs. While political debates on school choice often convey deep ideological chasms, opponents and proponents are likely to vary depending on the school choice initiative. For instance, proponents of magnet schools and intra-district choice plans to increase racial and socioeconomic integration

(Kahlenberg, 2006) are the same individuals who oppose public charter schools (Frankenberg, Siegel-Hawley, & Wang, 2010; Kahlenberg & Potter, 2012). Another example is the way in which charter school legislation is often passed with bi-partisan political support, masking differences among policy-makers for the reasons why they support school choice reform. Support for charter schools ranges from increasing privatization in public education, to using charter schools as a last ditch effort to save the public education system, and finally to the use of charter schools as just one reform effort among many to improve public education (Wells et al., 1999). While school choice initiatives often contend with sharp political partisanship, the federal NCLB public school choice policy passed without a great deal of opposition (Debray-Pelot, 2007; Rudalevige, 2003; Vergari, 2007). NCLB public school choice reflects the way in which school choice initiatives have been able to obtain broader public and political acceptance. Specifically, these policies gain traction when they are limited to the public school system and supported by the combined rhetoric of providing options to students in failing schools and putting pressure on low-performing public schools to improve. The varying degree of public and political support for different school choice initiatives is due to the theoretical assumptions used to support the impact of school choice and the details of how the school choice strategy operates within or outside of the public education system.

There is not one overarching theory of school choice with regards to its justification or how to put it into practice. Rather, there are several theoretical foundations for school choice that have been applied discretely, or more commonly, used in combination to explain the theory of action for a particular school choice initiative. The primary theories of school choice are the parental control theory that argues parents are in the best position to make educational decisions for their children based on students' needs and interests and parental preferences (Coons &

Sugarman, 1978), the market-based theory that argues for the benefits of increasing the amount of privatization in the education system (Chubb & Moe, 1990; Friedman, 1962), the theory that through innovation schools of choice can be used as incentives to promote voluntary desegregation (Metz, 1986), and the accountability theory that employs school choice as a sanction to motivate school improvement (Ravitch, 1995, 1997).

Figure 1 represents a framework for considering the way in which the four central theories of school choice underlie existing school choice policies in the American education system, and how NCLB public school choice compares with other school choice initiatives. The top portion of the figure presents the main categories of school choice in practice across the country. The second segment of the figure shows how school choice policies function within the education system. And the third portion presents the theories of school choice spanned across the school choice policies and elements of the education system. The purpose of the figure is to illustrate that school choice policies are often justified by modified and overlapping theories of school choice. Moreover, public and political support for school choice initiatives depends on how the theories interact with the education system.
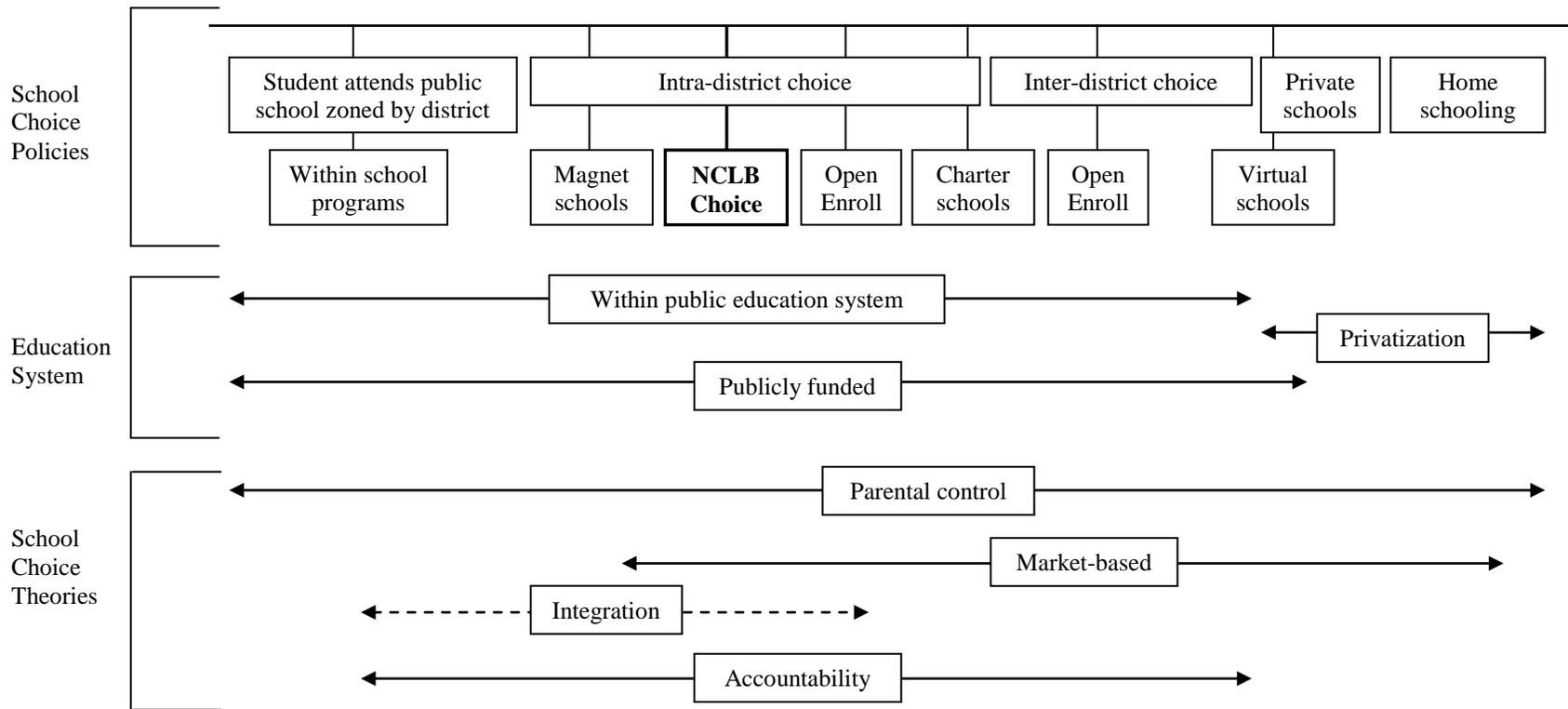
Figure 1. School Choice Continuum: Policies, Systems, and Theories

On the left side of the school choice policies portion of the figure, is the traditional process within the public education system where students attend the public school they are assigned to by the school district. Families do have choices at this side of the policy continuum since they can change residences, make use of alternative strategies to switch schools (i.e., using a family member's address or requesting case-by-case enrollment waivers), or select different programmatic options within the school (i.e., Advanced Placement coursework, taking college courses for credit at a local college, etc.). The intent of the NCLB public school choice policy was to provide more school choice options than the limited number of options available through traditional mechanisms. On the farthest right of the school choice policy continuum is homeschooling, where when applied to the fullest extent, families remove their children from the public and private education systems. For each of the school choice policies there is a range of implementation depending on local context, policy design, and individual interpretation.

Between the outermost categories, there are three main categories for school choice policies: intra-district choice, inter-district choice, and private schools. There are a number of school choice initiatives that fall into each of these categories, such as magnet schools, enhanced option schools, and open enrollment policies within intra-district choice, charter schools that cross intra- and inter-district choice, open enrollment within inter-district choice, public virtual schools that provide inter-district options, or privately run virtual schools, and the wide range of religious and secular private school options. NCLB public school choice falls into the category of intra-district choice as it allows students to switch from low-performing schools to higher performing schools within school districts. But it could have been closer on the school choice continuum to providing vouchers to students in low-performing schools to attend private schools had the Republicans obtained enough votes during debate and negotiations surrounding NCLB

(Rudalevige, 2003). More recently, there have been recommendations to expand NCLB public school choice to inter-district choice when the law is reauthorized to increase the number of high quality public schools students have access to (Richards, Stroub, & Holme, 2011).

The location of NCLB public school choice as an intra-district choice policy in Figure 1 is evidence of the interplay of theory and politics in how school choice initiatives are put into practice. The second portion of the figure indicates elements of the education system that influence school choice policies. School choice policies operate within and outside of the public education system. Given that school choice options that maintain the structure of the public education system appeal to a larger base than privatization measures, the vast majority of publicly funded school choice initiatives are contained within the public education system. While about 10 percent of school-aged children attended private schools in 2009-2010 and three percent were homeschooled in 2007-2008 (Snyder & Dillow, 2012), the American Federation for Children, an advocacy group for school choice, reported that less than 100,000 students participated in school voucher programs across the country during the 2011-2012 school year. The primary concerns of opponents of voucher programs, and all school choice initiatives to some extent, are that allowing public dollars to flow to the private education system will lead to greater inequities among students and result in a loss of support for traditional public schools (Goldhaber, 1999). In response to political and legal controversy around publicly funded voucher programs, corporate and business funded tuition programs for low-income students are growing (Henig & Sugarman, 2000). Despite conservative political attempts to provide publicly funded private school options to students through federal legislative mandates, bipartisan support for the final details of NCLB public school choice reflects the inclination to keep school choice initiatives that are paid for with public dollars within the public education system.

The range of school choice initiatives operating in the American education system are each supported by the central theories of school choice in one form or another. The bottom section of Figure 1 demonstrates the way in which the theories of school choice span and overlap across the school choice policy continuum. The theoretical assumption that parents should have control over school choice options for their children underpins the entire school choice continuum, with less control given to parents in school choice options on the left side of the continuum compared to the right side. The parents' rights theory suggests that creating greater opportunities for families to choose schools will lead to a better fit between students and the learning environment because parents will select schools based on the interests and preferences of their children (Coons & Sugarman, 1978; Gilles, 1998). At the same time, most school choice options within the public education system do not give families complete discretion to choose a school. Rather, parental control is restricted to varying degrees largely on account of concerns that parents will make school choice decisions that undermine other objectives that the public education system intends to focus on, such as limiting social stratification through the sorting of students based on motivation, student performance, and demographic characteristics (Cobb & Glass, 2009).

Market-based theory considers the education system a marketplace that will operate more efficiently if traditional school bureaucracies are forced to respond to competition (Chubb & Moe, 1990; Friedman, 1962; Hoxby, 2003; Ogawa & Dutton, 1994). According to the theory, parents are regarded as consumers who will use available information to make rational decisions that maximize utility about where to send their children to school. And in response to competition and student choice, schools will innovate and make changes that will attract and retain students. Otherwise, schools that are not appealing to families will close. However, there

are limitations when it comes to applying free-market theory to the education system, such as issues that arise when parents have imperfect information, there are not enough schools to choose from, there are barriers to choice like inadequate transportation, or when parents just make bad decisions (Bell, 2005; Henig, 1994; Neild, 2005). As a result, school choice initiatives that are supported by market-based theory within the public education system are typically designed with incentives for parents to make the types of decisions that the policy intends.

The market-based school choice rationale where choice is in and of itself a satisfactory outcome has not garnered much support as the foundation for school choice policies within the public education system. Instead, the theories of parental control and market-based student mobility are combined and used to frame school choice as a social equity issue where disadvantaged families should be liberated from failing public schools and provided similar educational opportunities that affluent families have through residential selection or by selecting private schools (Archbald, 2004; Phillips et al., 2012). Equity-based parental control was a theoretical driver of the NCLB public school choice policy. Specifically, the federal school choice policy released students from chronically low-performing public schools and permitted families to select a better public school within the district. Giving parents the opportunity to select another school was not in and of itself the desired outcome of the reform effort. Rather, the underlying theory was that deliberate selection of a higher quality school would lead to improvements in student performance.

Building on the notion that school choice can be used as a tool to persuade families to make decisions that achieve the objectives of the larger public education system, school choice policies have used the mechanisms of parental control and market-based school options to promote voluntary racial and socioeconomic integration, such as magnet schools (Goldring &

Smrekar, 2000; Metz, 1986). Magnet schools are public schools designed with innovative themes and instructional models that can enroll students from outside of traditional attendance boundaries. The theory behind magnet schools was that innovative school choice options would draw students from the private sector or other school districts back into the urban public education system, effectively desegregating schools by choice rather than mandatory enrollment assignment practices that had driven some families away. Neither the rhetoric or policy intent of NCLB public school choice has been based on integrating schools or providing an incentive for affluent families to stay in urban school districts.

The final school choice theory on the continuum in Figure 1 is the use of school choice as an accountability pressure to improve low-performing schools (Ravitch, 1995, 1997). While public schools may feel competitive pressures from market-based forces throughout the education system, accountability pressures take a different spin. School choice is a sanction under educational accountability. It is imposed on public schools that do not meet specified performance benchmarks. Consequently school choice through accountability is not something that schools opt into, rather it is intended to jolt low-performing schools into action. Several studies suggest that strong, external accountability mechanisms have a positive outcome on overall student outcomes (Carnoy & Loeb, 2002; Chakrabarti, 2012; Hanushek & Raymond, 2005). The research is more limited in terms of addressing the question of whether school choice as a sanction works to improve low-performing schools. Figlio and Rouse (2006) found that Florida's pre-NCLB accountability process of identifying low-performing schools, without a choice component, had a positive and greater impact on test performance compared with the introduction of school choice threats through a voucher program. West and Peterson (2009) found that Florida's state accountability ranking system had a positive impact on low-performing

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schools, while the federal NCLB public school choice policy did not. The findings hint at the

limited capacity of NCLB public school choice to make substantial improvements in low-

performing schools, even though the accountability theory of choice serves as a theoretical

foundation for the federal policy.

In summary, NCLB public school choice had the dual policy intent of releasing students

from chronically low-performing schools while at the same time using student transfers to

motivate school improvement. On the school choice policy continuum, NCLB public school

choice is a managed intra-district choice program supported by the theoretical assumptions of

social equity through parental control and the use of public school choice as an accountability

pressure. The combined theories suggest that purposeful student movement from low-

performing schools to higher performing schools will improve the performance outcomes of

students who participate in the program, as well as force the sending school to make positive

changes. While additional research should examine the impact of NCLB public school choice as

an accountability mechanism to improve low-performing schools, this dissertation will focus on

the way in which increased opportunities to access higher quality public schools under NCLB

public school choice had an effect on student mobility, the schools that students selected, and

student outcomes. Compared with other school choice policies, NCLB public school choice is

most similar to intra- and inter-district choice initiatives in terms of the theory of action for using

public school choice to provide options to students trapped in failing schools, and the possible

impact of the policy on student mobility and performance. The following sections will review

studies that examine the factors that predict student mobility and outcomes for students who

transfer between schools to inform hypotheses about what can be expected from a managed

school choice program, as well as methods for analyzing student mobility.

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Factors predicting student mobility

The NCLB public school choice policy intended to release students trapped in chronically low-performing schools and give them access to higher quality public schools. Moreover, the policy was limited to schools identified for Title I funds, a measure of student poverty, indicating that the policy was specifically intended to help low-performing, low-income students. Given the objectives and the wide reach of the federal school choice policy, it is important to understand more about the students who responded to the options provided and the context of those decisions. Details about which students were most likely to participate in NCLB public school choice and the schools they were most likely to leave will provide information to assess whether the federal school choice policy reached the intended students. This section is organized first by research on student characteristics and then research on the features of schools students leave under various school choice policies. The review will start with what we know about student participation and school characteristics under NCLB public school choice from the limited number of studies on students who took part in the policy.

Student characteristics

Even though the NCLB legislation was passed over a decade ago, there are only a handful of studies that have examined the impact of NCLB public school choice on student participation and outcomes. An official evaluation of the policy was released in 2007 covering the academic years 2002-2003 to 2004-2005, depending on the school district (U.S. Department of Education, 2007). The studied evaluated nine large urban school districts located in six states plus the District of Columbia. Overall, less than one percent of eligible students in the nine districts participated in NCLB public school choice during the study years. The study presented descriptive statistics of the demographic characteristics and prior academic achievement levels of

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participating students. White and African-American students had larger than average

participation rates, while Hispanic, Limited English Proficient (LEP), and students with

disabilities had lower than average participation rates. The study did not report participation

rates for students eligible for free or reduced price lunch (FRL). The study also found that, on

average, students who participated in NCLB public school choice had lower prior achievement

levels than the district average in both mathematics and reading.

Two additional studies examined the characteristics of students who participated in

NCLB public school choice in one school district each. The fourth study of NCLB public school

choice (Hofstedt, 2007) did not specifically examine the student characteristics that predicted

participation in the program. McCombs (2007) analyzed the federal school choice policy in an

urban, anonymous school district during the 2004-2005 school year. The author presented

descriptive statistics on participating students and used logistic regression to estimate the

probability of student mobility under NCLB public school choice. The descriptive analysis and

logistic regression found consistent results that white students, students in the "other"

racial/ethnic category but not African-American or Hispanic, students who had never attended

the sending school (but had recently been assigned to it), and students with higher prior

achievement levels were all more likely to transfer to an eligible receiving school under NCLB.

Students who were African-American, Hispanic, female, classified as special education, and

students enrolled in gifted education programs at the sending school were less likely to

participate in NCLB public school choice. In a study of NCLB public school choice in Collier

County, Florida, a mid-sized suburban school district, Kirkland (2009) used descriptive statistics

and logistic regression to look at the factors that predict student mobility. The study found that

white, multi-racial students, and students ineligible for free or reduced price lunch were more

likely to participate in the federal school choice program. The study did not examine the prior achievement levels or disability status of students who transferred.

Across the three studies, the characteristics associated with student mobility under NCLB public school choice varied, except for the participation rates of white students, which were higher in each of the studies. In the larger study of nine school districts, participating students had lower achievement levels than the district average, whereas students with higher achievement levels were more likely to transfer schools in the anonymous urban school district. The one study that looked at FRL eligibility in a mid-sized suburban district found that higher income students were more likely to take advantage of the transfer options provided through NCLB public school choice. In the large nine district and the anonymous urban district studies, students classified as special education were less likely to participate. Emerging from these three studies, but certainly not definitive since the samples are limited, were findings that more advantaged students may be more likely to use NCLB public school choice to leave low-performing schools. If this is in fact the case, the results are consistent with research on intra-district and inter-district public school choice options that suggests white, higher income, and higher achieving students were more likely to take part (Bifulco et al., 2009; Glazerman, 1998; Holme & Richards, 2009; Phillips et al., 2012; Reback, 2008), compared with research on participation in voucher programs (Goldhaber et al., 1999; U.S. Department of Education, 2009) or charter schools (Bifulco & Ladd, 2007; Booker et al., 2005; Schneider et al., 1998a, 1998b; Weiher & Tedin, 2002; Zimmer et al., 2009) where minority students and students eligible for FRL were more likely to apply. If the intent of NCLB public school choice was to provide opportunities for students to leave low-performing schools, with an underlying assumption that low-income, minority, or low-achieving students would benefit the most from the policy, then

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findings on student participation thus far are counter to policy intent. Given that student characteristics were determinants of participation in previous school choice policies, this dissertation will control for student race/ethnicity, gender, and student performance when examining the impact of NCLB public school choice.

The analytic methods employed by the three studies that examine the characteristics of students who participated in NCLB public school choice are relatively straightforward. The studies either reported descriptive statistics to compare student demographics and prior achievement among participants and non-participants or they used basic logistic regression models to assess the probability that students with different characteristics will transfer. The previous studies have access to data that identify students who take part in NCLB public school choice. The data available for this dissertation significantly increases the number of school districts that can be examined, but the data do not identify the reason for student mobility. As a result, this dissertation will employ an analytic methodology different than the ones used in previous studies to examine who responded to NCLB public school choice. Specifically, this dissertation will estimate average student mobility before and after schools offered NCLB public school choice, controlling for potential confounding factors that could also account for changes in student behavior.

School contextual factors

Since the NCLB public school choice policy is a program that provides choice to students based on the characteristics of the schools students attend, there should be school factors that influence whether students transfer under the policy. For example, school-level performance, whether it's the performance of the sending or receiving school, should be a driver of student mobility under NCLB since the policy targeted students in low-performing schools and specified

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the schools students could switch to. Then again, the mechanics of how schools were identified

as schools in need of improvement under NCLB could have resulted in schools offering NCLB

choice that were not substantially lower-performing than schools eligible to receive students. If

this was the case, students may have not responded to NCLB public school choice because the

set of receiving schools did not include attractive alternatives. There has been considerable

debate about whether NCLB public school choice actually provided high quality school options

for students (Kim & Sunderman, 2004; Lauen, 2006; Zhang & Cowen, 2009). However, this

does not appear to be the case in the studies of NCLB public school choice in practice. In the

U.S. Department of Education (2007) of nine school districts, students who participated in the

federal school choice policy left schools that had below average performance levels and attended

higher performing schools in both mathematics and reading. In a study of NCLB public school

choice in one Minnesota school district, Hofstedt (2007) found that students were more likely to

transfer from unsuccessful schools to successful schools, with school-level performance relative

to other schools in the district. McCombs (2007) reported that receiving schools in an

anonymous urban school district, on average, had mathematics and reading proficiency rates 15

percentage points higher than sending schools. Kirkland (2009) did not analyze school-level

determinants of student mobility.

NCLB public school choice targets low-performing schools to provide access to higher

quality schools, but there could be other school characteristics associated with students

participating in the transfer program. The study of nine school districts found that the schools

that African-American and Hispanic students left tended to be racially segregated by the

respective race/ethnicity. In contrast, white students left schools that had smaller school-level

concentrations of white students. Schools that had to offer NCLB public school choice in the

McCombs (2007) study varied in terms of school racial/ethnic demographics, but the author did not analyze whether school characteristics influenced student transfers. In a study of NCLB public school choice across 12 states in the first two years of its implementation, the Citizens' Commission on Civil Rights (2004) found that students who participated in the federal choice policy left schools that were highly segregated by race/ethnicity and poverty. Similar school factors appeared to have influenced student mobility in intra- and inter-district choice policies. The research on intra-district and inter-district public school choice programs indicates that participating students were more likely to leave low-performing, racially segregated, and high poverty schools to attend higher performing and less segregated schools by race and socioeconomic factors (Carlson et al., 2011; Fowler, 2003; Glazerman, 1998; Holme & Richards, 2009; Phillips et al., 2012; Reback, 2008; Welsh et al., 2010).

The use of a school fixed-effects model in this dissertation will control for time invariant differences in schools that change NCLB public school choice. Measures of school performance will be included as controls in the models given that school performance could change from year to year and because the previous research found that school performance was a significant determinant of student mobility. The question of what type of schools students left when provided the opportunity to switch schools under NCLB public school choice will be addressed in the second research question when comparing the characteristics of schools students selected with the characteristics of schools students left.

Student mobility and performance outcomes

In addition to understanding more about the student and school factors that predict student mobility, this dissertation will examine the schools that students switched to when NCLB

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public school choice was offered and analyze the performance outcomes of students who moved once they enroll in the new schools. The federal policy was designed to improve student performance by limiting the schools students could transfer to, specifically, by limiting choice to higher performing schools. If students moved to schools that were not noticeably better than the schools students left, then it may be less likely for student performance to improve as a result of the opportunity to switch schools. This section will first review research that addresses the question of the types of schools students have selected through NCLB public school choice and other school choice reform efforts. Then previous research on student performance outcomes after students transfer will be considered.

The schools students choose

One strategy researchers have used to study school choice selections is through parent surveys. Surveys allow researchers to ask parents to select the reasons why they chose a particular school or indicate the schools they would like to choose if given the opportunity. Researchers have used parent surveys to examine most of the school choice options in operation, including private schools, voucher programs, inter-district choice, magnet schools, and charter schools. From the surveys, several common characteristics have emerged that parents cite as particularly important factors when selecting schools of choice. The common themes include academic quality, convenience or location of the school, safety and discipline, and peer composition. In early studies, distance to the school of choice appeared to take precedence for parents over programmatic features, school quality, or school staff (Bridge & Blackman, 1978). More recent studies indicate that parents most often cite academic factors as their primary concern when selecting a school of choice (Bauch & Goldring, 1995; Gerritz, 1987; Goldring & Hausman, 1999; Greene et al., 1997; Hausman & Goldring, 2000; Kleitz et al. 2000; Schneider et

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al., 1998a; Witte & Thorn, 1996). Parent responses to surveys about their preferences for academic quality in schools of choice have been confirmed by studies that examine individual school choice behavior (Buddin et al., 1998; Figlio & Stone, 2001; Glazerman, 1998; Goldhaber et al. 1999; Lankford & Wyckoff, 1992; Lankford et al., 1995; Schneider et al., 1996). Additionally, research suggests that efforts to provide parents with detailed information about the quality of school choice options led to the selection of higher quality options than if the parents had to gather information on their own (Hastings & Weinstein, 2008; Kisida & Wolf, 2010).

Howell (2006) conducted a survey in Massachusetts of parents' interest, knowledge, and preferences under NCLB public school choice, roughly a year and a half after the law had passed. Among other topics, the survey asked parents to rank the most important school characteristics that would factor into decisions, if the parents were going to select a new school through federal school choice. The top responses from parents were the quality of teaching, indicators of discipline and safety, and class sizes. The bottom responses were distance to the school, racial composition, and whether friends attended the school. The results correspond with recent research on parental preferences for other school choice initiatives, specifically that parents appeared to prefer school academic quality over location or student demographics. The study also examined a subsample of responses where parents identified the name of the preferred school to determine if the characteristics of the preferred school were in fact better than the school students attended. The study found that parents of students attending low-performing schools consistently identified preferred public schools that were higher performing. At the same time, the preferred schools of choice had lower school-level percentages of African-American students, students eligible for free or reduced price lunch, and students classified as English Language Learners. Even as parents ranked the demographic composition of preferred

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schools lower than academic quality for the reason they would select a new school under NCLB public school choice, revealed preferences indicated that student demographics played into school choice decisions. On the other hand, given that demographics are linked with school-level performance, preferences for higher performing schools are intertwined with preferences for the peer composition of the school.

As mentioned in the previous section, research on NCLB public school choice showed that students left lower-performing schools and selected higher performing schools (Hofstedt, 2007; McCombs, 2007; U.S. Department of Education, 2007). The research also indicated that students were more likely to choose schools with a higher percentage of white students and smaller percentages of economically disadvantaged students (McCombs, 2007; U.S. Department of Education, 2007). The revealed behavior of families supports the findings from the parental survey on preferences in NCLB public school choice. Moreover, the studies of NCLB public school choice demonstrate that analysis of the types of schools students select when provided the opportunity to transfer should examine whether students selected schools that differed from schools they left in terms of school performance and demographic characteristics.

Performance outcomes

Providing options to leave low-performing schools was not the ultimate policy intent of NCLB public school choice. Rather, permitting students to transfer was the mechanism to achieve the real policy objective: produce increases in student performance. Was it correct to assume that providing access to higher quality public schools would impact student performance? School choice initiatives have experienced a mixed record in terms of improving student outcomes. Research on student mobility, where the change in school was not necessarily in pursuit of a better educational environment, has typically found that moving to a new school is

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more likely to be associated with negative impacts, such as lower academic achievement, higher instances of repeating a grade level, higher dropout rates, and behavioral problems (GAO, 1994; Gasper et al., 2012; Kerbow, 1996; Mehana & Reynolds, 2004; Nelson et al., 1996; Rumberger & Larson, 1998; Simpson & Fowler, 1994; Wood et al., 1993).

In contrast, research on intra-district and inter-district movement with the purpose of seeking out a better school has found some positive results. Hanushek et al. (2004) found minimally better student achievement gains for students who make inter-district moves in Texas, hypothesizing that these moves signal that families took school quality into consideration, compared with intra-district moves. Xu et al. (2009) also showed positive, but small achievement gains for students who made "strategic" inter-district moves compared with "reactive" intra-district moves in North Carolina. Under open enrollment in Chicago, Cullen et al. (2005) found that students who opted out of their assigned high school to attend a high-achieving school experienced higher academic outcomes than if they had transferred to regular or career academy high schools. Hastings et al. (2006) examined the open enrollment school choice program in Charlotte-Mecklenburg and found that when families selected schools based on explicit preferences for higher academic achievement, as opposed to non-academic factors, student achievement increased. Griggs (2012) examined four types of intra-district moves on student achievement gains in Nashville, including promotional transitions at the end of the school year, voluntary end of year movement, compulsory movement during the school year due to expulsions, and mid-year voluntary moves. The study found negative results in both mathematics and reading for every type of move. Research on magnet schools (Ballou et al., 2006; Betts et al., 2006), charter schools (Abdulkadiroglu et al., 2009; Betts & Tang, 2011; Bifulco & Ladd, 2006; Booker et al., 2007; CREDO, 2009; Hoxby & Murarka, 2007; Nicotera et

al., 2011; U.S. Department of Education, 2010; Zimmer et al., 2009), and voucher programs (Barrow & Rouse, 2008; Howell, 2002; U.S. Department of Education, 2009) have also been mixed, with the direction of achievement results depending on study design, location, and years covered in the study.

Three of the studies that examined NCLB public school choice reported on student performance outcomes. The U.S. Department of Education (2007) study was able to analyze performance data for students in six of the nine districts in the study. To control for selection bias that could arise when comparing students who participated in NCLB public school choice and students who remained in eligible sending schools, the study used student fixed-effects models. The models used longitudinal student-level data to compare the achievement gains of the same students before and after transferring with federal school choice, as well as comparisons between participants and non-participants. The models included independent variables to estimate an overall effect of NCLB public school choice, the effect after one year, the effect after two or more years in the same new school, and the effects of transfers interacted with student race/ethnicity and student disability status. Overall, the study did not find statistically significant effects for the NCLB public school choice policy. Across the six districts, there was one statistically significant negative effect in mathematics for students with disabilities. The study included two alternative sets of analyses. One analysis, using an intent-to-treat approach, followed students after they transferred even if they left the selected school, but the new model revealed the same statistically insignificant results. The second analysis matched students who transferred with students who would transfer under NCLB public school choice in a subsequent year to further control for the bias of participating. Again, there were no statistically significant achievement gains between current and future choice participants.

Overall, students who participated in NCLB school choice in the six urban school districts in the study did not experience achievement gains any greater or worse than if they had stayed in the sending schools.

McCombs (2007) and Kirkland (2009) also looked at the impact of NCLB public school choice on student performance. The study by Hofstedt (2007) did not examine student performance outcomes as a result of the federal school choice policy. The data available for the two analyses were quite limited. In each case, the authors were limited to one school district and used only two years of data, which restricted the analyses they could use to one year examinations of whether students who transferred experienced higher performance results than students who stayed in the sending schools, with controls for prior achievement. The study of one anonymous urban school district used ordinary least squares regression and found that higher achieving students transferred under NCLB public school choice and remained higher achieving than students who stayed in the low-performing sending schools, but the students still performed below average compared with district averages (McCombs, 2007). However, the study did not control for selection bias when comparing students who transferred and students who remained in sending schools. The study of one mid-sized Florida school district did not use regression analyses, but rather looked at differences in mean achievement between a matched set of students who transferred and students who stayed in the sending schools (Kirkland, 2009). The study did not find any statistically significant differences between the two sets of students in the one year after students transferred.

Because the data available for analysis in this dissertation do not identify individual students who switched schools as a result of NCLB public school choice, the analytic strategies to estimate the effect of the policy on student performance will differ from previous studies. The

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analyses in this dissertation cannot estimate the impact of NCLB public school choice for

individual students. Rather, this dissertation will use school fixed-effects models to compare

average student performance outcomes for students who made intra-district moves before and

after schools offered NCLB public school choice to students who attended the schools. The

models will examine the overall impact of NCLB public school choice and the impact broken out

by one, two, and three or more years after students transferred. The models also control for

potential confounding factors that could have caused students to transfer, which could lead to

biased estimates of the impact of NCLB public school choice on student performance if not

controlled for.

CHAPTER III

DATA AND METHODS

The intent of the NCLB public school choice policy was to create new opportunities for students to select and attend higher quality public schools that may not have been available to students through traditional school practices. Based on the policy intent, policy-makers wanted to see students respond to the policy by selecting higher performing schools and by making performance gains at the new school. This chapter will describe the data, sample, and analytic models this dissertation will use to address the following research questions:

1. What impact did the opportunity to change schools through NCLB public school choice have on student mobility?

2. Did the presence of NCLB public school choice, and the provision that students transfer to higher performing public schools, change student behavior in terms of the types of schools students who moved selected?

3. Did the academic performance of students who moved once schools began offering NCLB public school choice improve?

Data

This dissertation combines seven years of longitudinal student achievement data from the Northwest Evaluation (NWEA) Growth Research Database (GRD) with school-level data from the National Center for Education Statistics' (NCES) Common Core of Data (CCD) and school-level NCLB accountability data from state departments of education. The data are from the

schools years 2002-2003 through 2008-2009. Student testing data from NWEA provides a

unique set of student data for analysis because it provides longitudinal and comparable data that

spans school districts and states across the country, allowing this study to examine student

mobility and performance in a number of locations. If this study were to use state standards-

based assessments, additional steps would need to be taken to ensure that the assessment data

were comparable across states. However, because NWEA contracts with school districts and

states in a somewhat random manner, this study will have to pull out a sample of school districts

that meet a set of requirements necessary to examine NCLB public school choice over time. The

next section will describe the sample criteria in detail.

NWEA assessments are computerized adaptive student assessments aligned to academic

standards in states and cover the subject areas of mathematics, reading, and language arts in

grades two through ten. The assessment uses a one-parameter Item Response Theory model to

place all students on a single developmental, vertically equated scale, called an RIT scale, for

each of the subject areas. NWEA research provides evidence that the RIT scales have been

stable over twenty years (Kingsbury, 2003; NWEA, 2002, 2003). This dissertation will use

NWEA mathematics and reading scores and standardize student-level RIT scale scores by

subject area, school districts, and grade levels. Student performance data from NWEA is used in

several ways in the analytic models. First, in the first two research questions that look at student

mobility and the characteristics that students select, student performance data will be included as

an independent variable to control for differences among the students who attend schools that

offer NCLB public school choice over time. Separate models will be run using standardized

scores and fall to spring academic year gains. Second, student-level academic gains will be used

as the outcome variable for the third research question. Third, average school-level scores or

academic year gains will also be included in models to control for changes in school-level

performance over time. Fourth, for the second research question regarding school

characteristics, differences between the average school-level performance of the schools that

students select compared with the schools that students leave will serve as an outcome variable.

Finally, average school-level performance data will be used to measure the number of schools in

the district that are higher performing than schools that had to offer NCLB public school choice,

a factor that may have been important for students who had the opportunity to transfer schools

because of the federal school choice policy.

In addition to student achievement data, NWEA includes indicators for student gender

and race (White, African-American, Asian, Hispanic, Native American, and Other). The student

race/ethnicity variable in this dissertation combines the categories of Asian, Native American,

and Other into one Other category. NWEA requests, but does not require, that schools and

districts report data on student eligibility for free or reduced price lunch, special education

designations, and English language learner status. Consequently, missing data due to the method

for reporting these non-required student-level measures varies too much across the data to be

deemed reliable for inclusion in analyses. Student gender and race will be included in all models

to control for differences in students who attend schools that offer NCLB public school choice

over time.

NWEA assigns students unique identification numbers so that RIT scores can be linked

longitudinally. Students are also assigned to schools in the database. The longitudinal nature of

the data allows for the tracking of student movement between schools. Students are coded as

switching schools if the school that the student attends in the fall is different than the school that

the student attended in the previous spring. The student mobility variable excludes structural

moves, the normal transfers within school districts where students move from elementary

schools to middle schools to high schools. Theoretically NCLB public school choice could

impact structural moves if the next school (i.e., the middle school after elementary school) had to

offer NCLB public school choice and informed all of the incoming sixth graders that they had

the opportunity to attend another middle school in the district. However, the data available for

this dissertation do not include information about the schools that students were zoned to attend

or feeder school patterns. Without these key pieces of information, it is not possible to

disentangle structural moves from moves that take place at the time of a structural move but may

or may not be in response to the external federal policy. Inter-district moves are also excluded

since the federal NCLB school choice provision limited transfer options to intra-district student

mobility.

Students tested by NWEA are assigned school codes that can be linked with CCD to

bring in seven years of school-level data, including grade levels, school enrollment, and school

demographic information (NCES, 2010). School-level race and free or reduced price lunch

information are used to calculate the difference in school characteristics between sending and

receiving schools for the second research question. Specifically, the outcome variables measure

the difference in the percentage of students who are the same race as the student or eligible for

free or reduced price lunch between the school a student leaves and the school a student selects.

The outcome measures are designed so that students who do not change schools do not

contribute to the variation in school characteristics.

School-level AYP determinations, school improvement status, and NCLB public school

choice status were collected from state departments of education in states tested by NWEA for

the 2002-2003 through 2008-2009 school years. Data were obtained from state department of

education websites and through data requests when the information was not available online. Time-varying, NCLB public school choice status will be the primary variable of interest in this dissertation as the indicator of when schools had to offer choice. School improvement status is used to determine the eligibility of public schools that can accept students under NCLB public school choice. Title I schools identified for school improvement must offer federal school choice. Non-Title I schools that have been identified for school improvement are not required to offer NCLB public school choice, but the schools are ineligible to accept students through the policy. Information about eligibility is used to calculate the number of schools with overlapping grade levels eligible to receive students in the district. Since the number of eligible schools in the district varies by year and families may act on information about higher quality school options before the school their children attends offers choice, the variable will be included in models to control for information that students have about the quality of school choice options that could lead to student behavior similar to what we would expect to see as a result of NCLB public school choice. In addition, the number of eligible receiving schools may act as a moderating factor for NCLB public school choice that affects student behavior in response to the policy. To measure the moderating impact of the set of eligible schools on student behavior with NCLB public school choice, the variable will be interacted with student mobility from schools that offer choice.

The choice set of eligible receiving schools is designed to be specific to the school that offered NCLB public school choice, based on grade configuration and year. Only eligible receiving schools that have the same grade levels as the sending school contribute to the choice set of accepting schools. The choice set of eligible receiving schools could overlap completely with the number of schools in the district with the same grade configuration. However, it is

more likely that the choice set of eligible receiving schools will be a subset of schools in the district, as other schools may also have been identified as having to offer NCLB public school choice or non-Title I schools may be in school improvement and unable to receive students based on the specifics of the federal policy.

Yearly AYP determinations are another potential confounding factor when estimating the impact of NCLB public school choice on student behavior. Because NCLB public school choice determinations were not made until schools enter school improvement, which requires two consecutive years of failing to make AYP, a school could miss AYP on and off for years before having to offer choice. The models will control for AYP status since it could have served as a signal to families that the schools were not high quality and produce student behavior, such as increased intra-district mobility out of low-performing schools before they offered NCLB public school choice, behavior similar to what would be expected when schools began to offer NCLB public school choice.

Sample

The NCLB public school choice policy allows students to make intra-district school transfers between schools that are identified as having to offer choice and schools that are eligible to receive students. This dissertation examines NCLB public school choice by looking at how the opportunity to switch schools based on schools' NCLB choice status over time impacted student behavior. The analyses in this dissertation depend on two factors: tracking intra-district student transfers and observing the same schools under two conditions. The sample needs to allow for the observation of the same school once when it did not offer NCLB public school choice, and a second time when the school offered NCLB public school choice.

However, creating a sample that includes schools that change NCLB choice status over time is not enough. Student transfers under the NCLB public school choice policy are limited to intra-district moves. In order to examine the impact of the NCLB public school choice policy on schools that change status, schools need to be examined within the context of their school districts. As a result, the sample needs to be comprised of school districts with at least two schools with overlapping grade levels, school districts that have sufficiently large percentages of students tested in both math and reading, and school districts that contain at least one school that switches status from not offering NCLB public school choice to offering choice under the federal policy.

Sample criteria one: districts with overlapping grade levels

First, school districts must have at least two schools with overlapping grade configurations. NCLB public school choice was not an option for students in school districts where there were no public school alternatives. School districts with only one school and school districts without schools with overlapping grade levels are excluded from the sample. Table 1 presents the total number of regular local school districts in the United States from 2002-2003 through 2008-2009, the years of available NWEA testing data. Regular local school districts, as defined by CCD, exclude school districts that are part of a supervisory union, supervisory unions, regional education service agencies, state-operated agencies, federally-operated agencies, and charter local education agencies.

NWEA tests students in both math and reading in only a portion of school districts nationwide. For example, out of the 13,014 regular local school districts in the 2008-2009 school year, there were 1,927 school districts with only one school. NWEA tested students in 210 (10.9 percent) of these school districts. There were an additional 5,318 school districts with

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more than one school, but schools without overlapping grade levels. NWEA tested students in

1,021 (19.2 percent) of these school districts. A total of 5,769 regular local school districts have

at least two schools with overlapping grade configurations, making the districts eligible for the

sample in 2008-2009. NWEA tested students in 1,210 (21.0 percent) of the eligible regular local

school districts. Taking into account all years from 2002-2003 through 2008-2009, there were

1,584 unique regular school districts that tested with NWEA and met the first sample criteria.

Table 1. Sample Criteria One: Regular School Districts Tested by NWEA with More than One School and Overlapping Grade Levels, by Year

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09
Total Number of Districts							
Regular School Districts	12,795	12,725	12,544	12,477	12,775	13,035	13,014
Districts Tested by NWEA	651	856	1,124	1,476	1,890	2,106	2,441
Districts with One School							
Regular School Districts	2,200	2,114	2,022	1,997	1,893	1,940	1,927
Districts Tested by NWEA	31	49	77	109	154	159	210
Districts without Overlapping Grades							
Regular School Districts	4,897	4,965	4,716	4,817	4,923	5,211	5,318
Districts Tested by NWEA	252	359	477	620	780	905	1,021
Districts with More than One School and Overlapping Grade Levels							
Regular School Districts	5,698	5,646	5,806	5,663	5,959	5,884	5,769
Districts Tested by NWEA	368	448	570	747	956	1,042	1,210

Sample criteria two: high levels of student testing data coverage

NWEA test scores provide information about the schools students attend, and as a result,

information about student mobility between schools. The second criteria for inclusion in the

sample is that school districts must have a sufficiently large percentage of students tested by

NWEA over three or more consecutive school years. A minimum of three consecutive years of data allow for the observation of student mobility at two time points. Since this dissertation will compare student behavior in schools before and after they offer NCLB public school, there needs to be enough data to compare student mobility in two time periods. It is not enough to observe student mobility between two school years. With three years of data, the first year provides information about where students attend school before moving to a new school or staying in the original school in the second year. The second year of data provides information about where students from the first year ended up, as well as information about where students attend school before moving to new schools or staying in the school in the third year. The third year provides the information about where students end up after the second year.

To calculate testing coverage rates, enrollment data from CCD was merged into a data file of school districts that tested with NWEA and met the first sample criteria. Students had to have both fall and spring test scores in mathematics and reading in an academic year to remain in the sample. The number of students NWEA tested who met this requirement was divided by the number of students reported as enrolled in the school by CCD, by grade level and school year, for each school district. This resulted in testing coverage data specific to the school district, by grade level and school year.

There were 645 school districts that met the first sample criteria, but tested with NWEA for less than three consecutive school years. These school districts are excluded from the sample, leaving 939 school districts. Determining what qualifies as an adequate amount of student-level data over consecutive years is not an exact science. The ideal data would include all students in the grades tested in a school district for a minimum of three academic years. Most of the students would be in the database for all years, but there would also be students in the

database for fewer years since students regularly move in and out of districts. A full set of student-level data for a district over an extended period of time would allow for a thorough examination of trends in student movement.

There were very few school districts that tested with NWEA between 2002-2003 and 2008-2009 that met the requirement of total testing coverage across all grade levels tested for multiple years. Instead, this dissertation will consider several scenarios with a restricted set of longitudinal data. The scenarios will compare three levels of testing coverage (100 percent, 90 percent, and 80 percent) for a minimum of two consecutive grade levels and a minimum of three school years. For example, a school district would need to have high testing coverage for second graders in 2002-2003 and 2003-2004 and high testing coverage for third graders in 2003-2004 and 2004-2005. With these grade levels and consecutive school years, the analysis can compare the rate of second graders changing schools for third grade at the start of the 2003-2004 school year with second graders changing school for third grade at the start of the 2004-2005 school year. The end goal of comparing scenarios with different testing coverage rates is to generate a sample that includes districts with a high level of testing coverage to accurately track student movement, balanced against the need for a sample with a large number of schools to reliably estimate results.

Table 2 presents information on the number of students, schools, school districts, and states that could be included for analysis based on the different sampling scenarios. The first column indicates the numbers for school districts that met the first sampling criteria, as well as the requirement that the district tested with NWEA for a minimum of three years. These data are the ceiling for the sample if there were no additional requirements for testing coverage for grade level blocks or school districts with at least one school that changes NCLB choice status over

time. The second column in Table 2 provides the numbers for the sampling scenario of 100

percent testing coverage for at least two consecutive grade levels for three or more consecutive

school years. In this scenario, 84 of the 939 districts that tested with NWEA met the

requirements. There were 44,470 students that tested in these districts, with an average of 350

students per district. Students in grade levels outside of the grade configuration blocks that met

the sampling requirements were set to missing. There were 452 schools in these districts, with

an average of 5.38 schools per district. The school districts span 18 states.

Table 2. Sample Criteria Two: Minimum of Three Years of NWEA Testing Data

	First Sample Criteria	100% Testing Coverage	90% Testing Coverage	80% Testing Coverage
Student Records	8,422,835	87,920	4,457,339	5,203,749
Unique Students	3,661,574	44,470	1,750,256	2,021,502
With 1 year of data	1,354,348	9,949	338,673	405,730
With 2 years of data	937,679	27,465	615,241	685,491
With 3 years of data	699,538	5,195	445,915	506,298
With 4 years of data	408,625	1,857	250,008	284,768
With 5 years of data	177,017	4	77,737	99,827
With 6 years of data	70,832	--	20,174	34,702
With 7 years of data	13,535	--	2,508	4,686
Schools	8,461	452	5,604	6,087
Districts	939	84	680	715
Average # schools per district	9.01	5.38	8.24	8.51
Average # of students per district	2,252	350	1,629	1,779
States	42	18	34	34

The third column in Table 2 presents the data for the 90 percent or higher testing

coverage scenario. What stands out is that when the sample requirements are eased from 100

percent to 90 percent testing coverage, the number of students, schools, school districts, and

states increase considerably. The number of states nearly doubles. There are eight times more

school districts (680 versus 84) and 12 times more schools (5,604 versus 452). The number of students included in the sample under this scenario is now nearly half of the students tested by NWEA in school districts with more than one school with overlapping grades. Moreover, the average school district is larger with an average of 8.24 schools and an average of 1,629 students available for analyses.

Data for the 80 percent or higher testing coverage scenario are provided in the fourth column of Table 2. The differences between the 80 percent scenario and the 90 percent scenario are not as dramatic as the differences between the 90 percent and 100 percent scenarios. The numbers in the 80 percent testing coverage scenario are larger than the numbers in the 90 percent scenario, but are the numbers considerably larger to support including districts with fewer students tested? The student testing data provide information about student mobility by indicating when students show up in new schools. As a result, districts with lower rates of testing coverage have less information about student mobility. Easing the testing restriction from 90 percent to 80 percent added five percent more school districts, nine percent more schools, and 15 percent more unique students. However, easing the testing restriction from 90 percent to 80 percent does not increase the amount of data available enough to provide a good reason for losing important information about student mobility, which is critical to answering the research questions in this dissertation.

Sample criteria three: district contains schools that switch NCLB public school choice status

The final sample criteria is the requirement that school districts have at least one school that switches NCLB public school choice status over time. The analytic models in this dissertation will compare student behavior before and after schools offer NCLB public school choice. As a result, school districts eligible for the sample must have at least one school that

switches NCLB public school choice status within the study time period. Table 3 presents information for students, schools, districts, and states after applying the third sample criteria to the sample that met the first two criteria. The first column presents data for the sample that met the 90 percent testing coverage requirement in school districts where there were schools with overlapping grade levels and a minimum of three years of NWEA testing data. The second column provides data for the third sample criteria.

Table 3. Sample Criteria Three: School Districts with Schools that Change NCLB Public School Choice Status

	First & Second Sample Criteria, 90% Testing	Final Sample
Student Records	4,457,339	874,420
Unique Students	1,750,256	553,812
With 1 year of data	338,673	295,656
With 2 years of data	615,241	203,544
With 3 years of data	445,915	47,791
With 4 years of data	250,008	5,688
With 5 years of data	77,737	1,097
With 6 years of data	20,174	6
With 7 years of data	2,508	--
Schools	5,604	1,776
Never offer NCLB Choice	--	1,282
Always eligible to accept	--	1,273
Offer NCLB Choice at least once	--	494
Always offer NCLB Choice	--	86
Pre- and NCLB Years	--	298
NCLB and Post-Years	--	50
Pre-, NCLB, and Post-Years	--	60
Average Years of Data, by NCLB School		
Average # of Pre-NCLB Years	--	1.56
Average # of NCLB Years	--	1.19
Average # of Post-NCLB Years	--	0.34
Districts	680	176
Average # schools per district	8.24	10.09
Average # of students per district	1,629	1,560
States	34	28

The numbers of students, schools, districts, and states decrease quite a bit once it is required that districts have schools that switch NCLB public school choice status. Of the 680 school districts that met the first and second sampling criteria, 176 districts met the third criteria. The districts included an average of 10.09 schools with students who met the testing coverage sample criteria of three consecutive years of 90% testing in both fall and spring on the mathematics and reading assessments with an average of 1,500 students per district. There were a total of 1,776 schools in the 176 school districts with students who met the testing coverage sample criteria. Of the 1,776 schools, 494 schools (27.8 percent) offered NCLB public school choice in at least one year. 86 of the schools (4.8 percent) offered NCLB public school choice in every year that they tested with NWEA. There were 298 schools (16.8 percent) that tested with NWEA in years before they were identified as having to offer NCLB public school choice and in years once they had to offer choice. 50 schools (2.8 percent) tested with NWEA in the years they had to offer NCLB public school choice and the years after they were released from NCLB choice. And there were 60 schools (3.4 percent) that tested with NWEA in all three periods of time. In total, there were 408 schools (23.0 percent) in the sample that changed NCLB choice status and had information in both time periods. In the final sample there were over 800,000 student testing records for 553,812 unique students.

As the sample statistics indicate in Table 3, the number of students with data drops sharply after two years. However, the decline in student testing data does not appear to be an issue of student attrition out of sample schools. Rather, the decline in data appears to be due to the nature of the NWEA testing data and the sample criteria put in place to evaluate the NCLB public school choice policy with the available data. Districts that had schools with overlapping grades, three years of high levels of high testing coverage across a minimum of two grade levels,

and schools that switched NCLB public school choice status included an average of four eligible grade levels. If, for example, a district qualified for the sample because it had sufficient data for grades three through six, students were included in the grade levels that met the sample criteria. As a result, students in a district with four eligible grade levels could be observed for a maximum of three time points after switching schools if the student moved between grades three and four in the example. But if students switched schools in later grades or if the sending school didn't offer NCLB public school choice until students were in later grades, the possible number of data points for each student declines.

Sample characteristics

The three sample criteria outlined above transform the large NWEA student testing database—a database that included a somewhat random selection of states and school districts with varying levels of testing coverage—into a smaller set of school districts and schools that meet the requirements needed to examine student behavior when NCLB public school choice was implemented. Whether results from the sample schools and school districts can be generalized to other locations depends on how the sample compares to school districts not included in the sample. Additionally, the relevance of the findings may depend on whether the districts in the sample are the type of districts that policymakers intended to impact through federal school choice policy.

Table 4 presents information on the characteristics of sample districts compared with districts in the 29 sample states that did not meet the sample criteria listed above. The first column provides information for districts in the sample. The information, like average number of schools and students enrolled, varies from the data presented in Table 3 because Table 4 shows the characteristics of all schools in the sample districts whereas Table 3 presents

information for the set of sample schools, some with only a couple of qualifying grade levels with sufficient testing coverage in the sample districts. The second and third columns provide data for districts in sample states that did not meet the sample criteria. The difference between the two columns is that the second column includes all non-sample districts in the states and the third column excludes school districts that do not have overlapping grade levels. Given the policy specifics of NCLB public school choice, districts without overlapping grade levels would not have been able to provide school choice opportunities for students through federal policy. As a result, it may be more relevant to compare sample districts to the districts in sample states that could have offered NCLB public school choice.

The descriptive data in Table 4 indicate that in terms of the average number of schools and students enrolled in the districts, the non-sample districts where districts without overlapping grade levels have been excluded are closer in size to the sample districts. School districts without overlapping grade levels would be smaller than districts with schools with overlapping grade levels. On other characteristics, the districts in the sample do vary from districts in sample states that are not in the sample. The districts in the sample, on average, included more schools and enrolled more students than districts in states that were not included in the sample. A larger percentage of sample districts were categorized as being located in cities and towns than non-sample districts, while a smaller percentage of sample districts were in suburbs and rural areas. In terms of the racial demographics of districts, the sample districts had a smaller percentage of White and Other students, but larger percentages of Black and Hispanic students. Sample districts enrolled a larger percentage of students eligible for free or reduced price lunch and students categorized as English Language Learners. Sample districts had a smaller percentage of students in special education.

Table 4. Comparison of Districts in Sample States

| | Sample Districts | Non-Sample Districts | |
		All Districts in Sample States	Excluding Districts without Overlapping Grade Levels
# of Schools	15.3	5.2	9.5
# of Students	8,121	2,541	5,069
Geographic Location			
% City	15.1	14.4	11.4
% Suburb	31.3	27.4	36.7
% Town	32.6	13.1	18.4
% Rural	30.0	44.8	32.8
Race/Ethnicity			
% White	64.9	72.5	71.5
% Black	12.9	10.9	8.3
% Hispanic	17.1	11.0	13.6
% Other	5.0	5.6	6.5
% FRL	45.1	34.5	35.0
% ELL	8.5	4.9	7.0
% Special Education	14.4	16.5	17.5

Although there are differences between the sample districts and non-sample districts, the sample characteristics do not imply that the sample is necessarily skewed. The sample districts are representative of a range of types of districts across the country. Moreover, the characteristics of sample districts may better reflect the types of districts where NCLB public school choice provided opportunities to students. For example, the sample districts have more schools on average, are slightly more likely to be located in cities, and serve a larger percentage of minority students and students eligible for free or reduced price lunch. Given that NCLB public school choice was present in the majority of urban and large school districts (Center on Education Policy, 2006), the districts in the sample appear to reflect districts where the federal policy was most likely to be implemented.

Sample statistics for the dependent and independent variables that will be included in analytic models in this dissertation are presented in Table 5. The student-level variables are presented on the first page and the school-level variables are presented on the second page of the table. For both sets of data, descriptive statistics for the full sample of students or schools are presented in the first two columns. The second set of columns present means and a comparison of means for schools in the sample that switched NCLB public school choice status. The comparison of means is included in the table to explore whether student and school variables should be included as controls in the models.

The student intra-district mobility data indicate that roughly six percent of students switched schools to attend another school in the district in the sample time frame. Slightly higher percentages of students made intra-district moves out of schools that at some point offered NCLB public school choice, and there were a higher percentage of transfers when schools offered NCLB public school choice (eight versus seven percent). The descriptive statistics provide some evidence that there were was more intra-district mobility when schools offered NCLB public school choice, but the descriptive data do not control for any student or school factors.

The student race/ethnicity descriptive statistics show that the schools that offered NCLB public school choice enrolled different students than schools in the full sample. Specifically, the NCLB schools enrolled smaller percentages of White and Other students, and higher percentages of Black and Hispanic students. Among the schools that switched NCLB public school choice, the percentage of students in each of the race/ethnicity categories who enrolled in schools when the schools did not offer choice was different than when the schools offered choice. The gender variable is the same for the full sample and the NCLB public school choice schools. Roughly 51

percent of students in the sample were male. Student performance data are presented next in Table 5. The math and reading scores were taken from the spring semester of each academic year and were standardized by subject area, grade level, and school district. Students who attended schools that offered NCLB public school choice performed slightly lower on average than the full sample in both math and reading. And students who attended schools when the schools offered NCLB public school choice performed lower than students who attended the same schools when NCLB public school choice was not offered. Academic year gains between fall and spring were roughly the same for the full sample and students who attended schools that offered NCLB public school choice, and there were no differences in gains between students who attended schools before and after schools switched NCLB status. The grade level data indicate that were larger percentages of students in the sample in the lower elementary grades (second, third, and fourth) and middle school grades (sixth and seventh). There were also differences in the grade levels in the sample for schools that offered NCLB public school choice. Given that previous research on student mobility, including the studies on NCLB public school choice, found that student participation in choice initiatives and impact differed based on student characteristics, student characteristics will be included as control variables and interacted with student mobility to explore the differential effect of NCLB public school choice.

The school-level descriptive statistics are presented on the second page of Table 5. In the sample, 13 percent of the schools in the sample offered NCLB public school choice. 88 percent of the schools failed to make AYP at least once and 59 percent failed to make AYP at least twice. Since AYP was a signal of school quality for families, which could confound the impact of NCLB public school choice on student behavior, the two AYP variables will be included in the models. The average school-level performance of all schools in the sample was similar to the

average school performance of schools deemed eligible to receive students through NCLB public school choice. However, when the descriptive statistics are broken out for schools that offer NCLB public school choice, it becomes clear that school performance and the performance of schools in the choice set in the district varied significantly for schools when they offer NCLB public school choice and in time periods when they do not. For example, in math, schools performed worse on average in years when they offered NCLB public school choice compared with years when they did not offer choice (-0.20 compared with -0.13). Conversely, for schools that switched NCLB public school choice, the performance of the set of eligible receiving schools in the district was better in years when NCLB public school choice was offered compared with years when it was not. For example, the set of eligible receiving schools had average math performance of 0.11 when schools offered NCLB public school choice compared with 0.03 when schools did not offer choice.

The two additional measures of the quality of schools in the choice set, measures of the number of higher performing schools and the number of higher performing accepting schools, also differed in the two time periods for schools that switched NCLB public school choice status. There were a larger number of schools in the district that were higher performing than the schools that switched choice status when they offered NCLB public school choice. For example, when schools offered NCLB public school choice, on average there were nine schools in the district that performed better in math compared with six schools performing better when schools did not offer NCLB public school choice. There were also a larger number of accepting schools that performed higher in the district when schools offered NCLB public school choice (on average, seven compared with five). As a result, students had access to larger numbers of higher performing schools to choose from in periods of time when their schools offered NCLB public

school choice. Given the variation, the variables that measure the choice set of schools in the district will be included as potential confounding factors and interacted with student mobility to explore whether differences in choice set influenced the impact of NCLB public school choice.

The final four variables in Table 5 are measures that will be used as dependent variables for the second research question. The variables measure difference in school-level characteristics between schools that students leave and schools that they select. The first two measure differences in average school performance in math and reading. There was a statistically significant difference in the measure of differences in math performance between schools that students selected for schools that switched NCLB public school choice status, but not in reading performance. On average, there were no differences in the school-level race/ethnicity or free or reduced price lunch measures for schools that switched NCLB public school choice status. However, the average differences do not control for any student or school variables, which the analytic models will do.

Table 5. Sample Statistics

Variables	Full Sample		Schools that Switch NCLB Status	
			Do Not Offer NCLB	Offer NCLB
	Mean (SD)	{Min, Max}	Mean (SD)	Mean (SD)[‡]
Student-Level Variables				
Number of student records	874,420		120,654	76,794
Student intra-district mobility	0.06 (0.24)	{0,1}	0.07 (0.25)	0.08 (0.27)***
Race / Ethnicity				
White	0.65 (0.48)	{0,1}	0.57 (0.49)	0.49 (0.50)***
Black	0.14 (0.35)	{0,1}	0.15 (0.35)	0.24 (0.43)***
Hispanic	0.14 (0.35)	{0,1}	0.20 (0.40)	0.21 (0.40)***
Other	0.07 (0.26)	{0,1}	0.06 (0.23)	0.05 (0.23)***
Gender	0.51 (0.50)	{0,1}	0.51 (0.50)	0.51 (0.50)
Math score	0.07 (0.97)	{-6.38, 5.14}	-0.02 (0.98)	-0.11 (0.98)***
Reading score	0.07 (0.96)	{-6.09, 5.29}	-0.02 (0.98)	-0.11 (0.99)***
Math fall-spring gains	0.00 (0.56)	{-6.54, 6.80}	-0.00 (0.57)	-0.00 (0.57)
Reading fall-spring gains	0.00 (0.59)	{-6.61, 7.35}	0.00 (0.59)	0.00 (0.60)
Grade level				
Grade 2	0.15 (0.36)	{0,1}	0.14 (0.35)	0.15 (0.36)***
Grade 3	0.24 (0.43)	{0,1}	0.25 (0.43)	0.28 (0.45)***
Grade 4	0.23 (0.42)	{0,1}	0.24 (0.43)	0.26 (0.44)***
Grade 5	0.08 (0.27)	{0,1}	0.09 (0.29)	0.09 (0.28)***
Grade 6	0.12 (0.32)	{0,1}	0.13 (0.34)	0.11 (0.31)***
Grade 7	0.14 (0.35)	{0,1}	0.12 (0.33)	0.10 (0.30)***
Grade 8	0.01 (0.11)	{0,1}	0.01 (0.09)	0.01 (0.10)***
Grade 9	0.01 (0.12)	{0,1}	0.00 (0.03)	0.00 (0.00)***
Grade 10	0.00 (0.00)	{0,1}	--	--

‡ Asterisks indicate that the difference between time periods was statistically significant: ***$p < .001$; **$p < .01$; *$p < .05$

Table 5. Sample Statistics (continued)

Variables	Full Sample		Schools that Switch NCLB Status	
			Do Not Offer NCLB	Offer NCLB
	Mean (SD)	{Min, Max}	Mean (SD)	Mean (SD)[‡]
School-Level Variables				
Number of school records	5,356		765	484
Schools offer NCLB choice	0.13 (0.33)	{0,1}	--	--
Schools missed AYP one year	0.88 (0.33)	{0,1}	--	--
Schools missed AYP two years	0.59 (0.49)	{0,1}	--	--
Average school performance, math	-0.01 (0.27)	{-2.21, 1.61}	-0.13 (0.22)	-0.20 (0.23)***
Average school performance, read	-0.01 (0.26)	{-2.69, 1.44}	-0.13 (0.22)	-0.19 (0.22)***
Average school fall-spring year gains, math	0.02 (0.11)	{-0.81, 1.67}	0.02 (0.00)	0.01 (0.00)
Average school fall-spring year gains, read	0.02 (0.10)	{-1.28, 1.33}	0.02 (0.00)	0.01 (0.00)
Average accepting school performance, math	0.04 (0.08)	{-0.36, 0.75}	0.03 (0.06)	0.11 (0.12)***
Average accepting school performance, read	0.04 (0.08)	{-0.40, 0.76}	0.03 (0.06)	0.11 (0.11)***
Higher performing schools in district, math	5.92 (7.24)	{0, 46}	5.83 (7.67)	8.73 (9.50)***
Higher performing schools in district, read	5.92 (7.29)	{0, 47}	5.81 (7.57)	8.86 (9.57)***
Higher performing accepting schools in district, math	5.44 (6.66)	{0, 41}	5.25 (6.89)	7.34 (8.08)***
Higher performing accepting schools in district, read	5.46 (6.74)	{0, 42}	5.28 (6.87)	7.50 (8.24)***
Difference in average school performance between sending and receiving school, math	0.00 (0.12)	{-1.52, 2.15}	0.01 (0.10)	0.02 (0.12)*
Difference in average school performance between sending and receiving school, read	0.00 (0.12)	{-1.02, 2.63}	0.01 (0.10)	0.02 (0.12)
Difference in race/ethnicity between sending and receiving school	-0.00 (0.09)	{-1.00, 0.94}	0.00 (0.08)	-0.00 (0.12)
Difference in eligible for free or reduced price lunch between sending and receiving school	-0.00 (0.08)	{-0.68, 0.70}	-0.01 (0.06)	-0.01 (0.07)

‡ Asterisks indicate that the difference between time periods was statistically significant: ***$p < .001$; **$p < .01$; *$p < .05$

	2004 NCLB Choice	2005 NCLB Choice	2006 NCLB Choice	2007 NCLB Choice	2008 NCLB Choice
2002	S- - - →R	S- - - →R	S- - - →R	S- - - →R	S- - - →R
2003	·······►S——→R	S- - - →R	S- - - →R	S- - - →R	S- - - →R
2004	NCLB S——→R	·······►S——→R	S- - - →R	S- - - →R	S- - - →R
2005	S——→R	NCLB S——→R	·······►S——→R	S- - - →R	S- - - →R
2006	S——→R	S——→R	NCLB S——→R	·······►S——→R	S- - - →R
2007	S——→R	S——→R	S——→R	NCLB S——→R	·······►S——→R
2008	S R	S R	S R	S R	NCLB S——→R
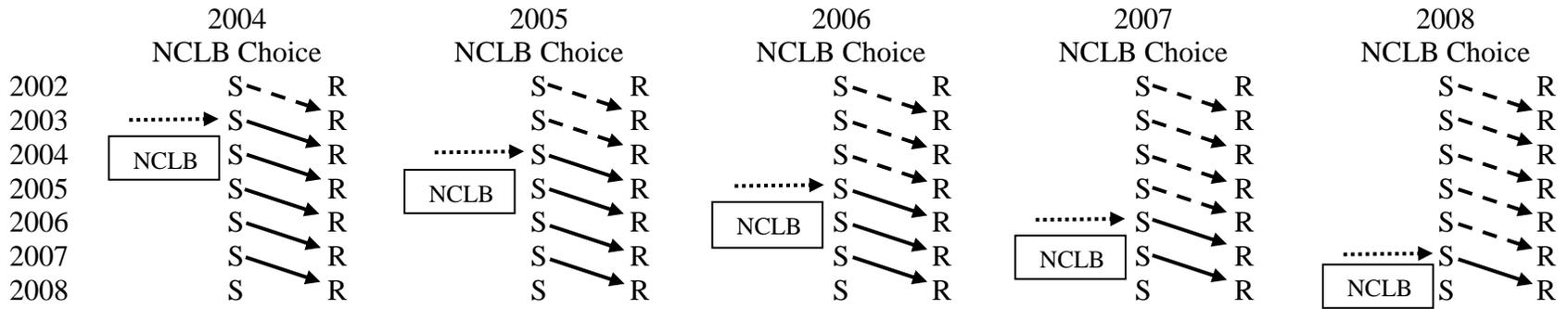
S   Sending school

R   Receiving school

·······► Dotted arrow indicates the academic year when the school is identified as having to offer NCLB public school choice (in the spring). Students can begin to switch schools through the policy between spring and fall.

- - -► Dashed arrow indicates the academic years prior to when a school has to offer NCLB public school choice.

——► Solid arrow indicates the academic years when NCLB public school choice provides opportunity to make intra-district moves.

Figure 2. NCLB Public School Choice: 2002-2003 through 2008-2009

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Analytic Models

This dissertation takes advantage of schools that switched NCLB choice status to compare variation in average student behavior before and after schools offered federal school choice. Schools changed NCLB public school choice status in different academic years. There was not one sweeping change across all low-performing schools when the NCLB law was implemented. Instead, NCLB public school choice designations were staggered and increased over time as benchmarks to make AYP became increasingly more challenging. School fixed-effects models will be used to compare student mobility, the characteristics of selected schools, and student performance before and after schools offered choice to determine if the federal policy led to changes in student behavior.

Figure 2 shows the patterns of NCLB public school choice school identifications from the academic years 2002-2003 through 2008-2009, the years of data in this dissertation. The dashed arrows represent academic years before schools had to offer NCLB public school choice. Schools were identified as having to offer choice after state assessments were completed in the spring. As a result, the first set of student transfers in response to NCLB public school choice occurred between the spring of the previous year and the fall of the year choice was implemented. The dotted arrow points to the spring semester when we would expect to begin seeing students leaving schools identified for NCLB public school choice. For example, if a school was identified as having to offer choice for the 2004-2005 school year, students were informed of their ability to change schools between the spring of the 2003-2004 school year and the fall of the 2004-2005 school year when choice was implemented. The solid arrows represent the academic years when schools offered NCLB public school choice. Since NCLB public school choice was implemented in a staggered approach over time, we would not expect the

school choice designation to be systematically correlated with other education reforms. However, grade level and year fixed-effects will be included in the models to control for any possible correlation with other initiatives during the same time period.

While it is unlikely that NCLB public school choice was systematically related to other reform initiatives, school AYP designations leading up to NCLB public school choice could have changed student behavior before students were given the opportunity to switch schools under the federal policy. The opportunity to switch schools through NCLB public school choice was based on the assumptions that identified schools were low performing and that there were better options within the school district. When schools offered NCLB public school choice it was a signal of low school quality to families. However, the broader NCLB federal education law provided other signals of low school quality prior to schools having to offer NCLB public school choice. If a school did not fail AYP for two consecutive years, it could have been identified as not making AYP multiple times before it had to offer public school choice. Across the country, AYP results were made quite public through school report cards and news stories. Failing to make AYP did not automatically trigger public school choice, but a school's AYP status provided information about its quality and could have resulted in changing student behavior in ways that were similar to the official NCLB public school choice policy by persuading students to switch schools.

Since students who switched schools under the NCLB public school choice policy are not identified in the data available for this dissertation, in order to conclude that changes in student behavior when schools offered NCLB public school choice were in response to federal policy, the analytic strategies in this dissertation need to control for confounding factors that may explain why student behavior changed at the same time that federal school choice was

implemented. For this reason, the analytic models will control for schools' AYP status before offering choice to strengthen the inference that average changes in student behavior were in response to NCLB public school choice. Specifically, indicators for the first and second years that schools were identified as not making AYP will be included in models. All schools that offered NCLB public school choice failed AYP at least twice before offering choice. Some schools could have failed AYP off and on for a number of years before offering choice. Additionally, schools that did not have to offer NCLB public school choice could have failed AYP multiple times, which provided information to families about school quality. When comparing student behavior in schools before and after they offered choice, indicators for the first and second time schools failed AYP will control for changes in student behavior when schools did not have to offer NCLB public school choice, behavior that may look similar to student behavior that would be expected when a school offered NCLB public school choice. Controlling for AYP status as a confounding factor will strengthen inferences that the opportunity to switch schools through NCLB public school choice impacted student mobility, the schools selected, and student performance.

The following sections will describe the analytic strategies for addressing the three research questions in more detail.

Student mobility

The first research question addresses whether students were more likely to make intra-district moves when their schools offered NCLB public school choice. The analytic model is specified as:

$$Student\ Mobility_{ijt} = \alpha_j + \beta_1 NCLB_{jt} + \beta_2 AYP1_{jt} + \beta_3 AYP2_{jt} + \beta_4 X_{it} +$$

$$\beta_5 X_{it} * NCLB_{jt} + \beta_6 Sch\ Perf_{jt} + \beta_7 Y_{jt} + \beta_8 Y_{it} * NCLB_{jt} + \theta_{gt} + v_{jt} \qquad (1)$$

where $Student\ Mobility_{ijt}$ is a binary outcome for intra-district mobility that describes if

student i, who attended school j in time t, left school j at the end of time t. If school $j + 1$ in time

$t + 1$ is the same as school j in time t, then $Student\ Mobility_{ijt}$ equals 0. If school $j + 1$ in time

$t + 1$ is a different school in the district than in time t, then $Student\ Mobility_{ijt}$ equals 1. If the

student makes a subsequent intra-district move in time $t + 2$, then $Student\ Mobility_{ijt}$ equals 1

in time $t + 1$. If the students stays in the new school in time $t + 2$, then $Student\ Mobility_{ijt}$

equals 0 in time $t + 1$. Coding intra-district mobility in this manner allows the model to estimate

the probability of making an intra-district move given that the student has not already done so,

which means that Equation 1 is a discrete-time hazard model for the first research question. The

model will examine whether students were more likely to make intra-district moves, if they have

not already done so, when their schools had to offer NCLB public school choice compared with

time periods when the schools did not offer federal school choice.

In the model, α_j are the school fixed-effects that capture factors that are time-invariant

for the school. θ_{gt} captures grade-by-year fixed-effects and v_{jt} is the random disturbance term.

$NCLB_{jt}$ is a binary indicator that equals 1 if school j had to offer NCLB public school choice to

students who attended the school in time t, and 0 otherwise. $NCLB_{jt}$ is not captured within α_j

because it is time-variant. The variables $AYP1_{jt}$ and $AYP2_{jt}$ are indicators for whether school j

failed to make AYP once and twice. After school j fails AYP for the first time or the second

time, $AYP1_{jt}$ and $AYP2_{jt}$ equal 1, respectively, for the remaining years that the school is in the

sample. The AYP variables are included in the model to control for the possibility that the

information about school quality that failing to make AYP provided families could confound the

effect of NCLB public school choice on student behavior.

X_{it} is a vector of student characteristics for student i in time t that includes race/ethnicity, gender, and student performance. The race/ethnicity data for students are a set of dummy variables with the categories of African-American, Hispanic, and other, with white omitted as the reference category. Gender is a dummy variable that equals 1 for male students. There are two student performance measures that will be used in separate models. The first is a standardized NWEA score in mathematics or reading for student i in time t. The student test score is from the spring semester of time t. The second performance measure is a standardized NWEA academic year gain score for mathematics or reading that is calculated by subtracting the student's score in the fall semester of time t from the student's score in the spring semester of time t.

The model also includes interactions between $NCLB_{jt}$ and student characteristics. These interactions are included in the model to explore whether students responded to the opportunity to switch schools through NCLB public school choice in different ways based on their characteristics. Given that previous research on NCLB public school choice indicated that participation in the federal program differed based on race/ethnicity and prior academic achievement, the models will examine how students with different characteristics in the sample respond to the policy.

Because the model includes school fixed-effects (α_j), school characteristics that are time-invariant are not included in the model. The model does include the variable $Sch\ Perf_{jt}$, a measure of school performance that varies for school j across time t. Similar to the student performance measures, there are two measures of school performance that will be included in separate models. The first school performance measure will be the average school performance by subject area for school j in time t. The second school performance measure is the average gain in school performance between fall and spring by subject area for school j in time t. The

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average gain in school performance is measured as the mean of the fall to spring gain for students in the school, by academic year.

Y_{jt} is a vector of district characteristics for school j in time t. There are three district variables that will be included in models that control for higher quality school options within the district. The first variable is the number of schools in the district with overlapping grade levels that performed better than school j in time t, by subject area. The second variable is the number of higher performing schools in the district eligible to accept transferring students under NCLB public school choice with overlapping grade levels for school j in time t, regardless of whether school j was identified to offer NCLB public school choice. The final variable is the average performance of the set of eligible receiving school for school j in time t, regardless of whether school j was identified to offer NCLB public school choice. The district characteristics are included in the model because the set of higher performing schools and schools deemed eligible to accept students through NCLB public school choice in districts changed over time. The comparable performance of other schools in the district and information that some schools were eligible to receive while others were not could confound the effect of NCLB public school choice on student mobility by providing information to families about the quality of schools that could induce student intra-district mobility in schools that do not offer choice.

Additionally, the measures of district performance may act as moderating variables on the impact of NCLB public school choice if they affect the amount of student mobility when school j offers choice. As a result, Equation 1 includes interactions between $NCLB_{jt}$ and the district variables, $Y_{it} * NCLB_{jt}$. When the interaction terms, $X_{it} * NCLB_{jt}$ and $Y_{it} * NCLB_{jt}$, are in the model, it will be insufficient to interpret the main effect coefficient on the $NCLB_{jt}$ variable to understand the full impact of NCLB public school choice on student mobility. Instead, the

marginal effect of NCLB public school choice will be discussed when interpreting results.

Marginal effects summarize fitted results, which take into account all of the $NCLB_{jt}$ interaction

terms, and can be expressed as:

$$d(Student\ Mobility_{ijt})/d\left(NCLB_{jt}\right) = \beta_1 + \beta_5 X_{it} + \beta_8 Y_{it}$$

where student mobility changes because of NCLB public school choice by $\beta_1 + \beta_5 X_{it} + \beta_8 Y_{it}$.

The student mobility model will evaluate the marginal effect of NCLB public school choice at

the mean of each interaction variable among the subsample of students who attended schools that

switched NCLB public school choice status. The interaction terms will allow this dissertation to

examine whether NCLB public school choice resulted in changes in student mobility based on

student characteristics and the set of eligible receiving schools in the district.

The schools students choose

The second research question in this dissertation is an examination of whether students

who transferred schools selected schools with different characteristics when their schools had to

offer NCLB public school choice. The analytic model is specified as:

$$Sch_{ij(t+1)} - Sch_{ijt} = \alpha_j + \beta_1 NCLB_{jt} * Student\ Mobility_{ijt} + \beta_2 AYP1_{jt} + \beta_3 AYP2_{jt} +$$

$$\beta_4 X_{it} + \beta_5 X_{it} * \left(NCLB_{jt} * Student\ Mobility_{ijt}\right) + \beta_6 Sch\ Perf_{jt} +$$

$$\beta_7 Y_{jt} + \beta_8 Y_{it} * \left(NCLB_{jt} * Student\ Mobility_{ijt}\right) + \theta_{gt} + v_{jt} \quad (2)$$

where the dependent variable, $Sch_{ij(t+1)} - Sch_{ijt}$, measures the difference in school

characteristics between the school student *i* attended in time *t* + 1 and the school student *i*

attended in time *t*. The school characteristics for both the school attended in time *t* and the

school attended in time *t* + 1 are measured in time *t* since students would only have information

about schools that they may transfer to from the current school year. As a result, the value of the

dependent variable for students who do not switch schools between time *t* and time *t* + 1 is zero.

Four dependent variables will be used to examine this research question. The first two are measures of school performance. Since the NCLB public school choice policy intended for students to leave low-performing schools and attend higher performing schools, the models with school performance as the outcome will examine whether students selected higher performing schools in years when they had the opportunity to move under federal school choice. The first school performance dependent variable is the difference in average school NWEA scores between sending and receiving schools in math and reading. The second school performance dependent variable is the difference between sending and receiving schools in average school annual academic gains in math and reading. Academic year gains were calculated by subtracting the average school NWEA fall score from the average school NWEA spring score. Academic year gains are an important indicator of school quality because they provide information about the value that schools add to student learning. A school may be composed of high scoring students who do not experience much academic growth over an academic year, making the school look high performing based on average performance scores. A student moving from a low-performing school to a high-performing school composed of high scoring, low growth students may benefit from peer effects, but the student may benefit even more academically from schools that produce larger learning gains.

The second set of dependent variables for school characteristics measure differences in school-level demographics. Even though school-level demographics were not specified within NCLB public school choice as elements that should be considered when selecting a new school, previous research on patterns of school choice suggest that students who switch schools are sensitive to the demographic make-up of schools. The first school-level demographic dependent variable measures the difference between sending and receiving schools in the percent of

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students in the school who are the same race/ethnicity as the transferring student. Measured this

way, a positive coefficient on the student race variables interacted with student mobility from a

school offering NCLB public school choice would indicate that students of that race/ethnicity

group selected schools with higher percentages of their own race/ethnicity than the omitted

group, White students selecting schools with higher percentages of White students. A negative

coefficient would indicate that students selected schools with lower percentages of their own

race/ethnicity, compared with the omitted group. The second dependent variable measures the

difference between sending and receiving school in the percent of students in the school who are

eligible for free or reduced price lunch.

Similar to Equation 1 that examines student mobility, Equation 2 for the second set of

research questions includes α_j, school fixed-effects that capture factors that are time-invariant for

the school j. θ_{gt} captures grade-by-year fixed-effects and v_{jt} is the random disturbance term. In

the school characteristics models, the effect of NCLB public school choice will be measured for

students who make intra-district transfers. The term, $NCLB_{jt} * Student\ Mobility_{ijt}$, is a binary

indicator that equals 1 if school j had to offer NCLB public school choice to students who

attended the school in time t for student i who left school j at the end of the academic year in

time t, and 0 otherwise. The model also includes the two AYP variables, $AYP1_{jt}$ and $AYP2_{jt}$,

that control for the possibility that information about school quality prior to the school offering

NCLB public school choice impacted student behavior.

The vector of student characteristics, X_{it}, as well as an interaction term between student

characteristics and NCLB public school choice for intra-district movers, $X_{it} * (NCLB_{jt} *$

$Student\ Mobility_{ijt})$, are included in Equation 2. Equation 2 will include the variable

$Sch\ Perf_{jt}$, a measure of school performance that varies for school j across time t. The final set

of independent variables in Equation 2 are the vector of district characteristics, Y_{jt}, for school j in time t and the interaction term between the vector of district characteristics and NCLB public school choice for intra-district movers, $Y_{it} * (NCLB_{jt} * Student\ Mobility_{ijt})$. When the interaction terms are in the model, the marginal effect of NCLB public school choice will be expressed as:

$$d(Sch_{ij(t+1)} - Sch_{ijt})/d\left(NCLB_{jt} * Student\ Mobility_{ijt}\right) = \beta_1 + \beta_5 X_{it} + \beta_8 Y_{it}$$

where the difference in school characteristics between sending and receiving schools changes because of NCLB public school choice by $\beta_1 + \beta_5 X_{it} + \beta_8 Y_{it}$. The models that examine the schools students choose will evaluate the marginal effect of NCLB public school choice at the mean of each interaction variable among the subsample of students who attended schools that switched NCLB public school choice status when the schools offered choice. The interaction terms will allow this dissertation to examine whether the impact of NCLB public school choice was different for students based on their student characteristics or because of the choice set of options in the district.

Performance outcomes

The third research question examines whether the opportunity to switch schools with NCLB public school choice lead to improvements in student performance. This dissertation will examine the overall impact of NCLB public school choice on student performance, as well as the effects on performance one, two, and three years or more after students transferred from schools offering NCLB public school choice. To examine the overall impact of federal choice, the analytic model is specified as:

$$Student\ Perf\ Gain_{ij(t+1)} = \alpha_j + \beta_1 NCLB_{jt} * Student\ Mobility_{ijt} +$$

$$\beta_2 AYP1_{jt} + \beta_3 AYP2_{jt} + \beta_4 X_{it} + \beta_5 Y_{jt} + \theta_{gt} + v_{jt} \quad (3)$$

where the dependent variable, $Student\ Perf\ Gain_{ij(t+1)}$, measures the fall to spring academic year gain in each subsequent year after student i attended school j. Models will be run for both math and reading. To estimate the overall impact of NCLB public school choice, $NCLB_{jt} *$ $Student\ Mobility_{ijt}$ takes on the value of 1 in the year that student i makes an intra-district move from a school that offered NCLB public school choice and every year after the move for as long as the student remains in the sample. The model also includes the two AYP variables, $AYP1_{jt}$ and $AYP2_{jt}$, the vector of student characteristics (X_{it}), and the vector of district characteristics (Y_{jt}) discussed in the previous sections for the first two research questions. However, the vector of student characteristics does not include the student performance measure that was part of the student mobility and school characteristics models. α_j captures school fixed-effects, θ_{gt} captures grade-by-year fixed-effects, and v_{jt} is the random disturbance term.

The second student performance model will examine the impact of NCLB public school choice one, two, and three or more years after students make intra-district moves from schools that offered NCLB public school choice. The model is specified as:

$$Student\ Perf\ Gain_{ij(t+1)} = \alpha_j + \beta_1 NCLB\ One_{jt} * Student\ Mobility_{ijt} +$$
$$\beta_2 NCLB\ Two_{jt} * Student\ Mobility_{ijt} +$$
$$\beta_3 NCLB\ Three_{jt} * Student\ Mobility_{ijt} +$$
$$\beta_4 AYP1_{jt} + \beta_5 AYP2_{jt} + \beta_6 X_{it} + \beta_7 Y_{jt} + \theta_{gt} + v_{jt} \quad (4)$$

where the measure of NCLB public school choice is broken up into three variables for the years after a student transfers from a school that offered NCLB public school choice. $NCLB\ One_{jt} *$ $Student\ Mobility_{ijt}$ equals 1 in the year that student i makes an intra-district move from school j that offered NCLB public school choice to students attending the school, and 0 otherwise.

$NCLB\ Two_{jt} * Student\ Mobility_{ijt}$ equals 1 in the year after student *i* makes an intra-district move from a school that offered NCLB public school choice, and 0 otherwise. And $NCLB\ Three_{jt} * Student\ Mobility_{ijt}$ equals 1 in all subsequent years after student *i* makes an intra-district move from a school that offered NCLB public school choice, and 0 otherwise. Similar to Equation 3, the student gain score dependent variable is taken from the year following the student's move in time *t*. As a result, the NCLB public school choice variables are regressed on student academic gains in the first, second, and three plus years after a student transfers from a school that offers NCLB public school choice. The model includes controls for the first and second time that schools are flagged as not making AYP, student characteristics, district characteristics, school fixed-effects, grade-by-year fixed-effects, and the random disturbance term.

CHAPTER IV

ANALYSIS

NCLB public school choice: Student mobility

The intention of the NCLB public school choice policy was to provide students in low-performing public schools new options to transfer to higher performing public schools within the school district. The first research question examines whether there were higher rates of intra-district student mobility when schools offered NCLB public school choice. Table 6 presents descriptive statistics for the average number of intra-district moves and the average intra-district mobility rate per school and year based on whether schools offered NCLB public school choice. The first panel of data shows the averages for all schools in the sample and suggests that there were mean difference in the average number of intra-district movers and intra-district mobility rates between schools that offered NCLB public school choice and schools that did not offer choice. In years that schools offered NCLB public school choice, there were an average of 13 students who transferred compared with nine students when schools did not offer choice. The average mobility rate in years that schools offered NCLB public school choice was 10.7 percent compared with 7.9 percent when schools did not offer choice.

The full sample includes schools that always offered NCLB public school choice and schools that never offered NCLB public school choice. Descriptive data for these two types of schools are presented in the second and third panels, respectively. The mean number of intra-district movers and mean intra-district mobility rate were higher in schools that always offered NCLB public school choice in the sample data compared with schools that never offered federal

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school choice. In fact, schools that always offered NCLB public school choice had the highest

average number of intra-district movers and the highest mobility rate among all types of schools,

while schools that never offered NCLB public school choice had the lowest average number of

movers and mobility rate. While these two sets of schools are interesting, they are not the focus

of this dissertation because the schools do not switch choice status and we do not know if the

intra-district mobility rates are related to something besides NCLB public school choice.

Table 6. Differences in Intra-District Mobility Based on NCLB Public School Choice

Type of School in Sample		Intra-District Movement		
		Do Not Offer NCLB	Offer NCLB	Mean Difference
All schools in sample	#	9.28	13.39	4.11***
	%	7.90	10.70	2.80***
	N	4,667	689	
Schools that always offer NCLB	#	--	16.22	--
	%	--	12.80	--
	N	--	205	
Schools that never offer NCLB	#	8.94	--	--
	%	7.93	--	--
	N	3,866	--	
Schools that switch NCLB choice	#	10.82	12.19	1.37
	%	7.72	9.81	2.09**
	N	765	484	
Schools that switch NCLB choice (pre-NCLB & NCLB)	#	10.37	12.60	2.23
	%	6.76	9.67	2.91***
	N	531	370	
Schools that switch NCLB choice (NCLB & post-NCLB)	#	8.39	10.47	2.08
	%	8.29	8.14	0.15
	N	97	40	
Schools that switch NCLB choice (pre-NCLB & NCLB, if all three time periods)	#	14.52	11.03	-3.49
	%	12.24	11.42	-0.82
	N	56	74	
Schools that switch NCLB choice (NCLB & post-NCLB, if all three time periods)	#	14.17	11.03	-3.14
	%	10.23	11.42	1.19
	N	81	74	

#: Average number of intra-district movers per school, per year.
%: Average rate of intra-district student mobility per school, per year.
N: Number of school observations.
***$p < .001$; **$p < .01$; *$p < .05$

The remaining panels present descriptive data for schools that switch NCLB public school choice status. In the sample there are schools with years before they offer NCLB public school choice and the years that they offer choice. There are also a set of schools that have years of data when they offered NCLB public school choice and the years after they were released from having to offer choice if they made AYP for two consecutive years. And then there are schools with all three time periods. The remaining panels examine whether there were average differences in the number of students who moved or intra-district mobility rates between periods of time. The fourth panel presents information for all schools that switched NCLB public school choice. The difference in the number of students who transferred was not statistically significant, but the average rate of intra-district mobility was by roughly two percent. The fifth panel presents information for the schools with data before and when they offered NCLB public school choice. The data are similar to all schools that switched NCLB public school choice status. The number of students who transferred was not statistically significant, but the average rate of intra-district mobility differed by nearly three percent. Among the schools with data during NCLB public school choice and after and the set of schools with data for the three time periods, the average number of intra-district movers and the mobility rates do not differ.

While the descriptive data in Table 6 suggest that intra-district mobility rates were different for schools when they offered NCLB public school choice compared to periods of time when federal school choice was not offered, the descriptive data do not control for differences in schools, students enrolled, or confounding factors that may influence the estimate of the impact of NCLB public school choice. The analytic models described in the previous chapter will use school fixed-effects regression models to examine whether students were more likely to make

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intra-district moves, if they have not already done so, when their schools offered NCLB public

school choice compared with time periods when the schools did not offer federal school choice.

Table 7. Impact of NCLB Public School Choice on Student Intra-District Mobility

	Model 1		Model 2		Model 3	
NCLB	0.006***	(0.001)	0.012***	(0.002)	0.011***	(0.002)
AYP, One Year	0.002	(0.001)	0.002	(0.002)	0.001	(0.002)
AYP, Two Years	0.004***	(0.001)	0.000	(0.001)	-0.000	(0.001)
# Higher Performing Schools			0.002***	(0.000)	0.003***	(0.001)
# Higher Performing Schools*NCLB					-0.002*	(0.001)
# Higher Performing Accepting Schools			-0.004***	(0.001)	-0.005***	(0.001)
# Higher Performing Accepting Schools*NCLB					0.002*	(0.001)
Average Accepting Schools Performance			0.018***	(0.002)	0.013***	(0.002)
Average Accepting Schools Performance *NCLB					0.035***	(0.006)
Average School Performance			-0.050***	(0.005(	-0.052***	(0.005)
Student Controls						
Black			0.023***	(0.001)	0.023***	(0.001)
Black*NCLB					-0.021***	(0.002)
Hispanic			0.004***	(0.001)	0.004***	(0.001)
Hispanic*NCLB					-0.017***	(0.002)
Other			0.010***	(0.001)	0.010***	(0.001)
Other*NCLB					-0.008*	(0.004)
Gender			0.002***	(0.000)	0.002***	(0.000)
Gender*NCLB					0.001	(0.001)
Student Performance			-0.007***	(0.004(	-0.007***	(0.000)
Student Performance*NCLB					-0.002**	(0.001)
Constant	0.055***	(0.001)	-0.015***	(0.003)	-0.014***	(0.003)
School fixed effects	Yes		Yes		Yes	
Grade*Year fixed effects	No		Yes		Yes	
Number of observations	874,420		874,420		874,420	
Number of groups	1,776		1,776		1,776	
R-squared	0.000		0.020		0.020	
NCLB Public School Choice Marginal Effect					*0.005*** (0.002)*	

***p < .001; **p < .01; *p < .05

Table 7 presents results for the impact of NCLB public school choice on student intra-

district mobility. Model 1 is the baseline model that includes the measure of NCLB public

school choice and the two AYP variables that control for confounding factors. In Model 1, the

opportunity to switch schools through NCLB public school choice resulted in a small and statistically significant increase in intra-district transfers, if students had not already done so. The magnitude of the effect of NCLB public school choice is small, but meaningful, given the amount of average student intra-district mobility among schools in the sample. The average intra-district mobility among schools that switched NCLB public school choice status when they did not offer choice was 10.82 percent (see Table 6). The baseline estimate of the impact of NCLB public school choice was 0.06 percent, or roughly a five percent increase on the amount of intra-district mobility than would have been expected without NCLB public school choice. Given the reports of low participation rates among eligible students (U.S. Department of Education, 2012), these results are consistent with findings from other studies of the policy.

Model 2 adds district choice set control variables, which are controlled for similar to the AYP variables as possible confounding factors on the impact of NCLB public school choice, average school-level math performance, and controls for student characteristics. The models in Table 7 include student math scores as the student performance control. In this model, all of the additional measures are statistically significant. The overall impact of NCLB public school choice in this model remains positive and statistically significant, and it is larger than the estimate from the baseline model.

Model 3 in Table 7 is the full model that includes the control variables from Model 2 and adds interaction terms between NCLB public school choice and the student characteristics variables and the district choice set variables. The interaction terms are entered into the full model so that the differential impact of NCLB public school choice on students can be examined. In the full model, Model 3, the marginal effect of NCLB public school choice was 0.05 percent, an increase of five percent over the intra-district mobility rate of 10.82 percent that would have

been expected if NCLB public school choice was not offered. NCLB public school choice led to increases in intra-district mobility for White students compared with Black, Hispanic, and Other students. The coefficients for each of the student race interaction terms compared with White students were negative and statistically significant. NCLB public school choice did not have a statistically significant impact on student mobility for male students compared with female students. The findings, however, suggest that higher average student performance in math was associated with less intra-district mobility when NCLB public school choice was offered. In other words, students with lower student performance in math were more likely to transfer schools when given the opportunity through NCLB public school choice.

In terms of the district variables as moderating factors, NCLB public school choice led to increases in intra-district mobility when there were larger numbers of higher performing accepting schools in the district, but not when there were larger numbers of higher performing schools in the district regardless of whether were eligible to receive. The third district variable, the average performance of the set of accepting schools also had a positive impact on student mobility. The findings appear to indicate that students were sensitive to the school quality indicators established by the federal policy, the eligibility status of higher performing schools. In districts with more high-quality school choice options under NCLB public school choice, students were more likely to make intra-district transfers.

Similar models were run that controlled for average school-level reading performance and student reading performance, average school-level math gains and student math gains, and average school-level reading gains and student reading gains. The results are not presented, but all of the models produced NCLB public school choice estimates that were similar in terms of the direction and magnitude of the results presented in Table 7. Taken as a whole, it appears that

for schools in this sample, the opportunity to switch schools through NCLB public school choice resulted in small and statistically significant increases in intra-district student mobility.

NCLB public school choice: The schools students choose

The second research question examines whether NCLB public school choice changed the types of schools that students attended, based on school performance and demographic characteristics. The previous section revealed that students in the sample were five percent more likely to make intra-district moves when their schools offered NCLB public school choice. At the same time that schools were identified as having to offer NCLB public school choice, the federal choice policy identified higher performing public schools that students were allowed to attend. The models in this section will examine whether the NCLB public school choice policy details—schools having to offer choice and the characteristics of the set of eligible receiving schools—had an impact on the schools that students selected when they transferred. Based on the intent of the federal policy, students who made intra-district moves from schools that offered NCLB public school choice should have selected higher performing schools. In terms of the racial/ethnic or free or reduced price lunch student composition of schools, the federal school choice policy did not specify school demographics as a component of school quality. However, given that previous school choice research found that students selected schools based on demographics, the models in this section will examine whether students who made intra-district moves when their schools offered NCLB public school choice took the opportunity to select schools with different demographic compositions than the schools selected by students when NCLB public school choice was not an option.

School performance characteristics

To examine the question of whether students selected higher performing schools when given the opportunity to switch schools through NCLB public school choice, two measures of school performance characteristics will be used. The first set of models will look at differences in the average school-level math performance between the schools students left and the schools students transferred to. The second set of models will look at differences in average school-level academic year gains. Both average performance and academic gains are considered to explore whether there are any differences in student behavior based on the type of school performance information. The NCLB public school choice policy was based on average school-level performance, but school academic gains may be a better indicator of school quality if students learn more at schools despite overall performance being lower. Similar models were run for average school-level reading performance and average school-level academic year reading gains. The results for reading were nearly identical to the results presented in Tables 8 and 9 and are not presented here.

Table 8 presents results from models that look at differences in school-level average math performance. The baseline model, Model 1, examines whether students who transferred from schools that switched NCLB public school selected schools that performed better than the sending school when NCLB public school choice was offered, controlling for the information that students received about failing to make AYP. The NCLB public school choice impact is for students who made intra-district moves from these schools. The baseline model results indicate students who left schools that offered NCLB public school choice selected schools with average math performance that was 0.193 higher than the sending school, compared with when students transferred from schools before NCLB public school choice was offered. In the full sample of

schools, average math performance was 0.01 with a standard deviation of 0.27 (see Table 5).

Students selected schools that performed roughly .71 standard deviation higher than the schools

they would have chosen in the absence of NCLB public school choice.

Table 8. Impact of NCLB Public School Choice on the Schools Students Choose: Differences in School-Level Math Performance

	Model 1		Model 2		Model 3	
NCLB*Student Mobility	0.193***	(0.001)	0.196***	(0.002)	0.166***	(0.002)
AYP, One Year	-0.000	(0.000)	-0.000	(0.000)	-0.000	(0.000)
AYP, Two Years	-0.002***	(0.000)	-0.002***	(0.000)	-0.002***	(0.000)
# Higher Performing Schools			0.001***	(0.000)	-0.001***	(0.000)
# Higher Performing Schools*(NCLB*Student Mobility)					0.028***	(0.000)
# Higher Performing Accepting Schools			-0.001***	(0.000)	0.001***	(0.000)
# Higher Performing Accepting Schools*(NCLB*Student Mobility)					-0.030***	(0.000)
Average Accepting Schools Performance			0.002*	(0.001)	0.000	(0.001)
Average Accepting Schools Performance *(NCLB*Student Mobility)					0.087***	(0.003)
Average School Performance			-0.076***	(0.002)	-0.076***	(0.002)
Student Controls						
Black			-0.008***	(0.000)	-0.008***	(0.000)
Black*(NCLB*Student Mobility)					-0.042***	(0.002)
Hispanic			-0.004***	(0.000)	-0.004***	(0.000)
Hispanic*(NCLB*Student Mobility)					-0.049***	(0.002)
Other			-0.000	(0.000)	-0.000	(0.000)
Other*(NCLB*Student Mobility)					0.005	(0.004)
Gender			-0.000	(0.000)	-0.000	(0.000)
Gender*(NCLB*Student Mobility)					0.007***	(0.001)
Student Performance			0.002***	(0.000)	0.002***	(0.000)
Student Performance*(NCLB*Student Mobility)					-0.001	(0.001)
Constant	0.001**	(0.000)	0.002*	(0.001)	0.002	(0.001)
School fixed effects	Yes		Yes		Yes	
Grade*Year fixed effects	No		Yes		Yes	
Number of observations	874,420		874,420		874,420	
Number of groups	1,776		1,776		1,776	
R-squared	0.054		0.062		0.069	
NCLB Public School Choice Marginal Effect					*0.193****	*(0.001)*

*** $p < .001$; ** $p < .01$; * $p < .05$

Model 2 adds the district choice set, average school performance, and student controls. The overall impact of NCLB public school choice for students who transfer remains the same in terms of magnitude and statistical significance. Model 3 adds interaction terms for student characteristics and district choice set variables. The overall impact of NCLB public school choice remains positive and statistically significant. The results for student characteristics suggest that Black and Hispanic students selected schools that were slightly lower performing when NCLB public school choice was offered compared with White students. Male students selected higher performing schools than female students. The results for students categorized as Other and the results for student performance were statistically insignificant. Two out of three of the district choice set variables had a positive impact on the average performance of schools that students who transferred from schools offering NCLB public school choice selected. The total number of higher performing schools in the district and the average performance level of the set of eligible receiving schools had a positive impact on the level of performance of schools students selected. However, the number of higher performing accepting schools had a negative impact on the average level of performance of schools students selected.

Table 9 presents results for models that examine the impact of NCLB public school choice on the average school-level academic math gains of schools students selected. For each of the models in Table 9, the overall impact of NCLB public school choice for students who made intra-district transfers from these schools was positive and statistically significant. The results from the full model, Model 3, suggest that the impact of NCLB public school choice on the difference in school-level academic gains of schools attended was 0.007. In the full sample, the average school had math gains of 0.02 with a standard deviation of 0.11 (see Table 5). When NCLB public school choice was offered, students selected schools with academic gains that were

roughly five percent of a standard deviation higher than the schools they left. The impact of

NCLB public school choice on differences in academic gains of the schools selected was not as

large in magnitude as the difference in average math performance, perhaps because information

about school-level learning gains was not provided to families.

Table 9. Impact of NCLB Public School Choice on the Schools Students Choose: Differences in School-Level Math Academic Gains

	Model 1		Model 2		Model 3	
NCLB*Student Mobility	0.006***	(0.000)	0.010***	(0.001)	-0.004***	(0.001)
AYP, One Year	-0.001***	(0.000)	0.000*	(0.000)	0.000*	(0.000)
AYP, Two Years	-0.000	(0.000)	0.001***	(0.000)	0.001***	(0.000)
# Higher Performing Schools			0.000***	(0.000)	0.000***	(0.000)
# Higher Performing Schools*(NCLB*Student Mobility)					0.015***	(0.000)
# Higher Performing Accepting Schools			-0.000*	(0.000)	-0.001**	(0.000)
# Higher Performing Accepting Schools*(NCLB*Student Mobility)					-0.015***	(0.000)
Average Accepting Schools Performance			0.029***	(0.001)	0.030***	(0.001)
Average Accepting Schools Performance *(NCLB*Student Mobility)					0.020***	(0.001)
Average School Gains			-0.068***	(0.001)	-0.068***	(0.001)
Student Controls						
Black			-0.000*	(0.000)	-0.000	(0.000)
Black*(NCLB*Student Mobility)					-0.028***	(0.001)
Hispanic			-0.000	(0.000)	0.000	(0.000)
Hispanic*(NCLB*Student Mobility)					-0.004***	(0.001)
Other			0.000	(0.000)	0.000	(0.000)
Other*(NCLB*Student Mobility)					-0.020***	(0.001)
Gender			-0.000	(0.000)	-0.000	(0.000)
Gender*(NCLB*Student Mobility)					-0.001*	(0.001)
Student Performance			0.000***	(0.000)	0.000**	(0.000)
Student Performance*(NCLB*Student Mobility)					-0.014***	(0.000)
Constant	0.001***	(0.000)	0.001*	(0.000)	0.001*	(0.000)
School fixed effects	Yes		Yes		Yes	
Grade*Year fixed effects	No		Yes		Yes	
Number of observations	874,420		874,420		874,420	
Number of groups	1,776		1,776		1,776	
R-squared	0.000		0.023		0.038	
NCLB Public School Choice Marginal Effect					*0.007***	(0.000)*

***p < .001; **p < .01; *p < .05

In terms of the impact of NCLB public school choice on the characteristics of students who transferred, Black, Hispanic, and Other students selected schools with lower academic gains than White students. There was a negative impact on male students compared with female students, as well. Higher performing students who transferred selected schools with lower academic math gains than lower performing students.

The findings for the district characteristics in the model examining differences in average school-level math gains were similar in direction to the findings from the model looking at average school-level math performance. Students who transferred selected schools with larger academic gains when there were a larger number of higher-performing schools in the district and when the average performance of the set of eligible receiving schools were higher. However, students selected schools with smaller academic gains when the number of accepting schools increased.

The results for the second research question suggest that in general NCLB public school choice had a positive impact on the quality of schools students attended when they transferred. Students who transferred from schools that offered NCLB public school choice selected schools that were higher performing in average math performance and average math academic year gains compared to the schools they left. Combined with results from the first research question, it appears that NCLB public school choice increased student intra-district mobility and influenced the types of schools student selected in regards to school performance. The next section will look at whether students in schools that switched NCLB public school choice status selected schools that had different demographic make-ups in the two periods of time.

School demographic characteristics

The next set of models examine differences in the demographic characteristics of schools—the percent of students the same race/ethnicity as the student and the percent of students eligible for free or reduced price lunch—between the schools that students left and the schools that students selected. The models look at whether the demographic composition of schools students selected changed when students transferred from schools that offered NCLB public school choice. The NCLB public school choice policy did not use race/ethnicity or free or reduced price lunch as criteria for identifying schools that had to offer choice or schools that could receive transfers. However, previous research discussed in an earlier chapter showed that school demographics played a role in student behavior when presented with school choice options. As a result, these analyses will examine whether students used the opportunity to switch schools through NCLB public school choice to attend schools with different demographics.

Table 10 presents results for the dependent variable measuring differences in the percent of students who were the same race/ethnicity as the student. The way that the variable is designed, the measure differs for students in the same school based on the student's own racial/ethnic classification. For example, the dependent variable for a White student would be the difference in the percent of students in the school the student left who were White compared with the percent of students in the school the student selected who were White. Changes in the dependent variable based on NCLB public school choice would indicate that students who transferred selected schools where the racial/ethnic demographics were more or less similar to the students' own race compared to schools they left.

Table 10. Impact of NCLB Public School Choice on the Schools Students Choose: Differences in School-Level Race/Ethnicity

	Model 1		Model 2		Model 3	
NCLB*Student Mobility	-0.015***	(0.001)	0.094***	(0.002)	0.093***	(0.002)
AYP, One Year	-0.004***	(0.000)	-0.001	(0.000)	-0.001	(0.000)
AYP, Two Years	-0.009***	(0.000)	-0.004***	(0.000)	-0.004***	(0.000)
# Higher Performing Schools			0.003***	(0.000)	0.004***	(0.000)
# Higher Performing Schools*(NCLB*Student Mobility)					-0.002***	(0.000)
# Higher Performing Accepting Schools			-0.003***	(0.000)	-0.003***	(0.000)
# Higher Performing Accepting Schools*(NCLB*Student Mobility)					0.003***	(0.000)
Average Accepting Schools Performance			0.007***	(0.001)	0.006***	(0.001)
Average Accepting Schools Performance *(NCLB*Student Mobility)					0.002	(0.003)
Average School Performance			0.009***	(0.002)	0.009***	(0.002)
Student Controls						
Black			0.001*	(0.000)	0.001*	(0.000)
Black*(NCLB*Student Mobility)					-0.191***	(0.002)
Hispanic			0.001***	(0.000)	0.001***	(0.000)
Hispanic*(NCLB*Student Mobility)					-0.144***	(0.002)
Other			0.032***	(0.000)	0.032***	(0.000)
Other*(NCLB*Student Mobility)					-0.080***	(0.004)
Gender			-0.000	(0.000)	-0.000	(0.000)
Gender*(NCLB*Student Mobility)					-0.002	(0.002)
Student Performance			-0.000***	(0.000)	-0.000***	(0.000)
Student Performance*(NCLB*Student Mobility)					0.001	(0.001)
Constant	0.006***	(0.000)	-0.007***	(0.001)	-0.007***	(0.001)
School fixed effects	Yes		Yes		Yes	
Grade*Year fixed effects	No		Yes		Yes	
Number of observations	874,420		874,420		874,420	
Number of groups	1,776		1,776		1,776	
R-squared	0.002		0.029		0.029	
NCLB Public School Choice Marginal Effect					*-0.016***	(0.001)*

***$p < .001$; **$p < .01$; *$p < .05$

When interaction terms between intra-district movers from schools offering NCLB public school choice and student characteristics and district choice set variables are added to Model 3, the marginal effect for NCLB public school choice was the roughly the same as the baseline model. In the full model, the impact of NCLB public school choice for students who transferred was the selection of schools with a demographic composition of students the same race/ethnicity

as the student 1.6 percent smaller than the schools students left. However, the effects for specific student race/ethnicity categories were much larger. Compared with White students, Black students selected schools with an average of 19.1 percent fewer Black students then schools they left. Hispanic students selected schools with an average of 14.4 percent fewer Hispanic students than schools they left. And students categorized as Other selected schools with an average of 8.0 percent fewer students the same race/ethnicity in the school they left. The policy did not have an impact on the choices of students based on gender or student performance.

For the district choice set variables, the findings were mixed. Students who transferred in districts with larger numbers of higher performing schools selected schools with student demographic compositions of their own race/ethnicity slightly lower than the schools they left. The opposite was true for students who transferred in districts with larger numbers of higher performing accepting schools. The average performance of the set of eligible receiving schools in the district did not have an impact on the types of schools students selected based on demographic composition.

The results for the percentage of free or reduced price lunch eligible students were larger in magnitude than the race/ethnicity demographics. Table 11 presents results for models that examine differences in the percent of students eligible for free or reduced price lunch between sending schools and schools that student selected. The overall impact of NCLB public school choice for students who transferred was consistent across the three models presented and suggests that students who left schools that offered NCLB public school choice selected schools with roughly 10 percent fewer free or reduced price eligible students. Given that NCLB public school choice identifications were based on Title I status, an indicator of school poverty, it should not be surprising that students who took the opportunity to transfer when NCLB public

school choice was offered left schools with higher percentages of free or reduced price eligible students and selected schools with lower percentages.

Table 11. Impact of NCLB Public School Choice on the Schools Students Choose: Differences in School-Level Free or Reduced Price Lunch Eligibility

	Model 1		Model 2		Model 3	
NCLB*Student Mobility	-0.100***	(0.000)	-0.106***	(0.001)	-0.083***	(0.001)
AYP, One Year	0.001*	(0.000)	0.001**	(0.000)	0.001**	(0.000)
AYP, Two Years	0.001***	(0.000)	0.001***	(0.000)	0.001***	(0.000)
# Higher Performing Schools			0.000	(0.000)	0.000	(0.000)
# Higher Performing Schools*(NCLB*Student Mobility)					-0.000	(0.000)
# Higher Performing Accepting Schools			-0.000*	(0.000)	-0.000**	(0.000)
# Higher Performing Accepting Schools*(NCLB*Student Mobility)					-0.003***	(0.000)
Average Accepting Schools Performance			0.000	(0.000)	0.001	(0.000)
Average Accepting Schools Performance *(NCLB*Student Mobility)					-0.010***	(0.002)
Average School Performance			0.000	(0.001)	0.001	(0.001)
Student Controls						
Black			0.005***	(0.000)	0.005***	(0.000)
Black*(NCLB*Student Mobility)					0.015***	(0.001)
Hispanic			0.003***	(0.000)	0.003***	(0.000)
Hispanic*(NCLB*Student Mobility)					0.038***	(0.001)
Other			0.000*	(0.000)	0.000*	(0.000)
Other*(NCLB*Student Mobility)					-0.004	(0.002)
Gender			0.000*	(0.000)	0.000*	(0.000)
Gender*(NCLB*Student Mobility)					-0.005***	(0.001)
Student Performance			-0.001***	(0.000)	-0.001***	(0.000)
Student Performance*(NCLB*Student Mobility)					-0.004***	(0.000)
Constant	-0.001***	(0.000)	-0.001	(0.001)	-0.001	(0.001)
School fixed effects	Yes		Yes		Yes	
Grade*Year fixed effects	No		Yes		Yes	
Number of observations	874,420		874,420		874,420	
Number of groups	1,776		1,776		1,776	
R-squared	0.042		0.049		0.053	
NCLB Public School Choice Marginal Effect					*-0.099****	*(0.000)*

***$p < .001$; **$p < .01$; *$p < .05$

The interaction terms between student characteristics and NCLB public school choice for intra-district movers in Model 3 in Table 11 indicate that Black and Hispanic students were more

likely than White students to select schools with higher percentages of students eligible for free or reduced price lunch. The results for students categorized as Other were statistically insignificant. Higher-performing students selected schools with lower percentages of students eligible for free or reduced price lunch than lower-performing students. For the district characteristics interaction terms, students in districts with larger numbers of higher-performing accepting schools and higher average performance among accepting schools selected schools with fewer students eligible for free or reduced price lunch.

Overall, NCLB public school choice appeared to have the impact of decreasing the percent of students in the schools students selected who were the same race as the student for intra-district movers. The policy also had the impact of decreasing the percent of students eligible for free or reduced price lunch. Combined with results about the performance of schools students selected, it appears that when NCLB public school choice was offered, it resulted in students selected higher performing schools with different demographic compositions than the schools students selected when they transferred from schools that did not yet offer NCLB public school choice.

NCLB public school choice: Student performance

The main intent of the NCLB public school choice policy was to create opportunities for students to attend higher performing public schools in order to improve student performance outcomes. Findings from the first research question indicate that students were more likely to transfer when NCLB public school choice was offered, and findings from the second research question suggest that students who transferred selected slightly higher performing schools with differences in race/ethnicity and free or reduced price eligible demographic compositions. The

third research question in this dissertation examines whether students experienced increases in performance level scores or academic gains when they transferred from schools that offered NCLB public school choice. Three of the four studies on the NCLB public school choice policy examined performance outcomes for participating students. The U.S. Department of Education (2007) study of multiple districts did not find statistically significant academic gains for student participants. The studies that examined one school district each found students who moved performed higher than students who stayed (McCombs, 2007) and statistically insignificant differences (Kirkland, 2009).

Student performance gains will be examined in two ways for math and reading. The first models will examine overall academic gains for students who transferred from schools that offered NCLB public school choice. In these models, students are flagged as intra-district movers for every year after they leave the school that switched NCLB public school choice status. The coefficient for this outcome is the average impact on academic gains after the intra-district move when schools offered NCLB public school choice. The second set of models will examine academic gains by the year after students transferred from schools that offered NCLB public school choice. Results will be presented for the first year, second year, and three or more years after students made intra-district transfers.

Table 12 presents results for performance gains in math. Model 1 is the baseline model for overall academic gains, controlling for the two AYP variables. The results suggest that there was no statistically significant impact of NCLB public school choice on the academic gains of students who transferred. In Model 2, controls for the district choice set of schools and student controls are added. The addition of these control variables does not change the results of the impact of NCLB public school choice on overall academic gains for students who transferred.

Models 3 and 4 in Table 12 present results for the models that break out the impact of NCLB public school choice on academic gains by years after the intra-district move. Similar to Models 1 and 2, there were no statistically significant impacts of NCLB public school choice on academic gains for students who transferred from schools when the federal school choice policy was available. Table 13 presents results for academic gains in reading and for all of the models the results are the same as what was found in math. For schools in this sample, it does not appear that the opportunity to switch schools through NCLB public school choice led to increases in academic gains after students transferred schools. These results are consistent with the U.S. Department of Education (2007) study of several urban school districts.

Table 12. Impact of NCLB Public School Choice on Student Math Performance Gains

	Model 1		Model 2		Model 3		Model 4	
NCLB*Student Mobility	0.003	(0.005)	0.004	(0.005)				
NCLB One Year*Student Mobility					0.005	(0.006)	0.005	(0.006)
NCLB Two Years*Student Mobility					0.007	(0.009)	0.008	(0.009)
NCLB Three Years*Student Mobility					-0.030	(0.019)	-0.030	(0.019)
AYP, One Year	0.006	(0.004)	0.006	(0.004)	0.007	(0.004)	0.006	(0.004)
AYP, Two Years	0.002	(0.002)	-0.001	(0.002)	0.002	(0.002)	-0.001	(0.002)
# Higher Performing Schools			0.000	(0.000)			0.000	(0.000)
# Higher Performing Accepting Schools			0.054***	(0.016)			0.054***	(0.016)
Accepting Schools Higher Performing than Average			0.013***	(0.004)			0.013***	(0.004)
Student Controls								
Black			-0.023***	(0.002)			-0.023***	(0.002)
Hispanic			0.009***	(0.002)			0.009***	(0.002)
Other			0.003	(0.003)			0.003	(0.003)
Gender			0.013***	(0.001)			0.013***	(0.001)
Constant	-0.011***	(0.003)	-0.025***	(0.007)	-0.011***	(0.003)	-0.025***	(0.007)
School fixed effects	Yes		Yes		Yes		Yes	
Grade*Year fixed effects	No		No		Yes		Yes	
Number of observations	874,420		874,420		874,420		874,420	
Number of groups	1,776		1,776		1,776		1,776	
R-squared	0.000		0.001		0.000		0.001	

***$p < .001$; **$p < .01$; *$p < .05$

Table 13. Impact of NCLB Public School Choice on Student Reading Performance Gains

	Model 1		Model 2		Model 3		Model 4	
NCLB*Student Mobility	0.002	(0.005)	0.002	(0.005)				
NCLB One Year*Student Mobility					0.008	(0.006)	0.008	(0.006)
NCLB Two Years*Student Mobility					-0.016	(0.010)	-0.015	(0.010)
NCLB Three Years*Student Mobility					0.013	(0.021)	0.015	(0.021)
AYP, One Year	0.009	(0.004)	0.009	(0.004)	0.009*	(0.004)	0.009*	(0.004)
AYP, Two Years	0.001	(0.002)	0.001	(0.002)	0.000	(0.002)	0.001	(0.002)
# Higher Performing Schools			0.001***	(0.000)			0.001***	(0.000)
# Higher Performing Accepting Schools			0.048*	(0.023)			0.048*	(0.023)
Accepting Schools Higher Performing than Average			0.000	(0.004)			0.000	(0.004)
Student Controls								
Black			-0.025***	(0.002)			-0.025***	(0.002)
Hispanic			0.008***	(0.002)			0.008***	(0.002)
Other			-0.009**	(0.003)			-0.009**	(0.003)
Gender			0.028***	(0.001)			0.028***	(0.001)
Constant	-0.008***	(0.003)	-0.012	(0.008)	-0.008***	(0.003)	-0.012	(0.008)
School fixed effects	Yes		Yes		Yes		Yes	
Grade*Year fixed effects	No		No		Yes		Yes	
Number of observations	874,420		874,420		874,420		874,420	
Number of groups	1,776		1,776		1,776		1,776	
R-squared	0.000		0.001		0.000		0.001	

*** $p < .001$; ** $p < .01$; * $p < .05$

CHAPTER V

CONCLUSION

The NCLB public school choice policy, enacted through the 2001 reauthorization of the federal Elementary and Secondary Education Act, increased school choice options for students attending chronically low-performing public schools. The federal school choice policy was one of the largest public school choice initiatives, spanning all states and affecting a large proportion of school districts nationwide, however participation among the millions of eligible students hovered around two percent. Despite the scope of the NCLB public school choice policy and the decade that it has been in existence, there have only been four studies of the policy's impact on students. This dissertation sought to fill a hole in the research to better understand whether the intent of the policy to provide new options for students to attend higher performing schools and ultimately improve student performance was fulfilled. This chapter will review the main findings presented in the previous chapter and discuss limitations that should be used when interpreting results. This chapter will also discuss policy and research implications of the findings from the three research questions.

Main Findings

This dissertation used seven years of student testing data combined with information about NCLB public school choice status to address three research questions:

1. What impact did the opportunity to make NCLB public school choice have on student mobility?

2. Did the presence of NCLB public school choice, and the provision that students transfer to higher performing public schools, change student behavior in terms of the types of schools students who moved selected?

3. Did the academic performance of students who moved once schools began offering NCLB public school choice improve?

Findings from the three research questions suggest that the NCLB public school choice policy had the intended impact of increasing intra-district mobility and changing patterns in terms of the types of schools selected. However, for schools in the sample, it does not appear that NCLB public school choice had the intended effect of increasing academic gains in math or reading for students who transferred when their schools offered federal school choice options. The following sections will discuss each of the research questions in more detail.

Before reviewing the main findings, there are limitations that should be taken into consideration when interpreting the results. As mentioned several times throughout this dissertation, students who participated in NCLB public school choice were not identified in the data available for analyses. Rather, the analyses took advantage of schools switching choice status to compare the same schools before and after the schools offered NCLB public school choice. The models did control for factors, such as AYP status, that could confound the impact of NCLB public school choice by changing student behavior in ways that would be similar to what we would expect from NCLB public school choice. Any statistically significant results in the models as a result of NCLB public school choice were for average intra-district movers who transferred from schools that switched status.

Student mobility

In order to examine whether NCLB public school choice impacted the frequency of student mobility, the analytic models in this dissertation used school fixed-effects to compare intra-district transfers from schools that switched choice status before and after the schools offered NCLB public school choice. The model for the first research question was a discrete-time hazard model that examined whether students were more likely to make intra-district moves, if they had not already done so, when their schools offered NCLB public school choice compared with time periods when the schools did not offer federal school choice. The models controlled for student characteristics and school performance. The models also controlled for potential confounding factors, such as whether schools failed to make AYP once or twice and information about the varying set of higher performing school options in the district.

Findings from the full intra-district mobility model suggest that NCLB public school choice increased intra-district transfers by 0.05 percent. While 0.05 percent may seem like a small increase in student mobility, the average intra-district mobility rate for all schools in the sample was 10.82 percent. A 0.05 percent increase in intra-district mobility as a result of schools offering NCLB public school choice was a five percent increase over the average intra-district mobility rate that would have been expected if NCLB public school choice was not offered. The policy also appeared to have a different impact on students based on race/ethnicity, student performance, and the availability of higher performing schools in the district. The opportunity to transfer schools with NCLB public school choice appeared to have decreased intra-district mobility for Black, Hispanic, and Other students compared with White students. In other words, the impact of NCLB public school choice on White students in the sample was to increase intra-district mobility, while decreasing intra-district mobility rates for other race/ethnicity groups.

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NCLB public school choice decreased intra-district mobility for higher performing students and increased transfers among lower performing students. Since the models control for average school-level performance, the different impact on intra-district mobility depending on student performance suggests that NCLB public school choice increased intra-district mobility for lower performing students regardless of school performance. While the data are unable to explain why students decided to switch schools, the opportunity to change schools through NCLB public school choice may have encouraged students who were struggling academically to select a different school.

Perhaps not surprisingly, districts where there were more high quality school options, as defined by the federal policy, resulted in increases in intra-district mobility when schools offered NCLB public school choice. A common criticism of the NCLB public school choice policy was that in many districts where the majority of schools were identified as in school improvement, there were effectively no options for students who wanted to transfer to higher-performing schools. Results from the student mobility models confirm that the school choice options available to students impacted student behavior.

Overall, findings from the intra-district mobility models are consistent with previous research on NCLB public school choice that students changed schools in response to the policy and the policy had differential impacts on student mobility based on student characteristics. NCLB public school choice did not dramatically increase the number of students who switched schools, but there were positive increases in intra-district transfers.

The schools students choose

Evidence from the first research question suggest that NCLB public school choice had a positive, but small, impact on intra-district mobility for schools in the sample. Given that the

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federal policy identified a set of eligible receiving schools and deemed them higher quality, it was likely that increases in student intra-district mobility could lead to changes in the types of schools that students selected when making intra-district moves. The second research question examined this issue by looking at the school performance and demographic characteristics of schools that students ended up in if they attended and transferred from schools that switched NCLB public school choice status.

The models for school performance indicators looked at differences in average school-level performance and average academic year gains between the schools students left and the schools students selected. In both sets of models, the results suggest that students selected higher performing schools when they transferred from schools that offered NCLB public school choice. The models again used school-fixed effects and controlled for the two AYP variables, district choice set variables, and student characteristics. When looking at average school-level math performance, students who transferred from schools that offered NCLB public school choice selected schools that performed 0.193 higher than the schools they left compared with students who transferred before NCLB public school choice was offered. The difference in average school-level performance was 0.72 standard deviations higher than the schools students would have attended in the absence of NCLB public school choice. The difference in academic math gains was 0.007. Results were similar for school-level reading performance. Overall, students who transferred when NCLB public school choice was offered selected higher performing schools compared with intra-district movers prior to the option to transfer with NCLB public school choice.

When the NCLB public school choice policy was developed, there were questions about whether the policy identified eligible receiving schools that were substantively higher

performing than the schools that had to offer choice. Since schools could fail to make AYP off

and on before failing in consecutive years, which would trigger NCLB public school choice, the

set of eligible receiving schools could include schools that had similar performance levels as

schools that triggered NCLB public school choice. The models in this dissertation examined the

performance level of schools selected regardless of whether students chose schools deemed

eligible to receive students under NCLB public school choice. And the results indicate that

students who transferred when NCLB public school choice was available selected higher

performing schools. Even if the NCLB public school choice policy did not accurately

distinguish between choice schools and eligible receiving schools, the results from these analyses

suggest that the information provided to students that their schools were low-performing

impacted the quality of schools students selected when transferring.

There were also two models that examined whether NCLB public school choice had an

impact on differences in the demographic composition between schools students left and schools

students selected if they made intra-district transfers from schools that offered NCLB public

school choice. The federal policy did not specify school demographics as factors related to

school quality, but previous research on NCLB public school choice and other intra- and inter-

district school choice initiatives indicated that school demographics influence student school

choices. The models looked at differences between sending and selected schools in the percent

of students who were the same race as the student and differences in the percent of students

eligible for free or reduced price lunch. The models used school fixed-effects and controlled for

district choice set variables and student characteristics.

The models that looked at differences in the race/ethnicity composition of schools

suggested that students who transferred from schools that offered NCLB public school choice

selected schools with the percent of students the same race as the student roughly 1.6 percent

smaller than the schools they left. The difference in the percentage of students the same race as

the student was small, but statistically significant, and suggests that intra-district movers were

more likely to select schools where the student body looked less like them if they left schools

that switched choice status when the schools offered NCLB public school choice. The

differences in the percent of students eligible for free or reduced price lunch were much larger.

Students who transferred from schools that offered NCLB public school choice selected schools

with 10 percent fewer free or reduced price lunch eligible students.

Overall, findings from the models examining whether NCLB public school choice

changed the mix of schools that students selected provided evidence that intra-district movers

selected different types of schools when the schools they attended offered NCLB public school

choice. Students selected higher performing schools, schools with race/ethnicity compositions

for the student's own race that were less than the schools they left, and schools with lower

percentages of free or reduced price eligible students. The results confirm that even if school

choice initiatives do not intend to depend on or impact school demographics, students are

sensitive to the characteristics of schools when selecting schools.

Performance outcomes

The third research question addressed the basic policy intent of NCLB public school

choice. Did the federal school choice policy impact student performance? Previous studies of

NCLB public school choice produced statistically insignificant results. The results from models

in this dissertation were consistent with previous research. None of the models demonstrated a

statistically significant impact of NCLB public school choice on academic gains after students

transferred. The models examined average student academic gains across all years after students

transferred, as well as academic gains disaggregated by the year after students left schools that offered NCLB public school choice. Students who left schools when NCLB public school choice was offered experienced the same academic gains as all other students in the sample. The previous research questions indicate that NCLB public school choice led to higher rates of intra-district mobility and students selected higher performing schools, but for the students in this sample those changes in student behavior did not lead to improvements in student academic gains.

Policy Implications

The results from this dissertation are consistent with previous research on the impact of NCLB public school choice. The federal school choice policy resulted in slightly more intra-district mobility and students selected higher performing schools, but the impact of NCLB public school choice on student performance gains was indiscernible. If the evidence indicates that students leave schools in pursuit of higher quality options, perhaps more students would have participated in NCLB public school choice and there would have been improvements in student performance if there had been more high quality school options. The reality for many students attending chronically low-performing public schools is that there are not very many good options within the school district. Nationally, in school districts where at least one school offers NCLB public school choice, over 40 percent of all of the schools in the district have also been identified to offer choice, compared with around 8 percent of schools overall that have to offer choice (Richards, Stroub, & Holme, 2011). This same study simulated a scenario of expanding NCLB public school choice from intra-district to inter-district public school options. Results from the simulation indicate that inter-district public school choice options under NCLB could increase

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the accessibility to higher performing schools by as much as 80 percent and leave less than 20 percent of schools that offered NCLB public school choice without eligible receiving schools. Given that this dissertation found no evidence that NCLB public school choice had a detrimental impact on student performance, expansion of the policy to provide access to more high quality schools may be warranted.

However, rather than increasing the scope of NCLB public school choice, recent education policy has decreased the federal school choice reform effort. NCLB has yet to undergo official policy changes through Congressional reauthorization, but the U.S. Department of Education, under two presidential administrations, has modified elements of the public school choice provision. Between the 2005-2006 and 2008-2009 school years, the U.S. Department of Education approved pilot programs in 12 states to provide supplemental educational services to students in the first year of school improvement. In effect, the pilot program eliminated the one year lag between implementing public school choice and then supplemental educational services by allowing schools in school improvement to offer the two components at the same time. Under the Obama administration, the U.S. Department of Education granted a number of states waivers on a variety of the NCLB provisions. For example, Massachusetts received a waiver from the school choice provision and will not have to offer school choice options to students in schools identified for improvement beginning in the 2012-13 school year (Pakos, 2012). The Center on Education Policy identified an additional five states (Connecticut, Mississippi, Nevada, Virginia, and Washington) that will no longer require public school choice for schools in school improvement (CEP, 2012). Without strong evidence that federal school choice policy leads to improvements in student performance, it is challenging to make the case that the policy should be expanded.

Research Implications

The empirical research base on school choice policies is robust and continues to grow, particularly in the areas of charter schools and school vouchers. The number of studies on open enrollment intra- and inter-district public school choice policies, such as NCLB public school choice, are more limited, yet these are the types of school choice initiatives that have the potential to drastically expand the school choice landscape for students, schools, and school districts. Additional research should continue to review the design and details of existing school choice policies and examine their impact on student participation, the types of schools students are more likely to select, and performance outcomes. This type of research will shed light on whether there are specific design details in managed school choice policies that have the greatest potential to impact student performance. Further research could examine different geographic regions to simulate the impact of expanded intra- and inter-district choice options. There are school districts where intra-district school choice options may not provide very many high quality options. If simulations indicate that school choice would improve student performance by expanding options beyond district boundaries, what types of incentives or resources are needed to encourage families to participate?

An additional line of research that underlies the theory behind NCLB public school choice, but has not been empirically assessed and was out of the scope of this dissertation, is whether intra-district school choice spurs low-performing schools to improve. Competitive effects research looking at whether the presence of charter schools has any effect on traditional public schools has demonstrated mixed results, but in many cases charter schools do not represent a large enough market share to pose a true threat to traditional public schools. Intra- and inter-district school choice policies could potentially have more of an impact since more

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students participate. However, if schools that lose students to choice are not presented with any additional sanctions, the impact of choice may have a limited impact on improving lower performing schools within the school system.

Finally, this dissertation was limited by not having access to information about students who actually participated in NCLB public school choice. Now that the federal school choice policy is more than a decade old, there may be large school districts with a good amount of data on students who participated. Researchers should seek out this data to look more closely at the impact of NCLB public school choice on students over longer periods of time. NCLB public school choice was a significant piece of federal legislation and there are still elements of its impact on students that should be better understood.

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