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The Influence Of The School Choice Provision, Within The No Child Left Behind Legislation, On The Academic Achievement Of Studen

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THE INFLUENCE OF THE SCHOOL CHOICE PROVISION, WITHIN THE *NO CHILD LEFT BEHIND* LEGISLATION, ON THE ACADEMIC ACHIEVEMENT OF STUDENTS AND ON THE DEMOGRAPHIC COMPOSITION OF TITLE I SCHOOLS IN COLLIER COUNTY, FLORIDA

by

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ABSTRACT

The *No Child Left Behind* (NCLB) Act of 2001, Public Law 107-110 (U.S. Congress), was passed by Congress in response to perceived failure of the public school system to effectively educate students, particularly disadvantaged students in the United States. The relationship of NCLB school choice to student achievement has not been clearly established. This causal-comparative study examined the following: (a) FCAT mathematics and reading achievement gains of targeted fourth through eighth grade NCLB choice students and a comparison group of eligible non-choosers with matching demographic characteristics; (b) the pre-test academic ability levels of NCLB choice students in fourth grade through eighth grade as compared with the achievement levels of eligible non-choosers, and; (c) differences in the ethnic and socioeconomic characteristics of choice students versus eligible non-choosers in kindergarten through eighth grade, and the impact of those differences on the demographic composition of individual schools. Differences in the achievement gains and in the pre-test achievement levels of NCLB choice students and the comparison groups were not statistically significant. NCLB choice students tended to have different ethnic and socioeconomic characteristics from their non-choosing peers. The effect of NCLB choice on Title I students and schools was discussed, and NCLB choice implementation issues were identified.

This dissertation is dedicated to my parents, Fred and Nita Jones, whose unwavering love and support have given me the foundation and the courage to strive for my goals; to my brothers and sisters: Jim Kirkland and Jan Chen; Vivian Grace and David Vogias; and to my favorite nephew, Dustin Elison.

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LIST OF ACRONYMS/ABBREVIATIONS

AFT	American Federation of Teachers
ANOVA	Analysis of Variance
AYP	Adequate Yearly Progress
BEBR	Bureau of Economic and Business Research
CCPS	Collier County Public Schools
DSS	Developmental Scale Score
ELL	English Language Learner
FCAT SSS	Florida Comprehensive Assessment Test Sunshine State Standards
FLDOE	Florida Department of Education
HumRRO	Human Resources Research Organization
ITBS	Iowa Test of Basic Skills
LEA	Local Education Agency
MANCOVA	Multivariate Analysis of Covariance
MANOVA	Multivariate Analysis of Variance
MIPR	Manhattan Institute of Policy Research
NAEP	National Assessment of Educational Progress
NAGB	National Assessment Governing Board
NCES	National Center for Educational Statistics
NCLB	No Child Left Behind
TPPI	Texas Public Policy Institute

SINI	School in Need of Improvement
USDOE	United States Department of Education

CHAPTER ONE: PROBLEM STATEMENT AND DESIGN COMPONENTS

Introduction

The *No Child Left Behind* (NCLB) Act of 2001, Public Law 107-110, (U.S. Congress) was passed by Congress in response to perceived failure of the public school system to effectively educate students, particularly disadvantaged students in the United States (Darling-Hammond, 2004; Gay, 2007; Lewis, 2003; Sugarman, 2004; Walberg, 2007; Witte, 2000). NCLB required that schools receiving federal Title I funds that did not made state-defined adequate yearly progress (AYP) for two consecutive school years must be identified as needing improvement before the beginning of the next school year (U.S. Department of Education [USDOE], n.d.e). For schools that did not meet the state-defined standards, NCLB required school districts to fulfill three conditions in order to receive federal Title I funds. These conditions were as follows: (a) Students attending these schools had to be provided with the option of attending an alternative public school, (b) parents had to be notified of the choice option no later than the first day of school following the year for which their school was identified for improvement, and (c) the school district was required to provide transportation to the school of choice (USDOE, n.d.c).

The implementation of NCLB school choice took place in an atmosphere that was politically charged with proponents of choice theory pointing to the superior performance of private school students over public school students as found by Coleman, Hoffer, and Kilgore (1982) and Lee and Bryk (1993). School

choice advocates claimed that public schools were performing poorly and argued that removing government bureaucracy from schools and applying a market economy instead would result in greater efficiency (Belfield & Levin, 2005; Chubb & Moe, 1990; Henig, 1995; Gill, Timpane, Ross, & Brewer, 2001; Jeynes, 2000; Lambdin & Mintrom, 1997). Proponents further cited equity advantages to be gained from breaking the virtual monopoly of neighborhood schools for families who could not afford to attend private schools or move to more affluent areas (Betebenner, Howe, & Foster, 2005; Betts & Loveless, 2005; Gill et al.; Greene, 2000; Hoxby, 2002a; Smrckar & Goldring, 1999; Viteritti, 2002).

Conversely, opponents of school choice claimed that public schools were performing as well as, or better than, private schools when differences in student background characteristics were accounted for (Bracey, 2002; 2004; Lubienski & Lubienski, 2006; Nelson Rosenberg & Van Meter, 2004). Opponents of choice argued that equity problems might be exacerbated as the choice schools drew the most able students in a process that was referred to as *skimming* (Carnoy, 2001; Cobb & Glass, 1999; Gay, 2007; Howe, Eisenhart & Betebenner, 2002; Okpala, Bell, & Tuprah, 2007; Walsh, 2005). They argued that this skimming would result in increased ethnic, socioeconomic and ability stratification in schools, having a negative effect on the non-choosers (Gorard, Taylor & Fitz, 2002). Opponents also argued that expanded school choice would result in inefficiency from duplication of efforts and from elevated costs of information dissemination and transportation (Chemsak, 2008; Goldhaber, Guin, Henig, Hess

& Weiss, 2005). They asserted that the better approach would be to concentrate on improving the quality of all schools (Darling-Hammond, 2004; Gay, 2007).

Statement of the Problem

School choice was a major NCLB strategy for improving schools and improving student achievement (USDOE, n.d.c.), but the relationship between NCLB school choice and student achievement has not been clearly established (Berends, Watral, Teasley, & Nicotera, 2006; Hassel, Terrell, Kain, & Zeibarth, 2007; Okpala et al., 2007; Walberg, 2007). Since the advent of the 2001 NCLB legislation, the opportunities for public school choice and the publicly funded costs associated with it began to increase (USDOE, n.d.b). During the 2006-2007 school year, almost 120,000 students took advantage of this option (USDOE, n.d.b, ¶4). In that same school year, 422 students from Collier County, Florida elementary and secondary schools attended an NCLB choice school. For the 2007-2008 school year, the number of Collier County students attending an NCLB choice school increased to 673 students in kindergarten through grade 12 (Collier County Public Schools [CCPS], n.d).

The funds to support this endeavor were siphoned from Title I budgets. Each Local Education Agency (LEA) had to reserve an amount equal to 20% of its total Title I allocation to implement the LEA's public school choice plan (Florida Department of Education [FLDOE], n.d.d). Of this amount, a minimum amount equal to 5% of the total Title I budget had to be allocated to support the

costs of choice with transportation (FLDOE, n.d.d). This represented a significant investment in a strategy that had unknown effects in two areas of concern identified by researchers: the impact on the academic achievement of the choosers; and the possibility of increased ethnic, socioeconomic, and ability stratification among schools (Henig, 1999; Walberg, 2007; Walsh, 2005). An examination of NCLB school choice and student achievement can assist in determining whether the use of Title I funds for school choice was warranted.

Research Questions

The following questions guided this research:

1. What differences are there in FCAT mathematics and reading development scale scores of students in grades four through eight who exercised NCLB school choice to attend non-Title I schools versus students who remained in Title I schools designated by NCLB as needing improvement?

2. What differences are there in the academic achievement levels on the FCAT mathematics and reading developmental scale scores of students in grades four through eight who exercised the NCLB public school choice option versus eligible non-choosers who remained in their geographically zoned Title I schools?

3. What differences are there in the ethnicity and socioeconomic status of students in kindergarten through grade eight who exercised the NCLB public school choice option versus eligible non-choosers from their geographically zoned Title I schools?

Definition of Terms

Adequate Yearly Progress (AYP) – "State-defined measurements of progress toward academic achievement standards in language arts/reading and mathematics. AYP measurements target the performance and participation of various subgroups based on race/ethnicity, economic status, educational disability, and English proficiency. AYP requires that a certain percentage of students in each subgroup score 'at grade level' on the FCAT in reading, writing, and mathematics. If even one of the groups does not score at grade level, the entire school does not meet the AYP requirements for that year" (CCPS, 2009).

Choice school – A school that the State of Florida has not identified for improvement, corrective action, or restructuring (FLDOE, n.d.a).

Eligible non-choosers - Students who did not opt to leave a zoned, geographically assigned Title I school that was designated by NCLB as being a "School in Need of Improvement" (SINI).

Florida Comprehensive Assessment Tests - Sunshine State Standards (FCAT SSS) – Criterion-referenced tests that measure selected benchmarks from the Sunshine State Standards and that were used to calculate AYP (FLDOE, n.d.b.).

Developmental Scale Scores (DSS) – FCAT SSS mathematics and reading test scores that were based on a vertically aligned scale that was developed to track learning gains over time for students in grades 3 through 10. The scale ranges from 86 to 3008 points (FLDOE, 2007) and "third graders' scores will be on the lower end of the developmental scale while the scores of tenth graders will appear on the higher end" (Coxe, 2002, p.1).

English Language Learner (ELL) – An individual whose native language was a language other than English, and whose level of English language proficiency denied him or her the opportunity to learn successfully in classrooms where the language of instruction was English (FLDOE, 2007b).

Learning gain – "The degree of learning achieved by one student as compared to himself or herself in one year's worth of time. Florida DOE will determine a student's learning gain by comparing a student's FCAT [developmental scale] scores at the end of one year with the student's FCAT [developmental scale] scores at the end of the prior school year" (Florida House, 2001, p.4).

Lotteried-in students – Students who applied to an oversubscribed choice school and who were admitted based on a randomly assigned lottery number.

Lotteried-out students – Students who applied to an oversubscribed choice school but were denied admission based on a randomly assigned lottery number.

Lottery randomization school choice research design – A research design that capitalized on situations where there were more than twice as many applicants to choice schools as there were available seats, and random lottery numbers determined which students were selected to attend the choice school. The achievement of the choice applicants who ultimately attended the choice school was compared with the achievement of those who applied but were not eligible due to the randomly assigned lottery number.

NCLB School Choice – "Reflects each parent's preference to transfer their child from a Title I school that has been identified as in need of improvement to a school that has not been identified in need of improvement. These options may also include specialty schools, charter schools, and non-Title I public schools" (FLDOE, n.d.e).

Panel data set school choice research - Research studies that compared the achievement gains made by students or schools over time. (Yaffee, 2003).

School In Need of Improvement (SINI) – A Title I school identified as not making AYP for two or more consecutive years (FLDOE, n.d.a).

Selection bias – A major problem in social science research that was manifested in school choice research when individuals selected themselves for participation

in a group, causing a biased study sample if there were differences between these self-selectors and people in the general population (Sugarman & Kemerer, 1999).

Snapshot research – Research that examined cross-sectional data at one or more points in time (Wiersma, 2008).

Socioeconomic status – A categorical variable that was broadly defined in this study by students' eligibility for free or reduced price lunch.

Research Methodology

This study was a causal-comparative analysis that sought to identify effects associated with NCLB school choice in a large public school district by comparing the FCAT SSS mathematics and reading DSS scores and the demographic characteristics of CCPS students from existing groups. For Research Question 1, which examined students' gains on the FCAT mathematics and reading tests from 2007 to 2008, the comparison groups consisted of: (a) Students in grades four through eight who exercised NCLB choice to leave Title I SINI schools for the 2007-2008 school year; and (b) an equal number of eligible non-choosers who remained in their geographically assigned Title I schools and were matched with the NCLB choice students based on grade level, zoned school, ethnicity, gender, socioeconomic status, ELL status, and learning disability status.

Research Question 2 addressed differences in the academic ability levels of NCLB choice students versus eligible non-choosers as defined by mean scores on spring 2007 FCAT mathematics and reading tests. The comparison groups for Research Question 2 were expanded to include all NCLB choice students in grades four through eight who elected a choice school beginning with the 2007-2008 school year, and all eligible non-choosers from the targeted grade levels. For Research Question 3, which assessed differences in the ethnic and socioeconomic characteristics, the comparison groups were further expanded to include students in kindergarten, first, second, and third grades.

Population

This study was conducted in Southwest Florida's Collier County Public School District (CCPS), which consisted of almost 42,000 students attending 28 elementary schools, 10 middle schools, 8 high schools, one K-8 school, 2 post-secondary technical centers, and 7 non-traditional alternative schools. Collier was one of the wealthiest counties in Florida. The Bureau of Economic and Business Research (BEBR) at the University of Florida indicated a per capita income that led the state from 2004 through 2008, the last year for which data were available (University of Florida BEBR, 2009). The distribution of this income tended to follow a geographic pattern, with a greater concentration of wealth in the coastal communities of Naples and Marco Island, where only 5.3% and 5.4% of the population, respectively, earned an income below the poverty level in 2007 (City-Data, n.d). By contrast, the inland areas had greater

concentrations of poverty, which reached the highest levels in the geographically isolated farming community of Immokalee, where 38.5% of the population earned an income below the poverty level in 2007 (City-Data), and the percentage of students who qualified for free or reduced lunch ranged from 87% to 97% (CCPS, n.d).

In order to be classified as a CCPS Title I school, at least 75% of enrolled students had to qualify for free or reduced lunch. During the two academic years for which data were collected, 14 CCPS schools met this criterion: 10 elementary schools, 2 middle schools, and 1 high school. All were designated as SINI schools whose students were therefore eligible for NCLB choice.

The accessible sample of students whose FCAT scores were used to analyze the relationship between academic achievement and NCLB choice consisted of two groups of 103 students who were in grades 4 through grade 8 during the 2007-2008 school year. The first group that was identified, referred to as the NCLB choice group, consisted of 103 students who exercised the option to attend a school other than their geographically zoned Title I SINI school beginning with the 2007-2008 academic year. The second group of students was then selected by identifying, for each member of the NCLB choice group, a student who remained in his or her geographically zoned Title I SINI school, and who had characteristics matching those of his or her counterpart in the NCLB choice group. The matching characteristics included grade level, gender,

ethnicity, socioeconomic status, and English Language Learner (ELL) status. Students' anonymity was protected; all students were identified by number only.

Data collection began with the grade 4 students because the FCAT tests were not administered until grade 3, so the grade 4 students were the first to have two consecutive years of scores. The study excluded students beyond grade 8 because the CCPS system had only one Title I high school, and the number of its students who opted for choice was fewer than four per grade level (CCPS). The study also excluded students from the CCPS choice database if they had not attended a Title I SINI school in the 2006-2007 school year. Students who were deselected on that basis had attended a non-Title I school, but later became eligible for NCLB choice because they were assigned to a Title I SINI for 2007-2008 based on change in residence, rezoning of school attendance boundaries, or a move to from the elementary school level to the middle school level.

Instrumentation

The outcome variables used to quantify academic achievement were measured by changes in students' FCAT-SSS mathematics and reading DSS scores from the spring of 2007 to the spring of 2008. The FCAT SSS developmental scale was specifically developed to reflect learning gains across grade levels on a criterion-referenced test (FLDOE, n.d.a). It provided the means of reporting student achievement on a single scale "that spans the entire range of student achievement for grades 3 through 10" (Human Resources

Research Organization [HumRRO], 2002, p. 1). Conversely, other measurement scales used to analyze learning gains, including the scale used by the State of Florida prior to 2002, reflected a student's relative standing rather than directly reporting that student's academic growth. In the HumRRO technical report on the development of FCAT vertical scaling, Hoffman, Wise and Thacker (2001) noted the following:

> Missing from the current reporting system is a direct estimate of the year-to-year growth for individual students. Certainly, a student's relative standing can be monitored with current data, that is, whether a student has maintained a Level 2 or a Level 3 score, etc. from year to year. On the other hand, there is no way to decipher the amount of achievement that students are gaining from one year to the next. A vertical linking of the grade-specific, operational scales is needed to create a means for more directly assessing achievement growth for individual students. Vertical linking provides the means for translating operational, grade-level test scores to a common measurement scale (p. 2).

As is typical in a developmental scale, the scores show larger increases at the lower levels and smaller increases at the higher levels (FLDOE, n.d.a).

Data Collection and Analysis

To determine whether there were significant differences in the achievement growth of NCLB choice students compared with the matching eligible non-choosers, the spring 2007 and 2008 FCAT SSS mathematics and reading DSS scores were collected from the CCPS intranet database and converted to z scores with a mean of zero and a standard deviation of 1. The conversion to z scores was necessary because multiple grade levels were used, and the relative value of gains in scores differed for each grade level. For

example, a reading score increase of 231 points in grade 4 was roughly equivalent to a 92-point increase in grade 8 (Educational Development Associates, n.d, p. 1).

After the mathematics and reading scores from spring 2007 and 2008 were converted to z scores using the appropriate grade-level means and standard deviations, they were analyzed using a Multivariate Analysis of Covariance (MANCOVA). The two dependent variables were the 2008 FCAT SSS mathematics and reading Z scores. The independent variable of interest was the students' transfer status: NCLB choice student versus eligible non chooser. Additional independent variables, including gender, ethnicity, and socioeconomic status were also analyzed. The 2007 FCAT SSS mathematics and reading Z scores were the covariates.

Next, differences between the academic ability levels of choice students and eligible non-choosers were compared in an effort to discover the relationship between NCLB choice and skimming that draws the most academically able students from Title I SINI schools**.** For this analysis, the entire CCPS database of students in grades 4 through 8 who had 2007 FCAT scores from Title 1 SINI schools was analyzed using a *t*–test and a Multivariate Analysis of Variance (MANOVA). Transfer status was the independent variable of interest; students assigned to each Title I SINI school were coded as NCLB choice students or eligible non-choosers. The dependent variables that quantified students' academic achievement levels were the 2007 FCAT SSS mathematics and

reading DSS scores. The dependent variables and additional independent variables, including the demographic characteristics of gender, ethnicity, and socioeconomic status were analyzed to identify any significant interaction effects between the demographic characteristics and the main effect of transfer status.

Finally, the ethnic and socioeconomic characteristics of NCLB choice students and eligible non choosers were examined to determine whether there were differences between the two groups that could indicate a relationship between NCLB choice and increased ethnic and socioeconomic stratification among schools. The comparison groups were expanded further to include in kindergarten, first, second, and third grade students assigned to Title I SINI schools. The number and percentage of K – 8 students district-wide who were eligible for school choice in each ethnic and socioeconomic group was identified. This was compared with the number and percentage of students in each ethnic and socioeconomic group who chose to transfer. This process was repeated at the school level by comparing the percentages of students from each ethnic and socioeconomic group who were assigned to each Title 1 SINI school with the number and percentage in each group who actually attended those schools.

Limitations and Delimitations

One limitation of the study was that selection bias could not be addressed by randomization because NCLB required school choice for all the eligible students who requested it and who could be placed in a choice school. A second limitation of the study is the lack of data on occupations and educational levels of

the parents, which have been associated with variations in student achievement (Blau & Duncan, 1967; Center for Education Reform, 2004; Sirin, 2005; White, 1982). Another limitation was the absence of academic achievement data for students in kindergarten through grade 2, who do not take the FCAT tests used in the study to quantify academic achievement.

A more unexpected limitation of the study occurred because the teachers' union and the school district administration became involved in a contentious dispute over salary in the 2007-2008 school year. The union called for teachers to *work to rule,* meaning that they were to work only the 7.5 hours per day required in their contract, and perform no extra duties. Teachers marched in protest lines at school board meetings, and they gathered in the parking lots to await their exact contractual arrival time before entering the school buildings. Faculty members who opted to participate in unpaid extra-curricular activities reported feeling pressured by their colleagues to discontinue. The annual district-wide Reading Symposium, which traditionally promoted the schools' literacy initiatives at a local shopping mall had to be cancelled, as were many events at the individual schools. The number of teachers actively involved in the protests diminished with time, but for a select few, it continued until the end of the school year. This dispute affected the usual activities of school personnel and it may have affected the quality of instruction. Furthermore, the possible effects of this dispute may have been different among the various schools within the district.

The delimitating factor was that the target sample consisted of students from a southern area of Florida characterized by a juxtaposition of wealth and poverty, and an area which had suburban and rural students, but no urban representation. Consequently, the results from this study cannot be presumed to be generalizable to students from other parts of the country, or to students with characteristics different from the students in the study.

Significance of the Study

This study contributed to the limited research on the relationship between NCLB-mandated school choice and student achievement, and to the broader relationship between public school choice and student achievement. For any program of school choice to be effective, parents and students must have accurate and meaningful information about the schools from which they may choose (Hastings & Weinstein, 2008; Howell, 2006; Lamdin & Mintrom, 1997; Okpala et al., 2007; Peterson, 2006). While NCLB required schools to publish reading and mathematics test score results for grades 3 through 8, and again in grade 10 in an effort to help parents distinguish between high and low performing schools, the NCLB formula for assessing these scores and achieving AYP amounted to a very broad, pass/fail instrument described by Peterson (2006) as one that "makes only crude distinctions between schools meeting performance benchmarks and schools not doing so" (p. 1).

Florida's A+ Accountability system, by contrast, divided schools into five different categories of achievement using the familiar A through F designations,

thus providing more specific information about student achievement in individual schools. In addition, the Florida school grading system took into account students' gain scores on a developmental scale, which indicated how much they had progressed from one year to the next. In contrast, this indicator of academic performance was virtually ignored by NCLB, which specified school performance criteria based on achievement *level* rather than *gains* (Peterson, 2006). This study was significant, therefore, because it provided an analysis of school choice in an environment where one of the key requirements of effective choice programs was met: that of providing meaningful information to families about the relative achievement levels of schools.

Organization of the Study

Chapter 1 provides an introduction to the dissertation. It includes the background of the study, a statement of the problem, the research questions, definition of terms, limitations and delimitations of the study, and the significance of the study. Chapter 2 provides a review of the literature on school choice. Chapter 3 describes the sample used in the study, the reliability of the instrument used to measure the student achievement gains, and the data analysis procedures. Chapter 4 provides the data results and analysis. Chapter 5 includes a discussion of the findings and recommendations for future research.

CHAPTER TWO: REVIEW OF THE LITERATURE

Introduction

School choice issues permeated national discussions of school reform in the years surrounding the turn of the century because choice implied the promise of increased school quality (Chubb & Moe, 1990; Gill et al., 2001; Jeynes, 2000; Lamdin & Mintrom, 1997; Okpala et al., 2007; Sugarman, 2004). The underlying assumption was that the educational program was inadequate in the schools whose students performed poorly on standardized tests, and that competition, or a market economy among schools, would result in improved educational outcomes (Betts & Loveless, 2005; Chubb & Moe; Friedman, 1955, 1962; Gerwitz, Ball & Rowe, 1995; Sweetland, 2002).

The issue of school choice in America has always been politically charged (Carnoy, Mischel & Rothstein, 2005; Cookson, 1994; Gill, et al., 2001; Lubienski, Weitzel, & Lubienski, 2009). Supporters believed market competition would improve student achievement, motivate poor schools to improve, and provide an alternative for low-income students trapped in ineffective and mismanaged schools (Cookson; Gill et al.; Lambdin & Mintrom, 1997). Opponents of school choice believed it would drain support from the schools that most needed it, and would be exercised by only a limited number of parents, resulting in a negative effect on the students who remained in the schools less chosen (Gorard, et al., 2002; Sugarman & Kemerer, 1999; Walsh, 2005). Despite the existence of numerous studies of school choice in its various forms, most of the literature on

the relationship between student achievement and public school choice cited the need for additional empirical evidence because the results to date have been limited, conflicting and ambiguous, with no consensus on any major aspect of the school choice debate (Ballou, Teasley & Zeidner, 2006; Berends et al., 2006; Hassel, 2005; Hassel et al., 2007; Okpala et al., 2007; Walberg, 2007).

Since the implementation of NCLB sanctions mandating school choice, only two published studies examining the relationship of academic achievement to NCLB choice in traditional, non-charter public schools were identified (McCombs, 2007; Okpala et al., 2007). McCombs used student-level elementary and middle school data in her study and did not find evidence of improved student achievement for choice students, but neither was she able to reject the null hypothesis that choice did not have an impact on student achievement. Okpala et al. used school-level data in their study of NCLB school choice and found significantly higher achievement on end-of-grade reading and math tests in selected North Carolina middle schools of choice than in traditional middle schools with similar demographic characteristics.

Due to the limited research on NCLB school choice, most of the relevant literature was drawn from studies of student achievement in voucher programs, which were programs that provided scholarships to public school students to assist with private school tuition (Gill et al., 2001; Greene, 2000; Kahlenberg, 2003), and from student achievement in charter school programs (Hassel, 2005; Okpala, et al., 2007; Walberg, 2007). Studies of the voucher programs and the

public charter schools have provided conflicting results. In addition, there was no consensus among researchers regarding the best research design for examining school choice (Ballou, et al., 2006; Bifulco & Ladd, 2006; Bracey, 2004; Braun, Jenkins & Grigg; 2006; Greene, Forster, & Winters, 2003; Hoxby & Murarka, 2007; Lubienski & Lubienski, 2006; Lubienski et al., 2009). There was debate regarding every salient issue related to school choice, including its impact on student achievement for the students who opted for a choice school, its impact on students and schools that were not chosen, and the best method for answering the questions about the controversial concept of increasing the alternatives to traditional public schools.

Theoretical Foundations

The theoretical framework for school choice was based on the application of a market economy to schools and on the assumption that choice would produce competition that will force underperforming schools to either improve or close completely (Chubb & Moe, 1990; Garn & Cobb, 2008). Milton Friedman (1955, 1962) was an early advocate for school choice in the form of vouchers, arguing that the government should not perform the dual functions of financing and providing education. He proposed a system in which the government would provide subsidies to families to purchase a specified minimum level of education per child per year from approved educational providers. Under his proposed system, parents would be free to spend their voucher amount and any additional money they chose on their children's education, and the government's role would

be restricted to upholding minimum standards. Friedman (1962) contended that the system of educational vouchers would create competition among schools and therefore promote the kind of innovative practices that are discouraged by the conformity required in bureaucratically run government schools.

The equity argument was further advanced by Coons and Sugarman (1978), who wrote that "society's objective is to give families of all incomes as nearly equal access to participating schools as possible" (p. 190). As a result, they proposed a system significantly more complex than Friedman's, in which voucher amounts would differ based on the tuition charges of the school, and on family income and family willingness to invest in education (as cited in Lamdin & Mintrom, 1997). Coons and Sugarman also noted that the availability of high-quality information about the performance of schools was a prerequisite for making meaningful choices among them.

For political scientists Chubb and Moe (1990), the perceived inability of contemporary public schools to function effectively was the central argument in favor of school choice. They analyzed the large data set from the 1966 Coleman, et al. study comparing public and private school achievement and they concluded that school autonomy represented the single most important ingredient of school success. Chubb and Moe asserted that bureaucratic governance of schools was counterproductive because educators spent an inordinate amount of time satisfying the mandates of the bureaucracy rather than focusing on improving school quality. They argued that that democratic

governance and bureaucracy go hand in hand, that they work together *against* autonomy; therefore they work against the effectiveness of schools. Chubb and Moe proposed that control of schools should be taken from the democratically governed bureaucracies and vested directly with schools, parents and students. Although Chubb and Moe's theoretical assumptions and their empirical studies have been criticized (Henig, 1995; Lubienski & Lubienski, 2006), their work has remained influential in school choice policy debates (Jeynes, 2000; Lamdin & Mintrom, 1997).

NCLB and School Choice Theory

The central theoretical arguments in favor of school choice were developed by positing private schools as the alternatives to public schools. NCLB choice, however**,** did not involve private schools; instead it offered choice among public schools, including publicly funded charter schools (USDOE, n.d.d). Consequently, NCLB choice did not correlate precisely with the arguments used in developing the historical theoretical foundations of school choice. Despite the lack of a perfect correlation between historical choice theory arguments and school choice as it existed under NCLB guidelines, two of the basic tenets of choice theory were satisfied by NCLB choice with regard to non-charter public schools. First, the market economy concept applied because funding follows the students. Second, the mandatory assignment of students to geographically zoned schools was eliminated (USDOE, n.d.b). When charter schools were chosen, reduced bureaucracy, which was a third tenet of choice theory applied

as well (Chubb & Moe, 1992; Gill et al., 2001, Lambdin & Mintrom, 1997, Walberg, 2007).

School choice was one of the four key elements or *four pillars* of NCLB legislation (USDOE, n.d.c., ¶5). These four pillars included: (a) stronger accountability for results on standardized tests, (b) an emphasis on the use of research-based educational instructional programs and teaching methods, (c) more flexibility for states and communities in the way they use their federal funds, and (d) more choices for parents. These first three pillars involved strategies for improving overall student achievement. The fourth pillar, more choices for parents, provided what McCombs (2007) referred to as an *escape valve* for the children whose schools did not meet standards despite the strategies encompassed in the first three pillars. NCLB legislation indicated that the purpose of the choice component was to provide the option of a quality education for individual students. Choice theory proponents would argue that it served the additional purpose of forcing ineffective schools to respond to the market pressures of declining enrollment (Belfield & Levin, 2005; Betts, 2005; Greene, 2001; Sugarman, 2004).

School Choice Research Designs

The identified school choice studies could be grouped into two categories: (a) Panel data set research that compared achievement gains made by students or schools over time, and (b) snapshot research that examined achievement levels of students in different types of schools at a one or more points in time.

The panel set research studies could be further subdivided based on the type of comparison groups used to analyze student achievement gains. These included comparisons of the achievement gains of students or schools with matching demographic characteristics, comparisons of the achievement gains of a single group of students when they were in a choice school versus the gains they made when they were in a geographically zoned school, and comparisons of the achievement gains of lotteried-in students and were accepted to a choice school with the achievement gains of lotteried-out students who applied but were not admitted due to a randomly assigned number.

Each design had proponents and detractors, with researchers sometimes advocating for their design of choice while criticizing alternative designs. In the case of the panel data designs with lottery-randomization control groups and the snapshot designs, the results pointed in opposing directions, with lottery randomization studies indicating improved achievement in choice schools (Hoxby & Murarka, 2007; Hoxby & Rockoff, 2005) while national data set studies indicated lagging achievement in choice schools (Braun et al., 2006; Lubienski & Lubienski, 2004, 2006; Nelson et al., 2004). The remaining studies revealed mixed results, with some indicating a choice school advantage (Greene, Peterson, & Du, 1998; Mayer, Peterson, Myers, Tuttle & Howell, 2002; Okpala et al., 2007); one noting a consistent traditional public school advantage (Bifulco & Ladd, 2006) and still others indicating no significant difference between traditional public schools and choice schools (Howell, Wolf, Peterson, &

Campbell, 2000; Kreuger & Zhu, 2004; McCombs, 2007; Witte, 1998; Zimmer & Buddin, 2005). The remaining studies yielded results that were contradictory based on either the type of choice schools that were studied (Gronberg & Janssen, 2001), the length of time students spent in choice schools (Booker, Gilpatric, Gronberg, & Jansen, 2004; Hanushek, Kain, & Rivkin, 2002; Solmon, Paark & Garcia, 2001; Sass; 2006), or the sample targeted for data analysis (Ballou et al., 2006).

Voucher School Research

Much early research on public school choice examined voucher school programs, and the studies yielded contradictory results even when different groups of qualified researchers examined the same data set (Gill et al., 2001). Some researchers found improved achievement for voucher students (Greene et al., 1998; Howell et al., 2000; Peterson & Howell; 2003) while others found the achievement of voucher students equivalent to that of their counterparts in traditional public schools (Kreuger & Zhu, 2004; Lubienski & Lubienski, 2006; MPR, 2000; Witte, 1998).

One of the earliest credible voucher programs was the Milwaukee voucher experiment, which began in 1991 (Witte, 1998). The resulting analyses of the program were perhaps indicative of the conflicting findings on the impact of vouchers on student achievement. In this program, the number of vouchers was initially 1% of the total enrollment in Milwaukee public schools, only non-sectarian schools were included, and only 341 students participated in the first year of

implementation. At the conclusion of the 5-year period for which his evaluation was commissioned, Witte compared the students in the voucher program with a group of Milwaukee public school students, controlling for background characteristics, and found no consistent difference in students' achievement in reading or math.

The data were subsequently reevaluated by Greene et al. (1998) using a different comparison group for the voucher students: students who had applied for vouchers and had been unable to use them due to lack of space in a participating school, or *lotteried-out* students. Greene et al. argued that this targeted group of students was more appropriate comparison group because it created a randomization effect among all voucher choosers, therefore avoiding the problem of selection bias, or the potential bias caused by the possibility that students and families who self-select for a voucher or private school program may have different unobservable characteristics, such as motivation, from students who do not. The change in the comparison group used by Greene et al. yielded different results from Witte's (1998); they found that voucher students' achievement was significantly higher in both reading and math than was the achievement of the lotteried-out students who were unable to use their vouchers.

The data were then examined again by Rouse (1998), who used both the lottery-randomization comparison group and statistical controls. Rouse found significantly smaller gains for voucher school students in reading than did Greene et al. (1998), but she found math gains similar to theirs. However, Rouse noted

the large attrition rate and speculated that the generalizability of the study was suspect since the students who struggled in the private schools may have been the ones to drop out of the program, leaving only those students who were performing well as members of the voucher school group. Indeed, all the researchers (Greene et al.; Rouse; Witte, 1998) noted that their results had limited implications with regard to the broader debate on vouchers and school choice because of the low confidence level of the study, the high attrition rate, and the limited number of students who participated in the testing process.

Forming a comparison group that consisted of voucher applicants whose lottery numbers prevented them from attending a choice school became the standard in later evaluations of voucher programs in Dayton, Ohio; Washington DC; and Charlotte, North Carolina (Howell et al., 2000), and in New York City (Mayer, et al., 2002). The initial evaluations of voucher experiments in each of these cities indicated no statistically significant difference in achievement between the lotteried-in and lotteried-out groups on the Iowa Test of Basic Skills (ITBS). However, when the results were disaggregated by ethnicity, African American voucher students scored higher compared to their counterparts in the comparison group of lotteried-out students (Howell et al.; Mayer et al.). While increased achievement among African Americans was found at a statistically significant level in all cities except Dayton, there were differences in the data and the results in the various locations. In Washington DC, the improved achievement among African American students did not appear until after

students had spent two years in the voucher program, but it was the only city in which the private school advantage was consistent across grade levels. In Charlotte, both reading and math ITBS scores were higher for African American students after only one year, but grade level results were not reported (Howell et al.).

Subsequent analyses of the data from the New York City voucher program, however, indicated that the finding of increased achievement among African American students was inconclusive and should be considered with caution (Krueger & Zhu, 2004; Mayer et al., 2002). After the first two years of the program, the original researchers had urged caution in attributing significance to the achievement differential among African American students because, when the scores were disaggregated by grade level, the increased achievement was found to be driven entirely by one grade level cohort, with no measurable difference attributable to students in the other grade levels (Mayer et al.). However, after three years in the private school, the researchers found that the African American advantage leveled out and became consistent across grade levels (Myers & Mayer, 2003).

In a subsequent review of the data, Kreuger and Zhu (2004) discovered an error in the formula for weighting of scores. Students without baseline data, primarily kindergarten students, were excluded from the calculations and there was no corresponding adjustment in the weighting formula to compensate for their exclusion. As a result of Krueger and Zhu's work, two of the original

researchers, Myers and Mayer (2003), revised their formulas and the new calculations revealed a weaker correlation between voucher students and ITBS achievement gains.

A second factor that affected the results of New York City voucher experiment study was the method of classifying students' race. The original race classification was based only on the race of the mother (Mayer et al., 2002). Krueger and Zhu (2004) found that when the father's race was also used to classify students as African American, the achievement gains were diluted even further. It should be noted that two of the initial researchers, Myers and Mayer (2003), responded to Krueger and Zhu's re-evaluation by noting the weaker correlation and advising caution in attributing significance to the findings. Conversely, their fellow researchers, Peterson and Howell (2003), wrote the following:

> Over the past year, we have identified numerous errors in Krueger and Zhu's (KZs) original paper and in their rejoinder, some of which they have corrected. Pointing out errors that KZ have subsequently corrected would only cloud the issue at stake in this exchange—namely, whether African Americans who switched from public to private schools in New York City posted positive test score gains. The overwhelming weight of the evidence suggests that in fact, they did (p. 60).

The different opinions of the various researchers, even when using the same data set, substantiated the assertions by Gill et al. (2001), Sugarman (2004), Hassel (2005), and Okpala et al. (2007) that the findings on the student achievement and school vouchers were conflicting and inconclusive.

Charter School Research

Since 1998, the literature on school choice focused less on voucher programs and more on charter schools, which grew in number dramatically (Hassel, 2005; Hoxby & Rockoff, 2005; Walberg, 2007). In Florida alone, the number of public charter schools increased from 5 in 1996 to 358 in the 2007-2008 school year (FLDOE, n.d.e). The results from charter school studies were contradictory, with researchers differing not only with regard to their findings, but also differing with regard to the best research design, as was the case with voucher programs.

Several studies found achievement in traditional public schools higher than in public charter schools (Bifulco & Ladd, 2006; Braun, et al., 2006; Lubienski & Lubienski, 2006; Nelson, et al., 2004; Robelin, 2008). A 2005 RAND study found no difference in student achievement between the two types of schools (Zimmer & Buddin). In contrast, other researchers found that students in charter schools outperformed students in traditional public schools (Hoxby & Murarka, 2007; Hoxby & Rockoff, 2005; Greene, 2000).

Still others found that charter school students lagged behind their traditional public school peers for periods of three to six years, when the gap between the two either disappeared, or the charter students began to outperform the traditional school students (Booker et al., 2004; Hanushek et al., 2002; Sass, 2006). Other researchers found that the performance of charter students relative to traditional school students varied greatly, sometimes with a charter school

advantage and other times with a traditional school advantage (Greene et al., 2003; Hassel, 2005; Solmon et al., 2001).

One of the earliest studies of charter schools was the Gronberg and Janssen (2001) Texas Public Policy Institute (TPPI) examination of charter and traditional public school students' scores on the Texas Assessment of Academic Skills between 1997 and 2000. Because Texas law established a distinction between charters serving at-risk students and other charter schools, TPPI researchers Gronberg and Jansen analyzed the two types of charter schools separately. They used a panel data set research design and reported their results in terms of gains on the Texas Learning Index. They controlled for selection bias by using school-level prior achievement scores to account for pre-existing differences between charter and traditional public school students. They then compared the variation from one year to the next in order to evaluate the achievement of students who switched from public to charter schools. TPPI researchers found that the at-risk charter students outperformed at-risk traditional public school students, but the non at-risk charter students performed worse than comparable public school students. They then conducted additional analyses of the data and found the newness of the charter schools to be a factor. First, they noted that continuing charters in their second or third year outperformed charters that were in their first year of operation. Second, they found that charter students' academic achievement was lowest in their first year in the charter, but that it improved in subsequent years. This finding of weaker academic

achievement in students' first year at a charter school was consistent with research indicating that student mobility had a negative effect on academic achievement (Pribesh & Downey, 1999; Swanson & Schneider, 1999).

Four additional studies yielded similar results with regard to the early years students spent in charter schools, but found that charter school student achievement improved over time until it equaled or exceeded the achievement of non-charter public school students. A study of Arizona charter schools by Solmon, Paark and Garcia (2001) and a study of Texas charter schools by Hanushek et al. (2002) found that students in their first two years at a charter school scored lower than their non-charter public school peers, but they found that by the third year, there was no difference between the achievement of the charter students and non-charter public school students. Still later, Booker, Gilpatric, Gronberg, and Jansen, (2004) found in a study of Texas charter schools that after a period of six years, the achievement of charter school students exceeded that of their traditional public school counterparts. This finding was corroborated by Sass' (2006) study of charter school student achievement in Florida, which indicated that, by the fifth year, Florida charter students' scores were equal to public school students' scores in math, but were higher in reading.

By contrast, Bifulco and Ladd's (2006), analysis of charter schools in North Carolina indicated lower achievement among charter school students even after five years. In an analysis of achievement in Los Angeles and San Diego,

Zimmer and Buddin (2005) found no statistically significant differences between charter and non-charter public school achievement.

Ballou et al. (2006) examined charter schools in Idaho, and argued for a panel data set research design that measured gains, but they did not agree with the model that measured student-level data for only those students observed in both types of schools. They noted that using this model to control for student achievement limited the study sample to only those students who moved back and forth between public and charter schools, stating that "just as charter school students may be atypical of the total student population, so the students who move back and forth between charter and traditional public schools may be a nonrepresentative subset of all those who enroll in charter schools" ¶2. Ballou et al. analyzed student achievement data two times: once using the student-level data of students who switched from non-charter schools to charter schools, and again analyzing school-level gains. They found that charter school achievement was superior when the model analyzing student-level data was used, but when school-level data were used, there was no significant difference between groups.

Hoxby and Rockoff (2005) chose the panel data set research model to analyze student gains over time, but they used the lottery randomization comparison groups to study charter school student achievement on the ITBS in Chicago. They compared the achievement of lotteried-in students who attended oversubscribed charter schools with the achievement of students who had applied to attend the charter schools but were unable to do so because of a

randomly assigned lottery number. Unlike previous studies of charter schools, Hoxby and Rockoff found "clear positive effects of attending a charter school on the math and reading test scores of students who enter charter schools in kindergarten through 5th grade" (p. 7), noting that "students in charter schools outperformed a comparable group of lotteried-out students by 5 to 6 percentile points in math and about 5 percentile points in reading" (p. 6). They noted that their research yielded greater gains for charter students than previous research, which they attributed to a superior research design.

> Research on charter schools, like the schools themselves is fairly new. We are not aware of any studies that use lotteries to isolate the effects of attending a charter school. Standard value-added analyses, which are often used to evaluate charter schools, rely entirely on an unusual group of students who switch from regular public schools to charter schools late in their elementary-school careers. Our analysis confirms that estimates of the effects of attending a charter school that rely on this peculiar group of students differ dramatically from estimates that are representative of students who apply to charter schools (p. 7).

Hoxby and Rockoff (2005) hypothesized that the differences between their results and previous studies probably stemmed from the tendency of parents to move children from one elementary school to another only if they were struggling academically, and argued that randomization provided estimates of achievement that were "inherently better than those based on standard gains analysis" (p. 7).

Subsequently, Hoxby and Murarka (2007) evaluated New York City's charter schools in what they described as "the largest lottery-based evaluation of charter schools to date" (p. 9). They first compared the demographic and

program eligibility characteristics of lotteried-in students with those of the lotteried-out students, and found no significant differences in the student characteristics. Hoxby and Murarka then used student-level state test scores from the 2000-2001 school year to the 2005-2006 school year and found that New York City's charter schools "raised their 3rd through 8th graders' math achievement by 0.09 of a standard deviation and reading achievement by 0.04 of a standard deviation compared with what would have happened had they remained in traditional public schools" (p. 5). In contrast with the voucher experiment results, they found "no evidence that the improvement in achievement differs between boys and girls or between blacks and Hispanics" (p. 6). In contrast with other charter school studies, they found no differences in achievement between the initial year and subsequent years when they controlled for school policies that provided for a longer school day and a longer school year.

Ballou et al. (2006) disagreed with Hoxby and Rockoff's (2005) assessment of the best research design, noting that lottery randomization studies were limited to those charter schools that were so oversubscribed as to have waiting lists long enough to support, not only a group of lotteried-in students who were able to attend the charter school, but also a comparison group with an equal number of lotteried-out students. Ballou et al. argued that such charter schools would seem to be among the very best, and it would be surprising if achievement was not greater in these schools when compared with traditional schools.

Lubienski, Weitzel, and Lubienski (2009) also questioned the generalizabiltiy and reliability of the lottery randomization studies conducted by researchers of achievement in both charter and voucher schools. They argued that, "while randomization models can make significant contributions in some circumstances, there are also substantial problems with randomized models when employed with real students and schools" (p. 175). With regard to generalizability, Lubienski et al. stated that the act of applying for a voucher implied a level of academic motivation that may not exist in the general population of students and families, thus indicating that any differences in achievement might not transfer to the general public. They also echoed the argument of Ballou et al. (2006) that such studies involved a very limited number of choice school and public schools. Lubienski et al. further stated that the public schools in these studies were "by no means representative of public schools in general. They have essentially been identified as failing schools by parents who choose to leave them for what are presumably higher performing private schools" (p. 178).

Lubienski et al. (2009) asserted that the strength of the lottery-randomization model was what they considered the "overstated claim" (p. 178) of school choice advocates that this research design controlled naturally for selection bias. They argued that controlling for the selection bias of students may have been countered by selection bias at the school level, since the students in the studies had to be accepted by the receiving schools. They further

noted that a large number of students whose lottery numbers entitled them to enrollment in a choice school did not take advantage of the opportunity, which raises the possibility that the students who did attend a choice school were more motivated and/or more financially able to do so.

An alternative model for assessing the effectiveness of charter schools involved analyzing the large national data set provided by National Assessment of Educational Progress (NAEP). In 2002, the National Assessment Governing Board (NAGB) authorized a pilot study of 4th grade charter school students' achievement on the 2003 NAEP assessment (Smith, 2004). "The study included 150 charter schools and sampled 3,296 students in reading and 3,238 in mathematics" (Smith, ¶ 2).

The charter school student data from the 2003 NAEP assessment sparked a heated debate that was played out in, among other publications, the New York Times (Carnoy et al., 2005). In a study commissioned by the American Federation of Teachers (AFT), researchers Nelson, Rosenberg and Van Meter (2004) alleged that the NAGB had unnecessarily delayed release of the 2003 NAEP charter school report and had violated its own policies in order to structure the report in a way that would portray charter schools in a more favorable light.

> On March 5, 2004, NCES presented 2003 NAEP charter school results to NAGB members at a closed session (permitted by law) of their meeting. The release date for the NAEP Charter School Report was still listed as June 2004. By NAGB's May 2004 meeting, however, not only had the release date been postponed again, to December 2004, but the plan for the much-anticipated report had been fundamentally altered. Whereas official NAEP reports have always contained only descriptive data – which was the original plan for the NAEP Charter School Report, as well – NCES

> now proposed accompanying the charter school results with a special, sophisticated analysis that 'would try to determine whether the characteristics of charter schools, such as their governance, can explain any achievement differences from other public schools beyond those accounted for by characteristics of the students.
>
> Although NAGB approved the new plan for the NAEP Charter School Report, NAGB policy (1989, 1994) prohibits officially reporting NAEP scores with officially prepared "adjusted" or "predicted" results because they "would be subject to serious methodological and political challenges and would be contrary to the strong national commitment to encouraging high standards for all children" (p. i).

Nelson et al. (2004) stated that the AFT was frustrated by repeated NAEP delays in releasing data that were collected in 2003 and so the AFT "decided to try to unearth the basic NAEP charter school results" (p. ii).

> Embedded in the questionnaire that was administered to schools along with the 2003 NAEP math and reading tests in grades 4 and 8 is the question: What type of school is this? "Charter school" was one of the possible answers. This enabled the American Federation of Teachers (AFT) to comb through the Web-based NAEP Data Tool to identify NAEP's first-time, nationally representative sample of charter schools (grade 4) that is the subject of the inexplicably twice-delayed charter school report (p. ii).

After Nelson et al. (2004) had identified the charter school students, they analyzed the data for the AFT and concluded that in grade 4, even when socioeconomic status was considered, charter school students' reading and math achievement was lower than that of non-charter public school students, and the difference was statistically significant. For grade 8 students, the reading achievement of charter school students was significantly lower than that of non-charter public school students, but there was no statistically significant difference in reading achievement.

A summary report on the results of the study was published on the front page of the New York Times on August 17th 2004. This elicited a swift response from the Center for Education Reform and 31 members of the research community in the form of a full-page advertisement in the August 25, 2004 edition of the New York Times criticizing both the AFT study and the newspaper's reporting of it.

The Center for Education Reform advertisement (2004) indicated the following flaws in the Nelson et al. AFT study: (a) The NAEP data did not include sufficient information on family background characteristics; (b) the data included only a single point-in-time set of test scores, which cannot effectively measure school effectiveness in the absence of better family background information; (c) the data analysis was unsophisticated, considering differences in only one family background characteristic at a time, rather than analyzing the characteristics simultaneously.

The major weakness of the AFT study that was cited in the Center for Education Reform advertisement was corrected in the December 2004 National Center for Education Statistics (NCES) pilot study report because it included additional information on family background characteristics that was unavailable to the AFT researchers, who were limited to the use of the web-based NAEP Data Tool. The additional information did not, however, produce a different result with regard to mathematics achievement; the NCES study confirmed the AFT finding of lower mathematics achievement for charter school students.

With regard to reading achievement, though, the NCES (2004) research did not support the Nelson et al. (2004) finding of overall lower achievement for charter school students, noting that there was no statistically significant difference between students from the two types of schools. The NCES study indicated, further, that when the results were analyzed by ethnicity, the reading achievement of White, Black, and Hispanic charter school students was not statistically different from that of their traditional public school peers. The NCES study did, however, corroborate the Nelson et al. finding of lower reading scores for charter school students who were eligible for free or reduced priced lunch when compared with eligible students from traditional public schools.

Despite the similarities in the results of the 2004 AFT and NCES studies, the press releases from the National Assessment Governing Board (NAGB, 2004), which authorized the NCES report, contained no references to the shared findings of lower overall math achievement in charter schools and lower reading achievement for students who qualified for free or reduced lunch. Instead, the press releases listed only those results that indicated no statistical difference between charter and traditional public school performance.

> The mathematics and reading performance of White, Black, and Hispanic fourth graders in charter schools is not measurably different from the performance of fourth graders with similar racial/ethnic backgrounds in in other public schools (NAGB, 2004, ¶1).

The NAGB is described on its website as independent and bipartisan. Notably, by selecting for press release only those data that indicated charter performance was equivalent to non-charter public school performance, and

omitting all data that indicated lagging charter school performance, it could be inferred that AFT researchers Nelson, Rosenberg and Van Meter (2004) were justified in suggesting that the decisions of the NAGB were motivated by a bias in favor of charter schools.

The finding of lower 2003 NAEP mathematics achievement for charter school students that was omitted from NAGB press releases was corroborated, however, in a pair of 2006 studies (Braun et al., 2006; Lubienski & Lubienski, 2006). Both studies used the complete data set employed in the 2004 NCES study, and both used the hierarchical linear modeling for data analysis. More recently, Robelin (2008) noted that the 2007 NAEP data indicated the same negative achievement for charter school students.

Critics of the studies using the NAEP data sets continued to caution that such studies should not be used to make causal claims because the NAEP data provided only point-in-time information about the achievement of a different group of students in each testing cycle (Carnoy, et al., 2005; Henig, 2007). They argued that such studies were fundamentally flawed because they did not measure individual student learning gains over time, thus leaving the important variable of student prior achievement out of the analysis (Carnoy, et al.; Henig; Robelin, 2008).

Lubienski et al. (2009) countered that that, “despite its limitations, NAEP is the largest nationally representative assessment and provides a detailed picture of student achievement and demographics” (p. 172). Lubienski et al. advocated for the use of NAEP data as follows:

> The data, combined with multi-level modeling approaches, allow researchers to control for the individual and school-level factors known to influence student achievement and thereby produce a clear picture of how achievement varies within and between various types of schools. Although NAEP is limited in offering only a “snapshot” of student achievement at one point in time, it offers a high-resolution image of achievement in various types of schools and the factors related to student and school outcomes (p. 172).

Charter school studies, using panel data set analyses of the achievement gains for comparison groups with matching characteristics, panel data set gains comparisons using lottery randomization comparison groups, and snapshot national data set analysis have failed to provide a consensus on the impact of choice on student achievement. The merits of the individual research designs were contested by scholars, and, as indicated inTable 1, the results were contradictory.

Table 1

Summary of Charter School Achievement Studies

Author(s) Location Publication Date	Research Design and Comparison Groups	Findings
Panel Data Set Gains Analyses: Comparisons of Similar Students and/or Schools		
Gronberg & Janssen Texas 2001	Panel Data Set Comparison of gains made by same students when in charter schools vs. in traditional public schools At-risk and non at-risk charters analyzed separately	Charter school achievement gains higher for charters serving at-risk students; Public school achievement gains higher for non at-risk students; Charter achievement gains lowest in students' first year at charter; gains improved in subsequent years
Booker et al. Texas 2004	Panel Data Set Comparisons of gains made by charter students vs. non-charter public students with similar demographic characteristics	Charter students' achievement gains higher after six years in charter school
Zimmer & Buddin Multiple states 2006	Panel Data Set Comparison of gains made by charter students vs. non-charter public students	No statistically significant difference between charter and non-charter public school students' achievement gains
Sass Florida 2006	Panel Data Set Comparison of gains made by all Florida students in charter schools and non-charter public schools	After 5 years in charter schools, there was no statistically significant difference in mathematics gains; Higher reading gains for charter students
Bifulco & Ladd North Carolina 2006	Panel Data Set Comparison of gains made by charter vs. non-charter public students in schools with similar demographic characteristics	Non-charter public school students' achievement gains higher even after 6 years in charter school
Ballou et al. IDAHO 2006	Panel Data Set Comparison of student-level gains made by same students when in charter school vs. in non-charter public school and Comparison of school-level gains of students in charter schools vs. non-charter public schools	Analysis of student-level gains of students who switched from public to charter schools found greater gains when the students were in the charter school; Analysis of school-level data found no statistically significant difference between the gains of charter vs. non-charter public school students

Author(s) Location Publication Date	Research Design and Comparison Groups	Findings
Panel Data Gains Analyses: Lottery Randomization Comparison Groups		
Hoxby & Rockoff Multiple states 2005	Panel Data Set Comparison of lotteried-in vs. lotteried-out applicants to oversubscribed charter schools	Charter school achievement gains of lotteried-in students were significantly greater than those of lotteried-out students in both reading and mathematics
Hoxby & Murarka New York City 2007	Panel Data Set Comparison of lotteried-in vs. lotteried-out applicants to oversubscribed charter schools	Charter school achievement gains of lotteried-in students were significantly greater than those of lotteried-out students in both reading and mathematics
Snapshot Data Analyses		
NCES National 2004	Snapshot Data Comparison of NAEP achievement levels of students in charter vs. non-charter public schools with advanced statistical controls for demographic characteristics	Grade 4 mathematics achievement levels higher for non-charter public school students in mathematics; No statistically significant difference in reading achievement levels;
Braun et al. National 2006	Snapshot Data Comparison of NAEP achievement levels of students in charter vs. non-charter public schools with advanced statistical controls for demographic characteristics	Grade 4 achievement levels higher for non-charter public school students in mathematics
Lubienski & Lubienski National 2006	Snapshot Data Comparison of NAEP achievement levels of students in charter vs. non-charter public schools with advanced statistical controls for demographic characteristics	Grade 4 achievement levels higher for non-charter public school students in mathematics; No analysis of reading scores
Robelin National 2008	Snapshot Data Comparison of 2007 NAEP achievement levels of students in charter vs. non-charter public schools with basic statistical controls for demographic characteristics	Charter school student achievement levels lower than non-charter public school achievement levels

Skimming: Ability, Socioeconomic, and Ethnic Stratification

Studies examining skimming, or the possibility that choice schools drew the most able students away from traditional public schools and resulted in increased ethnic and socioeconomic stratification were also contradictory. In her meta-analysis of charter school studies, Hoxby (2002b) concluded that school choice did not promote skimming. Rather, she touted school choice as the "proverbial rising tide that lifts all boats" (p.1), raising the achievement of students who remained in traditional schools as well as those who exercised choice.

In a 2003 analysis of charter schools in 11 states, Manhattan Institute for Policy Research (MIPR) scholars Greene, Forster, & Winters found, as did the studies of NAEP data sets, that charter schools served a disproportionate number of disadvantaged students. Since disadvantaged students have typically scored lower than their peers on standardized tests, this would suggest that choice schools were not drawing the most academically talented students away from traditional public schools.

Carnoy et al. (2005) subsequently challenged the assertion that disadvantaged students were disproportionately represented in charter schools. They performed a meta-analysis of charter school studies that were conducted using national NAEP data as well as studies from 12 states and the District of Columbia. They argued that, in the studies they deemed most rigorous, when factors of ethnicity and socioeconomic status were considered together, the results indicated that traditional public schools had a greater share of low-income

Black, Hispanic, and White students, because the public schools had a more disadvantaged population among each ethnic group. They noted, for example, that approximately 68% of Black students in charter schools were from low-income households, but 76% of Black students in traditional public schools were identified as members of low-income households (p. 35). This would suggest that superficial analyses of students' demographic characteristics could not dispel the possibility that school choice contributed to skimming.

The Ballou et al. (2006) study of Idaho charter school achievement identified *movers* and analyzed the mean academic gains in their schools of origin and their schools of destination. They found that "students moving to a charter school tend to select better than average schools, as measured by next year's gains among students already enrolled at the school" (p. 22).

Holmes, DeSimone and Rupp (2003), using more precise student-level data, studied charter schools in North Carolina and found that students leaving district schools for charter schools tended to have above average test scores. Similarly, McCombs (2007), in her study of NCLB school choice found that students who transferred under NCLB choice were "significantly more likely than eligible students who did not transfer to have scored at the highest proficiency level in reading (p. 97). Additionally, she noted that the choice students were more likely to be White and less likely to be African American, suggesting that school choice could contribute to ethnic stratification.

Howe et al. (2002) in an examination of Denver's open enrollment choice program indicated similar findings, stating that "in general, students requesting open enrollment…had higher test scores than their district cohorts and applied disproportionately to schools with higher test scores" (p. 22). They also noted patterns of race and income in student movement, with White students leaving minority schools, and students who did not qualify for free and reduced-price lunches leaving the schools with higher percentages of students who did qualify for free and reduced-price lunches. They concluded that the open enrollment choice program resulted in significantly increased ethnic and socioeconomic stratification within the school district.

As with studies of achievement, there was no consensus regarding possibility that skimming might result in increased ethnic, socio-economic, or ability stratification among schools. With regard to NCLB school choice, the probability of increased socio-economic stratification would seem to be intuitive since NCLB choice provided a mechanism for students to transfer from Title I schools which were, by definition, high-poverty schools. This could contribute to stratification of achievement levels as well, since socioeconomic status is a strong predictor of academic achievement (Chall, 1996; Coleman, 1966, Kahlenberg, 1999; USDOE, 2001).

Summary

While there was some research on voucher programs, and a larger body of research on public charter schools, there was little empirical evidence on

NCLB choice and student achievement in traditional public schools. Furthermore, the published studies on NCLB choice were inconclusive, with one finding improved achievement in choice schools (Okpala et al., 2007) and the other finding no choice advantage (McCombs, 2007). In the absence of a full body of research that correlated exactly with a study of NCLB school choice and student achievement, the most relevant studies were found in analyses of voucher programs and charter schools because they both involved students who sought an alternative to their geographically assigned school but who were not willing or able to attend private school. While the research from voucher programs yielded conflicting results, an achievement advantage for African American students was the most promising and most controversial finding (Gay, 2007; Kreuger & Zhu, 2004; Myers & Mayer, 2003; Walberg, 2007). Qualified research teams studying the same data reached different conclusions with regard to an achievement differential among African Americans.

The results from charter school programs were also conflicting, with the snapshot analyses of NAEP data finding a traditional public school advantage (Lubienski & Lubienski, 2004; Nelson et al., 2004; Robelin, 2008), the lottery-based randomization studies indicating a charter school advantage (Hoxby & Murarka, 2007; Hoxby & Rockoff, 2005), and mixed results from the remaining panel data set studies (Ballou et al., 2006; Bifulco & Ladd, 2006; Gronberg & Jansen, 2001; Hanushek et al., 2002; Sass, 2006; Solmon et al., 2001; TPPI,

2001). Results from the body of evidence on student achievement and school choice, therefore, remained inconclusive.

CHAPTER THREE: METHODOLOGY

Statement of the Problem

School choice is a major NCLB strategy for improving student achievement, but the relationship between NCLB school choice and student achievement has not been clearly established. One of the goals of NCLB legislation was to close the achievement gap so that minority and disadvantaged students performed as well as, or better than their peers in the academic arena (USDOE, n.d.c). Providing students with the opportunity, and the transportation, to choose an alternative to underperforming public schools was designed as a primary mechanism for accomplishing this goal. Despite claims by advocates from both sides of the debate, the body of evidence on school choice did not conclusively answer questions about its effectiveness in promoting student achievement, nor did it point to a consensus on the possibility of the unintended side-effect of increased ethnic, socioeconomic, and ability stratification among schools.

This study was guided, not by the broader questions that informed the discussion of school choice in general, but rather by the outstanding questions regarding the impact of NCLB school choice on students in the Title I schools that were targeted by NCLB for improvement. This study sought to add to the knowledge base on the relationship between NCLB school choice and the academic achievement of the students who exercised it, and to explore the

possibility of a relationship between school choice and increased ethnic, socioeconomic, and ability stratification among schools.

Instrumentation

The FCAT SSS tests and the developmental scale scores used to quantify achievement on these tests were subjected to rigorous statistical evaluation as reported by Harcourt Educational Measurement and the researchers subcontracted by the Florida Department of Education to analyze the tests (FLDOE, 2007a; HumRRO, 2001b, 2002).

Validity

The FCAT SSS mathematics and reading tests were designed to measure student mastery of specific skills and content described in the Sunshine State Standards, which were developed with the involvement of instructional specialists (FLDOE, 2007a). Procedures were established to ensure the content validity of the tests.

> The Florida Department of Education has implemented the following steps for all of the items included on the FCAT:
>
> - Educators and citizens judged the standards and skills acceptable.
> - Item specifications were written.
> - Test items were written according to the guidelines provided by the item specifications.
> - The items were pilot tested using randomly selected groups of students at appropriate grade levels.

- All items were reviewed for cultural, ethnic, language, and gender bias and for issues of general concern to Florida citizens.
- Instructional specialists and practicing teachers reviewed the items.
- The items were field tested to determine their psychometric properties.
- The tests were carefully constructed with items that met specific psychometric standards.
- The constructed tests were equated to the base test to match both content coverage and test statistics.

> Because FCAT assesses the content of the SSS and is developed using credible and trustworthy methods, the content validity of the test is substantiated (FLDOE, 2007a, p. 40).

In order to assess the validity of individual test items, the Florida Department of Education worked with Harcourt Educational Measurement in the spring of 2000 to identify schools and students that, when combined, were a representative sample of the state's student population. These students took field-test versions of the FCAT, and all test items were subjected to item analysis and bias analysis (HumRRO, 2002). Then in spring 2002, the FCAT SSS mathematics and reading tests that were administered statewide included field-test items and vertical-scaling items.

> To accommodate these items, 30 separate test forms were constructed for each grade and subject combination. All forms within a grade and subject contained the same core items, plus six to eight extra items. Field-test items were dispersed among 24 forms in order to collect data for a relatively large number of items while only requiring any one student to complete a small number of items. For the remaining six forms, items from adjacent grades were used to construct a vertical linking each of the tested grades (HumRRO, 2002, p. 3).

Criterion-related validity was quantified through a comparison of students' performance on the FCAT SSS tests and the NRT tests. The NRT was a version of the well-established Stanford 9 test. Both the FCAT SSS and the NRT tests were administered to students at approximately the same time, so they provided a measure of concurrent validity. The correlations in Table 2, which extend from 2001 to 2006, the most recent year for which correlations were published "confirm that the FCAT demonstrates concurrent validity with the Stanford 9 test; however, the validity coefficients do not indicate that the tests provide exactly the same information" (FLDOE, 2007a, p. 41). The criterion validity of the 2007 and 2008 FCAT tests used in this study was presumed to be equivalent to that of the tests from 2001 through 2006.

Reliability

Internal consistency reliability coefficients were first analyzed using Cronbach's Alpha to estimate the reliability of test scores from a single test to determine the extent to which the tests provided consistent measures of students' knowledge (FLDOE, 2007a). Because some items on the test were measured on scales of 0-2 and 0-4, Cronbach's Alpha was considered the more appropriate statistic (FLDOE, 2007a, p. 38). The reliability coefficients are reported in Table 3 (FLDOE, 2007a, p. 38).

The data were analyzed again using Item Response Theory (IRT) marginal reliabilities, shown in Table 4:

The data in Table 4 provide additional confirmation that the FCAT is a highly reliable test. In IRT, marginal reliabilities are used to represent the variability of test scores for a specific group of examinees. These marginal reliabilities estimate the standard error of measurement (SEM) for the test and can be interpreted in the same way as Cronbach's Alpha. Table 2 shows the reliabilities using the average SEM for all students. (FLDOE, 2007a, p. 39).

Table 2

Correlations between FCAT SSS and the NRT/Stanford 9 Tests

Grade	2001	2002	2003	2004	2005	2006
	FCAT SSS Reading					
3	0.84	0.84	0.85	0.83	0.83	0.84
4	0.80	0.83	0.82	0.80	0.78	0.83
5	0.84	0.84	0.84	0.84	0.80	0.83
6	0.83	0.84	0.83	0.82	0.83	0.83
7	0.83	0.82	0.82	0.83	0.83	0.83
8	0.82	0.83	0.82	0.82	0.82	0.82
9	0.82	0.81	0.82	0.81	0.82	0.79
10	0.80	0.80	0.78	0.78	0.80	0.80
	FCAT SSS Mathematics					
3	0.85	0.84	0.84	0.85	0.85	0.84
4	0.83	0.82	0.81	0.79	0.82	0.82
5	0.82	0.84	0.83	0.83	0.83	0.84
6	0.84	0.84	0.82	0.84	0.82	0.83
7	0.84	0.83	0.83	0.84	0.82	0.83
8	0.81	0.82	0.83	0.83	0.83	0.84
9	0.82	0.81	0.81	0.81	0.81	0.83
10	0.79	0.80	0.76	0.76	0.72	0.76

Table 3

Reliability Coefficients for FCAT SSS Tests

	Cronbach's Alpha Reliability Coefficients					
	FCAT SSS Reading					
Grade	2001	2002	2003	2004	2005	2006
3	0.91	0.91	0.91	0.89	0.89	0.89
4	0.90	0.90	0.90	0.86	0.86	0.85
5	0.88	0.87	0.90	0.87	0.86	0.87
6	0.91	0.89	0.89	0.89	0.90	0.89
7	0.92	0.91	0.91	0.89	0.90	0.90
8	0.90	0.89	0.89	0.86	0.88	0.85
9	0.91	0.87	0.89	0.89	0.89	0.90
10	0.89	0.86	0.88	0.88	0.89	0.85
	FCAT SSS Mathematics					
Grade	2001	2002	2003	2004	2005	2006
3	0.89	0.89	0.88	0.88	0.89	0.90
4	0.89	0.89	0.88	0.87	0.88	0.88
5	0.92	0.92	0.92	0.86	0.92	0.87
6	0.87	0.88	0.87	0.85	0.91	0.86
7	0.90	0.88	0.89	0.86	0.91	0.86
8	0.92	0.93	0.93	0.87	0.93	0.89
9	0.92	0.91	0.89	0.87	0.92	0.85
10	0.93	0.92	0.92	0.88	0.94	0.88

Table 4

Estimations of the Standard Error of Measurement

Item Response Theory Marginal Reliability of FCAT						
	FCAT SSS Reading					
Grade	2001	2002	2003	2004	2005	2006
3	0.88	0.90	0.91	0.89	0.92	0.92
4	0.91	0.89	0.91	0.87	0.91	0.92
5	0.89	0.87	0.90	0.88	0.89	0.90
6	0.90	0.89	0.90	0.89	0.92	0.93
7	0.90	0.90	0.91	0.89	0.92	0.92
8	0.91	0.87	0.90	0.88	0.91	0.91
9	0.90	0.88	0.89	0.89	0.91	0.92
10	0.90	0.89	0.88	0.87	0.91	0.92
	FCAT SSS Mathematics					
Grade	2001	2002	2003	2004	2005	2006
3	0.88	0.89	0.88	0.87	0.93	0.90
4	0.88	0.89	0.88	0.87	.093	0.88
5	0.94	0.93	0.93	0.86	0.94	0.87
6	0.88	0.89	0.87	0.85	0.94	0.86
7	0.90	0.88	0.89	0.84	0.94	0.86
8	0.94	0.93	0.93	0.86	0.95	0.89
9	0.91	0.91	0.90	0.86	0.94	0.85
10	0.94	0.93	0.92	0.88	0.95	0.88

Research Design

This study examined separate, but related types of questions that were both of interest to school choice researchers. Research Question 1 targeted analysis of the FCAT SSS mathematics and reading score gains of students in NCLB choice schools versus the gains of matched students in Title I SINI schools in order to determine whether there was a relationship between school choice and improved academic achievement. Research Question 2 and Research Question 3 were designed to investigate differences in the observable characteristics of NCLB choosers versus eligible non-choosers. Research Question 2 examined the academic ability of NCLB choice students versus eligible non-choosers, and Research Question 3 addressed the possibility of differences in ethnicity and socioeconomic characteristics of the two groups. Differences in the characteristics of choosers versus eligible non-choosers were of interest to school choice researchers seeking to determine whether there was a relationship between school choice and increased ethnic, socioeconomic, or ability stratification among schools.

Data Collection, Population, and Data Analysis

All student and school data were retrieved ex post facto from the Collier County Public Schools' intranet database archives used to report to the State of Florida, and from the CCPS Data Warehouse. The identity of individual students and schools remained anonymous; they were identified by number only. Because Research Question 1 focused on the academic achievement of NCLB

choice students versus matched eligible non-choice students, while Research Questions 2 and 3 targeted differences in the observable characteristics of choosers versus all eligible non-choosers, the samples and data collection procedures used for the questions differed.

Research Question 1: Sampling and Data Analysis

The sample for the current study analyzing mathematics and reading achievement consisted of: (a) Collier County Public School (CCPS) students in grades 4 through 8 who exercised school choice to move from a School in Need of Improvement (SINI) in the 2006-2007 academic year to an NCLB choice public school for the 2007-2008 year, and (b) eligible non-choosing students who remained in the Title I SINI schools and who were individually matched with choice students on the basis of grade level, sending SINI school, gender; ethnicity, eligibility for free or reduced price lunch, and ELL status.

The choice students were identified first. In McCombs' (2007) study of NCLB choice, the majority of the 96 choice students had never attended a SINI school; they had qualified for choice due to relocation, rezoning, or changing school levels (p. 98). By contrast, students in this study who did not attend a Title I school in 2006-2007 were deselected from the choice group. Many of these deselected students had attended schools with very affluent and high-achieving demographic composition. Since the intent of NCLB legislation was to benefit low-income "children in schools in need of improvement" (USDOE, n.d.d., ¶3), limiting the study to students who had actually attended one of these SINI

schools was deemed by the researcher to be a more appropriate sample for the study. After the NCLB choice students were identified, students for a comparison group of eligible non-choosers were identified based on demographic characteristics that matched those of the choice students.

To determine whether there were significant differences in the achievement growth of NCLB choice students compared with the matching eligible non-choosers, the spring 2007 and 2008 FCAT SSS mathematics and reading DSS scores were collected from the CCPS intranet database and converted to *z* scores with a mean of zero and a standard deviation of 1. The conversion to *z* scores was necessary because multiple grade levels were used, and the relative value of scores differed according to grade level.

A histogram, included in Chapter 4, provided a visual representation of the distribution of scores. Next, a Levene test for equality of variances was run to determine whether the variance of scores between the two groups was similar. A boxplot, also in Chapter 4, was created to identify outliers and their relative distance from the mean scores. The identification of outliers was conducted separately for univariate outliers in mathematics and reading scores, and then was conducted again to identify multivariate outliers.

The data were then analyzed using a Multivariate Analysis of Covariance (MANCOVA) to examine the significant differences among dependent variables of 2008 FCAT SSS achievement scores, the independent variables represented by demographic characteristics, and the covariates of 2007 FCAT SSS

achievement scores. The 2007 FCAT SSS scores were used as covariates to assist in controlling for selection bias and in controlling for regression to mean (Aron, Aron, & Coups, 2007; Heiman, 2005). Regression to the mean is a phenomenon that impacts analyses of gain scores as follows:

1. It operates to increase the obtained pre-test-posttest gain scores among the low pretest scores since this groups scores are more likely to have been depressed by error;
2. It operates to decrease the obtained change in scores among persons with high pretest scores since their pretest scores are likely to have been inflated by error; and
3. It does not affect the obtained scores among scorers at the center of the pretest distribution since the group is likely to contain as many units whose pretest scores are inflated by error as units whose pretest scores are deflated by it (Cook & Campbell, 1979, p. 52-53).

The MANCOVA was selected to reduce the possibility of Type 1 errors associated with doing a separate Analyses of Covariance (ANCOVA) for each of the two dependent variables, and to identify any interaction effects between the variables, therefore increasing the level of rigor of the study. The MANCOVA was designed as follows:

1. The two dependent variables were the 2008 FCAT SSS mathematics and reading scores.

2. Transfer status of students was the independent variable of interest; students were classified as NCLB choice students or eligible non-choosers.
3. Additional independent variables, including gender, ethnicity, and socioeconomic status were also analyzed to determine whether there were significant main effects or interaction effects between these variables and the variable of interest.
4. The 2007 FCAT SSS mathematics and reading scores were the covariates.
5. Post-hoc tests were employed for ethnicity to identify any differences in mean scores of the subgroups.

Research Question 2: Sampling and Data Analysis

To determine whether the academic ability of NCLB choice students, as measured by spring 2007 FCAT SSS achievement scores, differed significantly from the academic ability of eligible non-choosers, the sample was expanded to include all students in the grades 4 through 8 who were zoned to attend a Title SINI school for 2007-2008, regardless of the type of schools they had attended previously. Students from these schools were then classified into comparison groups of choosers or eligible non-choosers, and their 2007 FCAT SSS mathematics and reading scores were recorded. The data were collected and analyzed using a *t*-test and using a MANOVA as follows:

1. The dependent variables were the 2007 FCAT SSS mathematics and reading DSS scores.
2. Students from each Title I SINI school were coded according to their transfer status as NCLB choice students or eligible non-choosers. Transfer status was the independent variable of interest.
3. The mathematics and reading scores of NCLB choice students and eligible non-choosers were analyzed to determine whether there was a significant effect for transfer status.
4. Additional dependent variables, including the demographic characteristics of ethnicity and socioeconomic were analyzed to determine whether there was an interaction effect between these variables and transfer status.

Research Question 3: Sampling and Data Analysis

To determine whether NCLB choice students differed from eligible non-choosers with regard to ethnicity and socioeconomic status, the comparison groups were expanded to include the younger, non-tested grades, so that all students in kindergarten through grade eight were included in the analysis. Again, the students were classified into comparison groups of choosers versus eligible non-choosers. The data were analyzed as follows:

1. On a district-wide level, the number and percent of students eligible for NCLB choice in each ethnic and socioeconomic group were compared

with the number and percent of students from each ethnic and socioeconomic group who opted for school choice.

2. Logistic regression was conducted to predict students' transfer status on the basis of the independent predictor variables of ethnicity and socioeconomic status. The impact of the predictor variables was expressed in odds ratios estimating the likelihood of transfer.
3. The number and percent of students in each ethnic and socioeconomic group who were assigned to attend each Title I SINI school in 2007-2008 was compared with the number and percent that transferred, and compared with the number and percent who attended after NCLB choice students were re-assigned.
4. A bar graph was used to illustrate changes to the ethnic and socioeconomic composition of Title I SINI schools that resulted from removing NCLB choice students. As a reference point, the entire school district's demographic percentages for each group were represented as well.

Summary

The research methodology described in this study was designed to investigate whether a significant relationship existed between NCLB school choice and student achievement, and to determine whether students who opted for choice had different observable characteristics from eligible students who did not. Chapter 4 presents detailed results from the data analyses and reports the

findings. Chapter 5 provides a summary and discussion of the findings, with implications for policy and recommendations regarding the need for future research.

CHAPTER FOUR: ANALYSIS OF DATA

Introduction

This study was a causal comparative study designed to investigate the relationship between the school choice provision of 2001 *No Child Left Behind* (NCLB) legislation and (a) gains in the academic achievement of targeted fourth grade through eighth grade students; (b) the relative achievement levels of Collier County fourth through eighth grade students based on their NCLB transfer status as choice students or eligible non-choosers; (c) the demographic characteristics of NCLB choice students in kindergarten through grade 8 versus the characteristics of students who remained in their zoned Title I schools. All data were retrieved ex post facto from the CCPS databases, and the anonymity of both students and schools was protected through the use of case numbers to identify students, and the substitution of pseudonyms for school names.

The relationship of school choice to the achievement gains of fourth through eighth grade students was analyzed by comparing growth on the FCAT SSS mathematics and reading tests from spring 2007 to spring 2008 for students who elected school choice and for students with matching characteristics who remained in their Title I schools. The characteristic of academic ability for NCLB choice students versus eligible non-choosers was examined by comparing the mathematics and reading academic achievement levels on the FCAT SSS tests from the spring 2007 test administration, which was the year prior to transfer.

The relationship of school choice with the ethnicity and socioeconomic status of students in Title I schools was examined on the student level by using logistic regression. This statistical method was used to estimate the likelihood of transfer based on independent predictor variables of ethnicity and socioeconomic status. This was expressed in terms of odds ratios to measure the effect size, which described the strength of association for transfer status for each separate ethnic group. The impact of these transfers was examined at the school level by comparing the percentage of students from each ethnic and socioeconomic group who were zoned to attend each targeted Title I SINI school in the 2007-2008 academic year with the percentage of students who were in those groups after NCLB choice transfers occurred. District-wide averages added for reference.

Research Question 1

> Research Question 1: What differences are there in FCAT mathematics and reading development scale scores of students in grades four through eight who exercised NCLB school choice to attend non-Title I schools versus students who remained in Title I schools designated by NCLB as needing improvement?

Research Question 1 focused on the relationship of NCLB public school choice and student achievement as defined by achievement on the 2008 FCAT SSS mathematics and reading tests, while controlling for prior achievement using the spring 2007 scores as covariates.

All FCAT SSS scores were converted to *Z* scores because differences in expected score increases from one year to the next varied according to grade

level, with higher gains indicated at the lower grade levels and increasingly smaller gains expected up through the grade 10 final test year.

Identification of the Sample

Student demographic data and test data from the spring 2007 and spring 2008 FCAT SSS test administrations were retrieved from the CCPS Data Warehouse database in the summer of 2008 in order to identify students for the two comparison groups: the NCLB choice group and the group of eligible non-choosers with matching demographic characteristics.

Identification and classification of NCLB choice group

The CCPS Title I data reports on the NCLB school choice program included students who had exercised choice going back to the 2004-2005 school year. The list of students selected for the study was refined to include only those students who had attended a Title I school in the 2006-2007 academic year and then opted for an NCLB choice school beginning with the 2007-2008 academic year. It was further refined to include only those students who had both mathematics and reading FCAT SSS scores from both academic years. The deselection of students who were missing one or more test scores resulted in the elimination of only two students from the NCLB choice group.

For each identified NCLB choice student, the following information was copied from the Data Warehouse Title I Choice Report into a Microsoft Office Excel file:

1. Student number,
2. Title I school attended in 2006-2007,
3. Grade level in 2007-2008,
4. Gender,
5. Eligibility for free or reduced price lunch,
6. Self-reported ethnicity,
7. Learning disability, when applicable,
8. English Language Learner (ELL) status,
9. Spring 2007 FCAT SSS mathematics and reading DSS scores,
10. Spring 2008 FCAT SSS mathematics and reading DSS scores.

Socioeconomic status and ethnicity data

Eligibility for free or reduced price lunch was the variable used to categorize socioeconomic status. Students who received economic assistance for school meals were initially subdivided to distinguish between students who received free meals and those who paid a reduced price. These two categories were later combined due to the relatively small number of students with each ethnic designation.

Similarly, students initially classified as Haitian Creole or Black were combined to form a single category of Black students. The Haitian Creole designation, which was unique to Collier County, was created at the request of representatives from both the Haitian community and the American Black community who indicated that the ethnic identities of the two groups were distinct

enough to warrant separate categories of ethnicity. The State of Florida did not, however, have separate designations for Black and Haitian Creole students. Because of the relatively small number of students in the NCLB choice group, and consequently in the corresponding eligible non-choosers' group, the two categories were combined.

Grade level, learning disability and ELL data

Data were collected on each student's grade level, and when applicable, on learning disabilities and ELL status. These data were not classified as independent variables; they were not analyzed statistically. They were, though, used as matching characteristics in order to identify students for the comparison group of eligible non-choosers. None of the students in the NCLB choice group was classified as having a cognitive impairment, but there were six who had specific learning disabilities.

ELL status was subdivided into two categories. Active ELL students were those whose level of English language proficiency denied them the opportunity to learn successfully in classrooms where the language of instruction was English. Follow-up ELL students were those who had exited the active ELL program within the previous two years and had been mainstreamed into classrooms where the language of instruction was English. There was one active ELL student in the NCLB choice group and there were seven follow-up ELL students.

Identification of eligible non-choosers

The comparison group of eligible non-choosers was selected by identifying, for each member of the NCLB choice group, a student who remained in the Title I School in Need of Improvement (SINI) and who had characteristics matching those of the corresponding NCLB choice student. The procedures for identifying the eligible non-choosers comparison group were as follows:

1. NCLB choice students were subdivided based on the specific SINI school attended in 2006-2007, and were subdivided again by grade level.
2. Each NCLB choice student was matched with a student from his or 2006-2007 SINI school according to: (a) grade level, (b) gender, (c) ethnicity, (d) eligibility for free or reduced price lunch, (e) ELL status, and (f) learning disability.
3. The CCPS intranet database was checked to verify that each student who was identified for the group of eligible non-choosers remained in the Title I SINI school for the 2007-2008 academic year.

Description of the Participants

The study sample consisted of 103 NCLB choice students and a comparison group of 103 eligible non-choosers from Collier County Title I schools. The sample of NCLB choice students consisted of 53 female students (51.5%) and 50 male students (48.5%). There were 16 Black students (15.5%),

56 Hispanic students (54.4%), 29 White students (28.2%), and 2 mixed race students (1.9%). There were 70 students (68%) who qualified for free or reduced price lunch, and 33 students (32%) who did not qualify. Grade level distribution consisted of 25 fourth grade students (24.3%), 17 fifth grade students (16.5%), 51 sixth grade students (49.5%), 7 seventh grade students (6.8%), and 3 eighth grade students (2.9%).

Assumption Testing

Preliminary assumption testing was conducted to check for univariate and multivariate normality and outliers; linearity; homogeneity of regression slopes; homogeneity of variance-covariance matrices; and multicollinearity for the 2007 and 2008 FCAT mathematics and reading scores. The Kolmogorov-Smirnov goodness of fit test was conducted to assess univariate normality of the 2008 FCAT mathematics and reading dependent variables and the 2007 mathematics and reading covariates for the two comparison groups of choosers versus eligible non-choosers.

As indicated in Table 5, the results suggested that the 2007 FCAT mathematics and reading scores were normally distributed, but the 2008 FCAT scores were normally distributed only for the NCLB choice students. For eligible non-choosers, the mathematics scores were not normally distributed ($\alpha = .05$; $p = .001$), nor were the reading scores normally distributed ($\alpha = .05$; $p = <.001$).

Table 5

Normality of FCAT Score Distribution

Variable		Kolmogorov-Smirnov[a]		
		Statistic	*df*	*p*
07 math Z score	NCLB choice	.080	103	.200
	Eligible non-choosers	.066	103	.200
07 read z score	NCLB choice	.074	103	.052
	Eligible non-choosers	.054	103	.112
08 math z score	NCLB choice	.065	103	.069
	Eligible non-choosers	.073	103	.001
08 read z score	NCLB choice	.087	103	.089
	Eligible non-choosers	.079	103	<.001

Note. [a] Lilliefors Significance Correction

To identify outliers that impacted the normal distribution of scores, a boxplot, shown in Figure 1, was generated for 2008 FCAT scores of the two comparison groups This revealed two extreme outliers: a high math score for eligible non-chooser case 731, and a low reading score for NCLB choice case 200.

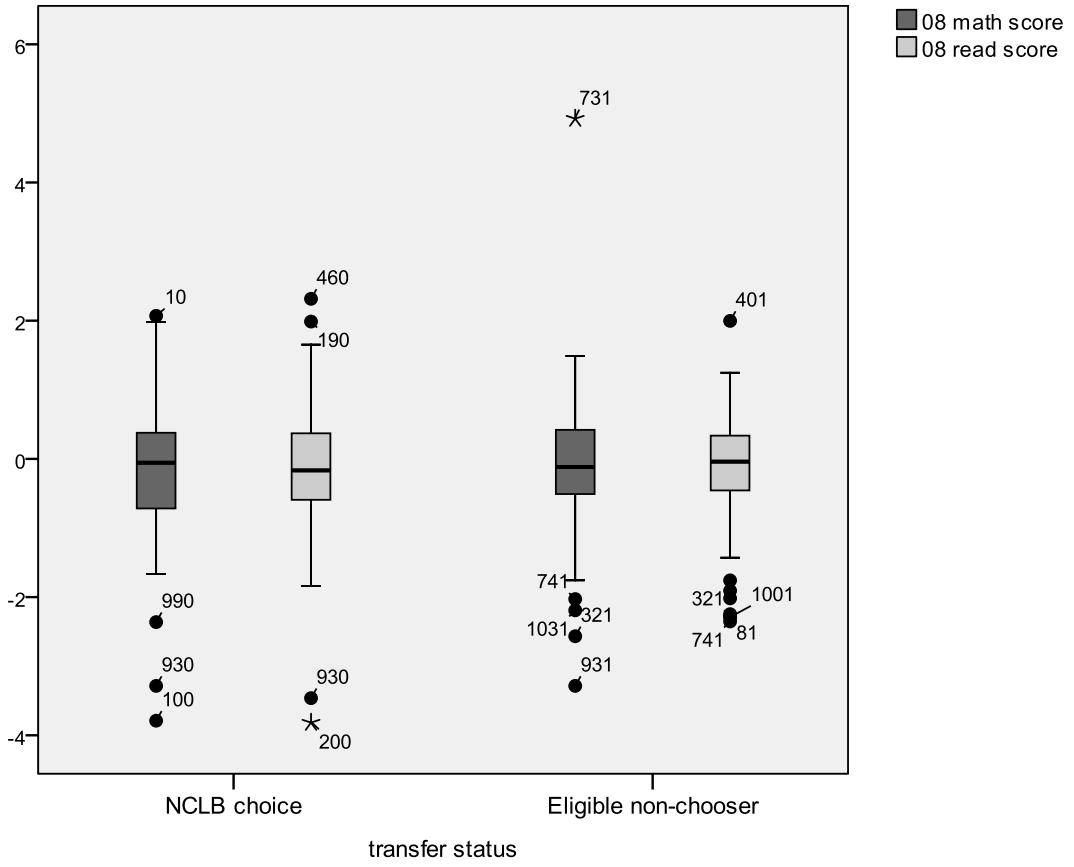

Figure 1. Boxplots identify FCAT mathematics and reading outliers for the two comparison groups in reading. There were two extreme outliers, identified as cases 731 and 200.

In order to identify multivariate outliers, the Mahalanobis distances were calculated and a linear regression analysis was conducted to identify any unusual patterns of scores across the dependent variables and covariates. An alpha value of .001 was used to determine the critical value for Mahalanobis distance. For $df = 4$ and $\alpha = .001$, $\chi^2_{\text{critical } (.001,\ 4)} = 18.47$. In addition to the 2

cases identified as univariate outliers, 3 additional cases were found to be multivariate outliers, $p = 57.27$; $p = 29.99$; $p = 27.80$.

These five outliers represented cases where at least one of the scores was exactly, or very near, the 100-point minimum, indicating that the students had either not attempted to complete the test successfully, or had gotten numbering transposed, resulting in scores that did not appear to be valid indicators of the students' mathematics and/or reading achievement. Since these cases did represented less than 5% of the sample, the two univariate outliers and three multivariate outliers were removed from the NCLB choice group, as were the cases for matching students in the group of eligible non-choosers. This reduced the total number of students in each comparison group by 5 students, ($n = 98$). Even with the outliers removed from the data set, the Kolmogorov-Smirnov test indicated a violation of the assumption of normality for the 2008 scores of eligible non-choosers in mathematics ($\alpha = .05$; $p = .008$), and in reading, ($\alpha = .05$; $p = .001$). Despite the significance of the Kolmogorov-Smirnov statistic, histograms depicting the mathematics and reading scores of the eligible non-choosers after the extreme outliers had been removed indicated relatively normal distribution, as is shown in Figure 2.

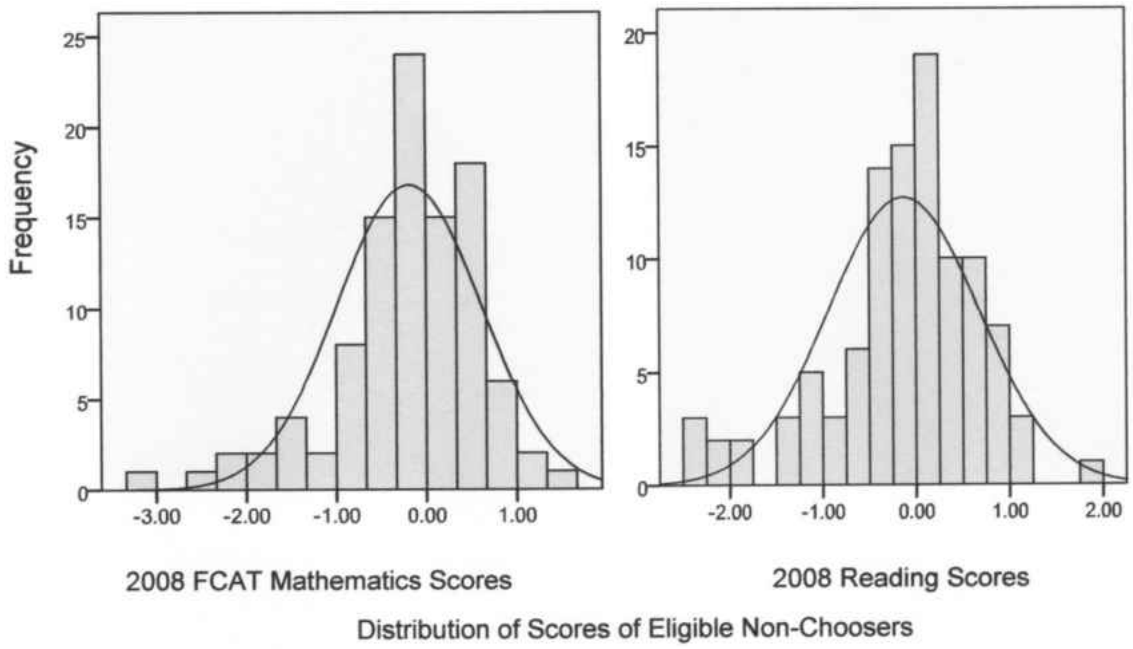

Figure 2. Histograms depicting the distribution of 2008 FCAT mathematics and reading scores for eligible non-choosers. The distribution is relatively normal.

Although the significance tests of MANCOVA are based on the assumption of multivariate normal distribution, MANCOVA is reasonably robust to violations of the normality when outliers are removed from the data set, especially when the number of cases in each cell exceeds 20 (Pallant, 2005). The number of cases in each cell exceeded 20 for transfer status, socioeconomic status, gender, and two of the three ethnic groups. Only Black students were underrepresented with a total of 16 in each comparison group. Because the histograms indicated a relatively normal score distribution for NCLB choice students and eligible non-choosers, and because the number of cases in each cell exceeded 20 for all but Black students, the MANCOVA analysis was

conducted to identify main effects for each of the variables. However, because of the very limited number of students in the individual cells found in the various combinations of gender, ethnicity, and socioeconomic status, any interaction effects would have to be interpreted with caution.

The assumption of a linear relationship between the 2008 FCAT score dependent variables and the 2007 FCAT score covariates for the NCLB choice group and the group of eligible non-choosers' group was assessed by generating scatterplots. As shown in Figure 3, the relationship of the mathematics dependent variable and covariate was linear. The same held true for the reading dependent variable and covariate, as shown in Figure 4.

To assess the assumption of equality of variance-covariance matrices, a Box's M test was conducted to determine whether, for each cell in the factor design matrix, the covariance matrix was similar. Both of the dependent variables, both covariates, and the independent variable of interest, transfer status, were entered into the equation. The Box's M significance level F (57, 3632) = 1.532, p = >.001 indicated that the assumption of equality of variance-covariance matrices was not violated.

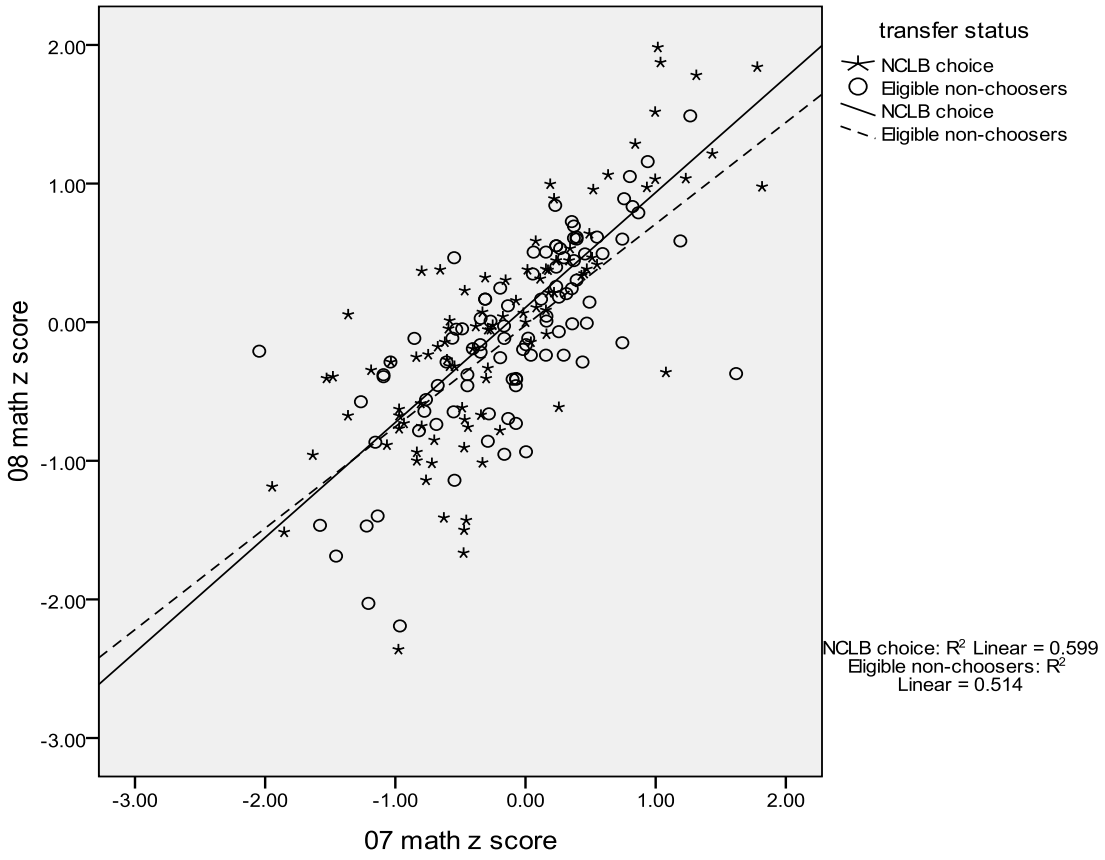

Figure 3. Scatterplot of the relationship between the 2008 FCAT mathematics scores and the FCAT 2007 mathematics scores.

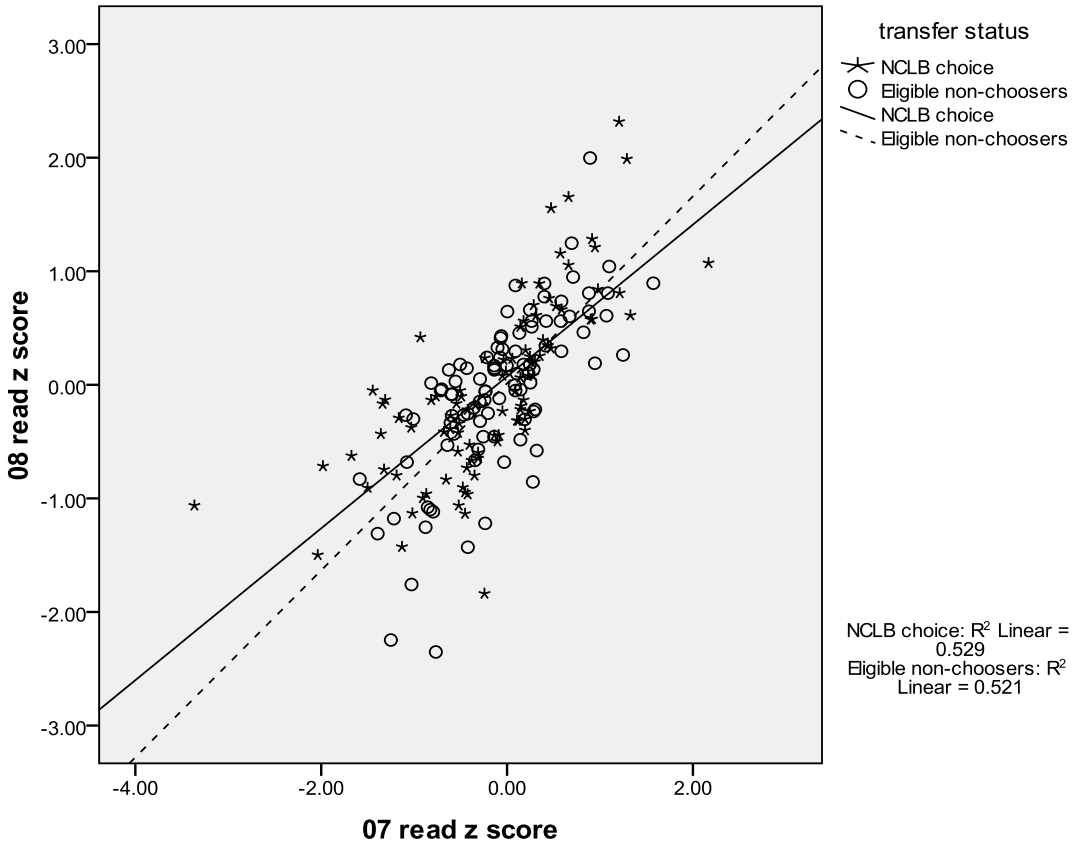

Figure 4. Scatterplot of the relationship between the 2008 FCAT reading scores and FCAT 2007 reading scores.

Levene's test was then used to check the assumption that the dependent variables would have similar variances for the comparison groups. The homogenity of variances assumption was met for both 2008 FCAT mathematics scores, F (21, 170) = 1.018, p = .444, and for the 2008 FCAT reading scores F (21, 170) = .889, p = .605.

Because MANCOVA works best when the dependent variables are only moderately correlated (Pallant, 2005), the correlation coefficient for the dependent variables was then calculated to check for multicollinearity, which is indicated when the correlation is .8 or higher. The Pearson product moment correlation coefficient indicated a .653 positive correlation between the two dependent variables of 2008 FCAT mathematics and reading scores, (r = .653, n = 192, $p < .001$). This indicates that the two covariates were not too strongly correlated with one another.

Data Analysis

The preliminary assumption testing indicated the presence of five outliers that were removed from the data set because they constituted fewer than 5% of the total, decreasing the sample to two groups of 98 students. No serious violations for the assumptions for normality, linearity, or multicollinearity were found after the outliers were deselected. As illustrated in Table 6, the multivariate tests indicated no significant differences in 2008 FCAT SSS mathematics or reading scores between students in the two comparison groups for any of the independent variables after controlling for the students' prior achievement level using the 2007 FCAT SSS mathematics and reading scores as covariates.

Table 6

MANCOVA Results for FCAT Scores and NCLB Transfer Status

Effect	*df*	*F*	η^2	*p*
FCAT Reading 2007	2, 181	44.65	.330	<.001
FCAT Mathematics 2007	2, 181	76.67	.459	<.001
NCLB Transfer Status	2, 181	1.17	<.001	.985
Gender	2, 181	1.10	.012	.337
Ethnicity	4, 362	.45	.007	.843
Socioeconomic Status	2, 179	2.75	.029	.067
Transfer Status * Gender	2, 179	.02	.001	.882
Transfer Status * Ethnicty	4, 362	1.01	.016	.429
Transfer Status * SES	2, 179	.05	.029	.952

Note. Alpha level = .05.
Mathematics and reading 2007 scores are covariates used to control for students' prior achievement.

The main effect for the variable of interest, transfer status, was not significant: F (2, 181) = 1.17, p = .985; η^2 = <.001. The main effects did not reach the level of significance for any of the other independent variables of gender: F (2, 181) = 1.10, p = .337; η^2 = .012); ethnicity: F (4, 362) = 0.45, p = .843; η^2 = .007); or socioeconomic status: F (2, 179) = 2.75, p = .067; η^2 = .029); nor did the interaction effect of gender, ethnicity or socioeconomic status with transfer status reach the level of significance, as shown in Table 6.

Research Question 2

Research Question 2: What differences are there in the academic achievement levels on the FCAT mathematics and reading developmental scale scores of students in grades four through eight who exercised the NCLB public school choice option versus eligible non-choosers who remained in their geographically zoned Title I schools?

Research Question 2 focused on the relative achievement levels of students who chose to transfer from Title I schools deemed as Schools in Need of Improvement (SINI), versus the scores of eligible non-choosers who remained in these zoned schools. This had been a question of interest to school choice researchers seeking to determine whether school choice contributed to ability stratification among schools by drawing the most academically able students away from struggling schools.

Identification of Sample

To determine whether the academic ability of NCLB choice students, as measured by FCAT SSS achievement scores, differed significantly from the academic ability of eligible non-choosers, the accessible sample was expanded to include all students in the FCAT-tested grades 3 through 8 who were assigned to attend CCPS Title I SINI schools in the 2007-2008 academic year, regardless of the type of school they had attended previously. First, a list of all students who attended Title 1 schools in 2007-2008, with their 2006-2007 FCAT test scores and demographic data was retrieved from the CCPS Data Warehouse. Then, a list of students who used NCLB choice to opt out of those schools was retrieved

and the two groups were merged. All students were then classified into one of two comparison groups based on their NCLB transfer status. Among the 189 NCLB choice students, 171 had FCAT mathematics and reading test scores. For eligible non-choosers, 3,591 had FCAT mathematics scores; and 3,587 had reading scores. Demographic information included the following:

1. race/ethnicity,
2. socioeconomic status as defined by eligibility for free reduced-price lunch,
3. grade level for 2007-2008,
4. assigned school,
5. assigned geographic area of the county.

Assumption Testing

A differentiated pattern of school choice was noted in that students from schools in the inland community of Immokalee, which was relatively isolated geographically, did not opt for NCLB choice as frequently as did students from Naples. The two communities of Immokalee and Naples are very different. Naples has isolated pockets of poverty, but it is overall one of the wealthiest cities in Florida. Immokalee, by contrast, is a very poor community that is a first stop for immigrants who do not speak English because they can find work harvesting crops without having English language proficiency.

Table 7

Transfer Status: Frequency and Mean Scores by Geographic Area

Transfer Status	Area	Mathematics			Reading		
		n	*%*	*M*	*n*	*%*	*M*
NCLB choice students	Naples	148	86	- .06	148	86	-.06
	Immokalee	24	14	- .47	23	14	-.61
	District	172	100	-.12	171	100	-.14
Eligible non-choosers	Naples	1655	46	- .42	1654	46	- .44
	Immokalee	1936	54	- .51	1933	54	-.47
	District	3591	100	- .47	3587	100	-.46

There were 1,960 Immokalee students and 1,803 Naples students who were eligible for NCLB choice and who had test scores for the study. Even though Immokalee students accounted for over half of the school district's total choice-eligible population, they represented only 14% (*n* = 24) of the study's 172 NCLB choice students, while Naples area students represented 86% (*n* = 148) of the choice total. Furthermore, even though the FCAT test scores of the eligible non-choosers were roughly equivalent in the two geographic areas, there were differences between the mean scores of the choice group from Naples as compared with the scores of the Immokalee choice group, as depicted in Table 7. The mathematics scores of the transfer students from Naples were .41 *SD* higher than the mathematics scores of the Immokalee transfer students, and the Naples reading scores were .55 *SD* higher. As a result of this difference in NCLB

school choice selection rate and the difference in the test scores of choice students from Naples and Immokalee, the comparison groups were further subdivided by geographic area for subsequent analysis.

Preliminary assumption testing included a Kolmogorov-Smirnov test used to assess univariate normality of the FCAT scores. It indicated that the mathematics scores of the eligible non-choosers were not normally distributed in the Immokalee group ($n = 1936$; $p < .001$), in the Naples group ($n = 1655$; $p < .001$), or in the composite district-wide group ($n = 3591$; $p < .001$). For eligible non-choosers, however, the Kolmogorov-Smirnov test indicated normal distribution of math scores for the smaller subgroups of Immokalee students ($n = 23$, $p = .198$) and Naples students ($n = 148$; $p = .058$), but not for the larger composite district-wide group (n = 172; $p < .05$).

The Kolmogorov-Smirnov test of reading scores for eligible non-choosers also indicated an abnormal distribution for the Naples, Immokalee, and district-wide groups, with $p < .001$ for all three. Among NCLB choice students, Kolmogorov-Smirnov indicated normal distribution for the Naples group ($n = 148$; $p = .200$), but not for Immokalee students ($n = 23$; $p < .001$) or the composite district-wide non-choosers' group ($n = 172$; $p < .05$).

To further assess the normality of score distribution, histograms were generated for the district-wide comparison groups, and for the smaller comparison groups from Naples and Immokalee. Despite the Kolmogorov-Smirmov statistic, the histograms revealed that the scores of the district-wide

group appeared to be relatively normally distributed, as is shown in Figure 5. Where they deviated from the normal curve, the scores of the NCLB choice students and the eligible non-choosers revealed a pattern of scores similar to each other.

The mathematics score distributions of the Naples and Immokalee groups were relatively normally distributed as well, and they mirrored the distribution of the district-wide group, as is shown in Figure 6 and Figure 7, respectively.

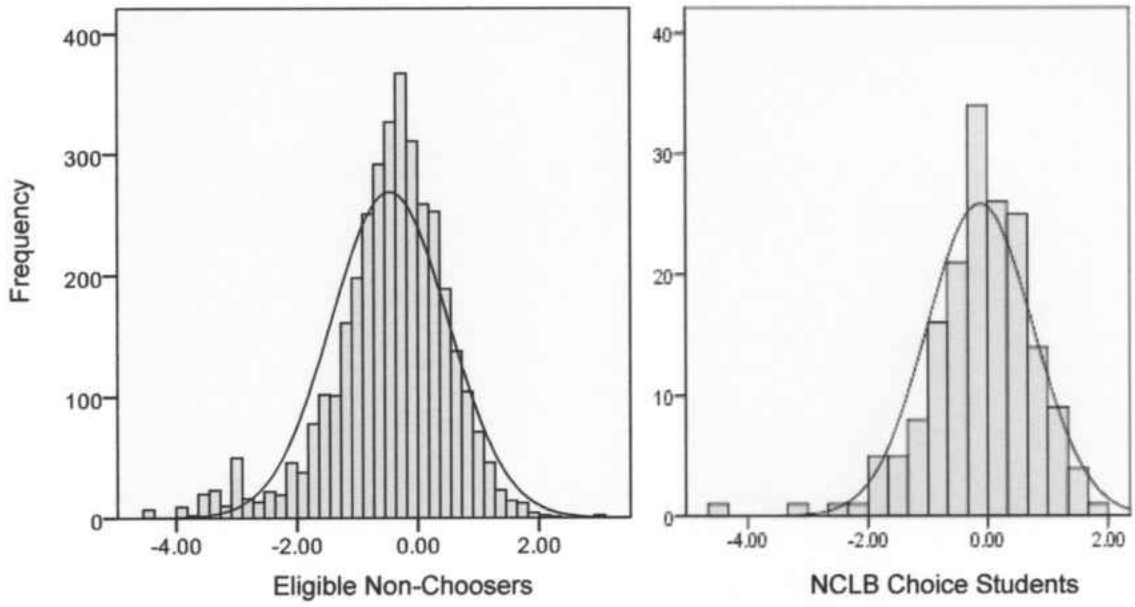

Figure 5. District-wide FCAT mathematics score distribution for the eligible non-choosers and NCLB choice students plotted with a normal curve.

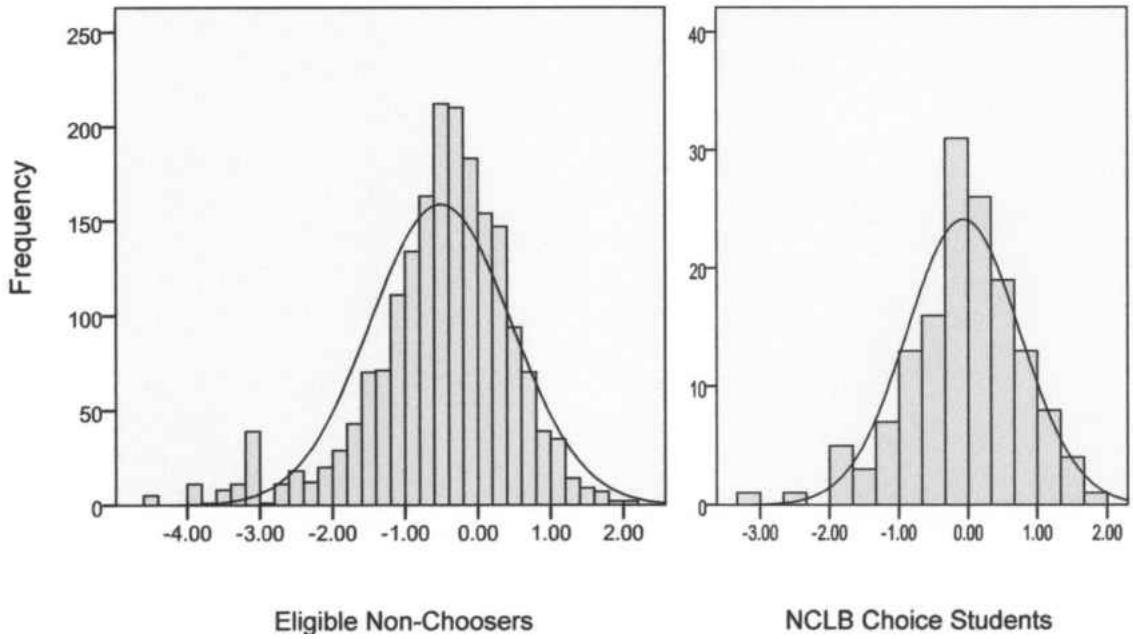

Figure 6. Naples-area FCAT mathematics score distribution for the comparison groups plotted with a normal distribution curve.

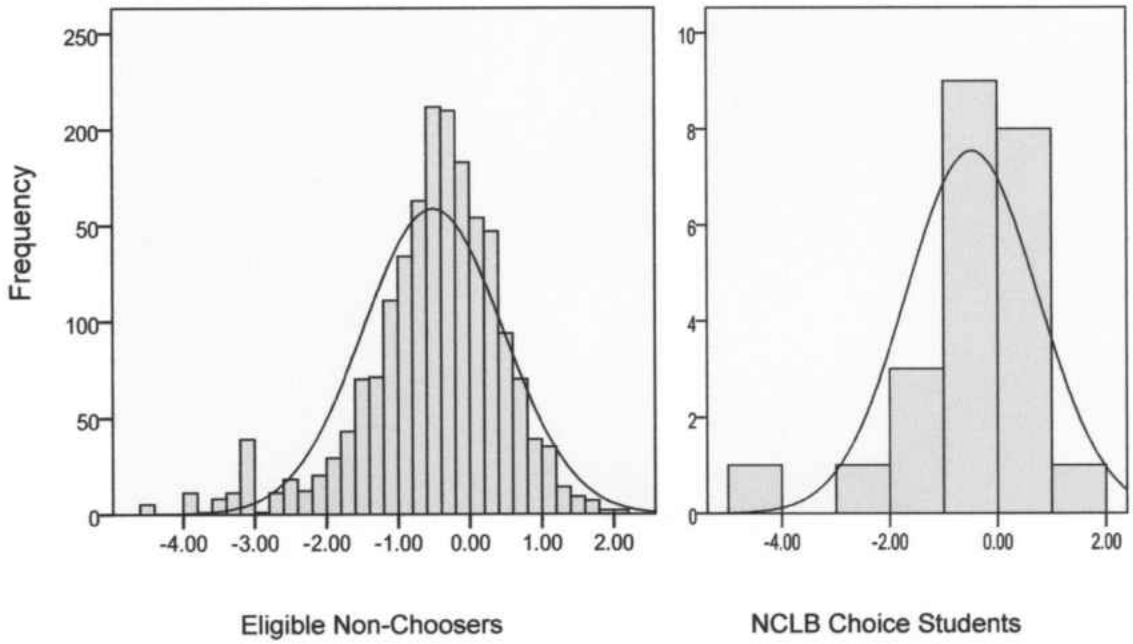

Figure 7. Distribution of FCAT mathematics scores for eligible non-choosers and NCLB choice students from Immokalee plotted with a normal distribution curve.

Reading scores appeared to be relatively normally distributed as well, and as with the mathematics scores, the deviations from normal curve tended to be similar for comparison groups district-wide, as is seen in Figure 8, and for the Naples and the Immokalee groups, as is shown in Figure 9 and Figure 10, respectively.

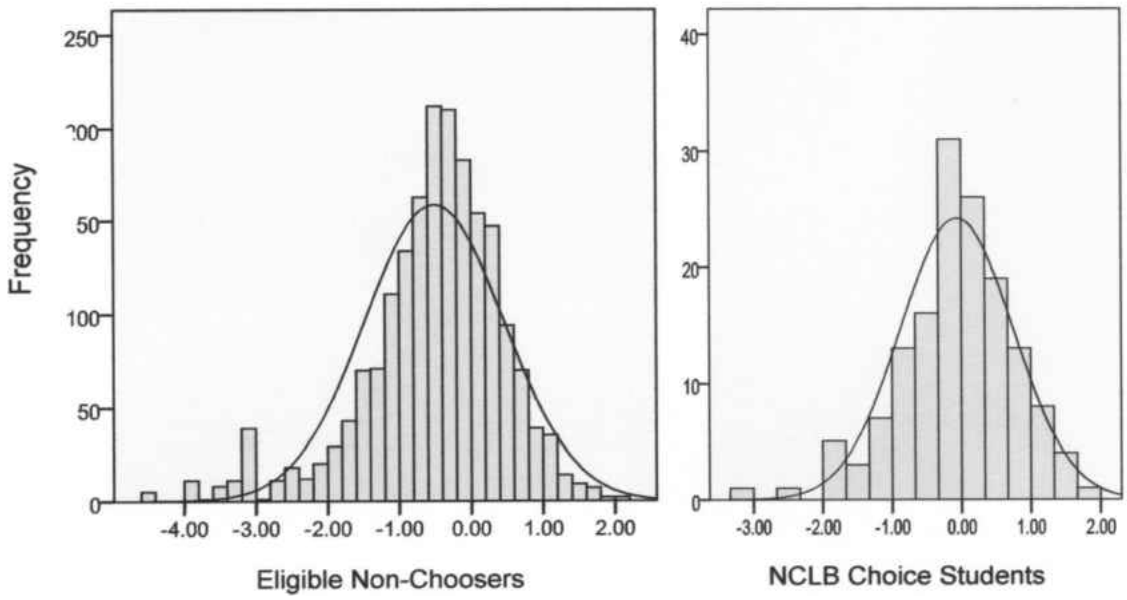

Figure 8. District-wide distribution of FCAT reading scores for the comparison groups plotted with a normal curve.

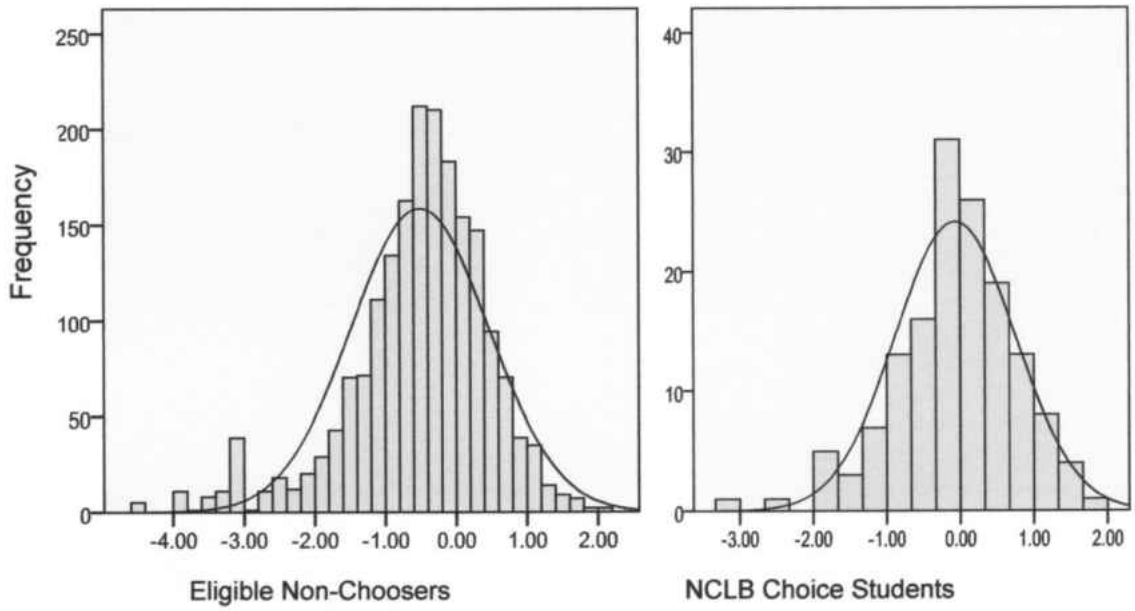

Figure 9. Naples-area FCAT reading score distribution for comparison groups plotted with a normal distribution curve.

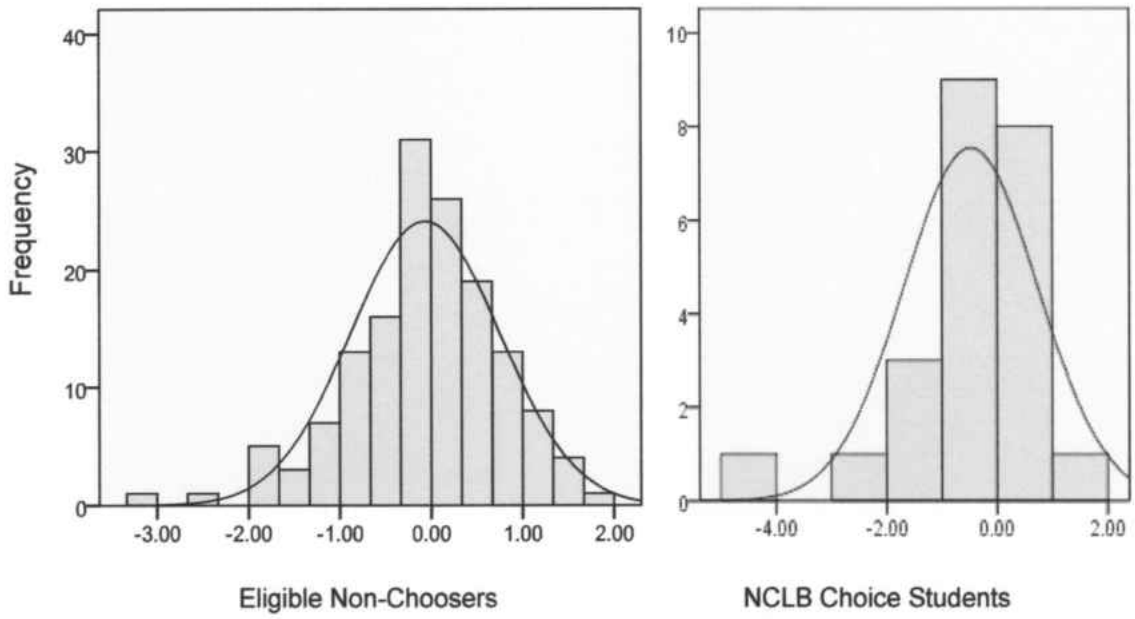

Figure 10. Immokalee-area FCAT reading score distribution for eligible non-choosers and NCLB choice students plotted with a normal distribution curve.

Because the scores of all the groups appeared to be relatively normally distributed, and because there were more than 20 students in each cell of the district-wide and Naples groups, the outliers remained in the data set.

In order to test the assumption of linearity, scatterplots were generated. District-wide, they indicated a positive linear relationship between the FCAT mathematics and reading scores for both the eligible non-chooser group, as seen in Figure 11, and the NCLB choice group, as is indicated in Figure 12.

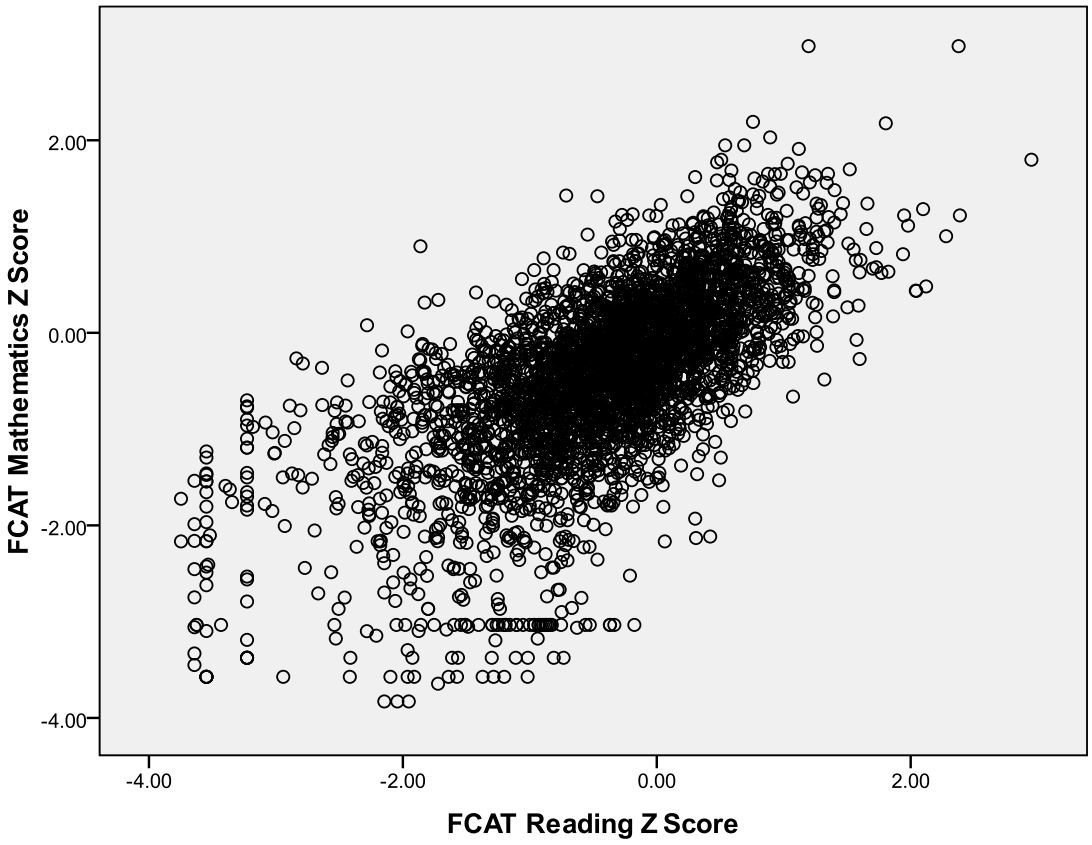

Figure 11. Scatterplot of district-wide eligible non-chooser group FCAT mathematics and reading scores depicting the linear relationship between the two dependent variables.

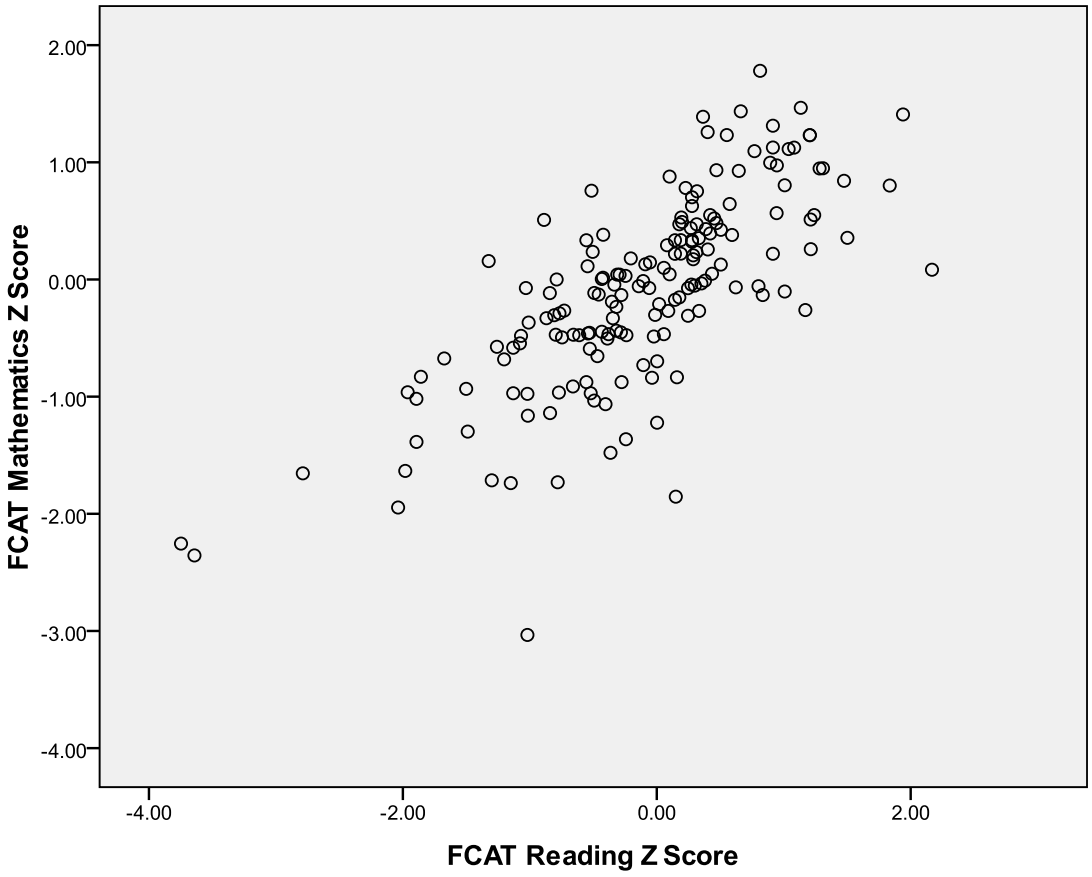

Figure 12. Scatterplot of district-wide NCLB choice group mathematics and reading scores depicting the linear relationship between the two dependent variables.

A positive linear relationship between the dependent variables was also indicated in scatterplots of Naples-area comparison groups, as shown in Figure 13 and Figure 14, respectively. The linear relationship was also indicated for the Immokalee-area comparison groups, as illustrated in Figure 15 and Figure 16, respectively.

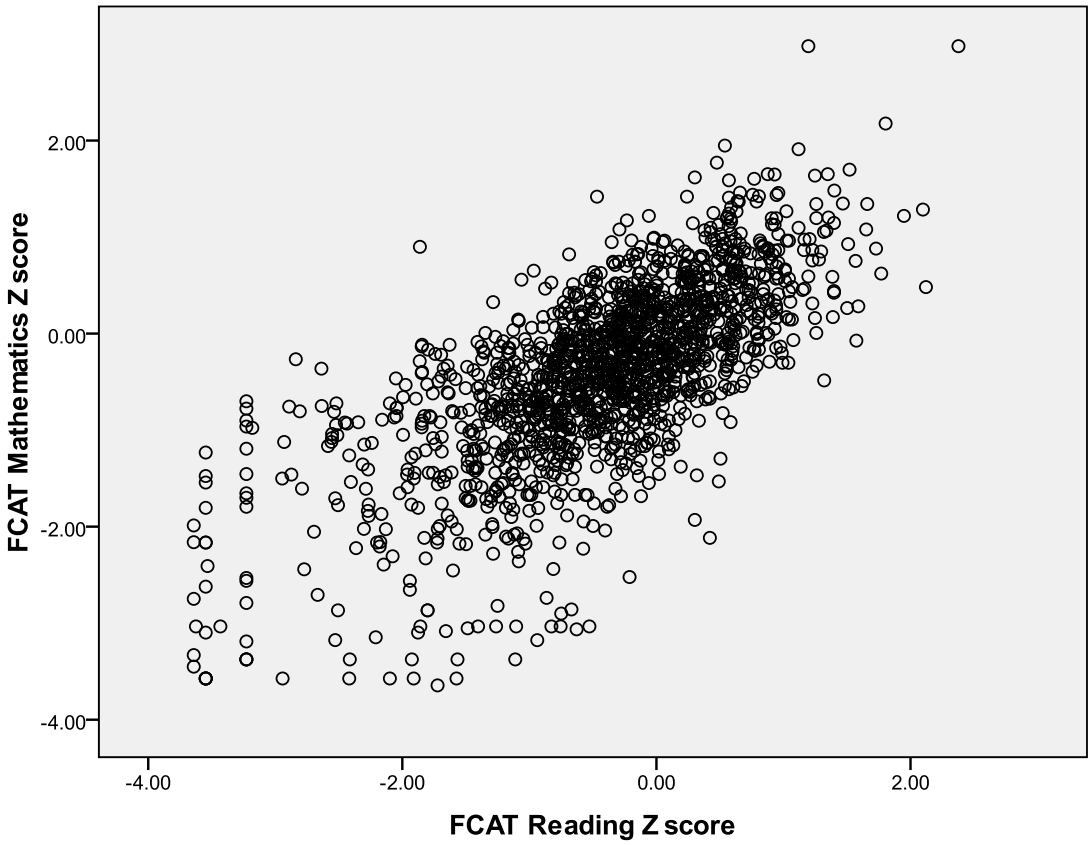

Figure 13. Scatterplot of Naples-area eligible non-chooser group FCAT mathematics and reading scores depicting the linear relationship between the two dependent variables.

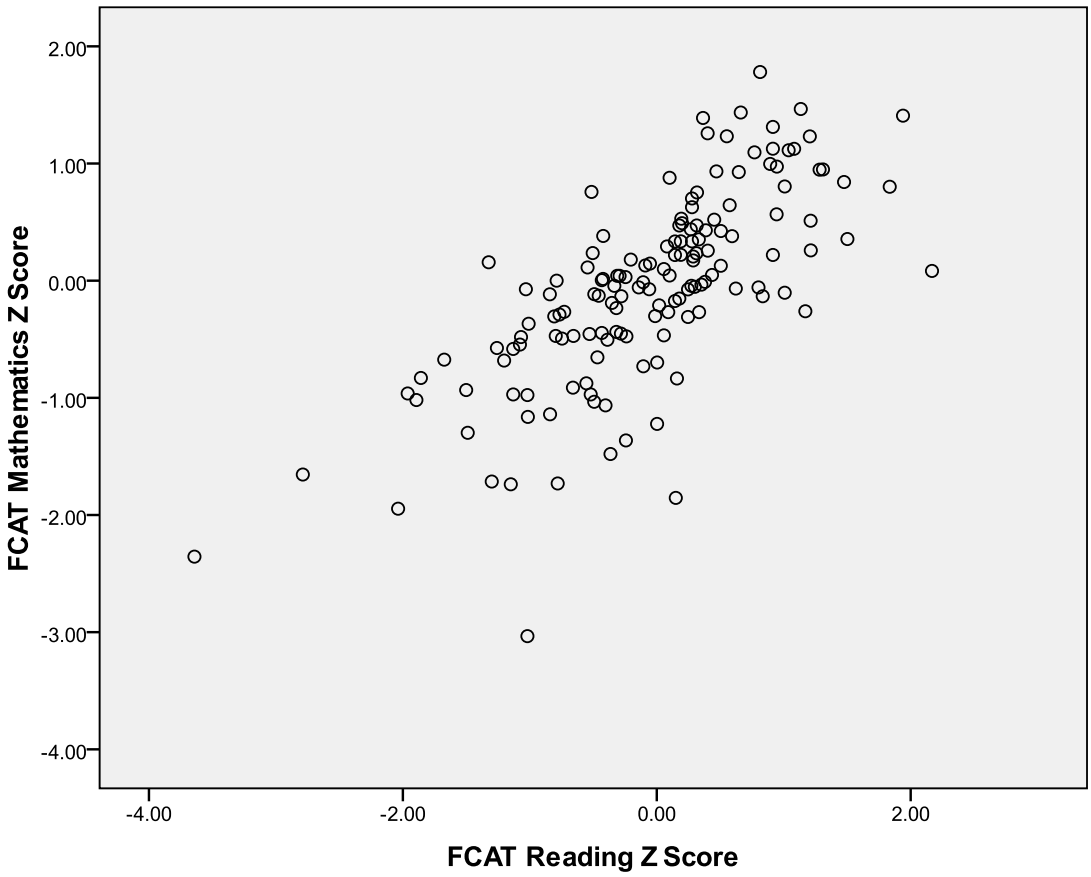

Figure 14. Scatterplot of district-wide NCLB choice group mathematics and reading scores depicting the linear relationship between the two dependent variables.

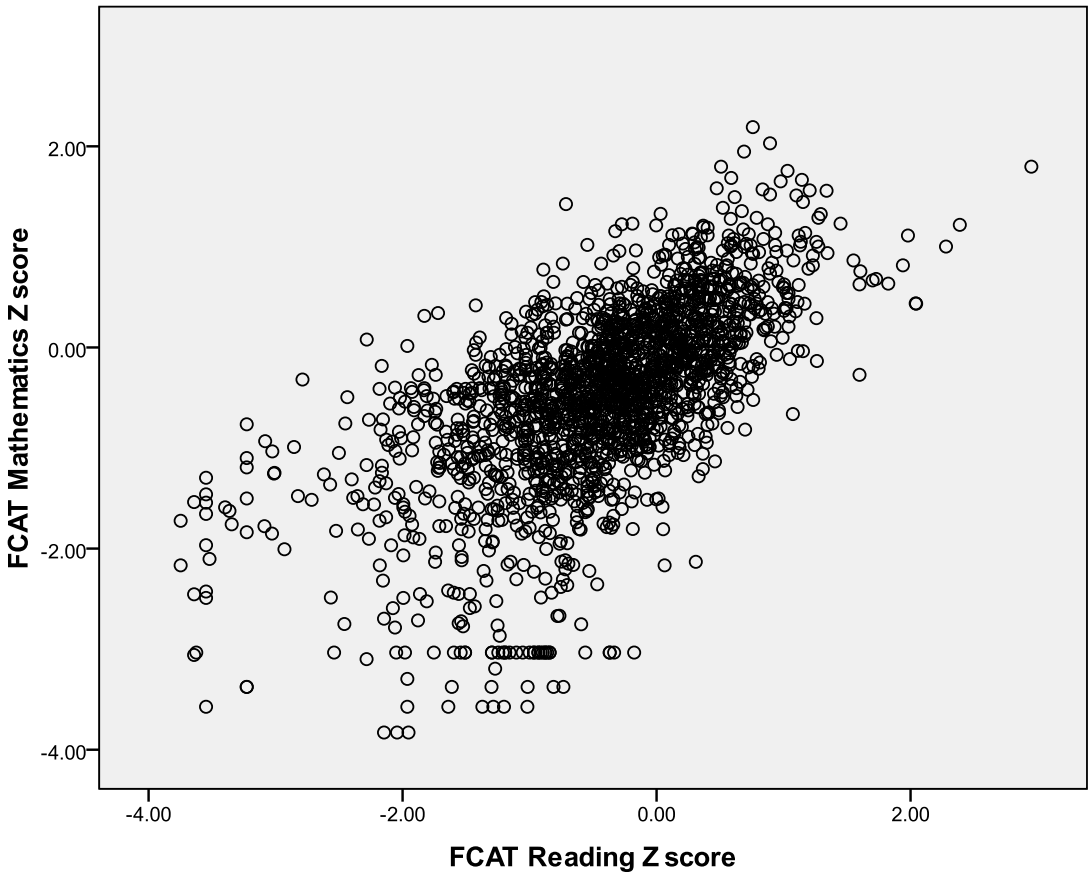

Figure 15. Scatterplot of Immokalee-area eligible non-chooser group FCAT mathematics and reading scores depicting the linear relationship between the two dependent variables.

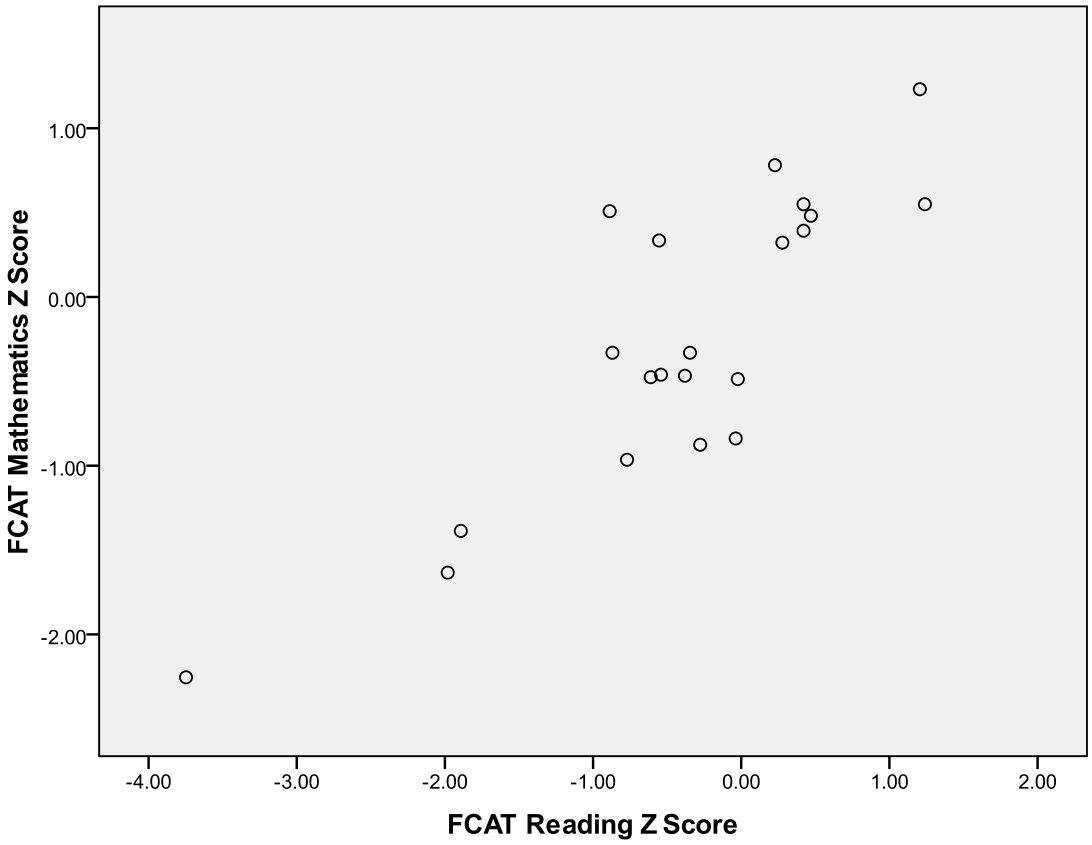

Figure 16. Scatterplot of Immokalee NCLB choice group mathematics and reading scores depicting the linear relationship between the two dependent variables.

Levene's test was then used to check the assumption that the dependent variables would have similar variances for the comparison groups. District-wide, the homogeneity of variances assumption was met for both the 2007 FCAT mathematics scores, F (3705) = .203, p = .154, and for the 2007 FCAT reading scores, F (3701) = .136, p = .713. Levene's test also indicated similar variances for the Naples-area NCLB choice students and the eligible non-choosers in mathematics, F (1780) = 2.98, p = .087, and in reading, F (1779) = .441, p =

.506. The pattern of linearity held for the Immokalee-area students as well, in both mathematics, F (1922) = .14, p = .316, and in reading, F (1919) = 1.01, p = .316.

The correlation coefficients for the dependent variables were then calculated to check for multicollinearity, which is indicated when the correlation is .8 or higher. The Pearson product moment correlation coefficient indicated a .674 positive correlation between the two dependent variables of 2007 FCAT mathematics scores and reading scores on the district-wide level, (r = .674, n = 3703, $p < 0.001$); a .714 correlation for Naples-area students (r = .714, n = 1781, $p < .001$); and a .635 correlation for Immokalee-area students (r = .635, n = 1918, $p < .0010$). It was determined, therefore, that the two covariates, were not too strongly correlated with one another.

Data Analysis

The mean mathematics and reading scores of the eligible non-choosers and the NCLB choice students were compared using *t*-tests and a MANOVA. First the scores were analyzed on a district-wide basis using an independent samples *t*-test, which indicated a statistically significant difference between the district-wide mathematics scores of eligible non-choosers (M = - .46, SD = .93) and the NCLB choice students (M = - .09, SD = .82); t (3537) = - 4.8, $p < .001$. The *t*-test also indicated a statistically significant difference between the reading scores of the district's eligible non-choosers (M = - .43, SD = .90) and NCLB choice students (M = - .11, SD = .92); t (3533) = - 4.5, $p < .001$. The magnitude

of the differences in means was small for both mathematics (η^2 = .006) and for reading (η^2 = .005).

The mean scores of the comparison subgroups from Naples and Immokalee were then analyzed using an independent samples *t*-test. For the Naples area students, the *t*-test indicated a statistically significant difference between the mathematics scores of eligible non-choosers (*M* = - .40, *SD* = .93) and the NCLB choice students (*M* = - .07, *SD* = .82); *t* (1780) = - 4.2, $p < .001$. There was also a significant difference between the reading scores of the Naples-area eligible non-choosers (*M* = - .42, *SD* = .95) and NCLB choice students (*M* = - .07, *SD* = .89); *t* (1779) = - 4.5, $p < .001$. The magnitude of the differences in means for Naples comparison groups were greater than for the district-wide groups, but were still considered small for both mathematics (η^2 = .010) and for reading reading (η^2 = .011).

By contrast, there was no statistically significant difference between the mean mathematics scores of the Immokalee area non-choosers *M* = - .51, *SD* = .97 versus NCLB choice students (*M* = - .47, *SD* = 1.22); *t* (1957) = - .196, *p* = .367. Nor was there a statistically significant difference between the mean reading scores of the Immokalee comparison groups of non-choosers, (*M* = - .47, *SD* = .92) and NCLB choice students, (*M* = - .61, *SD* = 1.29); *t* (1954) = - .713, *p* = .476.

Table 8

MANOVA Results for 2007 FCAT Pre-Test Scores Based on Transfer Status

Effect	*df*	*F*	η^2	*p*
District-Wide				
NCLB Transfer Status	2, 3670	.212	<.001	.809
Ethnicity	12, 7340	.801	.003	.094
Socioeconomic Status	2, 3670	2.370	.001	.067
Transfer Status * Ethnicity	10, 7340	.310	.001	.979
Transfer Status * SES	2, 3672	1.208	.001	.299
Naples Area				
NCLB Transfer Status	2, 1752	.096	<.001	.908
Ethnicity	12, 3504	.726	.005	.727
Socioeconomic Status	2, 1751	1.796	.002	.166
Transfer Status * Ethnicity	10, 3504	.369	.002	.960
Transfer Status * SES	2, 1752	1.001	.001	.368

Note. Alpha level = .05 using Wilks' Lambda.

A MANOVA was then conducted for the district-wide comparison groups and one was conducted for the Naples area groups. The MANOVA increased the level of rigor of the analysis, and allowed for simultaneous assessment of the variance in FCAT mathematics and reading scores, while minimizing the possibility of Type I errors associated with conducting *t*-tests or repeated ANOVAs. On the district-wide level, the MANOVA indicated no statistically significant main effect for the variable of interest, transfer status, F (2, 3670) =

.212, p = .809, η^2 = <.001; or for the additional independent variables of ethnicity, F (12, 7340) = .801, p = .094, η^2 = .003; or socioeconomic status, F (2, 3670) = 2.370, p = .067, η^2 = .001, as indicated in Table 8. The interaction of transfer status with ethnicity was non-significant F (10, 7340) = .310, p = .979, η^2 = .001; as was the interaction of transfer status with socioeconomic status, F (2, 3672) = 1.208, p = .299, η^2 = .001.

Similarly, in the Naples-area comparison groups, there was no statistically significant main effect for transfer status F (2, 1752) = .096, p = .908, η^2 = <.001; or for the additional independent variables of ethnicity, F (12, 3504) = .726, p = .727, η^2 = .005; or socioeconomic status, F (2, 1751) = 1.796, p = .166, η^2 = .002; as depicted in Table 8. The interaction effect of transfer status with ethnicity was non-significant F (10, 3504) = .369, p = .960, η^2 = .002; as was the interaction of transfer status with socioeconomic status F (2, 1752) = 1.001, p = .368, η^2 = .001.

Research Question 3

> Research Question 3: What differences are there in the ethnicity and socioeconomic status of students in kindergarten through grade eight who exercised the NCLB public school choice option versus eligible non-choosers from their geographically zoned Title I schools?

Research Question 3 focused on the relationship of NCLB public school choice and the observable characteristics of socioeconomic status and ethnicity for students who elected NCLB choice versus that of eligible non-choosers who

remained in their zoned Title I SINI schools. These characteristics were of interest to school choice researchers seeking to understand whether school choice contributed to increased ethnic and socioeconomic stratification among schools.

First, a descriptive analysis was conducted to illustrate the percentage of eligible students who elected to transfer, as disaggregated by ethnicity and socioeconomic status. This was done first on a district-wide basis, and then for the separate geographic areas of Naples and Immokalee. Next, logistic regression was used to estimate the likelihood of transfer based on independent predictor variables of ethnicity and socioeconomic status. The results were expressed in terms of odds ratios that described each group's transfer probability relative to one selected reference group. Hispanics were the reference group for ethnicity, and students who qualified for free or reduced-price lunch were the reference group for socioeconomic status.

The impact of NCLB choice transfers at the school level was then examined by: (a) determining which schools were most affected by NCLB choice and analyzing the odds of transfer at each of those schools based on students' ethnicity, and; (b) depicting the change in the ethnic and socioeconomic composition of these schools that resulted from NCLB choice transfers.

Description of Participants

The sample for Research Question 3 was expanded to include all students in kindergarten through grade 8 who were eligible for school choice for the 2007-

2008 academic year. There were 9,359 students divided among 10 elementary schools and 2 middle schools who were eligible for NCLB choice. In the Naples area, elementary schools consisted of students in kindergarten through grade 5, while middle school was for grades 6 through 8. In the Immokalee area, elementary schools were extended through grade 6, and middle school was for students in grade 7 and grade 8 only.

Table 9

District-wide Demographic Composition of Students Eligible for NCLB Choice

Race/Ethnicity	*n*	%
Black	1,787	19.08
Hispanic	6,515	69.62
White	808	8.63
Mixed Race	199	2.13
Asian	19	0.20
Native American	31	0.33
Total	9,359	100.00
Socioeconomic Status		
Eligible for Free/ Reduced Price Lunch	7,946	84.90
Not Eligible for Free/Reduced Price Lunch	1,411	15.10

Of the 9,359 students who were eligible for transfer, 573 (6.1%) opted to leave their Title I schools. The ethnicity and the socioeconomic status of students eligible for NCLB choice is shown in Table 9. Most of the choice

students were concentrated in the Naples area, where 505 (9.7%) of 5,207 eligible students elected to leave their zoned schools. In the Immokalee area, only 68 (1.6%) of 4,152 eligible students opted for NCLB choice.

Data Analysis

The racial/ethnic composition of NCLB choice students and eligible non-choosers was examined on three levels: (a) district-wide; (b) by geographic area, defined as the Naples and the Immokalee areas, and; (c) at the school level. Among students eligible for NCLB choice, there were differing levels of participation by ethnicity and by socioeconomic status. District-wide, and in both geographic areas, eligible White students were most likely to elect NCLB choice, and eligible Multi-racial students were second most likely to do so. There was a dramatic drop in choice participation for eligible Asians, Blacks, Hispanics, and then for Native Americans, who opted for school choice in successively smaller percentages, as shown in Figure 17.

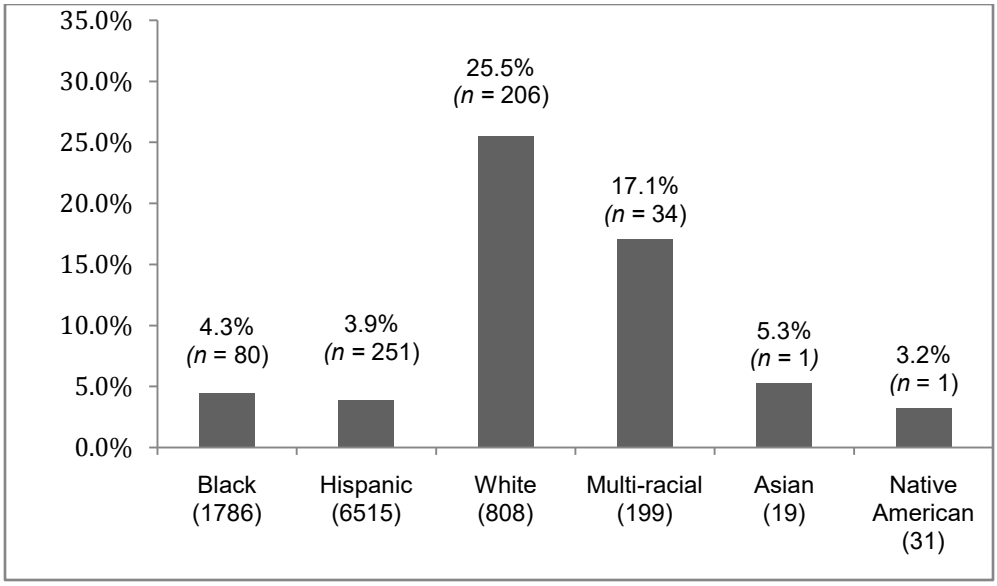

Figure 17. District-wide NCLB choice participation by ethnicity. The number and percent of eligible students who elected school choice from each group are shown. The total number of eligible students from each group is also indicated.

When the participation rates were disaggregated by geographic area, greater participation in the Naples area was contrasted with lesser participation in the Immokalee area, as indicated in Figure 18 and Figure 19, respectively. Despite the difference in the level of participation between the two communities, the relative participation among the four largest ethnic groups was similar, with White students participating most often, followed by Multi-racial students, then dropping significantly for Black students and finally Hispanic students. The percentage of eligible Asian and Native American students who elected NCLB choice varied by geographic area, but each was based on a single student's participation.

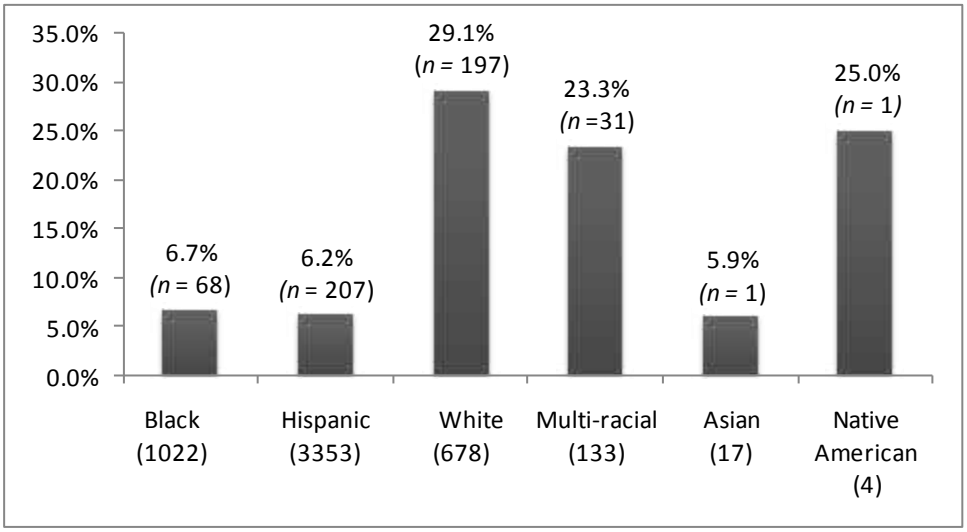

Figure 18. Naples area NCLB choice participation by ethnicity. A greater percentage of eligible students from this geographic area participated in NCLB school choice when compared with eligible students from the Immokalee area.

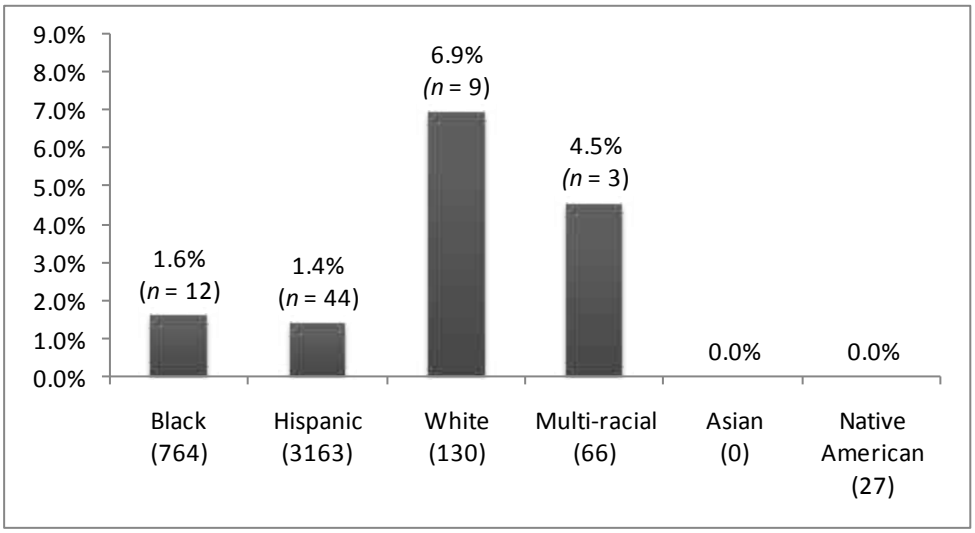

Figure 19. Immokalee-area participation in NCLB choice by ethnicity. Eligible Immokalee-area students were less likely to transfer from their Title I school than are eligible students from the Naples area, but the relative pattern of participation mirrored that of the Naples-area group.

A logistic regression analysis was conducted to quantify the odds ratio for participation in NCLB choice by ethnicity. Because there were so few Asian students, they were not included in this and subsequent analyses. Native American students were also excluded from further analysis, in part because there were so few students represented, and also because, for Native Americans in the Immokalee area, attendance in CCPS schools already represented a choice to opt out of attending the local Seminole school.

Omnibus tests for goodness of fit indicated that ethnic characteristics provided a statistically significant model for predicting transfer status (*n = 9309,* χ^2 = 417.6, *df* = 3, *p* < .001). The Hosmer and Lemeshow test for goodness of fit also supported ethnicity as statistically significant predictor of transfer status, with a value exceeding .05 (*p* = 1.0).

In determining the odds of transfer, Hispanics were used as the reference group since they were the majority and were the least likely to transfer, as indicated in Figure 17. When compared with the odds of transfer for the reference group of Hispanic students on a district-wide basis, Black students were 1.16 times more likely to transfer, White students were 8.3 times more likely to transfer, and Multi-racial students were 5.95 times more likely to do so, as depicted in Table 10. The odds ratio for Black students was indicated as non-significant (*p* = .272); however, this was a function of their close position relative to Hispanic reference group. If White students had been used as the reference group instead, the Black student odds ratio would have been statistically

significant ($p < .001$) and Multi-racial students, whose position was most similar to that of White students would have had a significance value higher than .05 ($p = 326$). Therefore, since the goodness of fit tests indicated ethnicity as a significant predictor of transfer status, and the significance values varied based on the arbitrary selection of a reference group, the odds ratios for all students were reported with their respective confidence intervals as indications of the predictive value for transfer status of each subgroup.

Table 10

Odds Ratios for Transfer Status Based on Ethnicity

	Wald	*df*	*p*	Odds Ratio	95% Confidence Interval	
District-wide						
Hispanic	485.67	3	<.001	1.00		
Black	1.21	1	.272	1.16	.89	1.50
White	424.10	1	<.001	8.37	6.84	10.25
Multi-racial	82.86	1	<.001	5.95	4.05	8.74
Naples area						
Hispanic	316.86	3	<.001	1.00		
Black	1.21	1	.915	1.08	.82	1.44
White	424.10	1	<.001	6.26	5.04	7.77
Multi-racial	82.86	1	<.001	4.71	3.07	7.22
Immokalee area						
Hispanic	26.87	3	<.001	1.00		
Black	.31	1	.580	1.04	0.53	2.02
White	273.81	1	<.001	4.26	1.97	9.24
Multi-racial	50.68	1	<.001	6.95	2.65	18.25

Note. Hispanic students are the reference group with the transfer odds set at a value of 1.

The odds ratios for the separate geographic communities of Naples and Immokalee were then calculated, as shown in Table 10. Omnibus tests indicated that ethnicity was a statistically significant predictor of transfer status in the Naples area (n= 5185, χ^2 = 290.08, df = 3, $p < .001$) as well as in the Immokalee area (n = 4123, χ^2 = 19.28, df = 3, $p < .001$). The Hosmer and Lemeshow test for goodness of fit supported ethnicity as a statistically significant predictor of transfer status in both geographic areas, with an identical value exceeding .05 (p = .10) for both Naples and Immokalee.

In the Naples area, Black students were 1.08 times as likely as Hispanic students to transfer, while the odds ratio for White students was 6.26, and for Multi-racial students it was 4.71. In the Immokalee area, the odds ratios were 1.04 for Black students, 4.26 for White students, and 6.95 for Multi-racial students. The 95% confidence intervals for Immokalee area groups should be noted, however, as they were relatively large.

The frequency of participation in NCLB choice varied according to socioeconomic status as well. As shown in Figure 20, eligible students from both Naples and Immokalee whose families could afford to pay full price for meals were more likely to elect school choice than were eligible students who participated in the free or reduced price lunch program. In the Naples area, of the 1,079 students who paid full price for meals, 191 (16.8%) chose to transfer out of their Title I schools, while only 323 (7.8%) of the 4,127 students who got free or reduced-price meals opted out. In Immokalee, the percentage of

participating students was smaller, but the ratio remained constant, with 10 (3.0%) of the 332 full-price students leaving their Title I schools while only 58 (1.5%) of the 3794 students getting free or reduced price lunch opted to transfer.

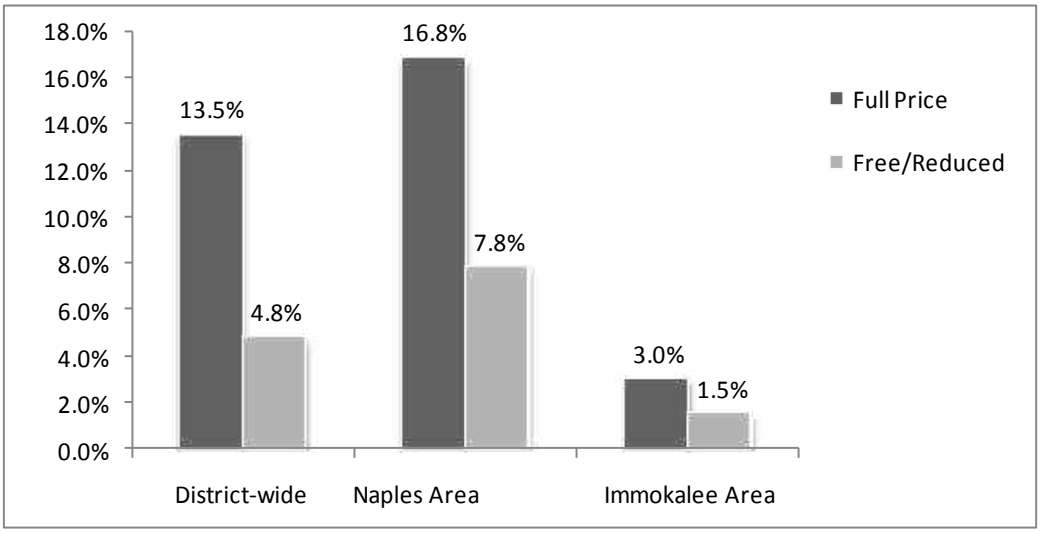

Figure 20. Participation of eligible students in NCLB choice by socioeconomic status. In each of the geographic areas, a greater percentage of the eligible students whose families could afford to pay full price for lunch transferred from Title I schools when compared with the percentage of eligible students who qualified for free or reduced price lunch.

Quantified odds ratios from the logistic regression analysis were illustrated in Table 11. Omnibus tests indicated that eligibility for free or reduced price lunch was a statistically significant predictor of transfer status on the district-wide level ($N = 9308$, $\chi^2 = 121.60$, $df = 1$, $p < .001$), as well as for the Naples area schools ($n = 5185$, $\chi^2 = 63.33$, $df = 1$, $p < .001$). This was not the case in the Immokalee area schools, where only 329 of 4,123 students paid full price for

meals, and socioeconomic status did not reach the level of significance as a predictor of transfer status (n = 4123, χ^2 = 3.49, df = 1, p = .063).

District-wide, the transfer odds for a student who did not qualify for free or reduced-price lunch were 3.02 times that of a student who did qualify, but in the Naples area, where most NCLB choice transfers occurred, the odds ratio was 2.29. The results from the Immokalee area were not included because Omnibus tests indicated that socioeconomic status was not a significant predictor of transfer status for that subgroup of students.

Table 11

Odds Ratio for Transfer Based on Socioeconomic Status

	Wald	*df*	*p*	Odds Ratio	95% Confidence Interval	
Full Price – District-wide	137.80	1	<.001	3.02	2.51	3.63
Full Price – Naples area	82.86	1	<.001	2.29	1.88	2.79

Note. Students who qualified for free or reduced-price lunch were the reference group.

The effect of NCLB choice at the school level was then examined. The impact on the demographic composition of individual schools was varied. In six of the twelve schools that were required to offer choice, there was almost no impact on the ethnic and socioeconomic composition of the student body because the percentage of students who chose to transfer ranged from 1.2% to 2.4% per school. Five of these six minimally affected schools were in Immokalee, where every school qualified as a Title I School in Need of

Improvement (SINI), and where only 68 of 4,152 eligible students opted to transfer. Furthermore, of those 68 Immokalee students who elected NCLB choice, 7 chose to attend a different Title I SINI in the Immokalee community. The sixth school with minimal NCLB choice participation was a new Naples-area school that first opened for the start of the 2007-2008 school year. Because the effect of NCLB choice on these six schools was negligible, their data were not analyzed further.

The remaining six schools, which were identified with pseudonyms, were targeted for additional study of the school-level impact of NCLB choice because they accounted for more than 88% of district's NCLB choice transfers, with 495 of the 573 choosers opting out of one of these six campuses. An examination of school-level NCLB choice data in the five targeted elementary schools and the single middle school suggested a pattern of transfers based on ethnicity and on socioeconomic status. Except for two schools in which the Black student enrollment held constant, and one school where the percentage of students who qualified for free or reduced price lunch was constant, the direction of change was always away from the district mean.

One consistent finding at every school was the tendency of White students to leave Title I SINI schools, where they were, in every case, under-represented relative to the 43% District mean for White enrollment. In Mariner Middle School, White student enrollment dropped from 13% of the school's population to 9% as a result of NCLB choice transfers, as shown in Figure 21. Similarly, the White

population of Everglades Elementary decreased, as indicated in Figure 22, from 12% to 9%. At Live Oak Elementary, White student enrollment dropped from 14% to 11%, and at Cypress Hammock Elementary, it decreased from 19% to 17%, as illustrated in Figure 23 and Figure 24, respectively. Palm Grove Elementary, which had the largest zoned enrollment of White students at 27%, realized the most precipitous drop with a 5 point decrease to 22%, as indicated in Figure 25. Conversely, Riverside Elementary, with the smallest zoned enrollment of Whites at 8%, dropped only 1 point to 7%, as shown in Figure 26. The cumulative effect of NCLB choice on the enrollment of White students in the six targeted Title I schools is illustrated in Figure 27. This decrease in the percentage of White students enrolled in Title I schools was consistent with their leading rate of choice participation relative to other ethnic groups.

The opposite trend occurred with enrollment of Hispanic students, whose margin of majority in the six targeted Title I schools increased from 62% to 65% due to NCLB choice, moving further from the district mean of 43%, as illustrated in Figure 27. Hispanic students transferred in greater numbers than any other group, but the percentage of eligible Hispanic students who chose to transfer was lowest of all ethnic groups district-wide, in the Naples area, and in the Immokalee area, as is indicated in Figure 17, Figure 18, and Figure 19, respectively. Consequently, since students from other ethnic groups transferred out of Title I schools at a greater rate than did Hispanic students, the relative proportion of this dominant group increased.

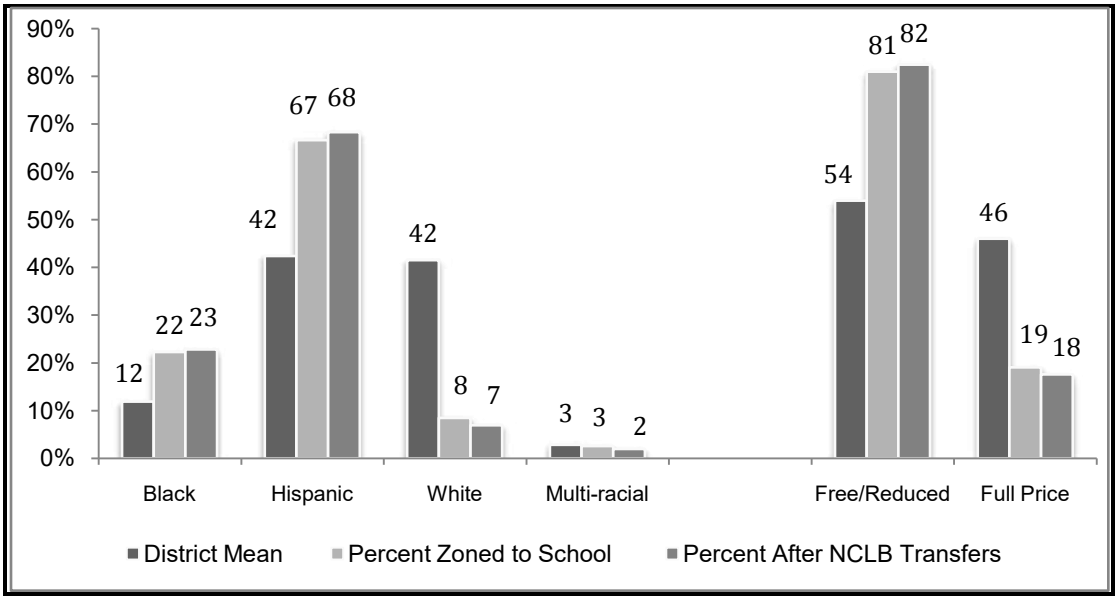

Figure 21. Mariner Middle School: Changes in demographic composition due to NCLB school choice.

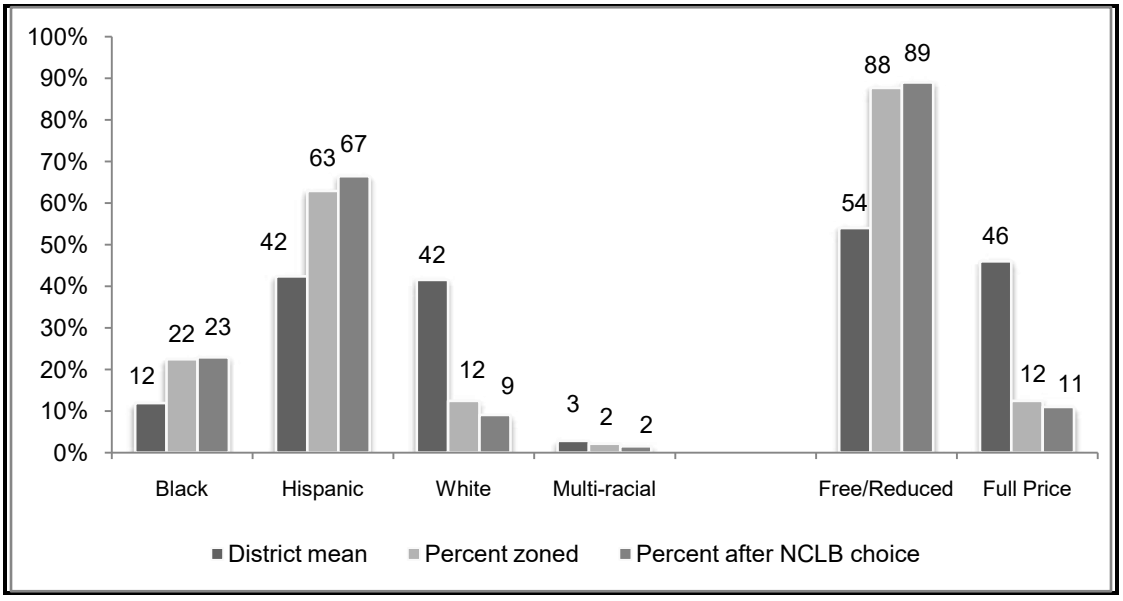

Figure 22. Everglades Elementary: Changes in demographic composition due to NCLB school choice.

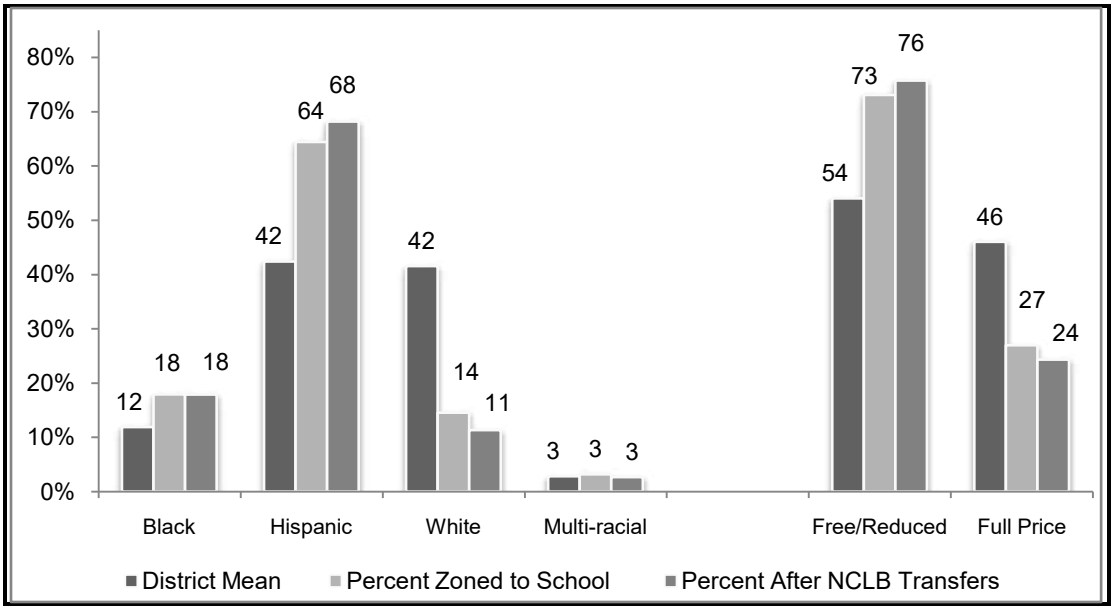

Figure 23. Live Oak Elementary: Changes in demographic composition that resulted from NCLB Choice.

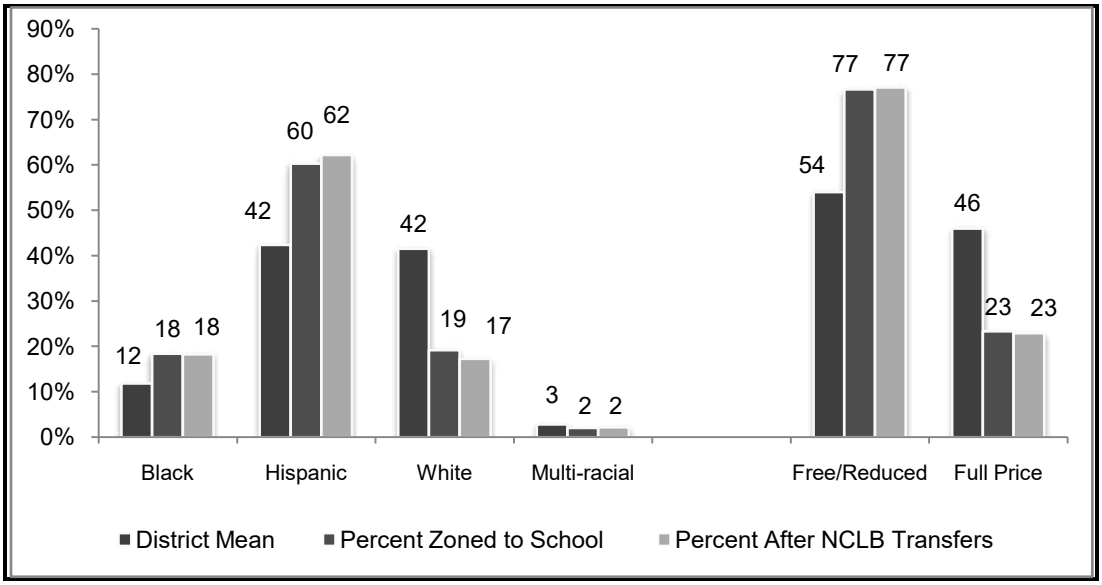

Figure 24. Cypress Hammock Elementary: Changes in demographic composition that resulted from NCLB Choice.

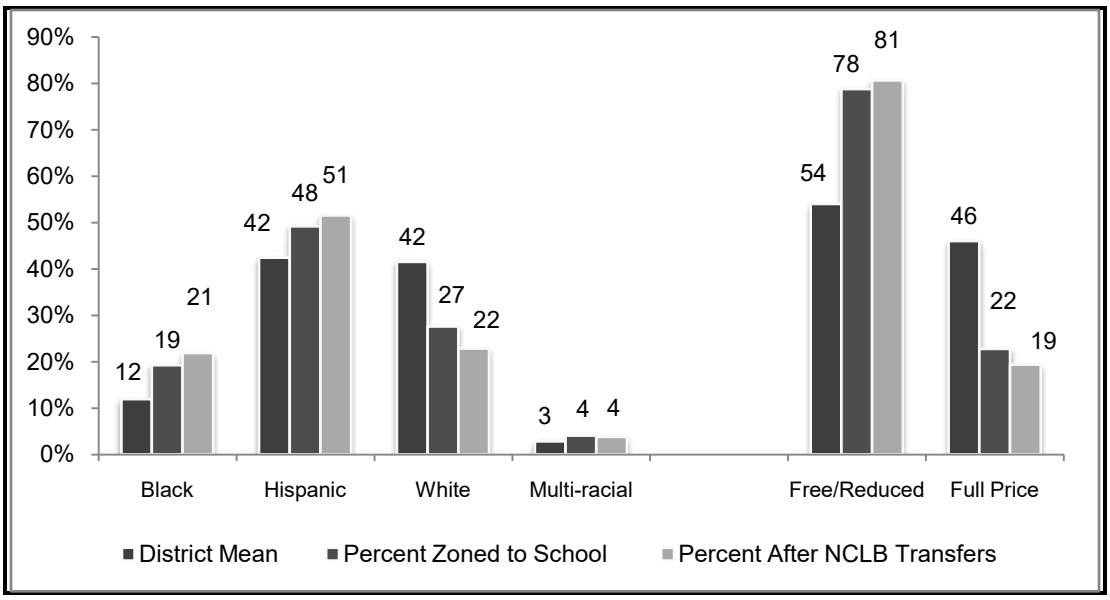

Figure 25. Palm Grove Elementary: Changes in demographic composition that resulted from NCLB Choice.

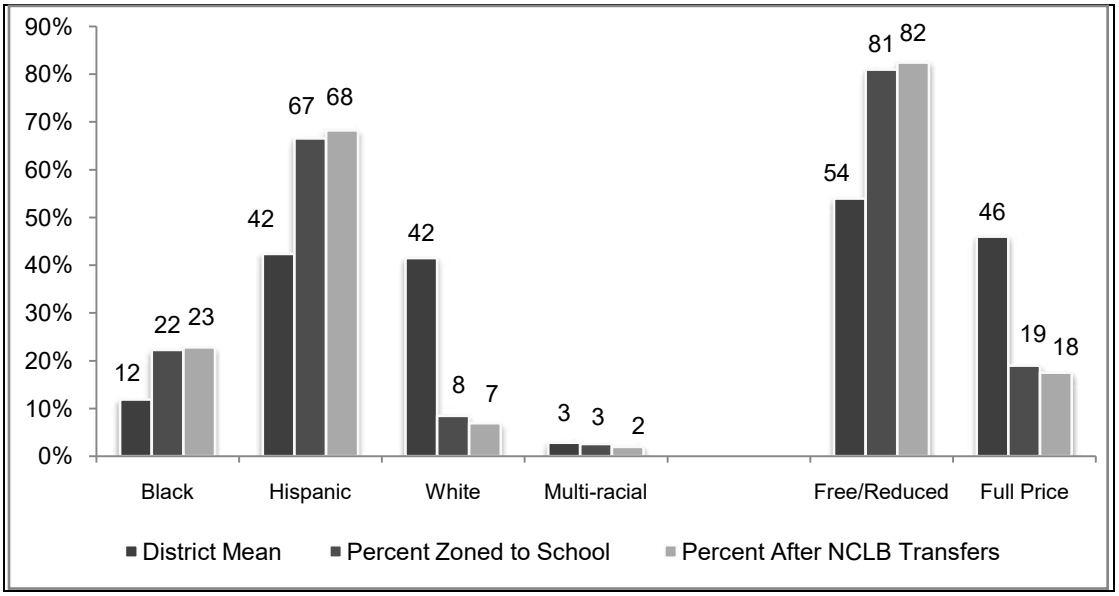

Figure 26. Riverside Elementary: Changes in demographic composition that resulted from NCLB Choice.

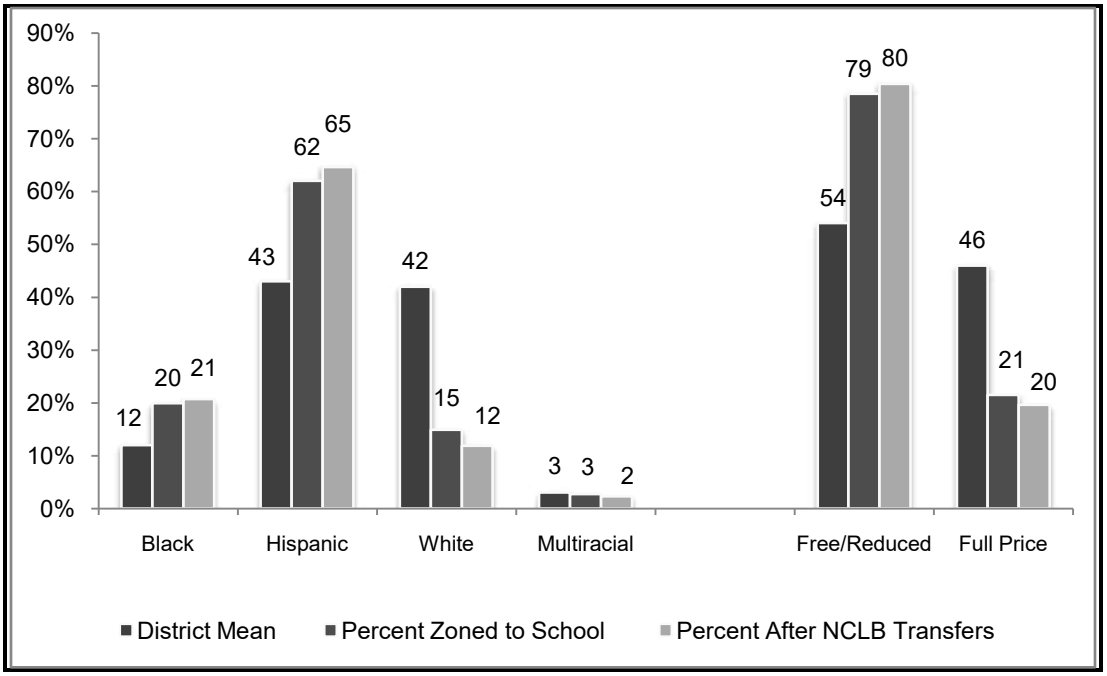

Figure 27. Cumulative effect of NCLB choice on demographic composition of students in the six targeted schools.

For Black students, the net effect of NCLB choice on enrollment percentage varied by school. Black student enrollment at Live Oak Elementary and Cypress Hammock Elementary remained constant at 18%, or six points above the district mean, as shown in Figure 23 and Figure 24, in order. At both Everglades Elementary, shown in Figure 21, and Riverside Elementary, shown in Figure 26, Black student enrollment rose incrementally from 22% to 23%. The proportion of Black students enrolled at Palm Grove Elementary increased from 19% to 21%, shown in Figure 21. There was a two percentage point increase at Mariner Middle as well, with Black student enrollment rising from 20% to 22%. In all the six schools combined, there was a net increase in Black student enrollment from 20% to 21%.

With regard to socioeconomic status, in Cypress Hammock Elementary, the percentage of students eligible for free or reduced price lunch remained constant, but each of the other five targeted schools, the percentage of qualifying students moved further away from the district mean of 45%. Everglades and Riverside elementary schools both realized a single point increase in the percentage of students on free or reduced price lunch, going from 88% to 89% and 81% to 82% respectively. Mariner Middle School's percentage increased two points from 78% to 80%, as illustrated in Figure 21. Live Oak Elementary and Palm Grove Elementary each netted a 3 point increase in the percentage of students who qualified for economic assistance, going from 73% to 76%, and 78% to 81%, as shown in Figure 23 and Figure 25, in order.

The school–level odds ratios for transfers based on ethnicity are presented in Table 12. Omnibus tests for goodness of fit indicated ethnicity as a statistically significant predictor of transfer status, with the same significance level in all schools ($p < .001$). The Hosmer-Lemeshow test supported this as well, with $p = 1.0$ in all schools. As shown in Table 12, White students consistently had a greater likelihood of transferring out of Title I schools, with the odds ratios varying from 4.42 times the Hispanic transfer rate at Palm Grove Elementary to 6.82 times the Hispanic transfer rate at Riverside, while the results for Black and Multi-racial students were mixed.

Table 12

School-Level Odds Ratios for Transfer Based on Ethnicity

	N Eligible	*n Transfer*	χ^2	*df*	*p*	Odds Ratio	95% Confidence Interval	
Mariner Middle								
Hispanic	443	55	55.43	3	<.001			
Black	134	10		1	.116	.57	.28	1.15
White	87	37		1	<.001	5.50	3.32	9.19
Multi-racial	16	6		1	.012	4.41	1.39	13.96
Everglades								
Hispanic	378	33	38.27	3	<.001			
Black	135	16		1	.291	1.41	.75	2.65
White	75	28		1	<.001	6.01	3.32	10.86
Multi-racial	13	5		1	.002	6.53	2.02	21.12
Live Oak								
Hispanic	669	55	57.98	3	<.001			
Black	186	25		1	.032	1.73	1.05	2.87
White	151	49		1	<.001	5.36	3.46	8.31
Multi-racial	33	9		1	.001	4.19	1.85	9.45
Cypress Hammock								
Hispanic	317	8	19.91	3	<.001			
Black	97	6		1	.091	2.55	.861	7.53
White	101	15		1	<.001	6.73	2.77	16.42
Multi-racial	11	0		1	.999	0.00	0.00	
Palm Grove								
Hispanic	294	23	64.44	3	<.001			
Black	115	0		1	.996	0.00	0.00	
White	165	45		1	<.001	4.42	2.56	7.63
Multi-racial	24	4		1	.146	2.36	.743	7.48
Riverside								
Hispanic	652	29	43.58	3	<.001			
Black	218	10		1	.931	1.03	0.50	2.16
White	83	20		1	<.001	6.82	3.65	12.76
Multi-racial	25	7		1	<.001	8.35	3.24	21.58

Note. Hispanic students are the reference group with the transfer odds set at a value of 1. Chi-square values represent the goodness of fit of ethnicity as a predictor of transfer status.

Summary

This chapter provided a detailed description of the data analysis procedures and the results for each of the three research questions. The analysis of the academic achievement gains of NCLB transfer students compared with matched eligible non-choosers did not indicate a significant relationship between NCLB choice and improved student achievement on the FCAT SSS mathematics or reading tests. School choice was a key component of NCLB legislation targeting greater academic gains for disadvantaged students. Because this particular study of Collier County students did not indicate a statistically significant relationship between this critical element of education policy its intended result, the data analysis procedures, including all assumption testing, were described in detail.

With regard to possible differences in the academic ability levels of NCLB choice students who opted to transfer out of schools that had not made Adequate Yearly Progress, the data were analyzed district-wide, and by geographic area of the county, separating the coastal, suburban Naples area students from the inland, rural Immokalee students. Using the 2007 FCAT mathematics and reading scores as the pre-test indicator of academic ability in the year prior to the transfer, a *t*-test indicated no significant differences between the Immokalee-area NCLB choice students versus non-choosers, but it did indicate differences for Naples-area students based on their transfer status. However, when the more

rigorous MANOVA was conducted, the higher achievement level of NCLB choice students was found to be non-significant.

Next, a descriptive analysis of the ethnic and socioeconomic characteristics was conducted in an attempt to identify patterns of NCLB choice that might lead to the ethnic or socioeconomic stratification of schools that has been an area of concern, particularly for opponents of school choice. The percentage of eligible students from each ethnic and socioeconomic group who chose to transfer was identified. Eligible White students were found to be more likely to transfer than were eligible Multi-racial, Black or Hispanic students, who opted out of Title I SINI schools in successively smaller percentages.

The school-level impact of NCLB choice on ethnic and socioeconomic characteristics was then analyzed for the six Title I schools most affected by transfers. The ethnic and socioeconomic composition of students who actually attended these schools in the 2007-2008 academic year was contrasted with the percentage of students who were zoned to attend them prior to the implementation of NCLB choice transfers. The district-wide mean percentage of each ethnic group was included for reference. Changes in the demographic characteristics of schools were incremental, with most groups increasing or decreasing by only one or two percentage points. When changes did occur, the direction of change was always away from the district mean for the identified group. There was a significant negative correlation between the percentage of eligible students in an ethnic group who chose to transfer and their ethnic

representation in the assigned school relative to their group's district mean percentage.

Chapter 5 further summarizes the findings of the study, and delineates the conclusions and the implications for practice as well as recommendations for future research.

CHAPTER FIVE: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

Publicly funded school choice for students trapped in underperforming schools was a cornerstone of NCLB legislation designed to close the achievement gap for disadvantaged students, but the relationship of school choice and academic achievement was not clearly established. Furthermore, the issue was highly politically charged, with emotional advocates on both sides of the issue injecting subjectivity into the public debate, and sometimes, into the research as well. While there was a growing, though conflicting body of evidence on the relationship of student achievement to public charter school choice, only two published studies examining academic achievement in the context of the NCLB option to transfer to a different traditional public school were identified. These two studies yielded contradictory results, as did the body of evidence from charter school studies. One of them indicated greater achievement in middle schools of choice than in the Title I middle schools required to provide the option of choice with transportation as a consequence of failure to meet Adequate Yearly Progress (AYP) goals (Okpala et al., 2007). The other study examined student-level data from middle and elementary schools, and found no statistically significant difference between the academic achievement of NCLB choice students and the eligible non-choosers who attended the Title I schools that had failed to make AYP (McCombs, 2007).

The primary issue of interest to school choice researchers was the effect of choice on achievement, but a secondary concern, particularly for opponents of choice, was the possibility that it could foster the unintended side-effect of increased ethnic, socioeconomic, and ability stratification among schools. This causal-comparative study addressed the outstanding questions related to these issues by examining the following: (a) FCAT mathematics and reading achievement gains of targeted fourth through eighth grade NCLB choice students and a comparison group of eligible non-choosers with matching demographic characteristics; (b) the pre-test academic ability levels of NCLB choice students in fourth grade through eighth grade as compared with the achievement levels of eligible non-choosers, and; (c) differences in the ethnic and socioeconomic characteristics of choice students versus eligible non-choosers in kindergarten through eighth grade, and the impact of those differences on the demographic composition of individual schools.

Research Question 1

The relationship of school choice to academic acheivement was the most important and the most immediate of the issues identified in this study because improved achievement was the outcome specifically targeted by NCLB legislation and funded by federal Title I spending. Collier County choice students were deemed by the researcher to be an advantageous sample for the study of school choice because Florida's A+ Accountability system met one of the key requirements of effective choice programs in that it provided families with

meaningful and readily understandable information about school performance using the familiar *A* through *F* designations, which contrasted with the broader pass/fail federal system used to denote Adequate Yearly Progress. In addition, Collier County met another requirement of successful choice programs because students who elected to transfer out of their Title I schools had real alternatives in the form of high-achieving schools that were easily accessible, at least for students from the suburban Naples area of the county, if not for the students from the more geographically isolated inland community of Immokalee.

Research Design

NCLB legislation was signed into law in 2001, but the sanctions mandating a choice option with publicly funded transportation for students in Title I schools that had not made Adequate Yearly Progress did not begin until the 2004-2005 school year. Consequently, the majority of the available school choice research conducted since the passage of NCLB legislation focused not on NCLB choice, but on public charter school choice. Analyses of the relationship of charter school choice to academic achievement gains have yielded conflicting results that have been associated, in some cases, with the research design. Snapshot studies analyzing levels of achievement from sources such as the NAEP data set have pointed toward greater achievement levels for traditional public school students (Lubienski & Lubienski, 2009; Nelson,et al., 2004) while panel data set analyses of achievement gains using a lottery-randomization method to form comparison groups have pointed toward a charter school advantage (Hoxby &

Murarka, 2007; Hoxby & Rockoff, 2005). The results were less predictable when the research design involved comparisons of the achievement gains of students or schools with matching demographic characteristics. Some studies favored charter school achievement, while others indicated better performance in traditional public schools, and still others found no statistically significant difference (Jeynes, 2000; Wahlberg, 2007).

This study employed the research design that has yielded the less predictable results and compared the 2008 FCAT SSS mathematics and reading achievement scores of NCLB choice students with the scores of eligible non-choosers who had matching demographic characteristics, while using 2007 FCAT SSS scores to control for prior achievement. Membership in the NCLB choice group was limited to students in grade 4 through grade 8 who had attended a Title I school in 2006-2007 and then elected to transfer to a different traditional public school for the 2007-2008 academic year. The analysis was limited to the identified grade levels because the younger students were not tested using the FCAT, and very few students at the high school level elected NCLB choice.

Students who had never attended a Title I school, but were subsequently made eligible for NCLB choice due to rezoning, relocation, or a change in school level were not included in the choice group because many of them had attended very high-performing schools with wealthy student populations. Consequently, they were not deemed by the researcher to be members of the population of

disadvantaged students targeted by this study for an analysis of academic growth or members of the population targeted by NCLB legislation for purposes of closing the achievement gap. The availability of NCLB choice to students who were not disadvantaged and who had never attended a Title I school occurred most often when students transitioned from one of 28 relatively small CCPS elementary schools into one of only 10 larger middle schools.

Findings

A MANCOVA was used to examine the relationship of the 2008 FCAT mathematics and reading achievement scores with the following independent variables: (a) transfer status, which was the independent variable of interest; (b) gender; (c) ethnicity, and; (d) socioeconomic status. The 2007 FCAT scores were the covariates.

The results of the MANCOVA indicated no statistically significant main effect for any of the variables, nor did it reveal any statistically significant interaction effects between transfer status and the other variables. The only variables that had a significant relationship with 2008 FCAT achievement scores were the 2007 FCAT scores used as covariates to control for prior achievement. This finding was consistent with McCombs (2007) analysis of elementary and middle school student-level data to assess NCLB choice and academic achievement.

Limitations

Despite the advantages cited for conducting research on school choice in the Collier County Public School district, there were limiting factors as well. One limitation was the lack of information supporting a more complete indication of students' socioeconomic status, such as the parents' level of education, which has been associated with student achievement in previous studies (Gill et al., 2001; Lambdin & Mintrom, 1997).

Another limitation was the restriction of test score data to gains made on the FCAT test from the end of one school year to the end of the following year. This was important because, although some research noted improved achievement after only one year in a choice school (Hoxby & Murarka, 2007; Hoxby & Rockoff, 2005), other studies indicated that achievement did not typically increase until students had spent more than one year in their school of choice (Booker et al., 2004; Gronberg & Janssen, 2001; Sass, 2006). The obstacle that prevented this study from assessing the trajectory of achievement gains over a multiple years was the limited number transfer students who had spent more than one year in a choice school and who could be matched with a comparison group counterpart based on multiple factors, minimally including: (a) grade level; (b) socioeconomic status; (c) ethnicity; (d) ELL status, and; (e) learning disability.

Research Question 2

A second issue of interest to choice researchers involved the possibility that NCLB choice might draw the most academically able students from Title I schools, resulting in the unintended side-effect of increased ability stratification among schools, referred to as skimming. While Research Question 1 assessed students' spring 2008 achievement scores, Research Question 2 assessed, instead, differences in 2007 pre-test levels of achievement of choosers versus non-choosers. In her 2007 study of school choice, McCombs found that NCLB transfer students were more likely to have scored in the highest levels of reading than in the year prior to choice selection than were non-transfer students, suggesting a positive relationship between achievement and transfer status that could constitute skimming.

As with Research Question 1, though, most of the relevant literature identified on this subject was based, not on NCLB choice research, but on charter school research, which yielded conflicting results on the issue. Charter school advocates have responded to charges that traditional public schools outperformed them with studies attributing the discrepancy to the greater proportion of minority and economically disadvantaged students in charter schools, which would suggest that choice did not contribute to skimming (Greene et al., 2003).

Charter school opponents countered with evidence contradicting the assertion of a higher proportion of disadvantaged students in charter schools,

and asserting that superior scores of traditional public school students were not based on higher levels of prior achievement. They examined the combination of socioeconomic status and ethnicity of students from charter and traditional schools rather than analyzing those characteristics separately, and found that traditional public schools had the greater proportion of disadvantaged students (Lubienski & Lubienski, 2009). Two meta-analyses were then identified, but they did little to clarify the issue, as they also revealed contradictory findings, with one indicating better traditional school performance (Carnoy, 2005) while the other found superior charter school performance (Hoxby & Rockoff, 2005).

Research Design

This study attempted to add to the limited knowledge base on the relationship of students' academic achievement levels and their NCLB transfer status by using spring 2007 FCAT scores as pre-test indicators of academic ability, and then analyzing the variability in scores of choice students versus eligible non-choosers. The sample for the NCLB choice group was expanded to include all NCLB transfer students who had spring 2007 FCAT scores and who elected to attend a choice school beginning with the 2007-2008 academic year, regardless of where they had attended school previously or whether they had 2008 FCAT scores. The comparison group of eligible non-choosers was expanded to include all Title 1 students in grade 4 through grade 8, and who had 2007 FCAT scores.

With the expansion of the comparison groups from two sets of 103 individually matched, equal sized groups to a relatively small group of NCLB choice students and a much larger group of eligible non-choosers, a pattern of differences between students from the coastal, suburban, Naples area and students from the inland, rural, Immokalee area became more obvious. Students from the Immokalee area constituted over 52% of the district's choice-eligible students (n = 1960), but they represented less than 14% of the 172 transfer students (n = 24) included in the study. Another difference between the students from the two areas was that the mathematics scores of the choice students from Naples were .41 *SD* higher than the corresponding scores of the Immokalee choice students, while the Naples reading scores were .55 *SD* higher. This discrepancy in participation level of students from the two geographic areas and the differences in the mean scores of the choice students from the two separate locations triggered disaggregation of data by geographic area for subsequent analyses.

Findings

After the assumption testing was conducted, the mean scores of choosers versus eligible non-choosers were analyzed using *t*-tests to assess differences between the comparison groups on a district-wide basis, and then for the comparison subgroups from the separate locations of Naples and Immokalee. The results of the *t*-tests indicated small but significant differences in the mean scores of choosers versus eligible non-choosers district-wide, and in the Naples

area, but revealed no significant differences for the Immokalee area comparison groups.

For the district-wide and Naples-area students, MANOVA tests were then conducted to simultaneously assess the two dependent variables of 2007 FCAT mathematics and reading scores, and their relationship to each other as well as their relationship to transfer status, which was the variable of interest. Additional independent variables, including socioeconomic status and ethnicity, were also entered into the analysis to identify any main effects associated with these factors, or any interaction effects between these variables and transfer status with regard to differences in FCAT mathematics and reading scores. The MANOVA tests results were non-significant with regard to all main effects and all possible interaction effects for both the district-wide and Naples-area comparison groups.

Limitations

This comparative analysis of the achievement levels of NCLB choice students and eligible non-choosers did not factor in the score difference typical of ELL students who were new to the country and who consequently tended to score on the lowest levels of the FCAT tests. Students with the lowest levels of English proficiency tended to remain in Title I schools where they were supported with Title I Paraprofessionals who worked as tutors and interpreters to assist

them with the acquisition of academic content as well as acquisition of the English language.

Research Question 3

Research Question 3 addressed the relationship between NCLB school choice with increased ethnic and socioeconomic stratification among schools. McCombs (2007) found in the only identified study specifically assessing the impact of NCLB choice on the ethnic composition of schools, that transfer students were more likely to be White and less likely to be Black. Related literature analyzing the impact of charter school choice on ethnic and socioeconomic stratification of schools was mixed, but charter school research was not as directly relevant for Research Question 3 as for the previous two research questions because charter schools were available to anyone who chose to attend them, while the NCLB option of attending a different traditional public school was available only to students from Title I schools.

While public school districts that received federal funds were required to report the status of all schools with regard to Adequate Yearly Progress, the only schools that were sanctioned with a mandate to provide choice with transportation as a consequence for not meeting AYP goals were the Title I schools. Since Title I schools were, by definition, comprised of a high proportion of economically disadvantaged students, legislation mandating the option for choice with transportation for students to leave only those schools would suggest an increase in socioeconomic stratification to be highly probable. Similarly, since

minority students were disproportionately represented in Title I schools, an increase in ethnic stratification would seem likely.

Research Design

Differences in the ethnic and socioeconomic characteristics of choice students versus eligible non-choosers in kindergarten through eighth grade were examined by using logistic regression to calculate the statistical significance of ethnicity and socioeconomic status as predictors of transfer status, and to identify the odds ratios for the transfer of students from each ethnic and socioeconomic group. The impact of choice on schools was then analyzed by identifying the number and percentage of students from each ethnic and socioeconomic group who attended Title I schools district-wide, by geographic area, and on the individual school level in the 2007-2008 academic year, then adding the NCLB choice students to their numbers, and recalculating the percentages to assess the effect of choice.

Findings

Logistic regression revealed that both ethnicity and socioeconomic status were statistically significant predictors of student transfer status when examined district-wide. Hispanic students, who represented the majority, were used as the reference group with an odds ratio of 1. It was found that White and Multi-racial students were more likely to exercise NCLB choice than were their Hispanic or Black peers. White students were 8.37 times more likely than Hispanics to

transfer, with a 95 % confidence interval of 6.84 to 10.25. Multi-racial students were 5.95 times more likely to transfer than were Hispanic students, with a 95% confidence interval ranging from 4.05 to 8.74. Black students were only 1.06 times more likely than Hispanic students to transfer, with the lower limit of the 95% confidence interval dropping to a negative ratio at .893, and an upper limit of 1.50, indicating that the odds of a Black student transferring were virtually indistinguishable from the odds for an Hispanic student transfer.

When the characteristics of NCLB choice were examined for students in the two distinct geographic areas of Naples and Immokalee, ethnicity was again identified as a statistically significant predictor of transfer status. The odds ratios were again calculated using Hispanic students as the reference group, and the probability of transfer relative to Hispanics decreased in both Naples and Immokalee for all groups except Multi-racial students from Immokalee, as depicted in Table 10. In Naples, the odds ratio for White student transfer remained high but it did decrease to 6.26 times that of Hispanic students, with a tightened 95% confidence interval of 5.04 to 10.25. This decrease reflected the removal of the large group of non-choosing Immokalee Hispanic students from the calculations. Multi-racial students were shown to be 4.71 times more likely to transfer, with confidence interval limits of 3.07 to 7.22. The odds ratio for Black student transfer was very similar to the Hispanic transfer rate, at 1.08 times that of Hispanic transfer, with the lower limits of the confidence interval again

dropping to a negative value at .816 times the likelihood of Hispanic transfer, and the upper limit being 1.44.

For Immokalee area students, the odds ratio for Black student transfer, at 1.04 to 1 was virtually indistinguishable from the Hispanic rate of transfer. The odds ratio for White student transfer was 4.26 to 1, and for Multi-racial students the ratio was 6.95 to 1, when using Hispanics as the reference group. It should be noted that the confidence intervals were quite large, as indicated in Table 10, due to the limited number of transfer students from Immokalee available for analysis.

The analysis of socioeconomic status as a predictor of transfer status indicated that it was statistically significant on a district-wide basis and for Naples students. This was not the case for students from the Immokalee area, where the number of participants did not allow for valid comparisons, since only 68 of the 4,094 eligible students elected to transfer, and only 10 of that group paid full price for school meals. In the Naples area, the odds ratio indicated that a student who did not qualify for free or reduced price lunch was 2.29 times more likely to transfer from a Title I SINI school than a student who qualified for economic assistance. The 95% confidence interval ranged from a lower limit of 1.88 to an upper limit of 2.79.

The school-level descriptive analysis revealed that the impact of NCLB choice varied among Title I SINI schools, with 6 of the 12 Collier County Title I schools accounting for 83% of participation in the program. In addition to

negligible participation in the five Immokalee schools, one school from the Naples area had minimal participation, with less than 2% of students opting out. This school was a new facility that opened for the first time at the start of the 2007-2008 academic year.

The impact on the demographic composition of the six remaining schools was examined to identify changes that occurred due to NCLB choice, and the results were presented graphically in Figures 21 through 27. The changes on the overall demographic composition of the schools were relatively small, with the composite change in socioeconomic status moving only one percentage point, from 79% qualifying for free or reduced-price meals to 80% qualifying.

With regard to ethnicity, there was a consistent pattern of change due to NCLB choice. In all six targeted Title I schools, there was a decrease in the percentage of already under-represented White students and an increase in the over-represented Hispanic population relative to the CCPS district mean for those ethnic groups. The impact on the proportion of Black students varied by school; in four schools, the percentage of Black students increased, while it remained constant in two. The proportion of Multi-racial students remained relatively unchanged.

Another consistent pattern was the direction of change away from the district mean. With regard to socioeconomic status as well as ethnicity, groups that had a smaller proportion of students than the district mean decreased in

representation, while groups with a larger proportion than the district mean increased as a result of NCLB transfers.

Limitations

This analysis was conducted in a Southwest Florida school district where the population of Hispanic students (*42%)* was roughly equivalent to the White student population (43%). The students and schools represented in the study were divided in two separate communities, Naples and Immokalee, which were segregated by geography, demographic characteristics, and rate of participation. The Naples area was characterized by a more ethnically diverse population and the proximity of both Title I SINI schools and non-Title I schools that had met Adequate Yearly Progress goals. This was contrasted with the geographically isolated schools from the Immokalee community where all schools were Title I SINI schools, and where Black and Hispanic students were over-represented, but the proportion of White students ranged from 4% to 6%, which was far below the 43% district mean. The results from this analysis can be presumed to be generalizable only to samples with characteristics similar to those of the students represented in this study.

Conclusions

Publicly funded school choice with transportation was a critical element NCLB legislation aimed at closing the achievement gap for disadvantaged students trapped in underperforming schools that did not achieve their Adequate

Yearly Progress (AYP) goals. As a condition for receiving Title I federal assistance, school districts were required to set aside a portion of their Title I budgets to provide all students from these Schools in Need of Improvement (SINI) with the option of transferring to a different traditional public school or charter school, and with transportation to and from the choice school. The issue of school choice has been fiercely debated, with advocates citing it as a mechanism for exerting the market economy forces required to improve schools and student performance, while opponents have decried it as a potentially polarizing influence that would drain resources from the schools and students most in need of them.

This causal comparative analysis was designed to assess the relationship of NCLB choice to the FCAT mathematics and reading achievement of a group of Collier County, Florida choice students to determine whether transferring to a different school was associated with the improved academic outcomes targeted by the legislation. It further compared the characteristics of NCLB choice students and eligible non-choosers to identify any differences in academic ability, ethnicity, and socioeconomic status, and then explored the effect of these differences on the demographic composition of individual schools.

Choice and Academic Achievement

For the analysis of achievement gains, NCLB transfer students were matched with students who had similar demographic characteristics and who remained in the assigned schools. The study indicated no significant differences

in the mathematics or reading achievement scores of the targeted students based on their transfer status after a single year in a choice school when compared to those of similar students who remained in their zoned Title I schools. NCLB choice was not, therefore, found to embody the immediate remedy advocated by some proponents of choice who have promoted it as a panacea for closing the achievement gap that has been persistently associated with disadvantaged students in underperforming schools.

Neither did this study corroborate the fears of choice opponents that it would result in skimming that drew the most able students away from Title I schools, as no significant difference was found in the academic ability levels of choice students, quantified by their test scores in the year before opting out of their SINI schools, when compared with the test scores of eligible non-choosers during the same time period.

Choice and Student Demographic Characteristics

This study did indicate, though, that NCLB choice was associated with changes in the ethnic and socioeconomic composition of Title I schools. In the Naples area, the odds ratio predicting the transfer of a White student was found to be at least 5.4 to 7.8 times higher than the odds ratio for the transfer of an Hispanic student. With regard to socioeconomic status, the odds ratio indicated that a student who did not qualify for free or reduced-price lunch was 1.88 to 2.79 times more likely to transfer than a student who did qualify for economic assistance. In the six schools that accounted for almost 85% of Collier County

NCLB choice, this translated into incremental changes that boosted the percentage of students in Title I schools who qualified for free or reduced-price lunch by, in most cases, a single percentage point.

The impact on ethnic composition was slightly more pronounced, with the proportion of White students decreasing from 2% to 5%, while the enrollment of Hispanic students showed a corresponding increase. This increase in the proportion of Hispanic students in Title I SINI schools occurred despite the fact that, in terms of raw numbers, more Hispanic students participated in choice than did members of any other ethnic group. This suggested greater representation of Hispanic students in non-Title I schools where they may have been under-represented relative to their district mean of 42%. However, the net impact on the Title I schools targeted for this analysis, was a change away from the district mean in every instance, with under-represented groups losing ground while the proportion of over-represented groups increased.

NCLB Implementation Issues

The difference in the odds ratios predicting transfer status for the various ethnic and socioeconomic groups, combined with the process of identifying transfer students for comparison groups highlighted an aspect of NCLB choice implementation that appeared to be in conflict with intent of the legislation and in conflict with the intended uses for Title I funds. Many students in the school district's NCLB choice database were identified as students who had never attended a Title I school, who had relatively high FCAT achievement scores, and

whose families did not qualify for free or reduced-price meals. These students were eligible for publicly funded NCLB choice primarily due to rezoning or because of a change from the elementary school level to middle school. However, since the purpose of this study was to examine the relationship of NCLB choice with the achievement of disadvantaged students from Title I schools, and because these students did not meet any of the identified criteria, they were deselected from the choice comparison group.

McCombs, in her 2007 study of NCLB choice also noted the participation of high-performing students in the program even though they had never attended Title I schools. Therefore, in the district McCombs studied, as well as in the CCPS district, Title I funds intended to support disadvantaged students were being used, and were *required* to be used, to transport high-achieving, non-disadvantaged students to their schools of choice.

Money was not, however, the only cost associated with transportation. The notable difference in the participation rate of students based on the geographic area of their assigned schools in the rural, relatively isolated community of Immokalee versus the participation rate in the Naples area suggested that the NCLB emphasis on providing transportation for choice was an important component of a successful choice program. Students from the 6 Title I elementary schools in Naples had 18 other schools from which to choose in their community, while middle school students had 8 other options. By contrast, Immokalee students resided in a community where poverty was widespread,

every school qualified for Title I assistance, and transferring to a non-Title I school required a significant investment of travel time that may have contributed to their decreased participation in the school choice program.

Implications for Policy

This study did not find a statistically significant relationship between NCLB choice and academic achievement, which called into question the use of school choice as a strategy for improving student achievement, and indicated the need for additional studies to provide clarification on this issue. Because of the problems inherent in identifying, within a single school district, the number of transfer students required to support statistically significant research findings on choice and achievement, a large-scale, broadly generalizable assessment of the impact of NCLB choice was not possible. This indicated, from a policy standpoint, the need for an evaluation system to quantify any correlation between NCLB choice and student performance. One component required for the establishment of such a system would be the addition to all state-wide reporting systems of data fields indicating students' transfer status to facilitate disaggregation of their achievement scores. Since school choice was touted in the promotion of NCLB literature as one of the four pillars of targeted school reform efforts, a plan for assessing the effectiveness of the strategy seemed to the researcher to be past due.

While this study did not indicate a statistically significant relationship between student achievement and school choice, it did reveal a trend that

supported an increase in ethnic and socioeconomic stratification in the Title I schools due to NCLB school choice. Because Title I schools, which were the only ones subjected to sanctions mandating choice as a consequence for failure to meet AYP goals, and because these schools were, by definition, comprised of a high proportion of economically disadvantaged students, this trend would have occurred unless the most prosperous students from Title I schools tended to remain while the least prosperous tended to transfer out. As found in this study, the opposite occurred.

The salient question with regard to policy involved assessing the value to society of an ethnically and socioeconomically diverse public school system. A positive relationship between school choice and academic achievement was not supported by this study, but even if such a positive relationship were to be established, the resulting benefits would still need to be weighed against the consequences of ethnic and socioeconomic stratification in the county's poorest schools.

On a more immediate level, the implications of siphoning Title I funds from disadvantaged students to provide transportation for school choice to high-achieving students, as was found in the process of identifying participants for this study, suggested a misuse of federal money that was directly at odds with the intended purpose of providing support to struggling and disadvantaged students.

Another implication for policy suggested by this study was the need to recognize the investment of time required for students in some communities to

access choice schools. The disparate levels of choice participation for students from Collier County's two distinctly different communities suggested that funding for transportation alone did not provide access to choice schools, but that proximity of alternative schools was an additional requirement for a successful choice program. If, hypothetically, school choice were to be associated with increases in student achievement, alternative strategies would still be required for subgroups of students in areas without reasonably close access to schools of choice, as could be found in rural areas similar to Immokalee, or densely populated urban areas with few available seats in schools that met AYP goals.

Recommendations for Future Research

More research is required to establish the relationship of school choice to the academic achievement of the students targeted by NCLB legislation for increased academic achievement. While NCLB choice was not found in this study to be significantly related to higher achievement gains, the results of this study, and the processes involved in conducting it suggested opportunities for future research that could add to the limited body of knowledge on NCLB choice and its relationship to student achievement as well as its impact on Title I schools and the students who remained in those schools. Some recommendations were:

1. Repeat the study in other areas of Florida and in other states.
2. Compare the trajectories of achievement score gains made by NCLB transfer students over multiple years with the trajectories of gains

made by those same students during the years they attended zoned Title I schools.

3. Compare the trajectories of achievement score gains of NCLB transfer students with the trajectories of gains made by students who had matching demographic characteristics and who remained in the zoned Title I schools.
4. Analyze the cumulative impact of NCLB choice on the demographic composition of Title I schools, tracking the effects on the relative proportion of students from each ethnic and socioeconomic group over successive years.
5. Conduct a qualitative analysis to explore the reasons that motivate families to participate in NCLB choice or to remain in their zoned Title I schools.
6. Examine the number and percentage of publicly funded NCLB choice participants who are: (a) high-achieving students (b) not economically disadvantaged, and (c) have not attended a Title I school.
7. Analyze the cost of providing transportation to high-achieving students who are not economically disadvantaged and who have not attended a Title I school.
8. Analyze the relationship between participation in NCLB school choice programs and the proximity of schools not designated as SINI schools.

9. Research the movement of students to and from Title I schools and schools of choice to assess retention in choice schools.
10. Explore the reasons Title I students return from their choice schools to their zoned schools.
11. Examine the relationship of NCLB choice with other indicators of student performance, including factors such as number of discipline referrals, attendance rate, and grade point average.

APPENDIX: LETTER OF APPROVAL FROM COLLIER COUNTY PUBLIC SCHOOL DISTRICT

OFFICE OF PLANNING AND ACCOUNTABILITY/STAFFDEVELOPMENT
5775 Osceola Trail
Naples, FL 34109-0919
(239) 377-0018
(239) 377-0006 FAX

Dear Ms. Kirkland,

We are pleased to inform you that your request to conduct the research outlined in your proposal entitled "No Child Left Behind School Choice and Student Performance Of Collier County Fourth Grade Through Eighth Grade Students" has been approved.

We do hope we that any publications or presentations derived from this presentation will be shared with Collier County Public Schools. Please do not hesitate to contact me with any questions or concerns about this research at 239 377 0017 or via e-mail at shaynevi@collier.k12.fl.us. Please inform the Committee of any changes in your study.

We wish you the very best in your research efforts. Thank you.

Sincerely

Vivian Shayne, Ph.D.

Vivian Shayne, Ph.D.
Coordinator of Program Evaluation
Collier County Public Schools
5775 Osceola Trail
Naples, FL 34109

cc.: Joe Abalos, Ph.D.
Dale Johnson
Debbie Terry
Dee Whinnery, Ph.D.
Rozalyne Wright, Ph.D.

APPENDIX: NEW YORK TIMES ADVERTISEMENT

Charter School Evaluation Reported by *The New York Times* Fails to Meet Professional Standards

We, the undersigned members of the research community, are dismayed by the prominent, largely uncritical coverage given by *The New York Times* to a study of charter schools by the American Federation of Teachers (AFT). According to the paper's lead news story on August 17, the analysis shows "charter school students often doing worse than comparable students in regular public schools."

The study in question does not meet current professional research standards. As a result, it tells us nothing about whether charter schools are succeeding. The following considerations are key:

- **Data Quality.** The study is based on data from the 2003 National Assessment of Educational Progress (NAEP). Often referred to as the Nation's Report Card, NAEP provides a valuable snapshot of student performance nationwide at a single point in time. But since only limited family background information is currently available for the 2003 NAEP, the study does not provide reliable information on the effectiveness of any particular type of school.

- **Only One Set of Test Scores.** Because only one year of information is available for charter schools from NAEP, the study provides test scores for only one point in time. But without better background information, accurately measuring school effectiveness requires information on student performance from at least two points in time.

- **Limited Background Information.** Because of limited NAEP information on family background, the study does not take into account such key characteristics of students known to affect their performance as parental education, household income, and the quality of learning resources in the home.

- **Unsophisticated Analysis.** When analyzing charter schools' effects on student performance, the study considers differences in only one family background characteristic at a time. To obtain accurate estimates, all available background characteristics must be considered simultaneously.

- **What NAEP *Can* Tell Us.** NAEP data do show that charter schools tend to serve a relatively disadvantaged population. As compared with traditional public schools, a higher proportion of students in charter schools are eligible for the federal free or reduced-price lunch program, are from minority backgrounds, and attend a school located in a central city.

- **Journalistic Responsibility.** The news media has an obligation to assess carefully any research sponsored by interest groups engaged in policy debates. Such studies need to be vetted by independent scholars, as is commonly done in coverage of research on the biological and physical sciences.

- **Further Research.** To date, we lack definitive evidence on the effectiveness of charter schools, in part because they are so new and so varied. Fortunately, higher-quality research on charter schools is already underway. Still more needs to be done before jumping to conclusions about the merits of one of the nation's most prominent education reform strategies.

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